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Interpreting Cultural and Sociopolitical Landscapes in the Upper Piura Valley, Far North Coast of Perú (1100 B.C.- A.D. 1532)

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INTERPRETING CULTURAL AND SOCIOPOLITICAL LANDSCAPES IN THE UPPER PIURA VALLEY, FAR NORTH COAST OF PERU (1100 B.C.- A.D. 1532)

By

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AN ABSTRACT OF THE DISSERTATION OF

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This dissertation is a diachronic settlement and landscape study undertaken from an interpretive archaeology perspective. The outcome of this study has been an interpretation of the settlement and landscape configurations as well as of the sociopolitical organization during the entire prehispanic occupation (ca. 1100 B.C.- A.D. 1532) of the Upper Piura River Valley in the Far North Coast of Perú. Also, the sociopolitical interaction between the local polities of the Upper Piura River Valley and the southern foreign Northern North Coast polities has been assessed.

The Far North Coast is not an environmentally “marginal” area as compared to the Northern North Coast. Yet, in terms of its prehispanic cultural development, it often has been characterized as “marginal” or “peripheral”. Such characterization is due in part to an overemphasis on the study of Mochica style cultural materials found in the Far North Coast. In particular, the emphasis on analyses of “high quality” Mochica ceramics has led to interpretations that view local Upper Piura River Valley sociopolitical developments from the perspective of the “dominant” Northern North Coast societies in an unbalanced situation disregarding the perspective of the supposedly “weaker, less developed” local societies.

In this sense, interpretations drawn from iconographic and stylistic analyses of objects on the one hand, and from landscape analyses on the other, seem like two

different versions of the same story. Since the latter is so uncommon and unexplored in Andean archaeology, I chose to apply it in this dissertation. For that purpose I followed two different but complementary paths of interpretation. The first path is an interpretation of the landscape from a dwelling perspective. The goal was to create an analogy of the experience of past individuals through an embodiment process via the movement of my body and mind through the landscape features.

A second path of interpretation was merged with the first one. This second path comprised a classic settlement pattern analysis oriented to clarify the nature of the sociopolitical interaction between local polities of the Upper Piura River Valley and the intrusive polities of the Northern North Coast. The second path of interpretation also entailed overlapping the settlement patterns observed onto the spatial structures and topograms defined and interpreted by the dwelling perspective.

As a result, I found that the study area is characterized by a 2600-year long process of dwelling in the landscape. Through this process and along the years, yet following a long, local process, revolving around the topograms, the landscapes conceptualizations and configurations changed. Two moments of the settlements and landscapes configurations were defined: the "old system" and the "new system". For most of its history (through all the "old system" and the first epoch of the "new system"), and acknowledging the mutual cultural influence with other areas (e.g., the Northern North Coast), the local landscape and settlement configurations were not disrupted and engaged in an egalitarian or coevolving sociopolitical interaction. Yet during the second epoch of the "new system", this situation changed drastically when a hierarchical and coercive interaction structure developed during the Chimú and Inca periods.

DEDICATION

To Cristina, because knowing her proved to me that strolling through the streets in full daylight with a lamp is indeed not a foolish thing to do.

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CHAPTER 1

INTRODUCTION

> The limits of my property extend from that part to that other one, and then to that area over there. We have been increasing our *fundo* area little by little, buying land from small landowners. Actually, those two distinct yellow patches that you see over there are now completely surrounded by our *fundo* borders. We expect soon, if we can convince the owner, to buy them too (February 7th, 2003).

Control of the landscape by sight line has been and continues to be a main motivating force in landscape organization and control in the Upper Piura Valley. The quote above is a reconstructed dialogue I had with one of the few well-off, large-scale landowners devoted to the agro-exportation of mangoes and avocados in the Upper Piura Valley. We had this conversation on top of Cerro Santo Tomé (or U199S1), one of the hilltop archaeological sites recorded during our surface survey. In fact, we arrived at U199S1 on a sunny morning of February 7th, 2003, a hot summer, and the owner, at first reluctant to allow us to get onto his property,[1] guided and climbed with us to the site together with “Ugo”, his chocolate Labrador. After a few words including the dialogue above, he left us to our recording.

The significance of the owner’s comments is that they reflect a behavior operated and motivated from a landscape perspective (sight) offered from the summit of the Cerro Santo Tomé where U199S1 is located. Moreover, it is significant because, as explained in this dissertation, it is very likely this kind of hilltop site (from the Chimú period) served similar purposes of territory and land use (and perhaps irrigation too) organization, distribution, and control.

This conversation with the owner of *fundo* Santo Tomé recalled a previous encounter at the beginning of the surface survey. The surveying crew, with maps and GPS in hand, was walking toward one of the possible sites when a very old farmer passed by waving his hand in salutation while riding his *carreta*[2]. This man, probably in his seventies or even younger, but with the harshness of the farmland life reflected on his wrinkled face, was not an uncommon sight observed daily during our survey. Hundreds of similar impoverished farmers, men and women, small landowners (*parceleros*) or landless people, were observed daily during our work. Most of the time, they were walking alone or in small groups. A question came quickly to mind; why, during the contemporary period, were a high frequency of seniors engaged in harsh agricultural tasks? Obviously, one possible answer was that all their lives they have been so attached to the land that they were accustomed to the work. Still, it seemed that there were other reasons that prompted them to still undertake these tasks rather than living a more relaxed, calm life as their age (and physical and health conditions) deserve.

Part of the answer came when we exchanged a few words with this old man we encountered on our way to one of the sites. It happened that one of the waypoints we had in the GPS led to an area located on his property. So, we found him again minutes later and approached him to explain what we were doing there. He was lying on his back, with his tattered clothing, underneath his *carreta* trying to fix it with movements of his trembling hands clearly affected by Parkinson disease. His cultivation plot looked as if it was in fallow or had been abandoned for a long time and very little area was under cultivation.

It was then that I learned from him that security was the main reason he came everyday from Chulucanas, the major town in the area and where his permanent home was located, to watch over his plot. Like him, other old farmers were doing the same and in some cases they were permanently relocating from Chulucanas or other *caseríos* (small villages) back to their cultivation plots. In fact, due to *parceleros* families increasing impoverishment, their children do not want to devote their lives to the farmland anymore and prefer to study and look for work in the city either in Piura, the capital city of the Piura region, or elsewhere in Perú. Also, due to this same economic situation theft rates have increased with thieves coming from Chulucanas to steal the crops.

From my experience the bottom line is that, either for security reasons or just to assert land ownership symbolically (even though plots are almost abandoned due to the farmers' old age and economic conditions) against current trends of land amassment by modern landlords, some inhabitants were returning to live next to their cultivation plots. The most significant fact is that this response to current socioeconomic conditions configures another factor of landscape dynamics. Indeed, as part of their decision-making process, these agents opt to (re)settle within the cultivation plots on somewhat elevated areas less prone to flooding during the regular rainy season or even during the abnormal heavy precipitation of the El Niño Southern Oscillation (ENSO) phenomenon. These elevated areas are, almost 100 percent of the times, the archaeological sites that are part of the prehispanic settlements.

These witnessed observations take us to our third and final story featured by *Don* Augusto Villalta. *Don* Augusto, in his late fifties, is also a small landowner and non-mechanized farmer but a bit more well-off than other *parceleros* but also working his plot without the help of his brood. He basically tends mangos trees and then sells the produce to a third party that distributes the produce into the national market. Although he has a shack on a low elevated mound within his plot, he does not live there. It is used only as a storage facility for items related to farm work or for an occasional overnight stay. He does not live in Chulucanas either. He lives in Balcones de Talandracas, a small *caserío* within the district of Chulucanas located on the elevated Andes piedmont, a 30-40 minute walking distance to his cultivation plot on the valley floor. He walks daily to work in his plot herding a handful of cattle and a couple of donkeys that he puts in a small corral constructed on top of the mound where he feeds the animals[3]. This mound is one of the sites excavated as part of my dissertation work. U15S6 (a.k.a. Loma Villalta) is a low extended earthen mound similar to those found on the valley floor. Also similar to other earthen mounds, it has suffered a series of modifications done throughout its history, partially plowed to expand the cultivation area and with a sink excavated by *Don* Augusto to collect water for his livestock and beasts of burden.

The three stories I present above reflect in part the theoretical approach developed in this dissertation. Certainly, the stories above happen in the present. Yet, it is precisely the insight gained through a reflexive exercise back and forth between the present and the past that has been critical in informing the interpretations presented in this dissertation.

I understand that a division between the concepts of a processual and a post-processual archaeology can be advantageous for the historiography of the discipline. I believe such a division is nonetheless irrelevant when dealing with the archaeological practice itself. Pigeonholing research agendas into these broader conceptual frames reflects a narrow-minded attitude that contributes negatively to understanding complex issues such as the human being and the nature of existence and subsistence. This unfruitful division between processual and post-processual archaeology is also encompassed within a broader separation: that between humanism and the natural sciences as different and irreconcilable paths of understanding. Fortunately, I am not alone in this soliloquy. In fact, recognition of the necessity of such intellectual complementary has come both from the natural sciences (Gould 2003) and the humanities and social sciences, the latter claiming to challenge the nature of a pure modern, value-free, objective scientific archaeology inheritor of the Enlightenment and calling for its redefinition incorporating its ethical, multi-vocal, and rhetorical aspects (Thomas 2004a).

Thus, why not draw together theoretical and methodological aspects from both processual and post-processual archaeology when considering that both have more in common, methodologically and theoretically, than we are often taught to expect? (e.g., Tschauner 1996; Wylie 2000). Interpretive archaeology, another tag within the discipline, can be a means through which this seemingly epistemological dichotomy in the archaeological discipline could be resolved or at least reconciled. True, interpretive archaeology is another label for post-processual archaeology that has brought in hermeneutics as a component of understanding the past. Two or three decades ago mentioning the words "interpretive" or "hermeneutics" would be considered blasphemy among many North American archaeologists, at least. Yet, in the late 1980s and early 1990s the world and modern western thinking became more plural and counterintuitive. It is not a surprise then that since the early 1990s on, processual and post-processual archaeologists started to find some common grounds. In fact, as Wylie (2000:149-154) argues even Binford (1989) himself may have found some points of convergence with post-processualist theorists such as Shanks and Tilley (1989) with both renouncing epistemic absolutes when they argue for a "mitigated" objectivism and a "relative" objectivity respectively, or when Binford coincides with the pluralism advocated by post-modern theorists and acknowledges the importance of shifting theoretical frameworks looking at external, multiple frames of references.

Certainly, unlike their more theoretically homogeneous processual counterparts, post-processualists sport opinions and approaches that vary, if an analogy is pertinent here, from skinheads to dreadlock hairdos (to be in accordance with our times). This variance is reflected, for instance, in several publications including various papers on interpretive archaeology (e.g., Hodder 1991; Hodder, et al. 1995; Thomas 2000; Tilley 1993a) or in the awakening and strengthening of material culture studies as an interdisciplinary field of study in its own right (e.g., Tilley, et al. 2006).

Perhaps the main point of disagreement in interpretive archaeology is the issue of meaning. On the one hand there are positions that argue for the existence of some meaning inherent in past material culture that can be objectively apprehended, and on the other, it is claimed an impossibility to find this inherent meaning with our interpretations thus only possible through our present experience of the world and reflecting then on the past (e.g., Hodder 1991; Hodder, et al. 1995; Thomas 2004a; Tilley 1993b).

In spite of these differences there is a general agreement on the defining aspects on which interpretive archaeology should be grounded and on what should be its role in the present. In fact, as Hodder (1991:13-16) argues, this diversified approach should integrate, through mutual and permanent interaction, its three main components: processual archaeology, hermeneutics, and critique. This means that: 1) some aspects and contexts from the past could be objectively apprehended through rigorous methodological processes inherited from processual archaeology; 2) they should be interpreted looking at the possible past meanings, historical processes, and individual and social actions that were repeated through time and thus patterned; and 3) archaeologists should be aware of the historical, social, and political context in which knowledge about the past is created, should be conscious of the discourse being created while interpreting, and should acknowledge the audience(s) whom they address when writing.

These three main components of interpretive archaeology are, in turn, intricately related with a relatively recent phenomenon: the appropriation and manipulation of cultural heritage by local and indigenous populations. The role of the archaeologists is of an interpreter and translator between the past and the present. As Hodder states (1991:14-15), the stories that archaeologists create must have a rhetoric that facilitates (and mediates) a dialogue between them (and the knowledge they create) and other voices that have their own perspective, reflection, and expectations on their cultural heritage. This fact is now evident in many parts of the world. For instance, when nationalism is fading or has faded away from western European countries, nationalism and other local and regional ethnic identity movements have increased among indigenous and other socially and politically less favored social groups in other parts of the world. Through these movements social identities are being appropriated and manipulated for several reasons, self-assurance and self-defense against global corporative interests (e.g., oil and mining exploitation) being one of them (e.g., Warren and Jackson 2002; Whitten 1996).

This crucial component outlined above is well-known and perceived by archaeologists currently doing fieldwork. In fact, it would not be a far-fetched idea to express that if archaeology as a discipline wants to survive in the near future, it should establish a dialogue and be in attunement with people's perceptions, expectations, and interests on their cultural heritage in the areas where archaeologists work. As some scholars have argued (e.g., Higueras 2000; Wylie 2005), archaeology can no longer be conceived as a self-contained discipline that only values the scientific significance of past material culture; long gone are the times when a satisfactory interaction between an archaeological project and local communities entailed just hiring local labor for digging, renting a house in the community, or buying food from the local market (however cf. Flannery 2006). This current conceptualization of archaeology has to be understood within the context of major changes that occurred in the early 1990s both within anthropology and other academic disciplines. These changes entailed, among other things, transformations in the politcs of anthropological knowledge that led to the critique of the old-style, modernist "objectivism". Causes and expressions of these changes are, for instance, the manipulation and appropriation of the Native American identity by Native American groups on the one hand, and by western, American archaeologists on the other (e.g., McGuire 1992), and reflected in the debate the revolved around the enactment of NAGPRA. Among other causes and expressions of these changes are also the increasing literacy rates among younger generations of indigenous peoples, the appropriation and renegotiation of local (not necessarily) indigenous social identities, the end of the Cold War, and the establishment of a bipolar global power structure (e.g., Hill 1992).

Our role, to avoid pseudoscientific opportunists, is then to establish this dialogue showing the data on which our interpretations are grounded, and to be conscious and open to the existence of other possible interpretations as drawn from this dialogue. The need to proceed in this manner becomes much more evident when, as in the case of my research project, investigators establish a constant and daily interaction with local people who perceive, live, act, and transform the same natural, social, and cultural landscapes on which they are performing their research. This is one of the reasons why I felt compelled and took it as my responsibility to, for instance, respond positively to invitations to talk about cultural heritage as part of celebrations on local identities (Montenegro Cabrejo 2003).

The significance of cultural heritage for local and indigenous populations thus plays a crucial role in any attempt to do an interpretive archaeology. It is particularly important in cases such as my study area where archaeological sites are found amid latent social tensions originated in land tenure problems. These socioeconomic problems combined with a lack of protection policies for cultural heritage by the Peruvian state jeopardize the future of local cultural resources. Therefore, inasmuch as local people have some sort of identification with their cultural and social landscape, archaeologists, following a central principle in archaeological ethics such as stewardship should become "…both caretakers of and advocates for the archaeological record for the benefit of all people;…" (Society for American Archaeology 1996:1-2). I believe it is in this context that the stories presented at the beginning of this introduction should be understood.

For me these stories also reflect another of the theoretical approaches used in this dissertation. In fact, part of the interpretations presented in this dissertation rest on a hermeneutic exercise based on a phenomenology of the landscape. Indeed, the paths walked, bodily actions, hills surmounted, sights from different perspectives, sounds, smells, conversations, etc., all constitute a relational universe that helped me to achieve an understanding and interpretation of the landscape while on the move. This active engagement between self and the world makes the agent who perceives a *being-in-the world,* a concept drawn from philosopher Martin Heidegger (1975) and used by Tim Ingold (2000) to define his dwelling perspective. Through this view it is also possible to recognize the temporality of the landscape which is the recognition of past existence of seasonal rhythmic cycles that past lives and works have left on the landscapes they inhabited. Traces of these lives and works are spread throughout landscapes and can be detected and interpreted archaeologically. If another analogy is pertinent here, the landscape and temporality of the landscape are akin to music written by composers. Musicians may be dead but nevertheless they have left their work (scores/landscape features) that can be interpreted many times and in various different ways.

The phenomenological perspective mentioned above may help to evoke past human engagements with their surroundings through the experience and embodiment of (ancient) landscapes. We have to recognize we are constrained and limited from our position in the present. Yet, being conscious of this limitation and from our contingent position in the present we can engage with the past; we may not be able to grasp all the forms in which these ancient landscapes were understood but certainly can approach them (Thomas 2001; 2004b).

Obviously, and following one of the components of interpretive archaeology described above, this hermeneutic exercise does not mean that any idea could be freely thrown in as possible interpretation. The interpretation(s) thus should also be grounded in data recorded in the field as has been done in the processual settlement pattern study that was also carried out in this dissertation research. This is one of the reasons why settlement pattern and landscape archaeology is a common ground where processual and post-processual approaches can meet and complement each other (Sabloff and Ashmore 2001:24). Moreover, it is precisely time and landscape that are the topics that bring closely together archaeology and sociocultural anthropology (Ingold 2000:189).

In sum and at the risk of being told that what I write is mere “fruity humanistic drivel” (see Flannery 2006), the lines above reflect the theoretical approach of this dissertation. It also reflects (and honors) my graduate training within a four-field department of anthropology that as an institution still conceives, I believe, human beings as total entities.

This dissertation is a regional study and a settlement and landscape study in the Upper Piura Valley on the Peruvian Far North Coast. Using the phenomenological description and interpretation of the landscape as a canvas I draw a picture and tell a story (or stories) about the prehispanic human occupation in the study area based on the data systematically recovered in the field. In general, I look at the spatial organization in the study area from the Early Horizon period (ca. 1100 B.C.) to the end of the Late Horizon period (A.D. 1532). Yet, I emphasize the Early Intermediate period to the beginning of the Late Intermediate period (ca. A.D. 300-1100). During this time span, local polities came into contact with two hypothesized powerful foreign states (Mochica –a.k.a Moche- and Sicán –a.k.a. Lambayeque) whose core area is located on the Northern North Coast area south of the Upper Piura Valley. My dissertation research has sought to determine if these states exerted social and political influence on the Upper Piura Valley local polities and how this influence (or lack thereof) is reflected on spatial and settlement organization at the regional level.

Ultimately, I am trying to interpret the nature of cultural contact and interaction between two costal areas that some scholars perceive as "core" (the Mochica and Sicán on the Northern North Coast) and "periphery" (local social groups from the Far North Coast). More specifically, I have posed two main research questions: 1) what were the sociopolitical and economic factors and strategies that shaped the organization of local polities as reflected on their settlement patterns?; and 2) what were the strategies and purposes of the Mochica and Sicán occupations and their impact on local polities as reflected in site location, density and settlement organization? To interpret the nature of this sociopolitical interaction two possible scenarios (each with its possible archaeological correlates) have been entertained: a coercive interaction or rather a more peaceful and negotiated solution.

This dissertation is presented in eight chapters. Chapters 2 and 3 present a geographical and historical account that sets this dissertation within a broader context and that will aid in contextualizing the analyses and interpretations presented throughout the text. Chapter 2 presents a characterization of the geographical and environmental characteristics of the Peruvian North Coast in general as well as those features that differentiate the Far North Coast from the Northern North Coast. It also underscores the relationship between some of these features and some cultural adaptive forms. Chapter 3 is a brief historiography of research done on the Far North Coast. It contends that, in general, the direction of research has been mostly marked by other non-academic interests and thus its simplistic characterization as a "peripheral" area. I also argue this situation can be explained by an element that I call the "Mochica Factor". Also on the basis of a literature review, the second part of this chapter presents a characterization of local polities, and explanations of the presence of "core polities" of the Northern North Coast in the Upper Piura Valley and other "peripheral" areas of the North Coast.

Chapter 4 develops the theoretical framework on regional and landscape studies as conceived in this dissertation. The discussion emphasizes the mind-body dichotomy that has pervaded landscape studies and how it could be resolved through the notion of dwelling perspective as argued by Ingold. Chapter 5 deals more directly with the methodological approaches to the dwelling perspective as applied to this dissertation research. Also it relates this topic on landscape with the other major concern of this dissertation: the sociopolitical interaction of the local social groups from the Upper Piura Valley with the Mochica and Sicán Northern North Coast polities. The research questions are presented as well as the hypothesized interaction scenarios and their associated expected archaeological correlates.

Chapter 6 covers the description of research methods used in this dissertation and explains the criteria used for the classification of sites and settlements. It also gives information on site preservation which is a product of the temporal and dynamic nature of the landscape. This chapter sets the groundwork for presenting the analysis results on settlement patterns in Chapter 7. In addition, in Chapter 7 I also describe the spatial structure of the study area prior to the presentation of the analysis. The latter is an important preliminary step as it composes the view of the researcher on the landscape as part of the dwelling perspective that in turn serves as the canvas on which the settlement pattern data are presented.

Finally, Chapter 8 discusses the impact (or lack thereof) the hypothesized intrusive Mochica and Sicán polities from the Northern North Coast might (or might not) have caused on the organization of the local settlement systems. This chapter ends offering some general conclusions of this dissertation.

Notes-Chapter 1

[1] The *fundo* Santo Tomé contains at least one more site (U199S2). The owner has built a house for his temporal stayings at the *fundo* partially on top of the latter. This type of activity contradicts current Peruvian cultural heritage laws that are supposed to be enforced by the Instituto Nacional de Cultura (INC- National Institute of Culture). The owner at first thought we were INC employees and thus his initial reluctance. This kind of problem is very common throughout the study area in the Upper Piura and in Perú in

general. Site preservation is affected by this kind of problems (see section 6.5 in Chapter 6).

[2] *Carreta* is a two-wheeled farm cart usually drawn by a donkey or mule. Its low-tech manufacture (welded iron bars as frame, two large truck tires and wooden planks) does not hinder its efficiency. It is very suitable for the unpaved and sandy dirt roads of the study area. It is used by *parceleros* as a means of transportation especially for carrying loads of items related to their agricultural activities and overall daily life. The *carreta* is definitely a conspicuous element of the landscape in the study area.

[3] In 2005 while doing lab work in Piura the capital city in the Piura region, I went to Balcones on a Sunday morning taking with me a copy of the topographic map of Loma Villalta long promised to *Don* Augusto. I did not find him at home. I chatted away with his wife for awhile and she told me he was at his plot. It was unfortunate to learn from her that some time ago while chopping wood in his plot, a chip entered one of *Don* Augusto's eyes making him blind almost completely in that eye.

CHAPTER 2

ENVIRONMENTAL SETTING

The purpose of this chapter is to describe and characterize similarities and differences between the Peruvian Northern North Coast and the Far North Coast and their human-nature interaction implications. This physical environmental characterization serves as a background to present the study area on which landscape observations were taken. Finally, it hopes to demonstrate that, in terms of environment, the Far North Coast is not a "peripheral" area as has been characterized from a (prehispanic) cultural point of view. In fact, objectifying the Far North Coast as "peripheral" (environmentally or otherwise) has negatively affected archaeological research on this area as will also argued in Chapter 3.

This chapter shows that geological, atmospheric, and oceanic factors are key elements in shaping the climatic conditions of the Peruvian coast. Likewise, this chapter shows that factors that differentiate the Northern North Coast from the Far North Coast are the Andean cordillera configuration, its distance from the ocean, the valley systems and alluvial fan formation, and the effects of intrusion of equatorial tropical waters and atmospheric moisture from the north and east.

2.1 The Andean Landscape and the Peruvian Far North Coast

The Central Andean territory is characterized by complex and high social, cultural, and environmental contrasts. Since the Spanish conquest in A.D. 1532, however, description of the human-nature interaction and its settings in the Central Andes (especially in territory of modern Perú) was simplified and portrayed as comprised of only three areas: coast (*la costa*), highlands (*la sierra*), and the jungle (*la selva o montaña*). Obviously, such a depiction stemmed from Europeans' own first experience with the Andean social and natural landscape later reinforced by administrative and bureaucratic colonial interests, and perpetuated throughout much of Peruvian history.

Even though some of the early, mid and late colonial documents can be considered as pioneering ethnographic research (Salomon 1985) on Andean social and political organization, language, culture, and religion, Andean ecology was not well explained or understood. This knowledge started to accumulate with the appearance of the first travelers and researchers in the mid and late eighteenth century (e.g., Juan and de Ulloa 1978[1748]) through the nineteenth and early twentieth centuries (e.g., Brüning 1989[1922]; Herrera 1942; Humboldt 1816; 1991[1802]; Martínez de Compañón y Bujanda 1978-1991 [1782-1788]; Middendorf 1893-1895; Raimondi 1874; Vásquez de Espinoza 1969 [1629]; Weberbauer 1921; 1935; Yacovleff and Herrera 1934-35a; 1934-35b). The tripartite, simplified *costa*, *sierra* and *selva* scheme was refined from the 1940s on the basis of biological data and information gathered and synthesized from previous centuries and decades. Based on this knowledge, a more varied and nuanced picture of Peruvian ecological landscapes started to emerge following modern pioneering studies by C. Troll (1937; 1968). Definitions such as life zones (*zonas de vida,* (Oficina Nacional de Evaluación de Recursos Naturales 1976; Tosi 1960), eight natural regions (*ocho regiones naturales,* (Pulgar Vidal 1941; 1987), and ecological regions (*eco-regiones,* (Brack Egg 1986a; 1986c) started to be formulated and discussed.

Similar awareness of the complexity and diversity of the Central Andes was also perceived in early cultural studies since early twentieth century and followed a somewhat similar developmental path. Alfred Kroeber (1927:650-653) was perhaps the first to suggest that stylistic and cultural interpretations of Andean material culture have to go beyond description and analysis of its intrinsic material characteristics, inserting these stylistic and cultural interpretations into their environmental context. In fact his early perceptions of significant differences between the northern and southern halves of the Peruvian north coast underlie its current bipartition (Kroeber 1930). This awareness further expanded after the publication of the *Handbook of South American Indians* and the early culture area classification (Steward 1949). Ethnohistorian J.V. Murra's later investigations, inspired by Troll's publications (Murra 1968; 1972; 1975; 1978; 1985a; 1985b), elucidated the intimate linkage between ecological conditions and the extent and activities of the Inca empire. Because of Murra's contributions, Andean human-nature interactions have become a significant component of Andeanists' research agendas. Edited volumes and bibliographies were compiled (e.g., Masuda, et al. 1985; Rice, et al. 1989; Richardson 1977), prehistoric irrigation systems (Farrington 1974) and landscape modification and applied archaeology studies were undertaken (e.g., Denevan, et al. 1987; Erickson and Candler 1989; Treacy 1994), models were proposed and refined (e.g., Salomon 1986; Shimada 1982; Wilson 1999), and comprehensive regional and cultural dynamics embedded in an ecological perspective were presented (Hocquenghem 1998; Shimada 1994).

Yet early culture area classification had its drawbacks that many modern research efforts could not overcome. Some areas were classified as "marginal" and thus were deemed undeserving of our attention. For instance, the Far North Coast was so designated since the early cultural-type (Steward 1949; Steward and Faron 1959), and culture area classifications of South American archaeology. In his major synthesis of Andean archaeology, Willey (1971:87) classified the Far North Coast as one of the 14 subdivisions of the central Andean area characterized as having "an appearance of marginality to the cultural developments immediately to the south". In retrospect, this bias seems to have influenced some researchers' decision to choose study areas especially in the Central Andes. That is, certain areas (e.g., the North Coastal Mochica core area, the Tiwanaku *altiplano*) have received disproportionate attention by modern investigators than other, "marginal" areas.

Such erroneous and prejudiced perceptions may be derived from the geographical and ecological characteristics of the Far North Coast that differentiate it from the Northern North Coast to the south, and the Northern Andes region (especially modern Ecuador) to the north. Thus this area has been perceived as an environmentally and culturally "transitional" zone (e.g., Burger 1984; Hocquenghem 1991; Lanning 1963) between the Northern and the Central Andes.

The remainder of this chapter is devoted to an ecological characterization of the Far North Coast emphasizing and comparing those features that make it distinct from the

Northern North Coast. Also, further characterization of the Upper Piura River valley and the study area are provided.

2.1.1 Location and General Description

Coastal northern regions on the Peruvian territory are found between 4° and 8° south latitude (Figure 1). The Far North Coast is between 4° and 6° south latitude and is comprised of (from north to south) the Tumbes, Chira and Piura River valleys, while the Northern North Coast is located between 6° and 8° south latitude and is comprised of (from north to south) the Olmos, Motupe, La Leche, Lambayeque, Zaña, Jequetepeque, Chicama, Moche, Virú and Chao River valleys (Collin Delavaud 1984). Since this chapter is about the geographical and environmental characteristics of the two areas mentioned above, I thus use the above characterization and separation. Archaeologically, however, either on the basis of the discussion on the sociopolitical organization of the Mochica polity or polities (e.g., Donnan and Castillo 1994), or on the basis of other environmental, linguistic, and cultural criteria (e.g., Kroeber 1930; Shimada 1994), the Northern North Coast is considered from the north bank of the Jequetepeque Valley north to even the Upper Piura River Valley and thus encompassing the Far North Coast. The south part of the Northern North Coast is considered either from the south bank of the Jequetepeque Valley or the north bank of the Chicama Valley south to the north bank of the Moche Valley or even as south as the Casma Valley. Yet throughout this dissertation I follow the geographical and environmental separation between the Far North Coast and the Northern North Coast and not the archaeological one.

Commonly the Peruvian coast is described as a sandy-gravely desert strip of land. It is characterized by a longitudinal alternation of oasis-type, population-harboring green-patched areas watered by fairly steep-gradient river basins originating in the Pacific watershed of the Andes. Also, distinction between the Far North Coast and the Northern North Coast is based on two main physiographic features: 1) the large Sechura Desert that separates both areas, and 2) a very different drainage system. In fact, as noted by Kroeber (1930) river systems from the Lambayeque region to the south have a relatively short course and seem to be comprised of pairs of dual, intervalley-connected irrigation systems. Furthermore, as argued by Schaedel (1951), in each of these dual valley systems, one valley always has both a larger discharge and cultivable area than the other, such as the La Leche-Lambayeque and the Chicama-Moche Valley complexes. On the other hand, the Chira and Piura Valleys that have longer courses before they reach the Pacific Ocean, are further apart, and do not form a similar intervalley system which, together with geomorphological characteristics explained below, make construction of intervalley canals unfeasible.

2.1.2 Geology

The Andes mountain chain is the main physiographic feature that characterizes the Central Andes. It is oriented NW-SE for most of the Peruvian territory, especially between 14° and 6° south latitude. This mountain chain has two major components: the Western and Eastern Cordilleras. These two features are cornerstones of the Central Andes geological morphology whose other components are the Coastal Cordillera, coastal plain and depressions, volcanic chain zones, inter-Andean valleys, the Titicaca

Basin, Sub-Andean Cordillera, Amazon plain, and Shira Mountains (Bellido Bravo 1979; in Iberico 1986:239-242). Dynamic, millions-years old geological processes such as erosion and tectonic plate movement and their effects including volcanism, subduction, and uplifting are continuously shaping this major physiographic feature. Moreover, it is within this gigantic "wall" that separates the Amazon basin from the Pacific watershed where most of the erosion, pluvial, and depositional processes have taken place, which in turn affects similar processes both in the Amazon basin and the coast thus shaping the diverse ecological systems in the Andes.

Geological processes such as those mentioned above have caused diverse disruptions of the natural stratigraphic sequence that further characterizes the geology of different regions. Certain characteristics differentiate the Far North Coast from the Northern North Coast. The main distinctive features are: 1) the Western Cordillera orientation and altitude; 2) the presence of the Coastal Cordillera; and 3) the Sechura Desert.

At about 6° south latitude the Andes veers from its NW-SE orientation to NE-SW towards Ecuador broadening the coastal plain on the Far North Coast. In fact, the widest coastal area (170 km) in Perú has been measured at 6° south latitude narrowing towards the south to 90 km by Chiclayo city (Northern North Coast), 70 km by Ica city (south-central coast), and only to 5 km by Punta Lobos in the Arequipa region (south coast), widening again at 17° south latitude (60 km at Mollendo, Arequipa), and at 18° south latitude (85 km at Tacna city) on the Peruvian Southern South Coast (Peñaherrera del Águila 1986:11-12).

Moreover, at this turning point, changes in the structure and morphology (mostly noticed in its altitude) of the Andes are noticeable north of Lambayeque (at the southern border of the Far North Coast). In fact, a saddle fold lowers the cordillera altitude to 3,000 m asl (the lowest point in South America) being the *paso de Porculla* (a transit point in the Piura region bordering the Lambayeque and Cajamarca regions) at only 2,144 m asl (Collin Delavaud 1984:8). This area of structural changes in the Andes is also known as the Huancabamba Transverse (Deler 1991; in Hocquenghem 1998:34). As Hocquenghem (1998:34-35,see also Anexo1,p.411) points out, this transverse marks the southern border between the Central and Northern Andes regions. Together with other physiographic features (Western Cordillera to the northeast and northwest, Coastal Cordillera to the west), the Huancabamba Transverse enclose a distinct geographic area, the Far North Coast, whose physical characteristics allow a ready connection with both the Pacific coast and the Amazon basin (Figure 2).

The Coastal Cordillera is a low altitude (below 1,200 or 1,000 m asl) mountain range that runs parallel to the littoral coast in a NW-SE orientation. It appears at the Paracas Peninsula on the South-Central coast and runs south reaching the southern border of Perú with Chile. This cordillera, however, is not present north of the Paracas Peninsula reappearing again next to the Far North Coast littoral (Iberico 1986:239). In fact, the Coastal Cordillera starts NE of the Sechura Desert depression at the Amotape Mountains next to the Ecuadorean border. This physiographic feature is characterized by the presence of broken, discontinuous open-arc shaped massifs that form impressive cliffs next to beach shorelines. The Coastal Cordillera continues from Amotape south and is observed in smaller blocks south of Paita, and then at the Illescas Mountains west of the

Sechura Desert at which point it submerges under the Pacific Ocean. Finally it reappears and ends at Lobos de Afuera, a small island off the coastline of Chiclayo (Collin Delavaud 1984:8; Dollfus 1958:95).

The Sechura Desert basin is a 300 km long and 200 km wide zone containing Miocene strata deposits of marl, clay, sandstone, diatomite, and phosphate, as well as Pliocene conglomerates cut by marine-built, and alluvial terraces (Collin Delavaud 1984:8). The Sechura Desert, an otherwise elevated basin, presents at some points contour levels 10 m below sea level. According to E. Jaillard (in Hocquenghem 1998:Anexo1,p.419) erosion on the base of the continental crust during subduction of the oceanic plate explains this phenomenon; the continental crust lost volume and thus sunk. The Sechura Desert is thus a sedimentary basin fed by alluvial sediments from the Andean pediment to the west. In fact, during heavy El Niño rains, water is drained and deposited in internal depression zones of the Sechura Desert creating a lagoon (named La Niña) that last for several years before drying out through evaporation.

2.1.3 Geomorphology

In general, as characterized by Peñaherrera del Águila (1986:11-16), the Peruvian coast morphology is characterized by an undulated surface comprised of a succession of low-altitude (below 1000 m asl) hills, and up to four levels of fluvial and marine (*tablazos*) terraces, and ancient beach ridges next to the littoral. Rocky hills isolated or form ranges that enclose plains created by alluvial deposits of coastal rivers and runoff sediments from adjacent hills. Aeolian sand sheets (pushed by the SW-NE prevailing south winds) and dune formations such as barchans and nebkhas cover most of these plains such as in the Sechura Desert. The coastal plain is crosscut by perennial and seasonal rivers as well as by dry ancient river basins and ravines. Triangular-shaped alluvial fans broaden towards the Pacific Ocean littoral. Alluvial fans have a larger area on the Far North Coast and Northern North Coast valleys than on the rest of the coastal valleys. Furthermore, beach ridges and alluvial fans create mangrove swamps especially on the Far North Coast, and littoral lagoons at other areas to the south. In addition, most of the Peruvian littoral presents a straight-line shape with the exception of some major formations such as the Paita and Sechura Bays on the Far North Coast, the Callao Bay on the Central Coast and the Paracas Bay and Peninsula on the South-Central Coast.

It is also important to underscore more detailed geomorphological differences between the Far North Coast and the Northern North Coast. The Western Cordillera pediment (the gently-sloping erosion surface on the steep-sided cordillera flank) morphology and formation is of particular significance as well as the aeolian sands. These two features play a key role in land-use and irrigation systems management in past and modern societies.

On the Northern North Coast (south of Chiclayo) the Pacific watershed has close contact with the Pacific Ocean. As described by Collin Delavaud (1984:12-14), the pediment is comprised of detrital material either washed from the Andean cordillera and transported by highland rivers, or created by sheetflood erosion deposits of coastal foothills. Hilltops and isolated massifs are surrounded by large glacis (erosional pediment) created by the sheetflood deposits. The Northern North Coast geomorphological landscape is thus characterized by an alternate succession between glacis or large fossil alluvial fans, active alluvial plains, and rocky capes. A major active pediment component is modern alluvial plains (or terraces) that start at the vertex of alluvial fans after rivers pass through the last narrow valley necks.

On the other hand, pediment is found at a further distance from the ocean in the Far North Coast. Also, unlike the Northern North Coast, rivers have formed real inland deltas flowing into the desert sedimentary basin. Glacis are as important as on the Northern North Coast. On the Far North Coast, however, their material composition are comprised of finer sediments and present a much gentler gradient due to different geological and climatic conditions. This pediment completely covers the Sechura Basin as far as 100 km west of the Andean cordillera foothills. Moreover, west of the SW-NE Sechura Basin axis, glacis were deformed and uplifted by recent (Quaternary) tectonic activity leaving east the enormous plio-Quaternary fan common to both the Piura and Chira Rivers. Accordingly, the Piura River, curving north, makes its way through a pediment-uplifted area. This uplifted area extends, south to north, from Quebrada Ñamuc (SW of Sechura Village) to Mancora with an elevation of 10 m in the south and up to 400 m in the north. Furthermore, unlike the alluvial fans visible on the middle to lower valleys of the Northern North Coast, for the most part the lower to middle Piura and Chira River Valleys of the Far North Coast are entrenched. In fact, due to the uplifted Sechura Desert the Piura River descends 35 m below its own alluvial fan. Likewise, the Chira River formed a canyon 50-100 m deep before building a delta on the Paita Bay (Collin Delavaud 1984:14-16; see also Kosok 1965:23 Figure 6,242 Figure 19,243 Figure 22,cf. 161 Figure 29).

Finally, as mentioned above, aeolian sands are also a major characteristic of the Northern North Coast and Far North Coast geomorphology. They are created by sediments discharged by the rivers into the littoral or washed glacis, and pushed back again by tidal currents. Then south prevailing winds push them inland covering the rocky glacis plains in an SW-NE orientation. The coastal landscape is thus adorned with parallel alignments of marching dunes. Sand dune formations such as barchans and nebkhas are formed; their height ranges between 3 m and 15 m high while some gigantic ones range between 30 m and 70 m. Dune plains (*medanos*) are formed when aeolian sands approach the terrace margins of valleys, depressions such as those found within the Sechura Desert, at entrenched valleys such as the Jequetepeque and Chira Valleys, and at dry canyons such as at the Talara *tablazo*. Frequently valley terraces cannot stop sand dunes allowing them to penetrate into the valley where they invade cultivated terraces and deflecting river courses (Collin Delavaud 1984:16-17).

2.1.4 Climate

The climates of the world are significantly influenced by atmospheric circulation systems and the winds produced by them. In fact, the South Pacific Anticyclone, the South Prevailing Winds, and the Inter Tropical Convergence Zone play a key role in the southern hemisphere climates (J. H. Chang 1972). Furthermore, climates are defined by other factors such as temperature, precipitation, insolation, humidity, evaporation, cloud coverage, topography, and altitude.

Although the Peruvian territory is found in a tropical zone below the equator, its climate is not warmer or more humid. Rather, it presents a high variety of sometimes contrasting climates due to four main transforming factors: 1) the Andean cordillera; 2) the South Pacific Anticyclone; 3) the cold Peruvian (or Humboldt) Current; and 4) the warm Equatorial Counter-Current (or *El Niño* Current) (Brack Egg 1986a:195-196).

Considering all factors above, Collin Delavaud (1984:23-30) suggested a climate classification for the Far and Northern North Coast. These are the climates for the Littoral Strip, High Pediment, and Pediment North of Lambayeque. The Littoral Strip and the High Pediment climates are shared both by the Northern and Far North Coast whereas the Pediment North of Lambayeque is exclusively found on the Far North Coast.

The Littoral Strip desert climate is not hot and sunny and prevails on the littoral up to ca. 60 km inland and ca. 150 m asl. Annual mean temperature ranges between 17.3 °C and 24.7 °C at Trujillo (Northern North Coast) and Zorritos (Far North Coast) respectively. Also, absolute maximum (33.5 °C and 37 °C) and minimum (8 °C and 13.4 °C) temperatures show remarkable differences between Trujillo and Zorritos respectively. The evaporation index increases from south to north with an annual index of 4.4 mm in Cartavio and Lambayeque (Northern North Coast) and 8.3 mm in Lobitos (Far North Coast). Precipitation is scarce south of the Chicama Valley on the southern Northern North Coast gradually increasing from south to north. At the Chicama Valley the annual mean precipitation is 10 mm, 32.7 mm at Lambayeque, 63.0 mm at Lobitos, and 128.6 mm at Zorritos. Precipitation patterns at the northern Far North Coast are influenced by the low pressure equatorial rains and by those of the Inter Tropical Convergence Zone (ITCZ) that sometimes descend on this area. As a result an irregular precipitation pattern is observed with a maximum precipitation (in 1932) of 1872 mm, and a minimum of 0.6 mm (in 1952) in Tumbes.

Climate changes inland as altitude increases. This is the High Pediment climate realm which is found between 150 m asl and 2300 m asl. Days are warmer and sunnier (cloud coverage is less continuous and ephemeral) than on the littoral. Mean temperatures are sometimes higher than 24 °C even during the winter season. Due to higher solar radiation and longer nights, however, the daily thermal gradient (12 °C-14 °C) is higher than on the littoral. Precipitation is higher than on the littoral. Also, precipitation is higher at lower altitudes on the Far North Coast than on the Northern North Coast. For instance, on the Far North Coast (Tumbes and Piura) a precipitation of 250 mm may be found at 500 m asl or below. On the other hand, on the Northern North Coast (Trujillo and Chiclayo) 250 mm precipitation is only found at 1,000-1,200 m asl.

The Pediment North of Lambayeque (a.k.a. *despoblado* or *sahel*) is warmer and sunnier than the other two climates. It is located between 100-500 m asl, within a 40-50 km wide land strip between the Sechura Desert basin and the Andean foothills, and runs from Jayanca (north of Lambayeque) to Tumbes. That is, it exclusively encompasses the Far North Coast excluding its littoral strip climate. Also, a distance of 70-250 km separates this pediment from the littoral approaching it again only at its northernmost end at Tumbes. Annual mean temperatures are always above 24 °C. The precipitation pattern is irregular but rainfall is higher than the other areas. Drizzle and fog also do not appear. Cloud coverage is higher with high Atlantic clouds prevailing in the sky throughout the entire summer. Relative humidity is lower than at the littoral with 68.8 percent at Pabur in the Upper Piura River. Evaporation is higher than on the littoral due to higher temperatures. The rainy season starts in November and lasts until May which is a longer period than that on the Northern North Coast. Annual mean precipitation is 283 mm at Pabur (Upper Piura) with a monthly mean precipitation of 91 mm in February and 89 mm in May. Precipitation intensity decreases with greater distance from the Andes, and greater proximity to the southern border of this area. For instance, at the capital city of Piura, the western border of the *despoblado* (50 km from the littoral and 70 km from the Andes), annual mean precipitation is only 73 mm. The irregularity of the precipitation pattern must be underscored though. In fact, depending on the effects of dry (droughts) and wet (including ENSO phenomenon) periods, annual mean precipitation at the capital city of Piura can be as low as 7 mm (in 1938) and as high as 366 mm (in 1943). Precipitation pattern becomes regular and with higher rainfall at Tumbes, the northern border between this climatic area and the tropical equatorial humid climate. Higher mean precipitation at the *despoblado* results in a continuous, short-life cycle, well-adapted vegetation cover.

Overall, atmospheric factors such as the South Pacific Anticyclone activity and cold and warm ocean currents play a major role in climate dynamics on the Northern and Far North Coast of Perú. These factors are complemented by particular geological and geomorphological characteristics. As a result, three different climates (Littoral, Pediment and High Pediment south of Lambayeque, and Pediment north of Lambayeque), have been defined. Precipitation pattern and intensity are the major differences between these climate areas and especially between the Northern North Coast and the Far North Coast.

2.1.5 Hydrology

The Peruvian Pacific watershed is comprised of 53 rivers that add up to a total of 279,689 km^2 (Oficina Nacional de Evaluación de Recursos Naturales 1980). Generally, these are short-course steep-sloped rivers. Most of them are seasonal rivers with a large discharge volume during the rainy season (December-April) gradually decreasing (and even completely drying up) during the dry season (May-November). They originate from precipitation at the river headwaters as well as by the melting of snow-capped mountains. Also, some of them (such as the Piura River) disappear underground or lose a considerable portion of their water volume to evaporation (Peñaherrera del Águila 1986:67-69).

A hydrological characterization and comparison between the Far and Northern North Coast is pertinent here. The catchment basin of rivers is found in a mountainous terrain between 2000-5000 m asl south of the Chancay River, and between 1000-3000 m asl north of it. Rain at these headwaters accounts for most of the water that flows in these rivers. Only the La Leche, Piura, Chira, and Quiroz (tributary of Chira) Rivers, at their lower-altitude, middle courses, receive water from occasional and weak summer precipitation (Collin Delavaud 1984:39).

Unlike regular tropical regimes, discharge patterns are irregular and greatly influenced by the contrasting precipitation (wet and dry) seasons. In fact, these rivers can be classified into three categories depending if they are: 1) almost always; 2) occasionally; or 3) never dry during the summer or dry season. The first category is comprised by the Chao and Chaman Rivers (La Libertad, Northern North Coast) and Bocapán and Zarumilla Rivers (Tumbes, Far North Coast). The second category is comprised by the Virú, Moche, La Leche (Northern North Coast), and Piura (Far North Coast) Rivers. The third category is comprised by perennial rivers such as the Chicama, Jequetepeque, Zaña, Chancay (Northern North Coast), Chira, and Tumbes (Far North

Coast) Rivers. This irregularity and high contrast in river regimes is reflected in their maximum (February-March) and minimum (August-September) gauged monthly discharge. For instance, they vary between 5-100 m^3/s, 7-70 m^3/s, and 30-320 m^3/s for the Chicama, Chancay (Northern North Coast), and Chira (Far North Coast) Rivers respectively. The Piura River belongs to both categories above because, during the dry season, its gauged monthly discharge is minimal on its upper course, null on the middle, and more significant on its lower course due to to emergence from the water table (Collin Delavaud 1984:41-43).

Moreover, if we focus on the annual volume and time of maximum discharge, the irregular character of these rivers becomes far more apparent. Indeed, charts plotting annual discharge volume over a span of years show an extremely irregular series of wet and dry periods, each lasting between 1-12 years for the Chicama Valley, and 1-6 years for the Chancay and Chira Valleys. In addition, maximum and minimum discharge volumes gauged indicate a far greater variability. That is, maximum and minimum monthly discharge is highly variable and thus is not characterized by a neat ascending and descending curve but rather one punctuated with several peaks. For instance, within March 1933 the Chicama River showed highly varied values such as 1444 m^3/s and 189 m^3/s; similarly in February 1943 the discharge of the Chira River fluctuated between 6500 m^3/s and 185 m^3/s (Collin Delavaud 1984:43-45).

2.1.6 Flora and Fauna

Basically, the Far North Coast and Northern North Coast share the same life zones and ecological regions and thus similar flora and fauna inventories and taxonomies.

The climates described in a section above (Littoral Strip, High Pediment, and Pediment North of Lambayeque Climates), prevail on the Pacific Desert, and Equatorial Dry Forest ecological regions (Brack Egg 1986a).

The flora has been classified into four main formations. Three of them correspond to the three climatic distributions described for the Far and Northern North Coast above (Littoral Strip, High Pediment, and Pediment North of Lambayeque – *Despoblado*- Climates). The fourth floral formation is comprised of non-climatic formations (dependent on access to readily available water) and are found on river margins, water tables on the desert strip, littoral lagoons, and mangrove deltas in Tumbes (Collin Delavaud 1984:30-35; see also Hocquenghem 1998, Anexo 3; Ríos Trigoso 1989).

An example of the floral and faunal taxa is presented below in Table 1 and is mostly based on works published by Brack Egg (1986b; 1999) and Ferreyra (1986), when noted.

2.2 Connotations for Human Existence

All of the environmental features of coastal northern Perú described above clearly have connotations for human existence. The modern Andean landscape is a result of thousands of years of human-nature interaction and human adaptation that led to the origins of civilization and development of complex societies in this central Andean area.

Obviously, the environmental features described independently for heuristic purposes above, are part of a discrete ecological system with interactions internally as well as with human populations. Some of the features mentioned above are the Western Cordillera orientation and altitude and the presence of the Sechura Desert. In fact, in general the Western Cordillera in northern Perú has a lower altitude than in other parts of the Central Andes further south. Yet, as pointed above, it is particularly lower at the Huncabamba Transverse in the Far North Coast which put the latter in a more advantageous position in relation to the Northern North Coast. Indeed, this area represents the shortest and lowest route that connects the Amazon rain forest to the Pacific Ocean. As such it has played a cultural, social, political, and economic key role since prehistoric times.

This area has served as a major crossroad allowing a confluence of migration waves especially during early prehistoric times that clearly left their marks over time in the archaeological cultures of the Upper Piura Valley. For instance, cultural features such as the construction of artificial residential and burial earthen mounds (*tolas*) in seasonal swamp lands, and urn burials, are shared by prehispanic populations of south and southeastern Ecuador, the Upper Amazon cultural tradition, and the Upper Piura Valley on the Far North Coast (see Kaulicke 1991:419; Lathrap 1970:162-163; Polia Meconi. 1995:275-288). Furthermore, I have even seen, as a past member of the Upper Piura Archaeological Project, ceramic vessels found almost complete but smashed in pits of yet unknown function (see Kaulicke 1991:400) that closely resemble ceramic forms of the Amazon cultural tradition such as the Cumancaya (e.g., Raymond, et al. 1975:60 Figure 36(6),77 Figure 46b). Moreover, the economic significance of the area is evident still today as reflected, for instance, by the fact that it is through this area that the northeastern trans-Andean oil pipeline crosses the Andes descending then towards the coast of the Pacific Ocean up to the port of Bayóvar in the Piura region. The lowest altitude of the area is also important because it allows Atlantic moist-ridden clouds to surmount the Andes from the eastern Amazonian basin meaning higher precipitation patterns on the Far North Coast than on the Northern North Coast. It transforms the area, at times, into a more equatorial, lush tropical landscape. This higher precipitation pattern is crucial considering, as shown in the hydrology characterization above, the extreme annual and seasonal discharge volume irregularity of Peruvian coastal rivers.

The change in the Andean cordillera orientation at the Huancabamba Transverse from a NW-SE to a NE-SW axis is also crucial to understand the different kind of relationship populations from the Far and the Northern North Coast have with their landscape. As described in the geomorphology section above, change in the Andean cordillera orientation entails a difference in the pediment extension between the Far and Northern North Coast. The pediment at the Far North Coast is more extensive and with a gentler slope than at the Northern North Coast. This phenomenon has several connotations for human settlement. In fact, unlike the Northern North Coast, the geomorphology configuration upstream in the Far North Coast rivers is characterized by higher non-flooding terraces and thus not prone to catastrophic flooding during normal or above normal (e.g., ENSO) precipitation. Moreover, modern and possible prehispanic irrigation farming on these terraces does not rely on water obtained and managed from the main streams (e.g., Chira and Piura Rivers), but from underflow and the water table (and even springs) of their intermittent tributary rivers (e.g., those perpendicular to the Upper Piura River north margin). Alluvial activity at these streams has allowed the formation of these interior, fertile non-flooding deltas right at the first slopes of the

Andes. Annual and seasonal agriculture is possible on these terraces. As Collin Delavaud (1991:300-301) pointed out, anthropomorphic activities on these terraces demonstrate a suitable cultural adaptation to the limitations posed by both the extreme seasonal and annual irregularity of the Peruvian coastal rivers discharge volume.

Although no early prehispanic irrigation canals have been documented in the Upper Piura Valley yet, it should not be ruled out that further research would find evidence of early irrigation farming on these terraces comprising features such as small-scale gravity-fed canals associated with ancient furrows and in general a planned and engineered management of topographic contour levels and wetlands. Indeed, as has been recently demonstrated (Dillehay, et al. 2005) similar small-scale irrigation agriculture systems have been documented for the preceramic period (the oldest irrigation canals in the Central Andes thus far) dating at least 5,400 years ago. Unlike canals previously known, these canals are located not on the flat alluvial plains of coastal valleys but on elevated terraces on the High Pediment of the Northern North Coast associated with secondary streams in a landscape similar to that of the Upper Piura Valley.

The formation of these interior deltas and elevated terraces on the Far North Coast (e.g., in the Upper Piura River Valley) is one of the key differences between the Far and Northern North Coast which I believe has connotations for human existence beyond the economic aspects. In fact, on the Northern North Coast the pediment is shorter (closer to the Pacific Ocean), with lower terraces, and steeper, than on the Far North Coast. Accordingly, irrigation farming has relied since early prehistoric times on canal irrigation systems fed by the main rivers (e.g., Chancay and Chicama Rivers) that run parallel to the alluvial plain unlike the perpendicular tributaries of the Far North Coast. Also, population sustenance and development of complex societies were completely dependent on large-scale irrigation farming and therefore subject to the adequate performance of these irrigation systems which demanded a significant amount of labor for their construction and maintenance. Moreover, the fate of these irrigation systems (and the populations and political systems supported by them) was inextricably related to environmental phenomena and catastrophes such as ENSO-related high precipitation and floods. The Far North Coast was probably subjected to other kinds of environmental stresses (e.g., irregular precipitation patterns) but surely, considering the geomorphology and environmental configurations mentioned above, its irrigation farming systems were not seriously affected by ENSO-induced catastrophes and were thus more resilient than those of the Northern North Coast. As I contend farther in this dissertation, a large-scale irrigation canal (fed partially by a major stream; e.g., the Piura River) did not appear in the Upper Piura Valley until very late prehispanic times, the construction and functioning of which was, I believe, a consequence of external sociopolitical and economic factors rather than those from local polities. Overall, I believe the Upper Piura River landscape configuration (use of elevated terraces and water from tributary rivers perpendicular to the major rivers) entailed a kind of engagement between local populations and their surroundings very different than that of Northern North Coast populations. This engagement was probably distinctive enough and even entailed particular ideological/cosmological worldviews different from those of the Northern North Coast stemming from different concepts of time and space and thus different cultures.

Finally, unlike the Northern North Coast, the longer and gentler slope of the pediment at the Far North Coast created the conditions of a unique and interrelated ecological system comprised by the High Pediment next to the Andes, the *despoblado,* and the Sechura Desert Basin and its littoral. In fact, most of the Sechura Desert is not a desert in the strict sense of the word. As Collin Delavaud (1991:301-304) pointed out, the pediment slope of the *despoblado* drain precipitation from the adjacent highlands through a series of temporary rivers or *quebradas* (e.g., Olmos, Cascajal, and Ñaupe *Quebradas*) which are almost or even completely dry during the dry season. This drainage process has brought alluvial sediments complemented by aeolian sediments which have formed terraces on the pediment slope and thus further interior deltas. Some of these terraces (those closer to the Andes slopes) can be perennial but partially irrigated with underflow while others (those further down the pediment slope) can be cultivated only seasonally also by underflow. Scarce precipitation during normal years, underflow, as well as water table of these tributary streams also allow the presence of a perennial forest in most of the *despoblado* populated mostly by *algarrobo* (*Prosopis spp*.) and *sapote* (*Capparis angulata*) trees, as well as grasses, herbs, and rhizomes such as *Yuca del Monte* (*Apodanthera biflora)* and *Yuca de Caballo* (*Proboscidea altheaefolia*). This forest is important not just for the resources it can be obtained from it (timber, fuel, fodder, etc) but also because it serves as a barrier to help stabilize sand dunes pushed eastwards by aeolic activity threatening cultivable terraces and alluvial plains next to streams and valleys.

During years of above-normal precipitation or even during heavy precipitation caused by an ENSO event all the temporary streams of the *despoblado* drain water and flood a Sechura Desert interior depression that is otherwise dry and saline creating shallow temporary lakes that host a significant array of flora and fauna (mostly fish and migratory birds). In fact, even though heavy ENSO precipitation and floods are sometimes regarded as catastrophes (destruction of modern urban and rural infrastructure such as roads and irrigation canals), it also has positive effects, which are clearly visible on the Far North Coast and especially in the *despoblado* and Sechura Desert. ENSO precipitations allow forest areas to grow further and regenerate, pastures become more readily available, the water table and underflow are recharged and thus areas of temporary cultivation are extended. Also, there is an abundant production of honey and *algarroba* (the pod of the *algarrobo* tree); gathering of the latter was probably an important economic activity during prehispanic and colonial times and certainly plays a key role in the sustenance of modern impoverished peasant families who gather and sell the *algarroba* as fodder to cattle farms in Lima and other cities. The abundance of water and pasture in the *despoblado* from the littoral massifs such as the Illescas massif to the upper slopes of the pediment next to the Andes enhances livestock production especially goats and their products which are also a crucial economic activity for modern inhabitants of the *despoblado*. In addition, livestock abundance and animal droppings contribute to a natural regeneration of the forest. Large and small-scale cattle and goat husbandry was an important economic activity during colonial times as it is today. It is also very likely that camelid herding was an important activity during prehispanic times; camelid dung has been documented in excavations at Bayovar on the north base of the Illescas Peninsula (Cárdenas Martin, et al. 1991:157-180). Human occupation of the *despoblado* next to the littoral has been documented from preceramic to late prehispanic times (e.g., Cárdenas Martin, et al. 1991; Milla Villena 1989) and camelids probably were a crucial means of transportation that help communication and migration between littoral populations and those found to the south and east. Finally, another ENSO positive effect is that the littoral fish and mollusk production increases as some new species appear, brought by the warm equatorial waters.

Overall, human occupation of the *despoblado* at the Far North Coast has been possible since prehispanic times and settlements occurred at either side of the Sechura Desert interior depression; at the littoral and littoral massifs at one end, and on the middle and upper levels of the Far North Coast pediment at the other. I believe that it is clear now that far from being a "marginal" area, the Far North Coast was perhaps environmentally more resilient than the Northern North Coast with a landscape that was perhaps much better understood by its prehispanic inhabitants than by those from today.

2.3 The Piura River, the Upper Piura Valley and The Study Area

The Far North Coast is comprised of the main Piura, Chira, and Tumbes River Valleys; they show variability in their geographic characteristics, and are distant and autonomous from each other. The Piura River Valley is the southernmost valley of the Far North Coast and forms the northern border of the Sechura Desert (Figure 3). On the basis of topographic and geomorphologic features it is divided in upper, middle, and lower courses. The upper valley stretches from the Hualcas area, next to its headwaters, to the modern town of Tambogrande; the middle course goes from Tambogrande to near Piura, the capital city of the Piura region; and the lower valley goes from Piura to the Sechura Desert and then the Pacific Ocean. It is perhaps the largest and one of the most populated valleys on the Peruvian coast. In fact, this 250 km long river originates in the highland region of Huarmaca and flows, entrenched within the Andes, in a SE-NW orientation fed by various tributaries along its course. At the end of its upper course the alluvial fan opens up and then narrows again during its middle course. Dodging a quaternary uplifting that pushed it northwards, the river, next to Tambogrande, veers towards a NE-SW direction flowing towards its tectonically depressed lower course, and then to the Pacific Ocean (Collin Delavaud 1984:283).

The study area is located within a portion of the Upper Piura River Valley between the Chulucanas, La Matanza, and Morropón Districts, in the Morropón Province, in the Piura Region (Figure 4). The Upper Piura Valley opens up its alluvial fan into four separate and successive “pockets” of fertile land brought by alluvial activity of its tributary streams increasing their size westwards. The smallest one is found between the village of Salitral and the area known as Río Seco. The second is found between Río Seco and Cerro Santo Tomé; the third between Cerro Santo Tomé (that form a valley neck opposing Cerro La Huaquilla) and the last valley neck formed by Cerro Loma Negra and opposing Cerro Punta Guaraguao; and finally the last and largest between this valley neck and into the Chulucanas Valley as this last “pocket” is also known. Tributary rivers of this last “pocket” descend through the first immediately adjacent Andes foothills from the north and northeast; these are (east to west), the Quebrada de Las Damas, Charanal, and Yapatera Rivers. The last two “pockets”, excluding the Yapatera River Basin, make up the study area focus of this dissertation.

Table 2 below summarizes environmental features for the Upper Piura Valley on the basis of publications by Guzmán (1994) and the Peruvian Ministerio de Agricultura (Instituto Nacional de Ampliación de la Frontera Agrícola del Ministerio de Agricultura

1983; Ministerio de Agricultura 1974). A more detailed description of the geomorphology of the study area is provided in Chapter 7 as the basis for the spatial structure of the study area. The latter is an important previous step since it comprises my view on the landscape as part of the dwelling perspective that in turn serves as the canvas on which the settlement pattern data are presented.

2.3.1 The Study Area Limits

This dissertation research focused its investigation on the third and fourth "pockets" of fertile land and adjacent foothills in the Upper Piura Valley. This area has historically harbored the most significant population concentrations in the entire Upper Piura River Valley. The study area totaled 255 km^2 and was broken down in 255 units of 1 km^2 each. Surface survey covered an effective area of 153 km^2; that is, slightly over 50 percent of the original study area size. The 153 km^2 surveyed area encompasses all the Upper Piura River north margin between the beginning of the third "pocket" (to the east), and part of the Charanal River basin to the west. Also, it covered a small section of the Upper Piura south margin between the river banks and the modern towns of La Matanza, Laynas, Carrasquillo, and Cerro Santo Tomé (Figure 5). Finally, although my knowledge of the archaeology of the Upper Piura Valley goes beyond what I have just defined as the study area, my analyses and interpretation are restricted to the data I collected in it (see also Footnote 8 in Chapter 7). In this sense, it is obvious, though worth pointing out, that the interpretations and conclusions presented in this dissertation could be further supported, refined, modified, or even rejected upon further research is done both in the study area and beyond it.

2.4 Summary

The Central Andes landscape is a complex amalgam of geographical, environmental, and human factors, which cannot be reduced to a simplistic explanation such as the tripartite *costa*, *sierra*, and *selva* classification. The information summarized and presented in this chapter indicates that geological and atmospheric factors are the key factors that shape the Peruvian Coast climatic conditions. Likewise, it has been useful to underscore the similarities and differences between the Far and Northern North Coast. The factors that differentiate both regions are the Coastal Cordillera, the Andean cordillera topography, orientation and altitude, its distance from the ocean, their valley systems, and alluvial fan formation. The Far North Coast is not an environmentally "marginal" area but perhaps much more resilient than the Northern North Coast. The Upper Piura River landscape configuration entailed a kind of engagement between local populations and their surroundings very different than that of Northern North Coast populations. This engagement was probably distinctive enough and even entailed particular ideological/cosmological worldviews different from those of the Northern North Coast stemming from different concepts of time and space and thus different cultures.

The Piura River Valley, as the other river valleys of the Far North Coast is separate and autonomous. Also, unlike many of the other Peruvian coastal valleys, it has a large and fertile alluvial plain on its upper course that has harbored human populations in the past and present. The scope of this dissertation is a section of the Upper Piura River that encompasses an area of 153 km^2.

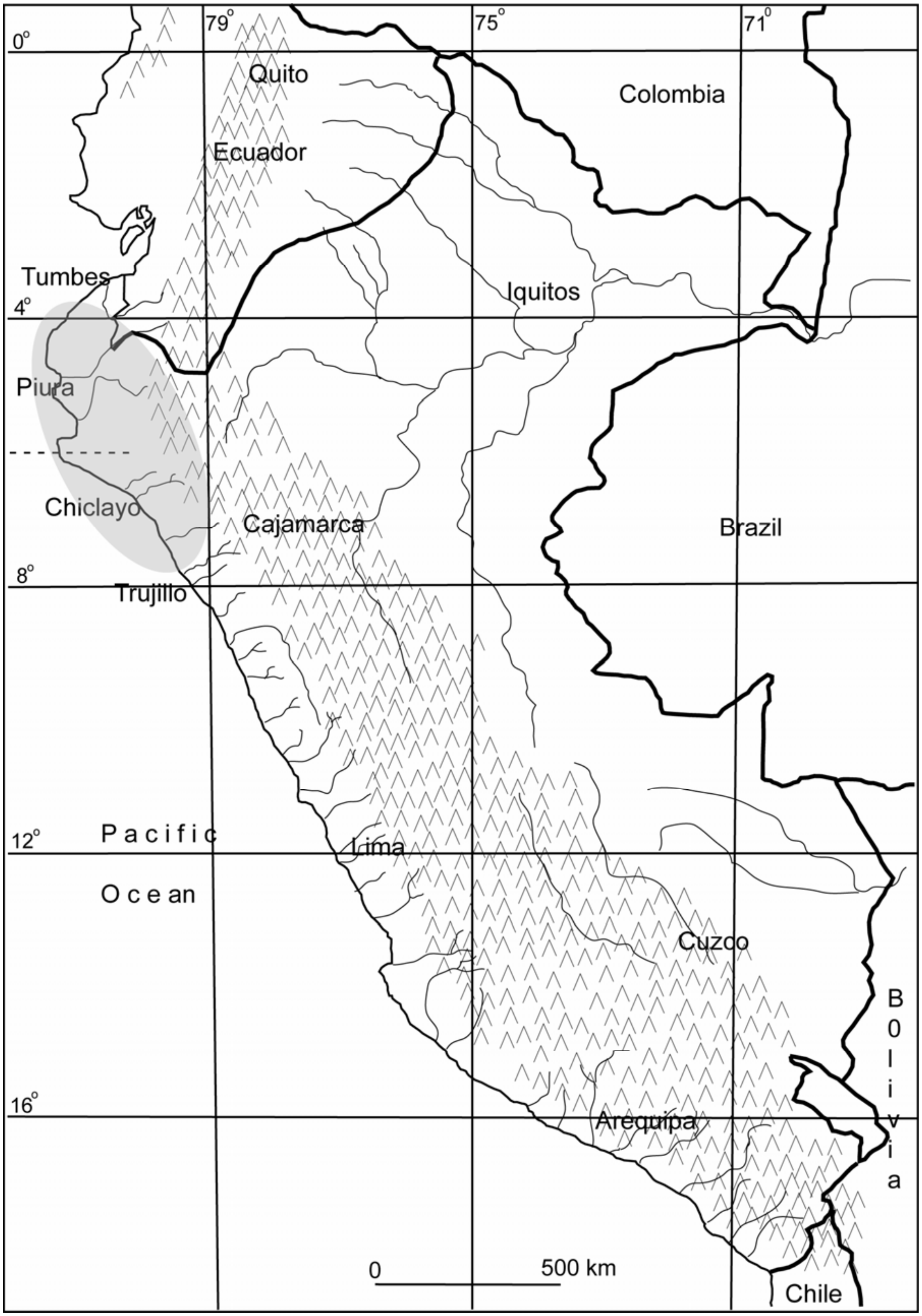

Figure 1: Map of Perú marking the Far North Coast and the Northern North Coast between the 4° and 8° Parallel and their separation (---------) at the 6° Parallel

Figure 2: Northwest Perú and the Huancabamba Transverse, enlarged in the lower photo (Source: http://visibleearth.nasa.gov).

Figure 3: The Far North Coast, the Sechura Desert, the Piura River, and the Northern North Coast (Source: http://visibleearth.nasa.gov).

Figure 4: Northwest Perú, the Upper Piura River Drainage (large square), and the Study Area (small square).

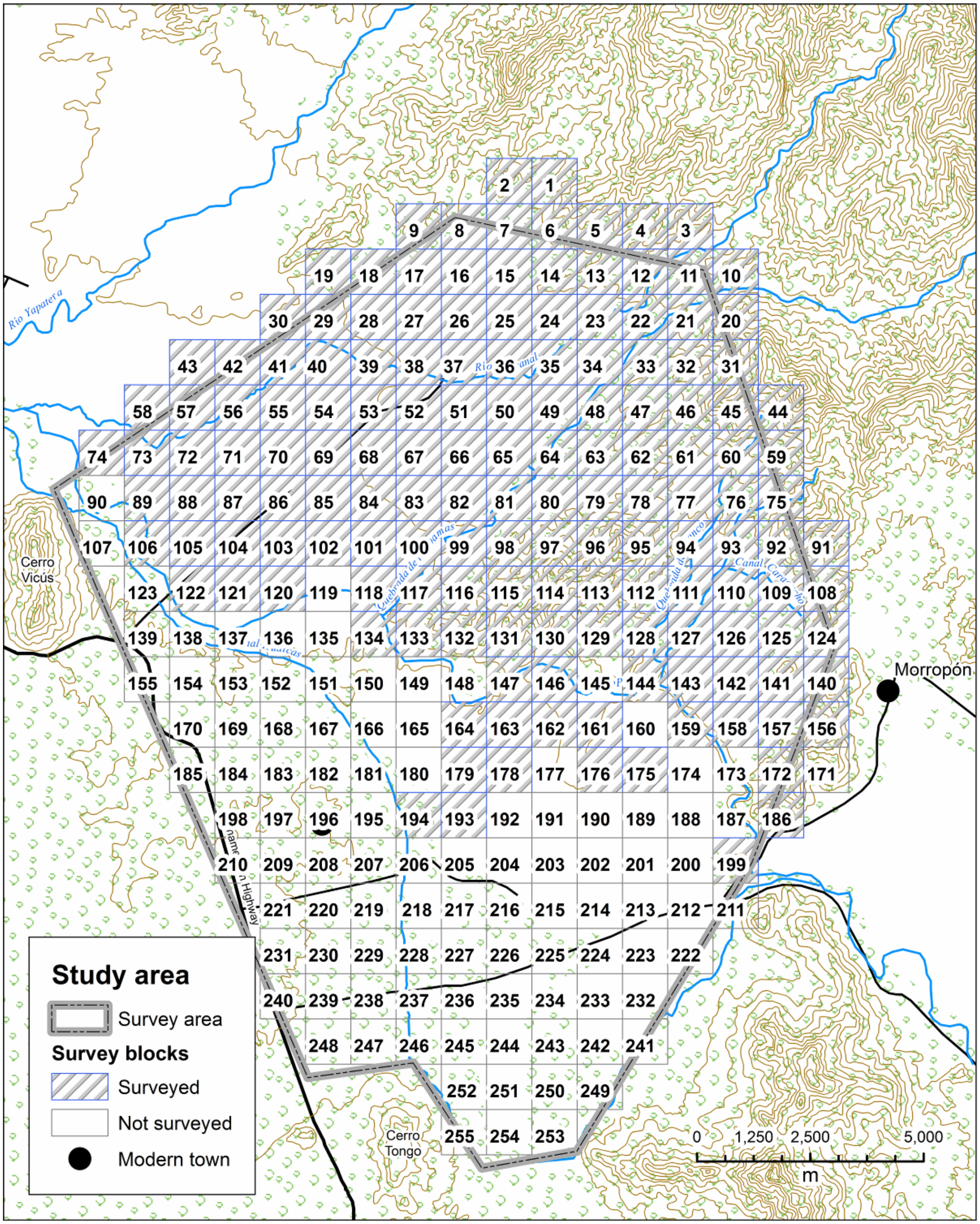

Figure 5: The Study Area and Survey Blocks

Table 1: Far and Northern North Coast Flora and Fauna

		Family	Species	Common Name	Life Form
Flora					
Climatic Formations	Littoral Strip	Agavaceae	*Furcraea andina* Trel.	cabuya	shrub
		Boraginaceae	*Coldenia paronychioides**	manito de ratón	grass
		Bromeliaceae	*Tillandsia usneoides* L.	barba de capuchico	shrub
		Capparaceae	*Capparis angulata* R&P	sapote	tree
		Capparaceae	*Capparis ovalifolia* R&P	bichayo	tree
		Chenopodiaceae	*Salicornia fruticosa* L.*	parachique	grass
		Cucurbitaceae	*Lagenaria sp.*	mate	herb
		Cucurbitaceae	*Cucurbita sp.*	zapallo	herb
		Fabaceae	*Prosopis* spp.	algarrobo	tree
		Poaceae	*Aristida adscensionis L.*	wichinca	herb
	Semi-Desert High Pediment	Annonaceae	*Annona cherimola* Miller	chirimoya	tree
		Cactaceae	*Neoraimondia macrostibas**	cactus	cactus
		Cactaceae	*Espostoa lanata*	cactus	cactus
		Capparaceae	*Capparis ovalifolia*	bichayo	tree
		Cucurbitaceae	*Apodanthera biflora* Gogn.	yuca del monte	herb
		Cucurbitaceae	*Luffa operculata* (L.) Cogn.	jabonillo	herb
		Fabaceae	*Acacia macracantha*	faique	tree
		Lauraceae	*Persea americana*	palta	tree
		Myrtaceae	*Psidium guajava* L.	guayaba	tree
		Sapotaceae	*Pouteria lucuma* (R&P) Kuntze	lúcuma	tree
	Pediment North of Lambayeque	Anacardiaceae	*Loxopterygium huasango* Spruce	hualtaco	tree
		Apocynaceae	*Vallesia glabra* (Cav.) Link	cuncun	shrub
		Bombacaceae	*Eriotheca discolor* (HBK) Robins	pasayo	tree
		Bombacaceae	*Ceiba trichistandra* (Gray) Bakh.	ceibo	tree
		Burseraceae	*Bursera graveolens* (HBK) Tri.&Plan	palo santo	tree
		Capparaceae	*Capparis angulata* R&P	sapote	tree
		Capparaceae	*Capparis ovalifolia* R&P	bichayo	tree
		Cucurbitaceae	*Apodanthera biflora* Gogn.	yuca del monte	herb
		Fabaceae	*Prosopis* spp.	algarrobo	tree
		Fabaceae	*Acacia macracantha*	faique	tree
		Fabaceae	*Cercidium praecox (R&P) Harms*	palo verde	tree
		Fabaceae	*Caesalpinia paipai* R&P	charán	tree
		Martyniaceae	*Proboscidea altheaefolia* (Bentham)*	yuca de caballo	herb
Non-Climatic Formations	Mangrove Delta in Tumbes	Asteraceae	*Bidens pilosa* L.	amor seco	herb
		Convolvulaceae	*Ipomoea crassifolia**	campanillas	herb
		Fabaceae	*Acacia macracantha*	faique	tree
		Fabaceae	*Prosopis* spp.	algarrobo	tree
		Poaceae	*Distichlis spicata* (L.) Greene	grama salada	grass
		Poaceae	*Brachiaria mutica*	grama	grass
		Rhamnaceae	*Scutia spicata**	Lipe	shrub
	River Margins	Asteraceae	*Tessaria integrifolia* R&P	pájaro bobo	shrub
		Boraginaceae	*Cordia lutea* Lam.	overal	shrub
		Cucurbitaceae	*Luffa operculata* (L.) Cogn.	jabonillo	herb
		Fabaceae	*Acacia macracantha*	faique	tree
		Fabaceae	*Prosopis* spp.	algarrobo	tree
		Poaceae	*Gynerium sagittatum* (Aubl.) Beauv.	caña brava	grass
		Poaceae	*Phragmites communis* Trin.	carrizo	grass
		Salicaceae	*Salix chilensis* Molina	sauce	tree
	Littoral Lagoons	Chenopodiaceae	*Salicornia fruticosa**	parachique	grass
		Poaceae	*Distichlis spicata* (L.) Greene	grama salada	grass
		Poaceae	*Cynodon dactylon* (L.) Pers.	pasto Bermuda	grass
		Solanaceae	*Datura stramonium* L.	chamico	herb
		Typhaceae	*Typha angustifolia* L.	totora	shrub
	Water Tables on Desert Strip	Capparaceae	*Capparis angulata* R&P	sapote	tree
		Capparaceae	*Capparis ovalifolia* R&P	bichayo	tree

Table 1 (continued)

		Fabaceae	*Prosopis* spp.	algarrobo	tree
		Fabaceae	*Acacia macracantha*	faique	tree
Fauna					
	Littoral Strip	Bothriuridae	*Brachistosternus ehrenbergi*	escorpión	arthropod
		Luridae	*Hadruroides lunatus*	escorpión	arthropod
		Sicariidae	*Sicarius peruensis*	araña	arthropod
		Syrphidae	*Volucella spp.*	abejorro	arthropod
		Burhinidae	*Burhinus superciliaris*	huerequeque	bird
		Cathartidae	*Coragyps atratus*	gallinazo cabeza negra	bird
		Cathartidae	*Cathartes aura*	gallinazo cabeza roja	bird
		Cathartidae	*Vultur gryphus*	condor	bird
		Falconidae	*Falco sparverius*	cernícalo	bird
		Furnariidae	*Geositta spp.*	pampero	bird
		Sternidae	*Sterna lorata*	gaviota peruana	bird
		Strigidae	*Athene cunicularia*	lechuza terrestre	bird
		Canidae	*Pseudalopex sechurae*	zorro de Sechura	mammal
		Tropiduridae	*Tropidurus peruvianus*	lagartija	reptile
		Tropiduridae	*Tropidurus theresiae*	lagartija	reptile
		Cricetidae	*Oryzomys balneator*	rata arrocera peruana	rodent
		Cricetidae	*Phyllotis amicus*	ratón de campo	rodent
	High Pediment and Pediment North of Lambayeque	Bufonidae	*Bufo spinolosus*	sapo andino	amphibian
		Bufonidae	*Bufo marinus*	sapo gigante	amphibian
		Anatidae	*Sarkidiornis melanotos*	pato crestudo	bird
		Ardeidae	*Egretta thula*	garza blanca pequeña	bird
		Ardeidae	*Casmerodius albus*	garza blanca grande	bird
		Burhinidae	*Burhinus superciliaris*	huerequeque	bird
		Columbidae	*Patagioenas spp*.	palomas	bird
		Cracidae	*Penelope albipennis*	pava de ala blanca	bird
		Furnariidae	*Furnarius leucopus*	chilalo	bird
		Furnariidae	*Geositta spp.*	pampero	bird
		Icteridae	*Molothrus bonariensis*	tordo parásito	bird
		Icteridae	*Icterus graceannae*	chiroca	bird
		Mimidae	*Mimus longicaudatus*	soña	bird
		Pandionidae	*Pandion haliaetus*	aguila pescadora	bird
		Picidae	*Veniliornis callonotus*	carpintero	bird
		Psittacidae	*Hapalopsittaca pyrrhops*	loros	bird
		Strigidae	*Athene cunicularia*	lechuza terrestre	bird
		Strigidae	*Bubo virginianus*	Búho americano	bird
		Tinamidae	*Crypturellus transfasciatus*	perdiz de ceja pálida	bird
		Trochilidae	*Eutoxeres aquila*	pico de hoz	bird
		Troglodytidae	*Campylorhynchus fasciatus*	choqueco	bird
		Tyrannidae	*Pyrocephalus rubinus*	putilla	bird
		Tytonidae	*Tyto alba*	lechuza de campanario	bird
		Canidae	*Pseudalopex sechurae*	zorro de Sechura	mammal
		Cervidae	*Odocoileus virginianus*	venado de cola blanca	mammal
		Cervidae	*Mazama Americana*	venado rojo peruano	mammal
		Didelphidae	*Didelphis marsupialis*	muca de oreja negra	mammal
		Felidae	*Felis colocolo*	gato silvestre	mammal
		Felidae	*Felis concolor*	puma	mammal
		Mephitidae	*Conepatus semistriatus*	zorrino enano	mammal
		Mustelidae	*Eira barbara*	hurón	mammal
		Myrmecophagidae	*Tamandua tetradactyla*	oso hormiguero	mammal
		Phyllostomidae	*Glossophaga soricina*	murciélago	mammal
		Phyllostomidae	*Desmodus rotundus*	vampiro común	mammal
		Sciuridae	*Sciurus stramineus*	ardilla de cuello blanco	mammal
		Tayassuidae	*Tayassu tajacu*	sajino	mammal
		Amphisbaenidae	*Amphisbaena occidentalis*	lombriz lagarto	reptile
		Boidae	*Boa constrictor ortonii*	macanche	reptile
		Elapidae	*Micrurus mertensi*	coralillo	reptile

Table 1 (continued)

	Gekkonidae	*Hemidactylus frenatus*	gecko	reptile
	Iguanidae	*Iguana iguana*	pacaso	reptile
	Tropiduridae	*Microlophus occipitalis*	lagartija	reptile
	Viperidae	*Bothrops barnetti*	sancarranco	reptile
	Chinchillidae	*Lagidium peruanum*	vizcacha	rodent

*Ferreyra 1986

Table 2: Upper Piura River Environmental Features

Precipitation	Temperature	Hydrology	Geomorphology
very irregular	mean annual 24° C	origin : confluence of Bigote and Canchaque rivers	four units:
as high as 700 mm/year	daily fluctuation max: 35.2° C	250 km from Pacific Ocean	alluvial plain
as low as 100 mm/year	daily fluctuation min: 21° C	fed by runoff of seven tributary rivers	mountainous structure
90% annual precipitation in January-April	max. January/February: 35° C	tributaries discharge only in north margin	aeolian deposits
	min. August/September: 17.8° C	total catchment basin (including tributaries): 3,148 km^2	colluvium deposits
		eroded sandy-silt texture river banks	

CHAPTER 3

RESEARCH BACKGROUND

This chapter has two purposes. First, to demonstrate that no significant archaeological long-term research endeavors have been carried out in the Far North Coast thus far. I contend that what I call the Mochica Factor has hindered the progress of archaeology in the region, and has conditioned the perception of the Far North Coast as a culturally "peripheral" area. Second, to characterize changes in local sociopolitical organization brought about by the arrival of core Northern North Coast polities to other "peripheral" areas further south, which serves as a valuable comparison for this dissertation.

Therefore, this chapter is subdivided into four major parts. The first section presents a history of archaeological research on the Far North Coast, especially in the Piura River Valley, as well as the definition of the Mochica Factor, a current trend in Peruvian archaeology and archaeology in general. Based on previous research, the next three parts present: 1) a characterization of local polities; 2) explanations of North Coast core polities present in the Upper Piura region; and 3) explanations of North Coast core polities present in other "peripheral" areas. These three points are further explored later in this dissertation after the research results are presented and analyzed.

3.1 Research History on the Far North Coast and the Piura River Valley

Archaeological research in the study area had a relatively late start and fieldwork conducted generally has been limited in scale and duration. Furthermore, there has been no clear research agenda and directionality that would have unified these scattered works.

The research history in the study area does not conform to the scheme elaborated by Willey and Sabloff (1993) for the history of the development of American archaeology. There is a great deal of overlap in the research topics and works published throughout the years. For instance, works that may be classified as part of the Speculative or Classificatory-Descriptive periods were carried out during the periods they assign to the Classificatory-Historical and even the Modern periods.

The nature and topical interests of works published also vary a great deal ranging from artifact and site description, culture history, field reports, iconography, to attempts of paleoenvironmental reconstruction. Yet, the list of references reviewed here underscores publications that are more pertinent to the purpose of this chapter.

As in every aspect of human history, there is a "before" and an "after" in the research history of the Far North Coast and the Piura River Valley. In fact, this historiography can be subdivided into the "Pre-Vicús" (before *circa* 1963) and "Post-Vicús" (after *circa* 1963) eras. The year 1963 has been chosen as a time marker defined by the discovery of the Vicús pottery style (and culture, according to some scholars) (Matos Mendieta 1965/66). This discovery brought about a shift in the area of interest for researchers from the Lower Piura River Valley and littoral to the Upper Piura River Valley.

3.1.1 The Pre-Vicús Era (before *circa* 1963)

Archaeological interest in the study area began in the late nineteenth century. Also, during the first three decades of the twentieth century topical interests of publications followed a similar trend. That is, publications were brief and isolated notes based on unsystematic excavations and field visits, descriptions of artifacts reviewed at private and museum collections, and brief discussions of stylistic and chronological issues within the temporal framework that Uhle was building for the archaeology of the Central Andes. Moreover, research aims and questions were not directly stated in this Pre-Vicús era publications; mere description of "exotic findings" (sites and artifacts) and their chronology seemed to be the main concern.

S. Scott's late nineteenth century (1895) work in the Chira Valley was the first report published. Archaeology was not yet a systematic scientific discipline. He visited various archaeological sites in the Lower Chira Valley digging prehispanic burials and looking for their associated artifacts. His written descriptions offer some details of monumental architecture, placement of burials, and artifacts. He reported on the location of sites, which probably helped later archaeologists. The next publication appeared 25 years after Scott's report. It was M. Uhle's (1920) brief note on Piura regional prehistory. Uhle visited this region for less than three months in 1919 to observe archaeological sites and local private collections. Although Uhle argued that the Upper Piura region seemed to be more stylistically independent from the Northern North Coastal Chimú style, he concluded that the Piura region in general was peripheral to the cultural developments from the south (the Northern North Coast), and thus "this region does not warrant more profound archaeological studies based on excavations" (Uhle

1920:166-167) *(translation is mine*). His underestimation of the Far North Coast may have sown the seeds of the later blooming Mochica Factor adversely biasing future research in the area.

Thematic interests did not dramatically differ during the 1920s and 1930s. In 1925, Kroeber (1965[1925]) published some photographs of ceramic vessels from Piura in the Peabody Museum collections. Also, in 1924, after a reconnaissance between Tumbes and the Paita Peninsula all along the coast, C.B. Brown (1926) discovered the first Preceramic period sites in Perú. He described stone and shell artifacts found at these sites emphasizing a set of conspicuous stone axes, mortars, and pestles. Finally, P. Means (1931) published the results of his visits and observations of private collections in the Piura and Chira Valleys. Like Uhle, he concluded that these regions were clearly influenced by the Chimú style from the Northern North Coast. Nonetheless, unlike Uhle, he did acknowledge that very little was known about the prehistory in this area and that it deserved future archaeological attention. Perhaps the highlight of his report was the publication of a tall black-ware stirrup-spout vessel picture from Morropón in the Upper Piura region (Means 1931:Figure 79). This artifact belonged to the Mr. Elías y Elías private collection but with no indication of its provenience. This became a “mythical” piece in the prehistory of the Far North Coast archaeology since its appliqué and incised decoration in a Cupisnique style led scholars to expect a significant presence of this style on the Far North Coast.

Similar topics continued to be covered during the 1940s, 1950s, and early 1960s. Unlike previous decades, however, more reports on surface surveys, and more detailed discussions on stylistic and chronological issues started to be entertained. Also, research focusing on early human settlement of the lower valleys and littoral areas took shape. In 1942 a singular ceramic piece located in a private collection attracted J. Rowe's (1942) attention. It was a polychrome double-spout and bridge vessel decorated with a Mochica style drawing. It was found near Sullana in the Chira River Valley. Rowe concluded this vessel was a mixture of two traditions (Mochica and Coastal Tiahuanco), reflecting a survival of Mochica influence that arrived at the Piura region during late Mochica times dragged by the "Coastal Tiahuanaco" influence (today known as Huari). Also in 1942 (Kroeber and Muelle 1942), there is a reference to the conspicuous presence of the paddle-marked technique in Piura. In addition, descriptions of vessels found in Piura and private collections and museums continued to be published, like those presented by Kroeber (1944:138-139, Pl. 41A). Moreover, on the basis of his work done in 1941, S.K. Lothrop (1948) published some information on sites he located during survey from Cabo Blanco to Piura (especially the Pariñas and Chira Valleys). Yet, Lothrop failed to publish a detailed report of his survey.

Unfortunately, Lothrop's worked inaugurated a trend in the archaeology of the Far North Coast characterized by only short-term projects, preliminary reports, and incomplete or unpublished data from surveys and excavations. In fact, following Lothrop's work, surface surveys in the area increased. Most of the results, however, were only published as preliminary reports with scarce or no graphic presentation of sites located and materials analyzed. In 1950, R. Christensen (1951; 1956) surveyed some sites in both the Piura Valley and Bay of Piura excavating at the site of Chusis near the mouth of the Piura River. Christensen's main contribution was to define a ceramic style of a period earlier than the ubiquitous paddle-stamped pottery. This style was similar to

Gallinazo (or Virú) and was later confirmed (in the 1990s) when excavations by the *Instituto Regional de Cultura* of Piura at a cemetery in Chusis unearthed Vicús and "Mochicoid" style vessels associated within the same context. Unfortunately, publications on the latter project are difficult to access. Also, by the mid 1950s L. Kostritsky (1955) described objects found in looted Preceramic period burials at Punta Aguja and Punta Nunura on the Illescas Peninsula. These objects included carved stone bowls, netting, and looped textiles.

The regional chronology of the Far North Coast gradually built up on the basis of investigations done in the late 1950s and early 1960s. Yet again, most of this work was not completed or was published only as preliminary reports. Indeed, E. Lanning visited the study area in 1957 and later that year D. Kelley undertook surface survey on the Illescas Peninsula and south of San Pedro. Moreover, in 1958 Kelley also located some shoreline sites at Colán and other inland sites next to the littoral, while Y. Haase also located sites at the Piura Bay, Illescas Peninsula, Paita Peninsula and north to Talara, as well as visited some inland sites next to the littoral in the Piura and Pariñas Valleys. In 1958 and 1959 P. Tolstoy undertook an intensive survey primarily of the Lower Piura Valley, revisiting sites already located by Kelley and gathering a larger surface collection. Altogether, Tolstoy recorded 234 sites. The published results of Kelley (1971) and Tolstoy's (1971) research were late and meager (most of the information is in unpublished manuscripts) even though they recorded a significant number of sites and gathered a large sample of surface-collected materials in comparison with other scholars.

Fortunately for the archaeology of the Far North Coast, E. Lanning (1960; 1963) stepped up and accomplished what his colleagues could not do. In fact, Lanning, through a rigorous stylistic attribute analysis and seriation, devised a regional chronological sequence defining 17 phases grouped into five ceramic styles (Negritos, Paita, Sechura, Piura, and Simbilá). Even though his sequence has some drawbacks (e.g., some of his phases are represented by a very small number of sherds), his seriation method proved to be very effective. Although this sequence has been later refined by other investigators (see below) it is still a valid chronological reference.

The Tokyo University scientific expedition to the Andes (Ishida 1960; Izumi and Terada 1961, 1966) was one of the very few research efforts focused on the Tumbes Valley. Although this was also a short-term endeavor, it offered some further archaeological, geomorphological, and botanical data to understand the Far North Coastal chronology through excavations at sites such as Pechiche and Garbanzal. Finally, a short article focusing on ceramic styles on the Tumbes littoral was also published in 1960 (Mejía Xesspe 1960).

There are different reasons why the Far North Coast (especially the littoral) received attention during the Pre-Vicús era. Diffusionism pervaded in that era and it was hypothesized (Christensen 1951; 1956) that the littoral zone was a well-situated setting for culture contact and influence from Mesoamerica. Other more mundane reasons such as the appeal of the scenic littoral landscape and beaches, and fascinating geological processes should not be ruled out. Yet, undoubtedly a critical factor was the development of the oil industry. In fact, as stated by Huertas(1999:39-48) drilling (mainly by foreign companies, nationalized in the 1970s, and again privatized in the 1990s) for petroleum began in the Far North Coast (in Lobitos) in 1863 and in 1895 (the same year as Scott's publication) explorations for petroleum in the Sechura area started. This mining activity was complemented by exploitation of phosphates (since 1958), sulphur (since 1886), and salt (since prehispanic times). These economic activities (especially the oil industry) had both beneficial and detrimental effects for the archaeology of the region. On the one hand, interest in petroleum exploitation brought about a great deal of research on geology and geomorphology of the littoral which in turn generated studies of paleontology, paleoenvironment, the ENSO phenomenon, and early human settlement (e.g., see Richardson 1977). In addition, the infrastructure and facilities (roads, docks, camps, lodging, fresh water supply, etc) built by the petroleum exploration companies provided access for archaeological surveys and excavations in this otherwise harsh desert environment (e.g., Cárdenas Martin, et al. 1991:ix-x). On the other hand, the exploration for petroleum and its concomitant infrastructure projects caused damage to the natural and cultural landscape of the littoral. For instance, these negative effects still manifested well into the Post-Vicús era during the mid 1970s when archaeological projects concerned with broader research questions on chronology and early subsistence ended up doing salvage excavations mainly due to the constructions related to the northeastern trans-Andean oil pipeline (Cárdenas Martin, et al. 1991:24, 33; Milla Villena 1989:29-30). Finally, petroleum and oil exploration and its related activities also opened up to the black market the illegal trade of precolumbian artwork which was further exacerbated during the Post-Vicús era after the discovery of the Vicús style[1].

Overall, the Pre-Vicús era was characterized by a predominance of notes and short-term research done on the littoral and lower valleys of the Far North Coast. By the end of the era the highlight was the regional chronology established by Lanning. Also, this was the "age of innocence" of the archaeology of the Far North Coast since the Mochica Factor was not clearly present yet.

3.1.2 The Mochica Factor[2]

The Mochica Factor is defined here as an academic (and sometimes not so academic) attitude that currently permeates a good part of archaeology and Peruvian archaeology in particular. It consists on the obsessive attraction that some archaeologists (Peruvian and foreign alike) have on topics such as gold, blood, war, and death, and on "high quality art" in general, and elite, Mochica art and iconography in particular. This attitude may be explained by the preeminence of mental templates derived from beauty and art canons (e.g., realism in classic Greek and Roman art) of Western culture. In the case of Peruvian North Coastal archaeology, this attitude leads to a "mochicacentrism"; that is, a research prioritization of the Mochica culture (or anything related to it) over other cultural processes, negligence of local (stylistically "less sophisticated") polity developments, and in general, a negative effect on the number and quality of research questions that could be formulated to better and more comprehensively understand the complex and vast cultural dynamics of the prehispanic North Coast.

I believe, however, the Mochica Factor is part of a trend in current world archaeology that clearly has ethical and political implications. It is worthwhile to explore it here since these problems are the essence of the Mochica Factor, but also explain how the idea of the "marginal or peripheral" perpetuates in archaeological discourse.

I start with the premise that for the modern anthropologically oriented archaeologist, a golden sumptuous metalwork object has exactly the same (scientific) value as a humble carbonized plant seed. I still believe many colleagues work following these ethical standards of the discipline. Yet, it does not mean their work and the knowledge they produce are not deeply imbued with cultural politics and politics in general. I believe I am not alone in this view since it has been discussed among academics for quite some time (e.g., Lutz and Collins 1993; Wylie 1996; 2001; 2003; 2005). In fact, as Shanks (2004:500-502) argues, politics have gone hand-in-hand with modern science since its inception in the seventeenth century when it was still known as "experimental philosophy". Modern science is connected with politics and thus has a moral history because it has always been endorsed by a community of witnesses (academics or not) that have been guarantees not of the search for an ultimate truth, but of scientific credibility. Thus science has always been part of society and as such has had always a constitution and a representation, and its production of knowledge (including knowledge of the past) has been always associated with certain political contexts and significance. Archaeology, being a science also born in modernity, should also be understood in such a way.

This way of reflecting on the archaeological discipline, whether we agree with it or not, is only possible within a context of solid academic and democratic institutions. Even if the characterization of a pure modern, value-free, objective scientific archaeology as inheritor of the Enlightenment is challenged (Thomas 2004a), it could be said that such institutional strength is the only guarantee that can allow this debate.

Archaeology and the knowledge it produces thus have to be understood within their social, political, and historical context. As part of this way of understanding modern archaeology, one critical issue is the value given to the knowledge (understanding of the past) produced by it. Now is when several questions arise: how should it be used?, who has the rights to use it?, for what purposes?. Throughout history we have several examples of how this knowledge has been used. Perhaps one of the best examples was the buttressing of nationalism of late eighteenth, nineteenth, and early twentieth century European nation-states after the (stratigraphically deep) distant-past was discovered (Thomas 2004a:106-111).

Now in the twentieth first century, the value of past remains and the knowledge gained from them is also a matter of appropriation, manipulation, and legitimacy. One critical aspect of the current debate over the value of archaeological knowledge is the conservation and preservation of cultural heritage. What is worth preserving?, what is worth studying?, what is worth publicizing through mass media?, what has no meaning or value?, who decides?, who sets the agenda?

Currently, this modern trend in archaeology and the Mochica Factor could materialize in different ways permeating and influencing both the academic and non-academic arena. For instance, the exultation of monumental, “spectacular discoveries” stalked by discovery-hungry TV producers, magazines, and professional photographers; the use of these “spectacular discoveries” to support careers of scholars; and the need of these “spectacular discoveries” for academic institutions in need of advertisement to enroll students. Indeed, in some cases what is offered to prospective students by academic departments has very little to do with understanding the past and has more to do with present and mundane personal benefits (e.g., see Tilley 1993c). In general this attitude reflects the conception of “the individual” (as a human universal) of modern Western philosophy which is even dangerously projected onto the past (Thomas

2004a:119-148). Obviously, this is not yet a generalized pattern and the presence of strong democratic and academic institutions allows recognition, diagnosis, and debate of the problem.

But what happens when there is a lack of strong democratic and academic institutions and we have instead fragile and ephemeral ones? This is when things become more intricate as is now the case with Peruvian archaeology. In fact, the use, manipulation and appropriation of archaeological knowledge have similar characteristics as in other parts of the world where global as well as national and local (and even personal), economic, social, and political interests overlap. The way this knowledge is used constitutes a palimpsest of agendas that rest on the manipulation and commodification of certain “spectacular discoveries” such as gold-ridden “elite” tombs from “glorious rulers”, monumental pictorial murals, and monumental architecture of the “earliest cities” in the Americas, and even the repatriation of formerly looted “fine” precolumbian artwork.

Clearly, since the last decade the archaeological agenda in Perú has been set by a vicious circle comprised by interests of corporations (e.g., TV production, tourism, mining companies, etc.), and the diffusion of these “spectacular discoveries” by the mass media mostly targeted to the minority Peruvian Middle or Upper Middle Class. The latter bounces back in the (lack of) cultural heritage policies of the Peruvian state. In fact, historically the Peruvian state has tried, unsuccessfully, to manipulate “elite” prehispanic iconographic symbols to create a national identity (Higueras 1995). Yet, currently the official (national and regional) discourse endorse these “spectacular discoveries” that are used, via the media, not to look for a national identity but for a myriad of reasons such as reinforcing (not as a real grassroots initiative but promoted by government officials working in national, state-run museums) a historical and ethnic connection with a glorified past, for electoral campaigns by local and ephemeral political movements, for regional, national, and international trade commercial purposes, and even to whitewashing the political image of Peruvian past presidents accused of kleptocracy and human rights violations.

The Peruvian archaeological community (including some foreign archaeologists) is unfortunately trapped within this vicious circle. As an institution, it is weak, fragmentary, and constantly involved in feuds. Sometimes these problems are even fueled by archaeologists themselves who take advantage of this situation for their own economic and political benefit. This attitude is materialized in the different discourses they have before local inhabitants, looters, private collectors, and even their own colleagues, aimed to maintain their power and the political relations more convenient to them (Smith 2005).

A weak archaeological constitution and representation will never be able to achieve a sound scientific credibility and, therefore, face (and resolve) the vicious circle mentioned above. I thus concur with current assessments (Kaulicke 2006) that argues archaeological research in Perú is meager with a very limited scientific production. It is trapped between its failure and inconsistencies in developing sound theory and methods, and the pressure (and economic temptations) placed by interests of corporations turning archaeological practice into a mercantile rather than a scientific endeavor.

The current management and manipulation of the Peruvian prehispanic cultural heritage has a clear, though implicit, message: these “spectacular discoveries” are the most valuable aspects of cultural heritage and thus worth preserving, promoting, and publicizing. This mentality is deleterious for both the archaeological discipline and the conservation of local cultural heritage. For instance, a focus just on the "elite" (supposedly represented by these "spectacular discoveries") social component of past societies perpetuates that simplistic archaeological interpretation where pre-industrial social organization is believed to only have been comprised by two or three "social classes" or divided just between "elite" and "commoners". Explanations based on just the "elite" component of a society are thus incomplete and biased.

As for the conservation of local cultural heritage, the message above is also pernicious. What about those modern local populations that live in areas inhabited since early prehistoric times but without "monumental", "spectacular" archaeological heritage?, is it worth valuing, preserving, promoting, publicizing? As I have pointed out elsewhere (Montenegro Cabrejo 2003) this lack of apparent "monumentality" and "grandiosity" does not mean at all that local histories are not rooted deep in history, rich, and significant. This is the case for the Far North Coast and specifically the Upper Piura Valley where 25 centuries of continuous human occupation cannot and should not be neglected, obliterated, and disregarded by the current official discourse characterized by an exacerbated Mochica Factor.

Overall, the Mochica Factor manifests a modern trend in archaeology and currently clearly dominating Peruvian archaeology. It can affect archaeological research and the production of knowledge. As explained below, the archaeology of the Far North Coast was somewhat affected by the Mochica Factor during the Post-Vicús era in spite of the good intentions some researchers might have had. Yet, the current exacerbated nature of the Mochica Factor in Peruvian archaeology threatens both the little progress achieved thus far in the archaeology of the region, and the rights of local populations to value and protect their local cultural heritage. Furthermore, it ultimately perpetuates the idea of the "marginal" or "peripheral" which is in fact a modern biased construction that has little to do, if any, with the archaeological past.

3.1.3 The Post-Vicús Era (after *circa* 1963)

This era began with the "discovery" of the Vicús style and culture. In fact, in the mid 1950s in Frias, and early 1960s in Vicús, both in the Upper Piura Valley, intense grave looting brought to light an enigmatic collection of gold objects and a heretofore unknown ceramic style respectively. Private collections and the precolumbian art market in Tumbes, Piura, Chiclayo, Trujillo, Lima and abroad overflowed with this looted ceramic style pieces. The then *Patronato Nacional de Arqueología* directed by L. E. Valcárcel was prompted to organize an expedition to this area and commissioned archaeologist R. Matos (1965/66) to undertake the task. Matos' reconnaissance was carried out in January and February 1963. His survey was largely non-systematic, briefly recording sites that were being looted. He also took notes on measurements and different shapes of the looted burial pits. He gathered a large ceramic surface collection from different chronological periods. With this ceramic assemblage he collected and the pieces he observed in private collections he was able to define the Vicús style for the very first time. The Vicús style was so designated because Vicús is a village name and the location of the first large looted area he saw.

The discovery of the Vicús style brought the Upper Piura region into the limelight. Indeed, unlike the Pre-Vicús era, archaeologists realized the existence of a previously unknown society artistically represented by this "sophisticated style". Furthermore, skillfully elaborated metal and pottery objects of an early Mochica style started to appear associated with Vicús style materials. The latter preconditioned the Mochica Factor to play a key role. Thus, for some authors the Vicús style became important to understand the Mochica culture origins, power, and its hypothesized expansion into the Upper Piura region, while the understanding of the prehispanic local sociocultural dynamics was relegated to a secondary position.

Research interests were similar to those of the Pre-Vicús era with new research themes introduced such as art history and iconography (especially on the Mochica style vessels) since the 1960s, and settlement pattern issues by the late 1970s. Yet, the "discovery" of the Vicús style and concomitant overflow of ceramic pieces into private collections caused a significant impact. For the next two decades the majority of publications on the archaeology of the Upper Piura Valley were devoted mainly to stylistic and chronological issues of just the Vicús and especially Mochica style objects; that is, part of the Early Intermediate period (ca. 100 B.C. – A.D. 500), leaving a large gap in the understanding of the prehistory of the area.

For instance, studies focused on stylistic descriptions (Bushnell 1966/67; Horkheimer 1963; 1965), chronological comparisons (Klein 1967; 1965; Larco Hoyle 1967), geological and metallurgical observations of looted artifacts (Petersen 1969), and stylistic and technological analyses on also looted metalwork artifacts (Disselhoff 1972; Lechtman, et al. 1982). Also, the findings, descriptions and news of intensive looting and destruction in the area of Yécala led to the first archaeological excavations of burials in the Upper Piura Valley (Disselhoff 1969; 1971; Emery and King 1971; Guzmán Ladrón de Guevara 1967; Guzmán Ladrón de Guevara and José Casafranca N. 1964). Overall, these excavations were short-term, occasional, and directed towards salvage. In addition, during the late 1970s a new typological classification and chronological sequence of the Vicús style ceramics (Lumbreras 1979; 1987)was presented on the basis of chronological sequences already proposed for the Lower Piura Valley (e.g., Lanning's)[3].

A major topical change occurred by the mid and late 1970s when J. Richardson and his students undertook systematic surface surveys on the Piura littoral, the Chira Valley, and the Upper Piura Valley (Richardson, et al. 1990:420, footnote 1). One of the main contributions of these surveys was the systematic documentation of the extensive intrusive Chimú period occupation on the Far North Coast. Also, their radiocarbon dates allowed them to suggest changes to Lanning's stylistic seriation. Their renewed interest in doing a more systematic research in the Piura region was commendable, was an attempt to move beyond the influence of the Mochica Factor, and it could have been a turning point in the archaeology of the Far North Coast. Indeed, a focus on settlement patterns was a breakthrough in the archaeology of this area. For instance, the goal of Décima Zamecnik's (1977) survey was to define and understand Vicús settlement and subsistence patterns as well as its relations with foreign cultural entities. Her study area partially overlaps with that of my dissertation fieldwork. Unfortunately, only one publication (Richardson, et al. 1990) and a series of unpublished manuscripts and short papers read at archaeological meetings were the outcome of all this work. Further, there is no graphic presentation of the ceramics analyzed that support their refined regional chronology making comparison difficult.

In the 1960s and 1970s research on the littoral and lower valleys of the Far North Coast continued, although at a lower intensity compared to the Upper Piura region. A sustained research interest by J. Richardson began in the mid 1960s. It should be underscored that Richardson's (1965; 1969; 1973; 1977; 1978) investigations introduced the topic of early human occupation, focusing on climate change, oceanography data, and paleoenviromental reconstruction in the Far North Coast archaeology. Another important contribution was the investigation made by the *Seminario de Arqueología* of the Riva Agüero Institute of the Pontifical Catholic University (herefter PUC) of Lima, Perú. The goal of the project was to look for the relationship between prehispanic coastal populations along the Peruvian north and north-central coast (Lower Piura Valley and Sechura Desert, and Chao, Santa, and Huaura Valleys) through observations on shared economic activities (mainly marine resources exploitation), settlement patterns, and establishing a chronological sequence dating these economic activities. The project was originally designed by J. Ramos de Cox between 1972 and 1974, but after her early death the work was carried out by M. Cárdenas.

Unfortunately this project only partially achieved its goals. Surface survey and test excavations at the Lower Piura Valley and the Illescas Massif in Sechura were carried out between November 1975 and January 1976 and investigations in the other valleys (Chao, Santa, and Huaura) between 1976 and 1978. Yet, only reports of the investigations in the Lower Piura Valley and the Illescas Massif in Sechura have been published thus far (Cárdenas Martin 1976, 1978; Cárdenas Martin, et al. 1991; Milla

Villena 1989). In spite of this flaw, results of the work at the Lower Piura Valley and especially at the Illescas Massif in the Sechura Desert demonstrated a long human occupation on this desert environment from the Preceramic period to perhaps the early Colonial period. It is argued that the resource base included exploitation of abundant maritime resources, *lomas* vegetation, freshwater obtained from natural springs on ravines, and procurement of agricultural products through exchange with populations settled on the Lower Piura Valley and even at longer distances. Also, although mostly not from primary contexts, samples for radiocarbon dating were obtained which dated most of the prehispanic occupation sequence.

In the 1970s contributions continued to appear as brief and isolated notes such as the description of Inca and Chimú-Inca style vessels from private and public collections found on the Far North Coast (Bonavia and Ravines 1971), as well as reports on the early utilization of maritime resources on the Tumbes area (Ravines 1973). Finally, in the 1970s attempts were made to combine ethnohistory and archaeological research interests to study the early Colonial period, especially on the Piura Lower Valley (Ramos Cabredo de Cox 1973). With few exceptions (e.g., Fernández Villegas 1989; 1990), however, this field is almost completely unexplored.

During the early and mid 1980s research and publications on archaeology of the Far North Coast dwindled, coinciding perhaps with the social and political turmoil that affected Perú during those years. J. Richardson (1981; 1983) continued publishing results of his earlier works arguing that, by 5000 BP, there was a change in the east Pacific Ocean current patterns, modern sea level was reached stabilizing the present day coastline, and modern distribution of shellfish, fish, and sea mammals was established.

He argued that these phenomena, in turn, caused the rise of complex maritime societies. His conclusions are supported by radiocarbon dating of the Chira beach ridges associated with materials from different chronological periods from the Preceramic to the Late Intermediate periods[4].

There were also some isolated and brief notes on the archaeology and ethnohistory of the Tumbes area (Kauffmann Doig 1987), as well as a report of excavations and ceramic materials analyzed from Colán (Ravines 1986/87). Ravines found that earlier human populations (Paita and Sechura phases) occupied the *tablazo* while later period occupations (Piura phases) settled on the beachfront. Similar settlement pattern and chronology were observed in Yacila a few kilometers south of Colán in the mid 1990s on the basis of a surface ceramic collection while visiting this area (Hocquenghem and Kaulicke 1995). By the late 1980s and during the 1990s the situation changed somewhat. Although some archaeological investigations were carried out in the Lower Piura Valley (e.g., R. Palacios's excavations at Chusís), there are hardly any publications available. In contrast, literature on the Upper Piura archaeology expanded due to a series of publications resulting out of the Upper Piura Archaeological Project (herafter UPAP).

Finally, since the late 1990s J. Moore has maintained a research focus in the Tumbes region carrying out surface surveys and excavations with topical interests ranging from the origins of sedentary village life during the preceramic period (Moore 2007) to the Chimú empire's occupation of the Tumbes region in late prehispanic times (Moore, et al. 1997).

Overall, research by Richardson and Moore is the most commendable in this Post-Vicús era maintaining consistency in their research topics and areas of interest. Also, significant were the investigations by UPAP, although as explained below it failed to maintain a sustained effort.

3.1.4 The Upper Piura Archaeological Project (UPAP)

The UPAP that started in 1986 has been the only sustained research effort (five seasons) within the Upper Piura region. Much new data and insights were generated on the Early Horizon and Early Intermediate period occupation of the Upper Piura Valley.

The UPAP was conceived as a collaborative research project between the French Institute of Investigation for Development (IRD, formerly known as ORSTOM) and the Archaeology Program of the PUC and was co-directed by Jean Guffroy and Peter Kaulicke, representing these two institutions, respectively. Although this research approach was presented as a team effort (Guffroy, et al. 1989b) the fact is that they lacked unified research objectives and attendant methodologies, thus resulting in different participants pursuing their own disparate research aims. With interest in defining the Early Horizon occupation and chronology and understanding the relationship between the Northern and Central Andean populations during this period, Guffroy (1989; 1992; 1994) focused his effort in excavating the major Early Horizon site of Ñañañique in Chulcanas. Some Late Intermediate period features (retention walls, human burials) were found during the process of excavations and were recorded as well (Guffroy, et al. 1989a).

Kaulicke, (1991; 1992; 1993a; 1993b; 1994) interested in elucidating the nature of the Vicús occupation and its relationship with the Mochica group, focused his attention on the Tamarindo area (ca. 20 km south of the Yapatera valley). The Tamarindo area, encompassing a series of large mound constructions in a 0.5 km^2 area, was inferred to have been the core of the Vicús and Mochica occupation in this region. Stratigraphic excavations in 10 locations within this area yielded important ceramic and architectural data. Classification of stratigraphically correlated groups of excavated ceramics on the basis of shape and decorative techniques led to a sequence composed of four phases: Vicús Tamarindo A, Vicús Tamarindo B, and Vicús Tamarindo C (C1 and C2).

Kaulicke's excavation also yielded an understanding of key differences in corporate architecture associated with Mochica and Vicus ceramics. The mound construction at Huaca Nima with Mochica ceramics is essentially solid adobe bricks, while Huaca Valverde with Vicús ceramics is built of compacted earth much like the coastal Ecuadorian *tolas*. In sum, though Kaulicke and his team failed to conduct a regional survey[5], their ceramic classification and chronology as well as architectural diagnostics are significant contributions to the archaeology of the study area.

A glimpse of the regional settlement pattern can be gained from Jean-Christophe Bats' (1990; 1991) survey. Bats joined Guffroy's team and carried out the survey in the Lower Yapatera River Valley, a small tributary of the Upper Piura River and in which the site of Ñañañique is situated. Bats' goal was to place Ñañañique occupation within the broader Yapatera Valley occupation as well as to define a local chronological sequence and cultural changes in this small valley. Bats surveyed 62 km^2 within a two month time span. Unfortunately no stratigraphic test excavations were undertaken. After a technological and morphological analysis and seriation of collected ceramics, Bats established a chronological sequence and then linked it to those sequences already elaborated by Guffroy, Kaulicke, Richardson and Lanning. After finalizing his chronology, he analyzed shifts in settlement patterns from a period that encompasses the tenth century B.C. to the sixteenth century A.D.

Kaulicke's publications, however, are preliminary and very little is known about other aspects of the Vicús and Mochica occupation (land use, organization of production, technology, subsistence, etc.). Also, although survey work is mentioned (see Makowski, et al. 1994:101, also Endnote 5) no details of resultant survey data have been presented and thus it is difficult to position the occupation of the Tamarindo area within the much broader Chulucanas valley. In addition, there is a clear lack of comparison between pottery analyzed by Kaulicke and that analyzed by Bats. Although Bats did not detect a Mochica presence clearly in the Yapatera Valley, he seems to have instead plenty of Vicús presence. In that sense, data from Tamarindo area seem to be isolated and lack regional context.

Pampa Juárez (or Vi-14) was a domestic/residential site next to the Tamarindo area and Yécala cemeteries. Excavations were directed by K. Makowski (also a UPAP member) at this site where craft production activities (especially metal and pottery) are hypothesized to have occurred during Mochica and Vicús times. The evidence presented is meager though. The cultural significance of this site is difficult to assess. In the volume published by Makowski and his colleagues (1994) data from Vi-14 do not figure prominently but are instead given a secondary status. Only four out of 493 figures in this book show or represent data from the Vi-14 excavations. In fact, this volume reflects Makowski and the efforts of his students to create a chronological sequence on the basis of the stylistic analysis of mostly looted Vicús and Mochica style materials with no provenance information. There is a correlation of their sequence with that defined by Kaulicke but using a rather different terminology. This book, due to the nature of its supporting data (inconsistent, heterogeneous, ungainly nature) is very inferential and, in a sense, it is very narrow in focus and overemphasizes stylistic and iconographic analysis of looted materials found in collections.

Overall, the UPAP has been the only relatively long-standing research effort (five field seasons and some few publications) in the Upper Piura Valley. There has been, however, no clear integration of results of the different members of the project. Its research interest has also been very narrow concentrating mainly on the chronology of specific time periods. Some of its results are very inferential and its cultural reconstructions seem overly reliant on the basis of stylistic change alone.

In general, due to the amount and results of its stratigraphic excavations, the UPAP has a very good control of the vertical understanding of the micro-region cultural history but a very poor understanding at the horizontal scale with only unsystematic and limited (except for Bats') surface surveys. That is, we do not know what happens after the Mochica presence in the area; also we are uncertain if their reconstructions based on the results of the Tamarindo area are applicable for the rest of the Chulucanas Valley.

The UPAP could have better integrated its research efforts with those of Peruvian, French, and German scholars representing natural sciences and other social sciences. The latter have been involved in a reconstruction of a regional and environmental history of the Far North Coast for the last 50 years (see Hocquenghem, et al. 1999). In this sense, the synthesis prepared by A.M. Hocquenghem (1998) is an invaluable contribution. She was able to combine information from the disciplines mentioned above with the archaeological data from various investigators, the UPAP, and her own fieldwork. The outcome was a major monograph on the cultural and environmental history of the Far North Coast from the Preceramic period to modern times. Although several of her ideas and hypotheses await field testing and refinement, her work opens a myriad of possibilities for future inquiries.

Ironically enough, Hocquenghem's publication coincides with a decrease of research attention on the study area. No major publication or research project after 1998 is known. After reviewing the research history on the Far North Coast, one is left with an impression that a lack of "attractive" Mochica style materials in archaeologically excavated contexts has made the study area "less appealing" for researchers. The Mochica Factor thus affected to some degree the research during the Post-Vicús era. Even the UPAP could not remove itself from these shackles since ultimately the research focus (judging from the number and focus of publications) overemphasized again the Mochica presence in the Upper Piura Valley rather than a better understanding of the cultural dynamics of the local Vicús populations.

Finally, it is clear that there is a large gap in our understanding of the prehispanic periods after the Early Intermediate period (the Mochica/Vicús period) which coincides with the "less sophisticated" material culture of the late prehipanic societies.

3.2 A Characterization of Local Polities

Like many earlier scholars, Hocquenghem (e.g., 1991; 1998; 1993) argues that the Far North Coast (the area between the Jubones River in Ecuador and the Olmos River in

Perú) has always been a transitional area between the North Andean and Central Andean cultural traditions. She also concurs with other scholars (e.g., Bennett 1948; Burger 1984; Lanning 1963; Willey 1971) in arguing that throughout prehistory, southern and northern cultural borders of the North and Central Andes respectively, have been pushed back and forth within this transitional area.

Following an *à la* Wittfogel argument, Hocquenghem believes that the main difference between these cultural traditions is found in the organization of production and its associated cosmological order. The Central Andes is characterized by a pan-Andean organization of production and cosmological order, based on a centralized authority, cooperative work (required to build large enterprises such as agricultural irrigation systems to cope with variable water availability), and ancestor veneration associated with an agrarian calendar system. This Andean organization and order would have led to increasing sociopolitical complexity as reflected in features such as elaborate social hierarchy, population concentration, and architecture monumentality among others. On the other hand, Hocquenghem believes (1991; 1998), water was not a limiting factor in the North Andes and thus a centralized authority was not required leading to societies with less sociopolitical complexity not reaching state-level status. Also, ethnic segmentation, competition between polities, and relatively limited social hierarchy, were other characteristics of North Andean polities (e.g., Bahía, Jama-Coaque, and La Tolita). In fact, DeBoer (1996:190-191, see Table 10.1), on the basis of settlement pattern data and site size from the Santiago-Cayapas region in northwest Ecuador, points out that throughout prehistory from the Formative period to colonial times, most sites were small (less than 0.03 ha) and only a few were large (more than 5.0 ha). Hence, Hocquenghem argues that sociopolitical organization and other cultural traits in the Far North Coast were similar to those of the North Andes during the Early Horizon and part of the Early Intermediate periods. This situation, however, may have changed by the end of the Early Intermediate period and certainly during the Middle Horizon period when the Central Andes cultural frontier was pushed northward changing the sociopolitical structure of local polities following the arrival of the Andean organization of production and cosmological order. This situation may have been consolidated during the Late Intermediate period and under the Chimú when the actual cultural border of both North and Central Andean traditions overlapped with the natural frontier between the wet and dry tropical forest of Ecuador and Perú, respectively.

Archaeological evidence available seems to support Hocquenghem's reconstruction above. For instance, on the basis of limited surveys conducted thus far a partial picture of local settlement patterns in the Upper Piura region can be gleaned. More than 40 sites and the extensive Yécala cemeteries dating to the Early Intermediate and Middle Horizon periods (e.g., Matos Mendieta 1965/66) show an extensive settlement concentration on both river banks centered around the Yécala cemeteries. A detailed mapping of the Tamarindo sector (just east of Cerro Vicús, and ca. 14 ha) by the UPAP defined artificial mounds, flat and raised platform areas, depressions (possibly sunken plazas or reservoirs), and low mounds (Kaulicke 1991:386-387). In reference to local architectonic features for the Vicús period, both monumental and domestic architecture have been documented. Artificial mounds can be multi-leveled and as high as 12-14 m, and built with a complex network of retention and structural walls known as *bahareque* in the North Andes. Domestic architecture is characterized by postholes, narrow ditches (probably remains of *quincha* or *bahareque* walls), and vessel imprints on the occupation surfaces or floors (Kaulicke 1991:393-401). These construction techniques and forms are distinct enough for relatively easy field identification of Vicús architecture. The local ceramic style -during the Vicús period- is represented by the Vicús style, which has been partially studied by the UPAP.[6]

There is also scant information about the local post-Vicús occupation in the study area. There is some information, however, for the adjacent Lower Yapatera Valley to the north where Bats (1991) conducted his study. He concluded that at the end of his first epoch (Chapica phase, ca. A.D. 200-300) the valley bottom area of Yapatera Valley came to be intensely occupied due to population movement from the headwaters of the valley. This expansion momentum decreased at the end of the second epoch; the total sites per phase reached its maximum (107 sites), and total number of sites were similar for its two phases (Vicús and Campana; ca. A.D. 300-1000). Also, during this time period, changes in site location occurred. Sites found on the Upper Piura River alluvial terraces are characterized by large areas of material concentration (Bats 1991:370-374). Kaulicke (1991) and others (e.g., Makowski, et al. 1994) reached a similar conclusion that human occupation in the study area reached its peak during the Vicús-Moche occupation (ca. A.D. 300-600).

3.3 Northern North Coast Polities in the Upper Piura River

Studies of the northern north coastal polities have been long-standing and intensive (e.g., Moseley and Cordy-Collins 1990; Moseley and Day 1982; Schaedel 1951;

Shimada 1994; 1995), contributing to the understanding of the sociopolitical, economic, and ideological aspects of the Mochica, Sicán, and Chimú core polities. Accumulated knowledge about them contrasts dramatically with what we know about the sociopolitical, economic and ideological interaction of these polities in "peripheral" areas, including the Upper Piura region. As a consequence of this paucity of archaeological attention, inferences on the nature of the Mochica, Sicán, and Chimú presence on the Far North Coast are based on limited field reconnaissance, presence/absence and distribution of ceramic types (those defined in the core area), and the analyses of pottery and metal objects with no provenience information found in private and public collections.

On the basis of observations of Vicús/Mochica pottery and metalwork stylistic features, the presence of the Mochica polity in the Upper Piura Valley has been argued as the consequence of a colony of skillful craftsmen established and controlled by the Mochica polity (Lumbreras 1979, 1987), or as a peaceful interaction between Mochica and local Vicús elite groups, who were gradually acculturated and then dominated by the powerful Mochica polity (Hocquenghem 1998; Shimada 1994). The underlying motive for this Mochica presence may have been to participate and eventually take control of interregional trade networks formerly in hands of the Vicús elite groups. These trade networks were those engaged with North Andean polities in Ecuador and may have been the means by which North Coast core polities obtained prestige and ritual goods and other coastal resources such as the *Spondylus sp*. shell (Hocquenghem, et al. 1993; Shimada 1999:433-434; Zeidler 1988; 1991). Similar inferences of a militaristic conquest and acculturation of the Vicús by the Mochica have been derived from iconographic and stylistic analysis by Makowski (1994) and his colleagues. On the other hand, other scholars (e.g., Kaulicke 1992; 1994; Shimada 1990b; 1994; 1999) suggest that there was no such Mochica colony during the early Early Intermediate period, but the presence of "Mochica" cultural traits represents adoptions and internal transformations of prestigious foreign traits by the long-standing local Vicús cultural tradition.

Hocquenghem (1998), however, in her diachronic reconstruction of the agrarian frontier in the Upper Piura, strongly argues that the arrival of the Mochica polity led to a second and third expansion of cultivated area through control and extension of irrigation and communication systems that were already developed on a smaller scale by the local Vicús chiefs. Hocquenghem infers that the first expansion of cultivated land was conducted under Vicús leaders. The basis for her inference about the second and third expansions is the strategic location (i.e., next to effective irrigation and prime alluvial lands for cultivation) of early –Moche III- (Huaca Nima) and late –Moche V- (Laynas) settlements located on the south bank of the Upper Piura River.

Besides isolated findings of Mochica-Huari style ceramics (Matos Mendieta 1965/66:111, Lámina 8g; Rowe 1942) there is no evidence that points to a possible Huari intrusion or influence in the Upper Piura region during the Middle Horizon period. The Mochica-Huari ceramics may have been brought to this area through the route that was used by the Moche V polity. Current understanding of the presence of the Middle Sicán (late Middle Horizon to early Late Intermediate periods) polity in the Upper Piura Valley is similar to that of Mochica; there is a clear lack of data derived from systematic archaeological research with very few exceptions (Guffroy, et al. 1989a; Shimada 1989). This situation contrasts with the amount of knowledge gained in the last two decades on the Sicán polity on the basis of sustained regional research conducted in the core La Leche-Lambayeque area (e.g., Shimada 1990b; 1995; Tschauner 2001). This research suggests (Shimada 1995) that the power base of Middle Sicán elite groups was, among other factors, the control of a large-scale inter-valley irrigation system as well as control of interregional trade with the North Andes formerly managed by the late (phases IV and V) Mochica polity. It should be underscored that Shimada (1995) emphasizes that the Middle Sicán expansion out of the Lambayeque heartland was strongly tied to the trade of metal products with wealth items. Presence of a Middle Sicán polity on the Upper Piura River has been suggested primarily on the basis of surface-collected or looted Middle Sicán pottery and metal objects and secondarily on a few excavated burials (Guffroy, et al. 1989a).

Hocquenghem (1998) hypothesized that the fourth expansion of cultivated area in the Upper Piura was executed during the Middle Sicán occupation; that the Middle Sicán polity built the south bank maximum elevation canal (Hualcas canal), and aided by arsenical bronze implements, achieved large-scale land modifications and a significant expansion of the agricultural frontier. Likewise, the fifth and last expansion of cultivated area in the Upper Piura may have occurred in the Late Sicán period, which was based on the capture of run-off from substantial seasonal rainfall from piedmont *quebradas.* Finally, Hocquenghem argues no further expansion of cultivated area occurred in the Upper Piura Valley after it was subjected by the Chimú first and then the Inca states.

In sum, after reviewing the literature on the presence of Northern North Coast and North Andean polities in the Upper Piura Valley it can be concluded that: 1) interpretations of the kinds of interaction are based on scarce empirical data and are thus tenuous; 2) although control of interregional trade networks has been argued as one of the main driving forces of Northern North Coast polities expansion, there is no detailed regional research investigating and defining the nature of local polities and their elites and the relationship between these local polities and intrusive states; 3) it has been hypothesized that Far North Coast polities shared a similar organization of production and sociopolitical structure (i.e., not as complex as a centralized authority) with the North Andes until the end of the Early Intermediate period; and 4) an *a priori* subject-dominance relationship between the local polities and intrusive states is presented as an axiom.

3.4 Mochica, Sicán, and Chimú Polities in Other "Peripheral" Areas

The documented changes to local sociopolitical organization brought about by the arrival of North Coast polities in other "peripheral" areas farther south serve as a valuable comparative basis for this dissertation.

3.4.1 Mochica

Conrad (1978) modeled settlement patterns for the Mochica period occupation in the Virú Valley. Conrad assessed Mochica site hierarchy and distribution in the valley on the basis of three independent factors or determinants. He concluded that the predicted and actual settlement patterns for the Virú Valley suggested that the determinant factors were, in decreasing order: (1) the maintenance of sociopolitical control; (2) the minimization of agricultural effort; and (3) the maximization of arable land. Wilson

(1987; 1988) suggested for the Santa Valley that warfare may have been another determinant for settlement location and the development of societal complexity in the North Coast. Wilson also suggested that during pre-Mochica times (Early Horizon and early Early Intermediate period) local population was largely located in the upper and middle sectors of the Lower Santa Valley. Although these sectors comprised less than 50 percent of the arable land, populations did not occupy the larger and more fertile lower valley to defend themselves from raids of hostile populations from the Nepeña Valley to the south, perhaps from the competing polities of Recuay and Gallinazo. According to Wilson, settlement location changed with the arrival of the Mochica (Guadalupito period) polity; other researchers (e.g., Chapdelaine 2008) argue for a more gradual conquest process entailing, initially, a peaceful coexistence with local populations. The Mochica may have imposed a *pax Mochica* defeating and conquering populations in the Nepeña Valley and thus allowing a settlement shift concentrating population in the more fertile, lower valley sector. Other factors affecting settlement change during the Mochica and later periods may have been the need to control and procure a much broader coastal resource spectrum, creating what Shimada (1982) has labeled “horizontal archipelagos”. Other factors affecting observed settlement patterns are preservation (Moseley 1983b), and a co-evolution of the physical landscape and human settlement especially in coastal Perú where extreme events (e.g., sea level stabilization, droughts, El Niño floods) have likely facilitated periods of rapid technological and cultural innovation (e.g., Wells and Noller 1999).

3.4.2 Middle Sicán

There are scarce data on Middle Sicán polity settlement organization outside its core area. No sustained research effort has been devoted to investigate Middle Sicán occupation in its provinces. This situation dramatically contrasts with the plethora of information gathered in the core area and its surroundings. Settlement patterns during the Middle Sicán period in the core Lambayeque-La Leche area evolved around the major religious and ceremonial center and capital of the Middle Sicán polity in the Poma area, mid-La Leche Valley (Shimada 1990b; 1995). Recent systematic settlement pattern studies in this core area- north bank of the Lambayeque Valley- (Tschauner 2001:305-313) argue that the Middle Sicán settlement pattern is characterized by a total of 114 settlements occupying an area of 576 ha, and a five-tier site size hierarchy (5 classes). The first three are composed of mound centers (probably of ceremonial and administrative functions). Class 1 is represented by a single site –Vista Florida-, which is surrounded by a triangle of second-rank mound centers on the periphery (Classes 2 and 3). Classes 4 and 5 are smaller sites (1 ha or less) comprised of habitation mounds and habitation sites. Tschauner (2001:305-313) concludes that Middle Sicán settlement focuses generally on occupation of the valley floor and is characterized by a solar settlement system focused on the regional center of Vista Florida and integrating the whole valley. Not all lower ranking sites, however, are centered around major mound centers; smaller habitation mounds and sites seem to be less dependent on elite centers in terms of their location.

3.4.3 Chimú

Chimú state expansion has been studied in the Jequetepeque Valley in the Northern North Coast (Keatinge and Conrad 1983). With the assumption that the Chimú was a militaristic state, Keatinge and Conrad used the Inca model (which in turn was based on ethnohistorical data) as well as results of studies in the core Moche Valley area at the site of Chan Chan in analysis of the Chimú expansive strategies. They concluded that Chimú presence in the Jequetepeque Valley followed the same pattern as in the core area. That is, to increase its tax tribute, the goal of the Chimú was to control land, water resources, as well as human labor and information flow through the establishment of two-tier hierarchy settlements. A lower order site, Talambo, had relatively direct control of basic resources such as land, water, and labor. The higher order center, Farfán (which also followed closely architectural patterns and layout of Chan Chan *ciudadelas*), collected and processed information from the lower order site to make decisions on managing basic resources as well as to supervise the extraction of these resources, goods, and labor to Chan Chan. This model might fit the Inca model of expansion in the sense that the Chimú state might have imposed (and not co-opted) its presence (physically observed in settlement and architectonic features) in areas where centralized government was weak or absent, which seem to have been the case for the Jequetepeque Valley.

Recent studies (Hayashida 2001; 2006; Tschauner 2001) on the presence of the Chimú and Inca states on the Lambayeque region have confirmed this flexibility of strategies in expansionist states. For instance, on the basis of his surface survey and excavation at Pampa de Burros, a site where a multi-family household of potters dwelled, Tschauner (2001:329-343) has suggested that politically, the Chimú attempted a military, territorial control. On the other hand, he also argues that North Coast polities were economically largely self-sufficient and thus the agricultural economy was left in the hands of the local Lambayeque leaders (cf. Shimada 2000:103). Political domination by the Chimú had the purpose of supervising the procurement and shipping of agricultural produce from Lambayeque to Chan Chan. According to Tschauner evidence such as the location of Chimú centers at strategic points of major irrigation canals and a lack of large storage facilities in the Lambayeque region point in that direction. He thus concludes that while the Chimú state may have had strong control of the political economy, the specialized subsistence economy in which consumer goods such as non-prestigious pottery were produced was largely independent and separated from the political economy of the Chimú state. Moreover, Chimú presence and interest in the control of land, water resources, and agricultural produce, was also felt in the Pampa de Chaparrí located not far from Pampa de Burros. According to Hayashida (2006), however, unlike Pampa de Burros changes occurred in Pampa de Chaparrí during Chimú times that were more drastic (see also Shimada 2000:103). Settlement patterns and architecture were transformed drastically reflecting the modification of social divisions that were stable since Middle through Late Sicán times. Thus, direct state intervention also brought changes to local household and community organization.

3.5 Summary

A review of the research history of the Far North Coast shows that no significant archaeological long-term research endeavors were ever undertaken. Most research efforts to date were devoted to stylistic and chronological issues. Also, external factors such as the oil industry and intensive looting and illegal trade of precolumbian art after the "discovery" of the Vicús style clearly had an influence on the research history. Clearly the presence of Mochica style cultural materials in this region is what mostly drew the attention of researchers perhaps influenced by the Mochica Factor, especially during the Post-Vicús era. I believed the current exacerbated nature of the Mochica Factor in Peruvian archaeology threatens both the little progress achieved thus far, and the rights of modern local populations to value and protect their local cultural heritage. Furthermore, it ultimately perpetuates the idea of the "marginal" or "peripheral" which is in fact a modern biased construction that has little to do, if anything, with the archaeological past. Finally, local sociopolitical developments have been viewed in terms of intrusive "core" polities without allowing for the possibility of active negotiation on the part of local groups with external polities. It is thus evident that more data and a better understanding of the cultural developments of local polities are badly needed before assessing interpretations of the intervention of foreign, "core" polities in the Far North Coast.

Notes-Chapter 3

[1] As an anecdote, in 2005 I was approached by an American undergraduate student after a talk I gave about my research for the core curriculum *Introduction to Anthropology* (ANTH-104) class at SIU Carbondale. He told me he has at home a small collection of precolumbian artwork (ceramic and metal objects) his grandfather got (or bought) while working on some sort of pipeline project in the Piura region several decades ago.

[2] While writing this chapter Izumi Shimada pointed out to me that the Mochica Factor is akin to his comment at the Southern Moche symposium held in 2004 (Shimada 2004) where he claimed that Mochica archaeology has an insular character reflecting its prima donna mentality in Peruvian coastal archaeology. According to Shimada this was a critique of the arrogant aggrandizing attitude of Moche archaeology, claiming that to better understand sociopolitical aspects of the Mochica polity, attention should be focused more on the relationships it had with its local, regional and highland neighbors. Yet, I believe that it is obvious the Mochica Factor I characterize in this chapter has much broader connotations that go beyond Moche archaeology.

[3] In the early 1970s former Upper Piura *hacendado* Domingo Seminario (who owned land in Pabur, where Vicús and Yécala are located) sold to the *Banco Popular* his private collection of Vicús and Vicús/Mochica style ceramic and metal objects (of which he was mostly responsible for looting), to partially pay his debt to the Peruvian state. Later this collection was transferred to the Museum of the Central Reserve Bank where it is currently located. The 1987 catalogue of this collection that Lumbreras also authored does not differ much from his earlier catalogue except for the discussion of the refinement of Lanning's sequence suggested by J. Richardson and his students.

[4] As explained in Chapter 6 and used in Chapter 7, this dissertation follows (and cross-references with other regional chronologies) the regional chronology proposed by Bats (1990; 1991) for the Upper Piura Valley (see Appendix C). The periods in this regional chronology do not coincide necessarily with the general chronological scheme devised

for the central Andean area (Menzel, et al. 1964). For the purpose of informing the reader, the equivalencies between these two schemes are as follow:

Years	Upper Piura	Central Andes
1100-700 B.C	Ñañañique	Initial/Early Horizon
700-500 B.C	Panecillo	Early Horizon
500-300 B.C.	La Encantada	Early Horizon
300 B.C.- A.D. 300	Chapica	Early Horizon/Early Intermediate
A.D. 300-700	Vicús	Early Intermediate/Middle Horizon
A.D. 700-1000	Campana	Middle Horizon
A.D. 1000-1375	Piura	Late Intermediate
A.D. 1375-1460	Chimú	Late Intermediate
A.D. 1460-1532	Inca	Late Intermediate/Late Horizon

[5] Kaulicke and Makowski systematically surface surveyed a 32 km^2 area between Cerro Vicús and Cerro Loma Negra on the Upper Piura River south bank (Guffroy, et al. 1989b:137). Results of this survey have not been published yet.

[6] Briefly, characteristics of this local ceramic style are: 1) external and internal surface colors varies between dark colors (e.g., reddish, brownish) to brighter colors (e.g., red pinkish and red purplish slip); 2) horizontal burnishing; 3) almost all vessels have a neck (short, flaring, longer, straight); also present are dishes and bowls with convex and converging walls; and 4) white painted designs on the rims, modeling, slip painting, and negative technique (Kaulicke 1991:401-413).

CHAPTER 4

THEORETICAL FRAMEWORK

This chapter explains the theoretical approach used in this dissertation. This dissertation regards landscape as an embodied experience. This approach therefore stems from Ingold's (2000) dwelling perspective, which in turn is defined as an active engagement between self and the world which makes one who perceives a *being-in-the world,* a concept drawn from the philosopher Martin Heidegger (1975). Through this view it is also possible to recognize the temporality of the landscape which is the recognition of a past existence of seasonal rhythmic cycles that past lives and works have left on the landscapes they inhabited. Traces of these lives and works are spread throughout landscapes and can be detected and interpreted archaeologically.

This chapter also sets the theoretical background for the methodology proposed in Chapter 5 to study interregional interaction through a settlement and landscape study in the Upper Piura Valley on the Peruvian Far North Coast.

The definition of landscape as conceived under the dwelling perspective is presented at the end of the chapter. Before that, a review and critique how regional and landscape studies are normally pondered is presented. This review and critique is framed under an old anthropological debate: the problem of mind and body.

4.1 Mind and Body: A Perpetual Dilemma in Humankind

Western philosophy, from the early classics through the Renaissance and post-Renaissance Cartesian school, to the modern era, has been concerned with the significance and nature of mind and body for human existence. The main debate revolves around the question of which of these two aspects predominates and ultimately explains human essence and existence. Actually, this dichotomy ultimately responds to the secular antagonism between the natural sciences and the humanities, the two main approaches to understanding humankind. It originated during the seventeenth century Scientific Revolution and has been perpetuated since then.

Obviously, this quagmire has permeated and transferred its metaphysical discussion into anthropology. Since the origins of the anthropological discipline this dichotomy has been the base on which various controversies on how human culture and society developed. In fact, on the basis of this basic dichotomy further opposing positions explaining human culture were developed. This dichotomy led to various scientific paradigms (e.g., nineteenth century evolutionists versus Boasian historical particularism, Marxism versus French Structuralism etc.) that were very influential in their times (Service 1985). Predominance and influence of either side of this basic dichotomy, and its various manifestations, have alternated throughout history as if it were a swinging pendulum.

Another form that takes this philosophical and theoretical confrontation in anthropology is the battle between rationalism versus relativism (Trigger 2003:4-7). Basically, this dichotomy focuses on the debate of human behavior as determined either by cross-cultural determinants, or discrete factors from particular cultures. In fact, for rationalism, cross-cultural determinants are universal and comprise basic human (biological) needs that have to be satisfied by adaptation. Hence, culture is geared towards satisfaction of these needs and discrete factors from particular cultures (beliefs systems, religions, consciousness, morality, etc.) are considered secondary phenomena. For this reason, adaptive behavior is the main focus of rationalism deemphasizing the importance ideas and belief systems might have among cultures. By the same token, the rationalist perspective is more interested in sociocultural evolution than in specific cultural particularities. Concomitantly, explanations are mainly materialistic and based on economic or ecological determinisms or those (such as classic Marxism) that bestow control of material resources a prime role in culture change.

In contrast, according to Trigger (2003:7-11) cultural relativism, akin to Boasian historical particularism, firmly believes that human behavior is mainly shaped by ideas and beliefs, rather than by material conditions. Members of every cultural tradition make sense of their lives based on their own experience, which in turn is historically contingent as knowledge transmitted from earlier periods. Cultural relativists do recognize that basic human needs and material factors can influence cultural traditions. Yet, they reject that ultimate decisions on social and biological reproduction and belief systems, are dictated by them. This cultural variability makes cultural change complex and uncertain. Likewise, interethnic understanding becomes difficult since every aspect of human behavior would be culturally determined by symbols and meanings decoded only by each particular cultural group. In a nutshell, unlike rationalists, the main focus of relativists is the world perception of cultural groups rather than their adaptive behavior in relation to their environment.

At the core of this distinction presented by Trigger lies the long-standing and eternally debated subject-object relationship. Indeed, looking at the rationale of the two approaches above (rationalism versus relativism), it is evident they are completely opposite and not reconcilable processes. On the one hand, the rationalist approach is an outward process from the subject-out, toward a world (object) that needs to be measured, controlled and/or adapted to. On the other hand, relativism is an inward process from the subject-in toward a world that is perceived and encoded by the individual (subject). This core dichotomy was founded by Descartes when he stated that humans (subject) were in a privileged position above all other beings. This was the moment in history when humans opted to separate themselves from nature and the rest of living beings, considering them as mere "things" or objects that behaved or functioned mechanically. Yet, research in the anthropological discipline (e.g., Santos Granero 2009) has demonstrated that there are other, non-western, ways of being a thing in the world.

4.2 The Dilemma in Regional and Landscape Studies

The subject-object dilemma is also present in issues discussed by any anthropologically oriented archaeology. It is also clearly present in such a broad and significant issue as regional and landscape studies. Franz Boas, as the founding father of American anthropology, tried to overcome this dichotomy in the 1880s when he embarked on a journey and transformation from physics to ethnology (Stocking

1982:133-160). In fact, trained as a hardcore materialist but nonetheless influenced by nineteenth century German historical geography (where geography and ethnology overlapped), Boas was aware of the possible syncretism of "the historicist spirit of romantic idealism and the hairy philosophy of monistic materialism" (Gillispie 1960; in Stocking 1982:140). This epistemological concern was present before and during his Arctic trip since he was not only interested in the relationship between people and their environment, but also on how land configuration influenced "the acquaintance of peoples with their near and far neighborhood" (Boas's letter to his uncle A. Jacobi, in Stocking 1982:138). Boas (influenced by historical geography) was interested in the relationship between subject and object (the external and internal, the physical and the psychic, the inorganic and the organic), as well as on the knowledge of the external world. Therefore, the underlying, core geographical/ethnological problem he studied in the Arctic was "...: the relationship of *men's knowledge* of the land and the actual topography –i.e., *between perception and reality*-….." (Stocking 1982:144, emphasis is mine).

Clearly, Boas' originally holistic perspective on landscape has been difficult to pursue by anthropologically oriented archaeologists, especially when dealing with regional and landscape issues. This failure could be explained by the strong influence rationalism has had on archaeological interpretation since the New Archaeology era. This attitude is especially manifested in regional studies in American archaeology where the subject-object dichotomy tends to perpetuate. On the other hand, the British counterpart has offered a counterbalance focusing on the subject's perspective while dealing with regions and landscapes showing, in some instances, radical positions. As described below, some of the British viewpoints seem to be closing the subject-object gap akin to how Boas conceptualized it.

4.2.1 Regional and Landscape Studies in American Archaeology

The study of settlement patterns has been a major hallmark of regional and landscape studies in American archaeology. Initially, it was believed that settlement patterns were a product of different factors and the relationships between them (Trigger 1968). These factors could be broadly characterized as environmental, economic, social, political, religious, and even fashion and taste. Some scholars (Chang 1972; Trigger 1967) even stressed that in settlement patterns studies, archaeological sites were not the subject under investigation. Rather, the real goal of investigation was the social relations among social units, and human behavior as reflected on ancient concepts of time and space.

Yet, it was G.R. Willey's (1953) work in the Virú Valley (Perú) in 1946 that was the epitome of settlement archaeology, influencing and shaping subsequent settlement and regional studies. Underlying Willey's rationale as well as later settlement studies under the New Archaeology, was a concern with the functional and environmental aspects of prehistoric human occupations and their role as determinants for settlement patterns. In fact, settlement studies were conceived under J. Steward's multilinear evolution theory and his cultural ecology method (Steward 1955) that gave anthropology back a time line formerly neglected by historical particularism. Steward's approach and influence focusing on the "culture core" is undeniable and still a valid perspective. It has even been revamped and fostered the proposition of a new paradigm on the basis of similar epistemological grounds (Wilson 1999), as well as modern methodological elaborations on long-term human-nature interaction such as in historical ecology studies (Balée 1998; Balée and Erickson 2006; Crumley 1994).

Still, settlement archaeology built under the cultural ecology umbrella perceived the environment as a static place from which humans extract their resources. It did not realize that both culture (humans) and nature establish a reciprocal dynamic mutually influencing each other. Further, it did not realize that structures of power and domination, historical consciousness, and human agency, have a crucial role in how societies organize, perceive, and conceptualize their landscape. In other words, this lack of perception reflected once again the omnipresent subject-object dichotomy.

The rationalist position above was further maintained by methods and methodologies applied to regional studies during the 1960s and early 1970s. In fact, the object (the real world) was sought to be described, understood, and measured within neo-evolutionism, cultural ecology, and neo-positivism frameworks trying to reach hard-science status as well as to generate general laws. With these aims in mind, theory and models from other disciplines were applied to anthropology and thus, to studies of settlement patterns, inter-population interaction, and regional interaction systems. For instance, locational and central-place models have been applied since the mid 1970s turning attention to disciplines such as cultural, human, or economic geography, to approach settlement patterns analysis and regional studies in general. Also, rigorous research designs for settlement patterns were proposed (e.g., Plog, et al. 1978; Schiffer, et al. 1978). In addition, extreme reliance on statistics led to methodologies such as "siteless survey" and rejection of the site notion (e.g., Dunnell 1983; Dunnell and Dancey 1983; Rossignol and Wandsnider 1992).

Cultural geography models such as locational or gravity models or site-catchment analysis (Crumley 1976; Dennell 1980; Johnson 1977; 1981; Plog 1976a; Roper 1979), asserted that physical space (i.e., distance, and travel time, a distance transformation) was one of the main variables involved in the regional interaction of human groups and in defining the size of catchment areas for prehistoric societies. For instance, distance and settlement patterns analysis were approached constructing models applied to random, uniform, and clustered patterns, emphasizing the second one in which Central Place Theory (CPT) and its variations (e.g., Bell and Church 1985), are applied openly. Models such as CPT were built assuming a formalist behavior such as risk minimization, cost-effectiveness, optimization, and maximization of certain variables (Johnson 1977:479), drawn from theories of the development of retail marketing systems in capitalist, industrialized societies.

Notwithstanding, it has been claimed (Johnson 1977) that even in pre-capitalist societies distance (to minimize, for instance, energy used in transport), was consciously considered since there seems to be an inversely proportional relationship between distance and the location of sites and the interaction of individuals. Some proponents of these models of spatial behavior acknowledge the existence of other considerations (social, political, ideological, etc.) that may also explain such behavior. They also claimed (Johnson 1977:480), however, that to go beyond mere descriptions these models are useful as a theoretical baseline to compare archaeological data. Further, it is argued (Johnson 1977:501) that these locational behavior models are helpful to understand causal processes involved in regional interaction systems rather than for predictive purposes. Indeed, their use as an aid in interpretation and as analytical tools is manifested in recent settlement patterns studies (e.g.,Tschauner 2001). In addition, applicability of these models and especially of their statistical procedures is confirmed by recent assessments and refinements (Drennan and Peterson 2004).

Three main general reviews on the state-of-the-art in settlement archaeology and regional studies after 26 (Parsons 1972), 37 (Vogt 1983), and 50 (Billman and Feinman 1999) years from the Virú Valley project respectively, showed that materialist, rationalist, and mechanistic thinking was and still is pervasive within settlement pattern studies. For instance, Parsons (1972) indicated that the major concerns and issues considered important by investigators were description and analyses of symbiotic regions, distinctions between community settlement patterns and zonal settlement patterns, development of the settlement system concept, and distinctions between settlement patterns versus settlement systems among others. Parsons also estimated that major needs and key problems faced by settlement archaeology were both methodological (sampling, refined chronology, functional interpretation, and paleoenvironmental reconstruction), and conceptual; the latter referred to the failure to develop adequate models from historical and ethnographic data. He claimed that such models would be useful to better frame the archaeological record and to design new research questions, problems, and programs.

In Vogt's (1983) review, a few innovative themes in settlement pattern research were underscored. Remote sensing (aerial photography and airborne radar), and radar imagery were highlighted as new data gathering techniques. Also, models used for analysis and interpretation were locational (e.g., CPT), ecological (e.g., "energetics"), fungal versus functional (in terms of the role of the elite), symbolic-structural or ideological, and based on disequilibrium.

The most recent compendium (Billman and Feinman 1999) also does not show theoretical and methodological innovations that would otherwise offer a departure from former studies (see also Wilson 1988; 1995). Evolutionary and ecological themes are the most common topics: the development and regional organization of complex societies, the origins and development of sedentary communities, the evolution of ranking, and especially the evolution of the state (Billman 1999:2). This stagnant situation of regional and settlement studies may well be exemplified by a statement by one of contributors of the volume who concludes that settlement pattern research "… demonstrates conclusively, dramatically, and uniquely its value in elucidating the environmental circumstances, mechanisms, and processes of cultural evolution…... It is the only viable archaeological strategy applicable to regional archaeology" (Sanders 1999:21). Such a statement may explain why one of the editors believes that future directions in settlement pattern archaeology should comprise "more encompassing" views including ethnographic and land-use research, and environmental and landscape reconstructions (Billman 1999:4); directions that were already envisioned and proposed by Willey as well as by Parsons and Vogt in the reviews mentioned above.

4.2.1.1 <u>On the Concept of Landscape</u>. These "more encompassing" views of settlement and regional studies in American archaeology had already started early in the 1990s, when the concept of "landscape" made its breakthrough within archaeological method and theory. Landscape, however, was not a new concept in the social sciences. It originated in central Europe in the early nineteenth century and was later developed by landscape ecologists who, in turn, drew from the combined efforts of ecologists, geographers, and landscape and regional planners, designers, and managers. Their main goal was a comprehensive understanding of the relationship between natural, agricultural, human, and urban systems (Naveh and Lieberman 1984). Concepts such as *Naturlandschaften* (natural landscape) and *Kulturlandschaften* (cultural landscape) (Langer 1973), or "inscape/landscape" (human perception and human impact on the landscape) (Dansereau 1975), or the "noosphere" (world dominated by the mind) (Vernadsky 1945), were presented by American and European landscape ecologists. These scholars recognized that urban and regional planning should work on the basis of complex “geosocial systems” that are cultural landscapes comprised of both anthropogenic and natural elements; therefore the human-environment relationship is a concern of both the natural and the social sciences (Naveh and Lieberman 1984:7).

The notion of landscape as conceived above was introduced into American archaeology, and especially into settlement and regional analysis by C. Crumley (1990) in the early 1990s. Crumley underscored the importance of cultural, social, and historical factors in the notion of landscape brought from landscape ecology where economic and ecological factors were predominant. Hence, according to Crumley (1990:73-74) landscape is defined by sociohistorical (political, legal, and economic phenomena), and physical structures (climate, topography, geology, etc.), as well as by the interpretations of these structures (aesthetic, symbolic, religious, ideological). As such, the landscape notion is applied within the context of settlement and regional analysis, human-nature interaction studies (past land-use, paleoenvironmental reconstruction, etc.), as predictive models for site location, and for research and conservation purposes (Madry and Crumley 1990). This approach was prompted by the appearance and rapid development of remote sensing techniques and GIS. Even within the context of this totalizing perspective, however, the subject-object dichotomy -at least from a methodological point of view- was still maintained since applied GIS analyses were quantitative (measurements, estimates, and predictions of the physical environment related to cultural features), rather than qualitative (landscape visual perception from the perspective of the individual).

Furthermore, more recently archaeologists (Stoddart and Zubrow 1999) have acknowledged this inheritance from landscape ecology as well as earlier anthropological approaches and research agendas such as human ecology and settlement archaeology (Feinman 1999:685), and have recognized that landscape studies in archaeology are still in their infancy (Fisher and Thurston 1999). In fact, landscape studies in archaeology encompass a wide variety of approaches and perspectives including simple environmental reconstruction, systemic/scientific approaches, historical ecology, and phenomenological perspectives (see also Ashmore and Knapp 1999).

Finally, it could be said that landscape in American archaeology has become a notion disputed between rationalist and relativists perspectives. New and more sophisticated versions of locational models supported by statistical analyses and mathematical algorithms through GIS are proposed for settlements and regional analyses of human interaction (Peterson and Drennan 2005). This approach is based on assumptions drawn from rejecting the notion of the site and on data gathered by “siteless” surveys, with population being estimated not from actual areas of archaeological sites, but computed from areas of both surface artifacts scatters and surface artifact densities. The authors claimed that their study is compatible with landscape approaches since the fundamental unit of analysis and observation is not the "site" but the "…continuous artifact density values spread systematically across a landscape…" (Peterson and Drennan 2005:20). Perhaps this new approach defines what could be termed the "statistical landscape".

4.2.2 Regional and Landscape Studies in British Archaeology

The origins of modern British archaeology were shaped by its economic approach to prehistory (Clark 1957) and subsequent rationalist approaches and models which in turn were also influenced by advances in other disciplines such as locational analysis in human geography (e.g., Clarke 1972, 1977; Haggett 1965; Haggett, et al. 1977).

Settlement archaeology studies were also the way in which regional and landscape studies began in British archaeology. Some concepts such as "settlement" and "community" were already being used in British archaeology before Willey's 1953 pioneering work in the Virú Valley. British scholars, however, also recognized that settlement archaeology as a systematic methodological approach did not start until 1953. In one of the first British compilations on settlement archaeology, differences and discussions between American and British scholars were more focused on terminologies, levels of analysis, the definition on urban and non-urban settlements, and still interested in finding economic and materialistic determinants and explanations for human behavior (Tringham 1972). Yet, this British compilation and state-of-the-art synthesis, unlike its coeval American counterpart (e.g., Parsons 1972), was already more permeable and willing to incorporate archaeologists, historians, sociocultural anthropologists, geographers, and natural scientists into the discussion of the different aspects of the human environment.

The permeability of British archaeology may be explained by the proximity that archaeology always had with the humanities, especially with the geographical and historical disciplines, that have had parallel and convergent paths. In fact, there are some volumes published (e.g., Wagstaff 1987) that are devoted to showing the similarities between archaeology and geography in their research topics. Hence, fundamental themes studied by geography are the analysis of distributions and locations, environmental influences on human activity, the nature of ecosystems, the role of man as an agent of ecological change, the reconstruction of past landscapes and landscape development, and the characterization of regions. British geographers (e.g., Roberts 1996) also recognized that landscapes (past and present) cannot be understood just based on the practical economic aspects of life, but that we also need to acknowledge that there exist powerful social, religious, and psychological bonds, and therefore we need evidence from the geographical, archaeological, and historical disciplines.

Between the 1960s and the mid 1980s, British geography and archaeology encountered each other and since then have undergone similar methodological changes. Since the mid 1980s positivism was put to question in both disciplines. New approaches in both disciplines veered toward less mechanistic explanations emphasizing, rather, the social context and meaning of data. Readings of sociocultural anthropology and social theory heavily influenced both disciplines. In archaeology this was the post-modern reaction criticizing processual, structuralist, and classical Marxist archaeology, as well as the "new" and humanistic geography. This critique revolved around conceptions of the relationships between the individual and social totalities, and between idea and practice as exemplified by Giddens's (1979; 1984) Structuration Theory, Bourdieu's (1977) Theory of Practice, as well as Foucault's (1977) historiography of power relations in social practice and his concept of power/knowledge. In short, this reaction emphasizes the (active) role of the individual within societies.

This switch in archaeological method and theory can also be understood within the rationalists/relativists or subject/object dichotomy. Akin to anthropological theory in general, there are extreme relativist positions such as Shanks and Tilley's (1987) invitation to experience the archaeological discipline as an almost entirely hermeneutical experience (derived from contemporary literary criticism) bordering the limits of epistemological nihilism. Among other things, such radical postures have been criticized (e.g., Chippindale 1993; Kohl 1993) for sharing the same vices with processualism such as self-praise, polemical, combative styles, a type of preaching style etc., (Kohl 1993:17-18), and for becoming detached and distant from the intrinsic nature of the archaeological discipline; i.e., the study of the human past through the remains of its material culture.

Post-processualism, however, also has merits and has brought important contributions to archaeological method and theory. It is receptive to multiple perspectives to understand the past, advocates theoretical pluralism, and is flexible enough to even share research programs (e.g., Hodder 1991) and methodological approaches with the New Archaeology such as Middle-Range Theory (Tschauner 1996). Yet, perhaps one of the most significant contributions of post-processualism was the relation it established with the history considering it as a valid path towards explaining the past, unlike the New Archaeology which neglected its validity as a model due to its ideographic particularism.

4.2.2.1 On the Concept of Landscape. As part of the theoretical and methodological diversity championed by post-processualism, the concept of landscape in archaeology became more nuanced than before, influenced by theories from British human and cultural geography (e.g., Bender 1993; Cosgrove and Daniels 1988; Pile and Thrift 1995; Seamon and Mugerauer 1989). This singularity and complexity of the landscape concept reflects its multiple meanings, which can vary according to both the specific historical context and social groups who use or conceive it (Thomas 2001:166).

Also, the British critique reminds us that the landscape concept originated in the modern era. For instance, some contributions (e.g., Thomas 1993) have argued that the representation of landscapes since the Renaissance has influenced landscape perception in Western civilization within an object/subject relationship in which the viewer is outside of history and does not participate in it. Thomas claims that landscape painting and the idea of landscape emerged together with capitalism and thus the concept has a bias in terms of both social class and gender, since this prioritization of vision is reflected in the power of gaze considering this as gendered (i.e., looking at the landscape through the medium of the male gaze).

Thomas, hence, suggests that there are two other different ways of looking at places besides the westernized landscape perspective. These two different lines of argument are: 1) a hermeneutic phenomenology in which places where we lived are not considered as purely external objects; and 2) the idea of resistance by (social, cultural) forces opposing faceless powers which produce and dictate the use of space. It is worth exploring these lines of argument and especially the first one since it partially shapes landscape as conceived in this dissertation.

Landscape as a phenomenological experience in archaeology has been an idea pioneered by C. Tilley (1994) and influenced by a humanistic perspective that differentiates between the notions of space and place[1]. Landscape as conceptualized by Tilley rests on four main assumptions. First, it is based on the contrast between the concepts of spatial science versus humanized space; unlike the former which is impersonal and neutral, the latter considers space as a medium, which is socially produced (Tilley 1994:9). Space conceived as such is defined by degrees of human experiences, emotions, attachment and involvement, and thus has a subjective dimension; it is contextually constituted; and has different meanings for different individuals, human groups, and societies. In sum, space is political, not neutral; it is invested with power and related with the creation of identities, social relationships and biographies (see also next chapter).

Second, Tilley also contrasts and distinguishes between a western, capitalist space versus pre-capitalists, non-western space (e.g., desanctified versus sanctified, economic versus cosmological, "useful" to act versus "useful" to think, etc). This dichotomy however does not neglect that landscape is invested with manifestations of power in pre-capitalist societies; it is just different from capitalist societies. It is manifested in manipulations and identifications with the mythical world and ritual knowledge, and perpetuated through human body actions and practices such as walking through paths, geographical features, and monuments, investing them with meaning (Tilley 1994:20-22).

Third, a phenomenology of landscape is also based on the concepts of dwelling and *being-in-the-world* which entails the understanding and description made by the subject of the exterior world through the experience of the subject using means such as perception (seeing, hearing, touching), body actions, movement, as well as emotions and memories based on systems of values and beliefs (Tilley 1994:12). Among these, human body movement and especially walking plays a key role as the means through which thought (subjectivity) and the exterior world (objectivity) converge.

Finally, a phenomenological approach to landscape is possible because even though the "skin" of the prehistoric landscape (i.e., prehistoric fauna, flora, etc.) is long gone and only bits of it are possible to be understood through the natural science, the "skeleton" (i.e., mountains, hills, rivers, cliffs, etc.) is still present. This skeleton combined with the human-made monuments may give us evidence of prehistoric conceptualizations of space and the relation between man and land. In other words, it would be possible to do an archaeology of the topograms and topographs (see next chapter Santos Granero 1998), offering possible interpretations on landscape conceptualization during prehistoric times.

In a nutshell, landscapes for Tilley are historical and culturally contextual spaces created by places invested with meaning as a result of the dialectical relation between the individuals' perception and their physical (environment) surroundings through the phenomenological experience of their body actions, emotions, and attachments.

There are several potential problems in Tilley's arguments. It has been argued that his subjective approach (his phenomenological experience) is a perspective from a twenty first century white, male, middle-class, heterosexual, academic individual, that may very well differ from the perspective and experience prehistoric denizens had of their physical surroundings. Yet, as Thomas (2004b:32-33) has argued, a phenomenological approach to landscape is not a process of empathy (i.e., an attempt to reconstruct meanings or the minds of past people) but a process of analogy in which the relation with a past world (landscape) is reworked through one's own body. Tilley is perhaps right when he rejects prioritizing interpretation (or "discursive levels of consciousness") over experience since he considers that it would set up barriers in an otherwise mutually dependent process of understanding (Tilley 1994:23-24). I believe, however, Tilley's reluctance to unbalance these two components of understanding leads to another potential weakness which is a lack of strength in his methodology of data collection and analysis. For instance, in the case studies he presented only scatters of flints on the ground account for the Mesolithic landscape. Also, the Neolithic landscape is evaluated basically from the standpoint of the observer's visual perception (i.e., Tilley's), and restricted to observing patterns of intervisibility among places considering their orientation to topographically dominant landscape features (e.g., spurs and terminal ends of mountain escarpments). I firmly believe it is not a problem of prioritizing one of these components over the other but a matter of making both equally strong. The phenomenological experience depending on the degree of involvement and attachment with the world could be a really strong undertaking; so should the process of data collection and analysis. A permanent dialogue and a complementary relationship between these two components are the requirements to propound a sound interpretive archaeology as outlined in the introduction of this dissertation. Finally, although Tilley argued that his approach is holistic inasmuch as he reconciles a naturalist with a culturalist approach to landscape, he tends to emphasize the latter and thus loses balance by tilting more towards the side of the subject.

Overall, neither American nor Bristish archaeology has been able to formulate a well-meditated theory of landscape that could reconcile the body-mind (object-subject) dilemma; rather they have favored one side or the other. As explained in the next section, I believe the dwelling perspective is a theoretical approach that could reconcile this seemingly undeniable dichotomy.

4.3 The Dwelling Perspective: Mind and Body Reconciled

Formally trained as an archaeologist both during my undergraduate and graduate studies I found myself ready to head down to the field to collect data that would answer my research questions. Indeed, as explained in Chapter 6, part of my field strategy comprised of breaking down the study area into 1 km^2 survey control units, locating archaeological sites and other landscape features within UTM Cartesian coordinates, and measuring the sites among other aspects of the recording process. It would be followed by tabulating and analyzing data, comparing the results with those of other scholars obtained through similar methods, and finally offering an interpretation. True, this is what I have tried to do in this dissertation. Yet, once in the field it was clear that such a detached approach could not be the only way of understanding. Walking the field wearing a white lab coat looking at things under a microscope (or GPS receiver) would not be enough.

Such an insight was based on previous experiences working and living in the study area, readings in sociocultural anthropology on the relationship between societies and their landscape and, more importantly, on the work itself that I was starting to do in the field. Indeed, as days went by I started feeling more and more that I was part of these vivid moving pictures that daily constituted the landscape of the study area. These pictures, scenes and their characters (including our survey team) were depictions analogous to some of Pieter Bruegel the Elder's paintings (Hagen and Hagen 2004) although not set in sixteenth century Low Countries but in the twentieth first century tropical dry forest of rural Far North Coast of Perú.

Upon starting fieldwork and realizing the experience I was going through, I remembered a paper I skimmed some time ago in which precisely a painting by Bruegel (*The Harvesters*, 1565) was used to exemplify the conceptualization of landscape and the temporality of landscape. This was the work of social anthropologist Tim Ingold (1993; 2000:189-208). I went to review more carefully Ingold's argumentation and realized that his theoretical framework was perhaps the one that best fit what I was experiencing in the field. I believe it is the most profound insight on landscape conceived beyond the mind-body separation, and thus has shaped the way landscape is understood in this dissertation from the practice of fieldwork through the process of dissertation writing.

Ingold believes in the indissoluble nature of mind and body, and its application to human behavior understood in its broadest sense. Crucial to Ingold's argument is his notion of the dwelling perspective which in turn is the basis for his concepts of taskscape, skills, and the temporality of landscape. It is beyond the scope of this chapter to discuss in detail Ingold's epistemological and theoretical underpinnings. I consider it necessary, however, to briefly summarize them to properly understand his argumentation and main concepts.

Ingold's (2000:1-7) concern is in fixing the existing separation, otherwise intrinsically complementary, between the sociocultural and biophysical components of the anthropological discipline as part of his broader attempt at mending the gap between the arts and humanities on the hand, and the natural sciences on the other. Ingold argues that the proper connection between the human being as a biological organism and as a social subject (as a person) could be completed through a third party: the human mind.

His theoretical framework is built on a careful review of the literature on ecological psychology, social anthropology, developmental biology, and phenomenology. His theoretical scheme could be explained under two broad components: Relational thinking and time and landscape (or the temporality of landscape).

4.3.1 Relational Thinking

Following psychologist J. Gibson (1979) and anthropologist G. Bateson (1973; 1980), Ingold (2000:3) argues that perception is not just a task carried out by the mind but it is the result of the organism as a whole (mind and body) engaging (through movement) with its environment. Therefore, person and the organism could be one and the same and human life can be understood without dividing these separate but complementary components (the biophysical, sociocultural and psychological) into different layers.

Unlike organisms conceived by neo-Darwinian theory and population genetics as self-contained entities in relation with others but unaffected in their internally specified nature, characteristics of organisms in developmental biology are understood as being "…not so much expressed as *generated* in the course of development, arising as emergent properties of the fields of relationship set up through their presence and activity within a particular environment" (Ingold 2000:4). Hence, these characteristics are akin to principles of ecological psychology as proposed by Gibson, and to those (as conceived in contemporary anthropology) of the individual whose growth and maturation within society is only possible within fields of social relationships[2].

Ingold labels his theoretical construction as a relational-ecological-developmental synthesis. In a nutshell, it argues for the indissoluble nature of the mind and body in the understanding of human behavior, where the mind does not try to apprehend a world that is "out there", but instead mind/body generates, through daily practice and interaction with its environment (biotic and abiotic, cultural and social), the required knowledge and understanding to conduct itself within this world. On the basis of this relational thinking scheme Ingold defines two of his main concepts: skills and dwelling.

Skills (i.e., "cultural variation") are the capabilities, both biological and cultural, whole (human) organisms (mind/body) have to perceive and act on their world within a structured environment and learned since birth through daily practice of specific tasks. (Ingold 2000:5). The dwelling perspective is the context in which skills should be studied. Incorporating M. Heidegger's (1975) concept of dwelling (as opposed to building), into his relational synthesis, Ingold argues that the dwelling perspective does not assume that people arrive, live and act in a world with preconceived forms and meaning. Rather, it conceives the world and its myriad of elements constantly manifesting to the dweller (the *being-in-the-world*) to who all these elements "…take on significance through their incorporation into a regular pattern of life activity" (Ingold 2000:153).

In sum, the key aspect of this relational thinking is knowledge and habits and thus understanding constantly incorporated, processed, and generated by the mind-body through daily interaction with its surroundings and practice of certain activities.

4.3.2 The Temporality of Landscape

The relational thinking described above is also the basis on which Ingold builds other key concepts such as landscape and the temporality of landscape. He also argues that two unifying themes closely relate archaeology and sociocultural anthropology. These are time and landscape since time marked the process of human life which in turn also marked the process of landscape formation (Ingold 1993:152).

Taskscape is another key concept to define landscape and the temporality of landscape. Taskscape is the pattern of dwelling activities from which temporality is intrinsic; as Ingold (1993:153) contends, the temporality of landscape can be recovered when the distinctions between landscape and taskscape are dissolved.

Ingold (1993:153-157) points out that landscape is not land, (which is quantitative and homogeneous), is not nature, (an object "out there" that a human –i.e., a subject- has to consciously rebuild before any meaningful interaction takes places between them), and is not space (the union of a symbolic meaning with certain discrete component of the surface of the earth). Rather, space entails that meanings are not attached to, but gathered (discovered) from, the world. This means that each place draws its unique importance through the context of the individuals' experiences and engagement (dwelling) with the world. In a nutshell, landscape is defined as "…the world as it is known to those who dwell therein, who inhabit its places and journey along the paths connecting them" (Ingold 1993:156).

Central to Ingold's definition of landscape and also implicit in the dwelling perspective is the role of the (human) body; body and landscape are complementary terms engaged in a relation akin to that of organism and environment. In addition, these two forms (landscape and body) do not exist independently "out there" ready to be occupied or defined by its genetic makeup respectively. Rather, Ingold argues (1993:156), citing Goodwin (1988), that these forms "…are generated and sustained in and through the processual unfolding of a total field of relations that cuts across the emergent interface between organism and environment". This process is known as embodiment which for Ingold is not a movement of inscription but of incorporation; that is, forms are not transcribed onto materials but generated by themselves through movement. Also, this movement is what is known as the life-cycle processes which originate the organisms after they incorporate them. Along the same lines of reasoning Ingold then proposes that it could be possible to identify a series of united and interrelated cycles that give form to the landscape which in turn is an embodiment of these cycles (Ingold 1993:157). Ingold tries to support this proposition presenting his idea of temporalizing the landscape after first comparing, contrasting, and dissolving the differences between landscape and taskscape.

Temporality for Ingold is neither history nor chronology. Rather, temporality implies that time is intrinsic to the passage of events (as places, etc.), the latter being a product of actions in the past as well as a source of activities in the future. Temporality is effected by us as participants, but effected from a certain point in the present; that is, the present is not a segmented part of history determined by the past and determinant of the future. Rather, the present incorporates past and future into itself. Hence temporality and historicity intermingle "…in the experience of those who, in their activities, carry forward the process of social life" (Ingold 1993:157). These activities are what Ingold refers to as taskscape which for him has an intrinsic temporality. Also, Ingold (1993:158) argues that tasks get their meaning in relation to other group of tasks that are undertaken as a series or parallel actions which usually are performed by a numerous people. This ensemble and mutually interconnected tasks is what Ingold refers as taskscape. Therefore, making an analogy between landscape and tasks, it can be said that if the landscape is a suite of related features, then the taskscape is a suite of related activities.

Similar to landscape, the taskscape is qualitative and heterogeneous. Also, as landscape is not as land, the taskscape is not as labor. In fact, similar to land, labor is quantitative and homogeneous and is measured in time. But this time is clock-time (uniform, quantitative), whereas the time that measures the temporality of the taskscape is social (qualitative). Social time entails moral values, affections, etc., particular to the life of specific people in specific places (Ingold 1993:158-159).

In a nutshell, the temporality of the taskscape (following Ingold's analogy of social life with orchestral performance), is rhythmic (a repetitive cycle of performed tasks), comprised of a complex interaction of multiple rhythms, only exists through movement (through the act of dwelling), and is incorporated and continuously going on (Ingold 1993:161).

Ingold claimed that to temporalize the landscape the distinctions between the latter and the taskscape have to be dissolved. To overcome this distinction, and similar to the analogy he made between the taskscape (social life) and music listening or performance, he suggests an analogy between the landscape and the act or process of painting (performance).

To Ingold, performance (both in music and painting), is not "…the preparation of objects for future contemplation, [rather] it is an act of contemplation itself" (Ingold 1993:161). In this sense, the differences between music and painting and hence between the taskscape and the landscape are now not so obvious. Ingold argues that as a performance, the landscape (akin to music) is a product of movement. Yet he also argues, citing Inglis (1977), that landscape forms (unlike music), are frozen in a solid medium (Ingold 1993:162).

Ingold argues that the characteristics of landscape features as solid media allow them to be studied long after the movements that originated them ended. Again, similarly to the temporality of taskscape, Ingold suggests that present landscape forms incorporate both the past and future. Ingold supports his argument based on the relational thinking of American philosopher George H. Mead and his contributions to social psychology and his theory of perspectives (e.g., Mead 1938; 1977[1938]). Mead's main argument is that in the act of perceiving, objects are brought to an hypothetical "now" and thus temporal distances are suspended in the present in which the perceiving individual and the perceived object exist simultaneously. It creates a context that allows, in abstraction, alternative reactions to the perceived objects or events, before the act is actually completed in fact (Mead 1938:128). This "completed" act in abstraction (the perceived object) is what Mead defines as a "collapsed act".

Ingold suggests that the suspension of the temporal distance as argued by Mead applies not only to the future but also to the past. He combined the idea of collapsed act with the temporality of the taskscape and the phenomenological experience (through dwelling). He thus posits that "…*the landscape as a whole must likewise be understood as the taskscape in its embodied form*: a pattern of activities 'collapsed' into an array of features" (Ingold 1993:162, italics in original), and thus its forms originate together with the forms of the taskscapes as part of the same ongoing activity (i.e., the process of dwelling). Finally Ingold claims that since the activities that comprise the taskscape never end, the landscape is thus always a "work in progress".

Finally, Ingold states that the temporality of the taskscape (and thus the landscape too) encompasses the rhythmic phenomena (resonances) of both the non-living and living world. First, human beings and the rhythms of their activities resonate with both other living entities as well as a myriad of other rhythmic phenomena (cycles of seasons, day and night, tides, etc.). And secondly, life, to Ingold, is not restricted to self–contained individual organisms acting upon an inanimate world. Rather life is the generative field in which complete relations of organism-environment takes place. The dissimilarity between the animate and the inanimate is undone when we see the world as a total movement of becoming; it builds itself into the forms we observe and each form in turn is explained by the uninterrupted relation it has with those that surround it. In other words, in the act of dwelling, we move together with the world (not acting upon or doing things to it). The landscape is therefore not the fixed, static, and changeless forms we see and act upon; rather they are forms in motion but at such a slower and imposing pace than our own human activities which are just sand grains of this moving world (Ingold 1993:163-164).

Overall, the landscape and its forms are the embodiment of a series of rhythmic daily activities (taskscape) performed by individuals through the act of dwelling, and in attunement with their surroundings (both the animate and inanimate world). The landscape and its congealed forms, although always in motion, have a temporality for it incorporates past and future into the present in a "collapsed act" and therefore could be perceived and interpreted also through dwelling.

Landscape as conceived above goes beyond the opposing naturalist and culturalist views on landscape. Upon recognizing the temporality of landscape, archaeology can embark on the process not of putting meanings on landscape forms but of discovering keys to meaning in every landscape feature through dwelling. As argued in the next chapter, I believe it is a viable process inasmuch as archaeological and ethnological fieldwork is in itself an act of dwelling.

I believe the arguments presented in this chapter have justified my choice of the dwelling perspective as my theoretical framework. Obviously, the dwelling perspective, as any other theoretical approach, probably has weaknesses that can be criticized. The purpose of this chapter was, however, to show the theoretical approach that has given direction to this dissertation and not to embark on an in-depth epistemological discussion that could further expand this already lengthy chapter. For this reason, a critical assessment of the dwelling perspective is beyond the scope of this chapter. Besides, such critical assessment would inevitably lead to the split of the mind-body dichotomy in the conception of the landscape, something argued against to in this chapter, and thus making this chapter ending in a circular argument. Of course, I could carry out such a critique of the dwelling perspective later in a published article or, even better and in an exercise of academic prophylaxis, leave that critique to colleagues that would read my work.

4.4 Summary

Landscape in archaeology has been conventionally conceived either under a naturalist or a culturalist perspective. This dichotomy parallels the debate on Western philosophy and anthropology on the preeminence of either the mind or the body as major determinants for human culture. It has been argued that landscape as pondered under the dwelling perspective could break this dichotomy and be studied archaeologically.

Notes-Chapter 4

[1] A similar perspective on space and place in American academia has been explored not in archaeology but in geography (e.g., Tuan 1974a; 1977), philosophy of time and space (e.g., Casey 1996), and sociocultural anthropology and ethnohistory (e.g., Harkin 2000).

[2] This relational thinking in modern social theory is perhaps best epitomized by P. Bourdieu's theory of practice and his central concept of *habitus*. This theory and concept are also key components of Ingold's synthesis since, as he argues, Bourdieu's *habitus* was conceived to end with the separation between mind and body, and between knowledge and practice; Ingold (2000:162-163) also illustrates us that *habitus* was first

introduced in anthropology by Marcel Mauss in 1934 (see also Chapter Nine endnotes 2 and 3 in p. 427, and Hodder and Hutson 2003:108-109).

CHAPTER 5

METHODOLOGY AND RESEARCH QUESTIONS

This chapter presents the methodological approach to landscape from a dwelling perspective. This approach is a hermeneutic exercise that engages the other main topic of this dissertation: sociopolitical interaction in the prehispanic Upper Piura Valley. Therefore this chapter also presents the methodological approach to this second topic. Finally, the dissertation research questions and archaeological correlates are described.

As presented in the Introduction, the more general question of this research was: What are the strategies and factors that shape a given sociopolitical organization? That is, to what extent and in what manner do external and internal factors and strategies combine to give rise to local polities and their specific sociopolitical organizations? More specifically, this research question is presented as two direct questions: 1) what were the sociopolitical and economic factors and strategies that shaped the organization of local polities as reflected in their settlement patterns?; and 2) what were the strategies and purposes of the Mochica and Sicán occupations and their impact on local polities as reflected in site location, density, and settlement organization?

5.1 An Ethnographic (but Pertinent) Digression

Before touching on methodological issues themselves, I think it is pertinent to briefly recall in this section that pre-Capitalist and non-Western societies also organize and conceive their space and landscape on the basis of factors other than material and economic needs. Tilley's argumentation on the phenomenology of landscape mentioned in Chapter 4 rests on a great deal of ethnographic information from Australia (Aborigines), Alaska (Koyukon), and sub-arctic North America (Mistassini Cree), the Tewa of New Mexico, and several Melanesian societies.

Yet, we do not need to go so far away to corroborate that in Andean societies similar ways of conceptualizing landscape have been documented. Indeed, for instance J. Bastien (1978; 1985) demonstrated that the application of metaphor to land and society is a distinctive mark of the Andean culture. On the basis of his research within the community of Kaata in the Qollahuaya territory, an Aymara ethnic group located 150 km to the northwest of Lake Titicaca, Bastien showed that the mountain was a metaphor for Andean social organization offering to their inhabitants a cultural understanding of their lineage and marriage principles. Bastien demonstrated that the conceptualization of space, landscape, and associated social organization cannot be understood only by economic and political factors (e.g., a verticality model). Rather, it is understood by the amalgamation of all parts (mountain, *ayllus* on different ecological levels and their "bodies"), all of which is defined by Bastien as the mountain/body metaphor. This way of conceptualizing and relating physical space and human existence breaks the subject-object dichotomy and offer a context in which to understand Qollahuaya people who state that they are like the mountain and the mountain in turn, is like them.

The movement of the human body throughout the physical territory of the community engaging land and people is a key component in the experience of the Qollahuaya people, constantly reified and perpetuated through ritual. In fact, as observed in other Andean ethnographic cases (e.g., Rasnake 1986) the use of ritual and especially communal rituals also contribute to operate concepts of space and geography into which history is incorporated and transformed. These ritual acts are comprised by movements of the human body ("traveling" within the community for several days) through which ritual officers (i.e., the community) incorporate each household within its "body".

Likewise, phenomenological experience and history (historical consciousness) play a key role in space and landscape conceptualization since it is patterned and contextualized in myths, written documents, and geographic features. It is important for indigenous identity especially within the context of power relations between local communities and states and in the context of reclaiming communal land that was formerly usurped by foreign, non-indigenous groups.

For instance, J. Rappaport (1985; 1987; 1988; 1990; 1994a; 1994b) has underscored the importance of historical consciousness in what she calls territory-building in the Colombian cordillera among the territory of the Páez (Central Cordillera, NE of Department of Cauca), and the Cumbe (Pasto ethnic group, in Nariño, on the Colombia-Ecuador border) peoples. In fact, according to Rappaport territorial maintenance and group identification among the Páez is achieved through a system of mythical/historical knowledge. To maintain boundaries at all levels Páez people performed key actions or practices that allow them to re-appropriate their territory. These three key practices are planting, looking, and walking or traversing.

The practice of looking (sight) is materialized through the climbing of high mountains and the distribution of land by *caciques* in Páez myth, as well as the tending of fallow land during herding. By walking through a territory land and boundaries are formally recognized, while the agricultural activity of planting maintains and defends the territory constantly by appropriating and re-appropriating it. All these activities crosscut economic, social, political, and ideological domains.

Also, a key component in this territory and polity building is the *cacique* myth (various *caciques* who brought the land titles and walked throughout all the territory until they hid in sacred lakes), which is encoded into a sacred geography. This sacred geography, through various but similar versions of myths, provides a mnemonic device to reconstruct history and the contents of the *resguardo*, the political unit into which the Páez people are organized. Moreover, reading and creation (and re-creation) of history through sacred geography involves the same territorializing activities (also performed by the mythical *caciques*) mentioned above (looking, walking, and planting).

Similarly for the Cumbe, Rappaport asserts that their history and the past are embedded in the interaction between material culture and ritual activities from the present, all of which contain symbols of their identity associated with the inception of their community in the colonial era. History is mostly symbolized through activities of the present. History is therefore also experienced in material things and in the landscape with concrete evidence of the past that they daily see, touch, or walk.

Among the Cumbe, the *cabildo* staffs of office and the boundary-ditches are the two elements that encode evocative symbols that are related to the communal past. The Cumbe landscape is characterized by a complex web of ditches (*zanjas*), line fields, and paths. Information on the nature of land tenure from generation to generation is provided by them. A complex series of markers define boundaries; some of these are permanent, like *zanjas*, and some are temporary such as plants. Thus, *zanjas* become part of family memory. Similar to the Páez, history is recorded in both written documents and in the terrain.

Another example of bodily experience and history written in the landscape comes from the Yanesha, an Arawak-speaking ethnic group on the eastern slopes of the Peruvian Central Andes (Santos Granero 1998). The Yanesha also identify various sites and features of the landscape and directly associate them with past events, personal, mythical or historical. Moreover, they also use narrative and perform some practices (traditions, myths, remembrances, rituals, body practices such as walking, pilgrimage, offerings in ceremonies at sacred places, etc.) to preserve their historical memory. Santos Granero coins the term “topographic writing” for this kind of protowriting system which nonetheless is characteristic of both, literate and non-literate societies.

Building on J. Goody’s (1993) definitions of pictograms and pictographs, Santos Granero argues that topographic writing is an “identifying-mnemonic device” which is based on topograms which in turn become topographs when the former are combined in sequential or non-sequential forms. Topograms are defined as “…elements of the landscape that have acquired their present configuration as a result of the past transformative activities of human or superhuman beings” (Santos Granero 1998:140).

Topograms can be understood in themselves and "evoke a single thing, event or idea" (Santos Granero 1998:140). Examples of human-made topograms are graves, garden sites, old buildings, battlefields, bridges, trails, mines, etc. On the other hand, topograms ascribed to supernatural beings are natural elements that are clearly distinguishable in the landscape due to their conspicuous characteristics such as shape, size, color, etc.

Topographs on the other hand, also using Goody's (1993:8) definition of pictographs, are defined "as landscape signs that 'stand in opposition to or in conjunction with other such signs', forming a 'wider semiotic system" (Santos Granero 1998:140-141). Therefore, topograms when combined in sequential form or in other various ways become topographs. For instance, among the Yanesha their power is legitimized through myths inscribed in a sacred geography. The topographs of these myths are a series of topograms that recount the Yompor Ror (solar divinity) saga (hills, rivers, streams walked by Yompor Ror, people that were transformed into stones, etc.), as well as those topograms that evoke Yato' Caresa (the warrior divinity) and his warriors when they fought the cannibalistic Muellepen (rocks where Muellepen bodies were "burnt"; elongated, large polished stones on the riverbed that represent bodies of the Yanesha warriors killed by the Muellepen, etc.) (Santos Granero 1998:141).

Similarly to the Páez and Cumbe, this topographic writing is a flexible process for topograms can be combined and recombined in space or time generating new stories depending on the social, political and historical context. In fact, Santos Granero (Santos Granero 1998:141) has argued that topograms do not only recount the mythical consecration of the Yanesha traditional territory. They also preserve in their memory the historical despoliation (since the early Peruvian Republican era), as well as contemporary desecration of their territory characterized by modern Peruvian state intrusion into their territory (for construction of penetration roads) and political violence.

Finally, the phenomenological relation between body movements and landscape features (and thus history, identity, power, etc.) can also be perceived not just in ethnographic instances but also in written records of stories, legends, and myths. It is corroborated by surveying some stories, legends, and myths from the Peruvian North Coast (e.g., Arguedas and Izquierdo Ríos 1947; Centro de Investigación y Promoción del Campesino (CIPCA) 1990; León Barandiarán 1938; Toro Montalvo 1990). For instance, in the legend *El Médano Blanco* (The White Sand Dune) from Sechura in the Piura region (Arguedas and Izquierdo Ríos 1947:23-24), a large, tall, and enchanted sand dune is the focus of the action. This dune hides coveted precious and golden objects at its core. It charms people who walk on its surroundings or try to climb it, and who stop climbing after a few meters, in fear, when they start feeling they are sinking into the sand dune.

Overall, the intention of this digressive section has been to underscore the fact that the areas where we archaeologists usually do fieldwork were (and are) loaded with meanings. The ways these meanings are generated is through myth, legend or ritual narratives, individual performance of bodily acts such as looking (sight), and walking, for all of which some landmarks in the landscape constitute an embodiment. Yet, while doing an archaeological study of landscape the idea is not to get into the minds of prehistoric people to get those meanings. Rather, it is possible to find clues to those meanings in the landscape that could be used as another venue of interpretation. In another words, and using Santos Granero's terminology, I contend that it is possible to do archaeology of the topograms through the dwelling perspective as explained below.

5.2 Methodology: Two Paths to Interpretation

During fieldwork it was not infrequent for me, during our 40 min lunch break, to feed not just my body but also my soul via a 10 minute nap. After a good morning of walking and work, we would look for shade under a tree and sit for lunch at the top of some artificial mound, or the slopes or top of a hill. After having lunch I would lie on my back, cover my face with my straw hat, and close my eyes. Before falling asleep and amid a calm silence it was hard not to notice, at a distance, a myriad of noises that constitute the taskscape of the study area: *parceleros* chatting while taking a break, water splashing after kids and youngsters playfully jump into the Piura River, birds singing, clothes being scrubbed while women chat and launder at the shore of the meanders of the Piura River, swarms of honeybees passing by, the *chuggah chuggah* of a gas water pump taking water from the river to irrigate small adjacent cultivation plots, hatchets knocking tree trunks, etc.

When perceiving the modern landscape as mentioned above, it has to be considered that (although not necessarily with similar activities or even thoughts) past peoples did interact and engage with similar physical features (rivers, hills, natural and artificial mounds, etc.). It becomes easier then to realize that, as conceived in the dwelling perspective (see Chapter 4) the modern landscape is clearly charged with and is witness to the works and lives of past people. It is possible therefore to gain knowledge from past landscape inasmuch as "*…the practice of archaeology is itself a form of dwelling*" (Ingold 1993: 152, emphasis on original). In other words, while in the field, the archaeologist parallels the experience of the native dweller and for both the landscape is a story that is created and that involves actions and experiences of the lives and times of people in the past who formed the landscape. Hence, perceiving the landscape is "…to carry out an act of remembrance, and remembering is not so much a matter of calling up an internal image, stored in the mind, as of engaging perceptually with an environment that is itself pregnant with the past" (Ingold 1993: 152-153).

Finally, and also considering how landscape is perceived by other non-Western societies as described in the previous section (see also Basso 1996; Harkin 2000) the stories we tell are not meant to cover the landscape with further layers of meaning. Rather, as Ingold (1993: 171) argues, these stories are told to open up the world disclosing its meanings and putting the listener (reader) in relation to the physical features of the landscape. In other words, as another venue for archaeological interpretation, through the dwelling perspective and considering the temporality of the landscape it is possible to look for keys (in every feature of the landscape) to those meanings, thus doing an archaeology of topograms as argued above.

Overall, an archaeology of topograms does not imply "digging" into the minds of ancient people. As Thomas (2001:180-181) points out, this attempt by archaeologists to fill in the "empty signs" of landscapes is a risky "surrogate discourse". On the contrary, what is sought through the relational nature of the dwelling perspective is to reach an interpretation that can be described as an allegory. In fact, this goal is achievable using our bodies as analogs, by experiencing similar sets of material relationships and circumstances (i.e., the contact with physical features such as rivers, hills, natural and artificial mounds, etc.) that had meaning for people in the past and thus getting at clues of those meanings.

The methodological approach to the dwelling perspective in this dissertation is drawn from other disciplines such as environmental engineering, urbanism, and environmental psychology. In fact, concepts and insights from environmental psychologist J. Gibson (1960; 1979) combined with phenomenological philosophy have been instrumental and influential on the works of urban planners, architectural historians and architects, and environmental engineers such as Lynch (1960; 1971), Norberg-Schulz (1971) and Higuchi (1983) respectively.

Higuchi's work is especially significant for this dissertation. Following Lynch and Norberg-Schulz, and a dwelling perspective, he applied these ideas not to urban but to Japanese rural (and suburban) landscapes. Using the experience of the individual as the center and free point of observation, Higuchi made systematic observations on the visibility of landscapes, devising indexes concerned with the visibility or visual perception of landscapes. He therefore defined and described visual and spatial structures of landscape.

This dissertation specifically draws from the definition and description of Higuchi's spatial structures of landscape. The spatial structures of landscapes entail analyzing landscapes as spaces comprised of topographical features looking for existent types of spaces, their characteristics and significance, and the components that establish the spatial structure of the spaces he is considering. Higuchi contends that in Japan (and probably in many other societies as well), topography is so important that it is used as spatial design and determines not only spatial organization and use, but also is intrinsic to other aspects of human culture such as mythical and religious beliefs (valleys or ravines where dead spirits or deities reside, hills as barriers for evil spirits, or battlefields of mythical heroes and warriors), or the feeling of a "homeland" (for the meaning and experience of space and place in humans see also Tuan 1974b, 1977).

Higuchi describes and analyzes seven types of landscapes that the ancient Japanese used as living spaces (where imperial capitals, Buddhist monasteries, Shinto shrines, gardens or burial mounds were constructed). These spatial structures create certain kinds of environment and are so important that according to Higuchi almost all topographical space in Japan is a variation or combination of these seven types. Higuchi further claims that in a much broader sense, the seven types he discusses are comprised of four main elements: boundary (e.g., mountain or hill chains, rivers, etc.), focus-center-goal (i.e., prominent landmarks such as mountains, hills, eminences projecting into or rising from plains), directionality (created by mountains that stand up from flat areas, by sloping ground surfaces, basin or valley that open up or taper to the ends, etc.), and domain (total space created by the other three components), all of which give landscape its structural identity.

Hence, as Higuchi (1983:184) argues, "the elements that determine the spatial structure and nature of landscapes thus inform us of design options within a given landscape; they tell us what we ought to look for in that landscape…". In this dissertation, and to help my interpretations, I use therefore these four main structural elements of the landscape but adapted to the reality of the Upper Piura Valley to develop an analogous set based on my dwelling experience.

At this point, I must emphasize that I did not read the work by Higuchi until after coming back from the field and while writing this dissertation. In that sense, I was not pre-conditioned by his work nor was I adopting all the connotations that can be drawn from his dwelling perspective as applied to the Japanese landscapes. I have used the study of Higuchi as a heuristic tool to help me convey what I experienced in the field and thus to better communicate with the reader. The use of this heuristic tool implies the use of a terminology and definitions of topographical features (the main elements that constitute the landscape) that are applicable anywhere on the planet Earth where such features are present. On the other hand, the use of this heuristic tool does not imply, by any means, the same cosmological connotations that the topographical features have in the Japanese culture. Yet I do believe, as I have argued in the ethnographic section above, that topography in the Upper Piura Valley was and is important to organize the space as well as for its intrinsic relationship with other aspects of human culture such as cultural identities, and legendary, mythical, and cosmological beliefs.

I also have to underscore that my involvement with the landscape in my study area is not limited to the eight months of fieldwork carried out for this dissertation research. In fact, before starting the fieldwork for this dissertation research in 2002, I had already been interacting with this landscape for 15 years (during various field seasons) participating throughout the extent of the Upper Piura Archaeological Project between 1987 and 1990 with short visits after that period, including a 10-day reconnaissance in 1997 (Montenegro Cabrejo, et al. 1998). In other words, the experience of all these years including the most intense one during the 2002-2003 dissertation research field seasons allowed me to gain insights into the landscape and its forms and how it was organized as perceived by my mind-body, observations that later were transmitted during the process of dissertation writing using Higuchi's terminology as a heuristic tool. That is to say, Higuchi's terminology was tailored to my dwelling perspective in the Upper Piura Valley and not the other way around.

The approach devised by Higuchi in tandem with the evidence of human settlements for every chronological period was thus used to convey my interpretation (according to my experience) of how the landscape (topographical) forms changed in their spatial organization through time. In this sense, and as applied to the reality of the Upper Piura Valley, only three (the Zōfū-Tokusui, Sacred Mountain, and Domain-Viewing Mountain landscape types) of the landscape configurations proposed by Higuchi were found to be similar to those observed in my study area (see Chapter 7). And again, when I say similar, I refer to the presence and position of certain landscape features as defined by Higuchi and, by no means, to the ideological or other kind of connotations that the names might evoke for the Japanese people. This is especially true for the Zōfū-Tokusui landscape type for which I am using the name just to refer to the spatial arrangement of the topographic features and not to any meanings the name might connote. On the other hand, and on the basis of my experience with some of the landscape features, the ethnographic background discussed above, and even some of the archaeological evidence I had observed (e.g., constructions on hilltops), I do assume that the Sacred Mountain and Domain-Viewing Mountain landscape types had that kind of connotation for the prehispanic inhabitants of the Upper Piura Valley. Once again, however, I do not assume in any way that the sacred and perceptual essence and meanings these landscape types had or have for the Japanese people are the same for the prehispanic inhabitants of the Upper Piura Valley.

Finally, as argued above, the terminology of Higuchi for describing the spatial structure of the landscape proved to be useful to present my interpretation on how it changed (or did not change) throughout all the prehispanic occupation sequence (see last section in the settlement and landscape analysis for each chronological period in Chapter 7). Yet the terminology by Higuchi was not used for every aspect of my dwelling perspective in relation to the landscape. For instance, most of the topograms defined in Chapter 7 are based on my experience in the field and in an exercise in analogy as to which landscape features might have had potential significant meanings for the prehispanic inhabitants of the study area. In very few cases, the definition of the topograms used some of Higuchi's terms for the main components of the spatial structure (e.g., directionality) in order to better describe them and to emphasize their significance as topograms.

Thus, methodologically I proceeded following two different but complementary paths to interpretation. On the first one, a traditional approach to settlement archaeology was carried out, working with data recovered during surface survey. These data and analyses consist of sites recorded and located by GPS Cartesian coordinates, description of the characteristics and locations of sites, and elaboration of classical distribution maps of sites hierarchies (using the rank-size rule and analyzing their social and political implications and interactions) for the different chronological periods under study. This first path is more directly related to the other main research concern in this dissertation (see next section). The second path to interpretation was undertaken within a dwelling perspective and is sensitive to the temporality of the landscape; interpretations were generated on the basis of the perception I acquired from my relation with my surroundings (topographical features of the landscape, etc.) throughout the daily practice of fieldwork. This path of interpretation led to both the definition of the spatial structures of the landscape and of the topograms. This second path of interpretation is analogous to the pages of a story in which I interpret the landscape of the study area following the dwelling perspective. Also, and merging with the first path of interpretation, it serves as the canvas on which the human prehispanic occupation in the study area is depicted to interpret sociopolitical changes.

The research strategies used to operate this methodological approach are explained in detail in Chapter 6. Yet it would be pertinent to underscore here that the survey crew and I worked (and walked) together daily with local field assistants. At least one of them was always an inhabitant that lived around the particular spot of the study area that was being surveyed, for a period of approximately one or two weeks per spot. A constant interaction and conversation with them as well as with the numerous farmers we encountered almost daily (most of the sites are found around owned cultivation plots), were also instrumental in the practice and process of relating to the landscape.

There are three main reasons to pursue these two paths of interpretation. First, I believe that a good characterization of local settlement patterns and landscape characteristics can be achieved. This characterization sets the grounds and offers the elements to discuss sociopolitical interaction with foreign polities, the second major topic of this dissertation. Second, not ancient meanings but clues about them are sought in the landscape features. That is, an archaeology of the topograms was undertaken. The goal is just to suggest the landscape features in which local ancient populations, through the process of embodiment, may have inscribed their histories and memories. This goal is regarded as a small and partial contribution to a task that should be part of a major long-term and interdisciplinary project involving archaeologists, ethnologists, and historians as well as researchers from the natural sciences. Finally, the third reason, closely related to the second one, is that nowhere is it more clear than while doing this kind of research, how past, present, and future merge within a single path. Modern people in the study area are in constant interaction with their surrounding landscape, perceiving, affecting, and modifying it with different expectations often at variance with those of archaeologists.

5.3 Sociopolitical Organization and Interregional Interaction

The second topic of this dissertation can be framed within a general theoretical concern that studies culture contact, a pervasive topic in the anthropological discipline. A compendium (Cusick 1998a) of papers on this topic has shown a diverse number of perspectives. Culture contact and interaction can be perceived as evolutionary (in a Darwinian or in a cultural sense), as considerations of political economy and consumption, as emphasizing geographical and spatial dimensions of culture contact (underscoring the relationship between contact, borderland environments, and frontier expansion), and as the relationship between culture contact and power relations and oppression (Cusick 1998b:7).

Generally, however, theories and models applied to study culture contact and interaction –e.g., World System Theory (Wallerstein 1974), the Core-Periphery Model (Nash 1987; Stoddart 1989), Tributary-Capitalist Model (Wolf 1982), Metrocentric, Pericentric, and Systemic Models (Doyle 1986), and the Territorial-Hegemonic Model (D'Altroy 1992; Hassig 1985)- are based on political economy. They overemphasize the intrusive states and do not adequately consider active role that local populations and polities play in shaping the specific forms and manners in which the intrusive state interacts with local populations. Also, they assume, a priori, resource extraction, a dominance-subject relationship, and consider the economic, military, and political factors as main actors of sociopolitical change.

Unlike theories and models above, other perspectives (Schortman 1986; 1989; Schortman and Urban 1987; 1994; 1998; 2001; Stein 1998) focus their research on peripheral areas. For instance, the Social Salient Identification Model (SSI) emphasizes the effects of intraregional transformations on interregional interaction and the development of interregional systems of social identification (Schortman 1989:60; Schortman and Urban 1987:70-72). The Distance-Parity model (Stein 1998:228-230) considers that the hegemonic power of the core decreases and decays with increasing distance to its peripheries, leading towards a more balanced relationship increasing parity or symmetry in economic and political relations. It is important to understand culture contact and interregional interaction between core and periphery from the perspective of the peripheries. Thus, following a similar direction, in this dissertation I define the sociopolitical organization of local polities through a diachronic analysis of settlement patterns. Such an understanding grants better knowledge of some of the main actors (local polities) of prehistoric culture contact in the Upper Piura Valley.

In a more general sense, however, culture contact processes are complex and flexible and can be better understood as a continuum that implies flexibility and other alternatives to interaction and culture contact besides the dominance-subject relationship. Some scholars who have been long concerned with interaction and culture contact have recognized this continuum and have established categories of interaction systems between societies organized across different levels of complexity. Yet, this categorization has no intent to create pigeonholes but just to be a tool that can be used to understand variation in the interaction processes. These categories are the egalitarian, coevolving, and hierarchical interaction systems. This framework compares and contrasts the relatively fragile and non-coercive interaction structures of egalitarian and coevolving systems with hierarchical interactions, in which people have no other way out than to participate and be involved in the system (Schortman and Urban 1998:110-117).

One of the main drawbacks of these approaches such as the SSI or the Distance-Parity Models is that they are mostly based on analyses and interpretations of stylistic and technological styles of material culture and their geographic distribution among the interacting polities. Unfortunately, they have not been applied to settlement pattern data. Therefore, with the settlement pattern data I obtained through fieldwork I have tested in this dissertation the scenarios of coevolving and hierarchical systems of interaction and their archaeological correlates.

5.4 Research Questions and Archaeological Correlates

To attempt answering the research questions presented at the beginning of this chapter, the scenarios envisioned for the sociopolitical and economic organizations of local polities and the nature of interaction between the North Coast core polities and local polities of the Upper Piura River were: First, the possibility that interaction was coercive. This may imply a military presence to control production zones and trade networks as reflected in the presence of fortified sites (e.g., residential or domestic sites encircled by high, concentric stone walls). Also, major sites of possible residential and administrative function may present some access restrictions to the site (i.e., located at a strategic point in the landscape such as on a hill slope and flanked by *quebradas*) and in circulation within the site. Moreover, if the Mochica and Sicán occupations were coercive and imposed, architectonic features may show clear signatures of Mochica and Sicán presence such as materials and construction techniques (e.g., segmentary construction associated with marked adobe brick for Moche I-IV phases, and chamber-fill technique for Moche V and Middle Sicán), site layout, shapes, orientation, and in general architectonic canons from the Northern North Coast polities. It is important to point out that material culture such as architectural styles and techniques can evidently reflect social boundaries and interactions (e.g., Stark 1998). Likewise, a multi-tier settlement hierarchy and associated road network is expected. In addition, these sites should, in terms of monumentality and overall architectonic quality, stand out and be more impressive than any of the other sites in the study area. Also, if control of production zones and trade networks was a Mochica and Sicán prime mover, sites should be found in preeminent locations (e.g., at crossroads, valley choke points, controlling major water intakes of irrigation systems and field systems); i.e., a more advantageous placement than for local polity settlements. Forced intrusion of Northern North Coast polities may create clear signatures of spatial reorganization such as that recorded for the Guadalupito (Mochica) phase in the Santa Valley (Wilson 1988) and for the Middle Sicán in the Lambayeque Valley (Tschauner 2001). In terms of the stylistic and technological analysis of pottery, a coercive, political dominance over local polities may imply the presence of the unadulterated Mochica and Middle Sicán styles together with their local emulation in elite contexts (e.g., major sites of local polities). It should also imply that the technological and stylistic influence is unidirectional with no hybridization or influence of local pottery technological and stylistic canons on ceramics from Mochica and Middle Sicán styles. Technological and stylistic features of Mochica and Middle Sicán ceramics have been well defined elsewhere (Cleland and Shimada 1992; 1998; Kaulicke 1992; Shimada 1994; Tschauner 2001). Finally, it should also be reflected in evident changes in the repertoire of pottery shapes and in some cases a certain degree of standardization of certain vessel shapes.

A second scenario considers interaction as a more peaceful or negotiated process. Signatures reflecting this kind of relationship are almost the opposite as those of the first scenario above. This implies the absence of fortified sites in the study area; sites should be readily accessible with no evidence of sites located in strategic defensive areas; architectonic features at most sites may show clear traditional signatures of local traditions. Sites found on preeminent locations should demonstrate local occupation as reflected on architectonic features and pottery sherds found in surface collections and test excavations. Also, there should be no clear signatures of spatial reorganization showing similar settlement patterns over time. Likewise, foreign enclaves may exist within some large local settlements. In terms of the stylistic and technological analysis of pottery, even though some unadulterated Mochica and Middle Sicán styles may be present, the pottery assemblage recovered was expected to show a very high frequency of pottery made in a local tradition as well as some cases of stylistic hybridization without ideologically charged icons or themes emblematic of the core polities. This situation also implies that the technological and stylistic influence is bidirectional, with hybridization and mutual influence of local ceramic technological and stylistic canons with Mochica and Middle Sicán styles and techniques. Finally, there should not be any significant changes in the repertoire of pottery shapes and no evidence of the standardization of vessel shapes should be found.

Finally, a last scenario is a potential situation of physical coexistence without much or any interaction. In this case, a foreign polity occupation may be represented by very few sites (perhaps one or two) and can be an outlier in relation to the settlement system observed in the study area. Also, all architectonic features observed as well as pottery styles identified in the sample collected should show an unequivocal foreign origin and also should not present any evidence of stylistic mixture or hybridization. This situation may also represent an interaction that was confined to social elites, in which case a highly restricted spatial distribution (e.g., in elite residences, ceremonial structures) of foreign status markers could be expected.

5.5 Summary

The methodological approach of this dissertation follows two different but complementary paths of interpretation. The first path -bearing in mind that non-Western societies conceive of landscape not only as nature that can be manipulated and controlled as an external object- is an interpretation of the landscape from a dwelling perspective. This interpretation is meant to be an analogy of the experience of past individuals and entails an embodiment process that reflects my engagement with the landscape features (especially the topography) through the same act of fieldwork (dwelling). The end result of this first path of interpretation could be termed, in Santos Granero's terminology, an archaeology of topograms.

This first path of interpretation merges and overlaps with the second one. The second path of interpretation rests on a traditional settlement pattern analysis that aims – applying the rank-size rule to survey data- to answer the research questions of this dissertation on the sociopolitical interaction between local, "peripheral" polities of the Upper Piura Valley and the "core" intrusive polities of the Northern North Coast (especially the Mochica and Middle Sicán polities). This second path of interpretation merges and overlaps with the first one inasmuch as settlements defined in the settlement pattern analysis are superimposed over the spatial structures and topograms defined and interpreted through the dwelling perspective to broaden even more the interpretation on the prehispanic cultural and sociopolitical landscapes in the Upper Piura Valley.

CHAPTER 6

RESEARCH METHODS AND SITE CLASSIFICATION

The research methods and strategies applied in this project are comprised primarily of systematic pedestrian survey, test excavations, and ceramic analysis. The surface survey is comprised of two dimensions (vertical and horizontal) that parallel the two paths of interpretation proposed in this research. This chapter also explains the criteria used to classify archaeological sites and settlements. Finally, this chapter also offers information on site formation and preservation acknowledging the potential problems that could affect interpretations of the archaeological record.

6.1 Surface Survey Design and Strategies

The first step in the survey design was to collect the pertinent cartographic, photographic, and environmental data of the research area. A set of 75 aerial photos from SAN (*Servicio Aerofotográfico Nacional*) Project No. 7458 was acquired. These photos were taken in 1956; it was the lowest flight available resulting in a manageable scale (1/10,000) suitable for the aims and goals of the survey. Also, rainfall precipitation by the mid 1950s oscillated around or below the mean annual precipitation (220 mm) resulting in a relatively sparse vegetation coverage by the year of the flight.

Next, a series of topographic maps from the study area were purchased. The most useful were a set 17 topographic maps from the *catastro rural* (rural survey) of PETT (*Programa Especial de Titulación de Tierras*) from the Peruvian Ministry of Agriculture (*Ministerio de Agricultura*). These maps were also in a 1/10,000 scale and covered most of the study area. These maps proved to be a good complement to the aerial photos inasmuch as both have the same scale and also present landscape features such as major roads and cultivation plots visible in both of them. These facts were very helpful for site location and orientation purposes. In addition, as cultivation land survey maps, their advantage is that elevation points were taken and drafted every meter. As such, these maps differentiate cultivation and drainage areas, information also useful for the location and interpretation of archaeological sites. The main drawback of these maps is that they provide information only on cultivated areas and do not include the topography of adjacent mountain slopes or major hills within the study area. At best, only the very first and lowest contour lines of these topographic features were depicted in the maps. This in fact, however, was not a great deal of inconvenience since most of the study area is found within modern cultivation land and because these areas were also covered in the aerial photographs inspected. Finally, other publications with further environmental data from the study area were obtained (Guzmán Martínez 1994; Instituto Nacional de Ampliación de la Frontera Agrícola del Ministerio de Agricultura 1983; Ministerio de Agricultura 1974).

Once the information described above was acquired, the next step in the surface survey design was to solve logistical problems. Among these, the most important were the location of the headquarters of the project, distance to the study area, and transportation. Ideally, a central location would have been preferred for the headquarters. Yet, certain factors (lack of electricity, running water, accessibility to services and main transportation routes to the capital city of Piura essential for weekly provisioning, etc.) precluded locating the headquarters at modern small villages *(caseríos* or *centros poblados*) within the study area. Therefore, the modern city of Chulucanas, capital of the Morropón Province, was selected as the location for the field camp. Chulucanas is located outside the study area but next to its northwestern margin. The drawback of this location was its marginal position in relation to the study area and thus the varying amount of time needed daily to get to the different survey units. Time limitations of the surface survey made it imperative to count on some sort of motorized transportation, though. As dissertation research, however, the surface survey also had budgetary limitations making a truck rental an impossible option due to its outrageously high costs. Therefore, a more economical option was chosen; that is, renting a *mototaxi* (a two-wheeled motorcycle transformed into a three-wheeled cart), which is the means of transportation most commonly used by modern villagers especially to commute between the *caseríos* and Chulucanas and vice versa.

With logistical problems solved, selection of methodology and field strategies options were the next step in the survey design. As usually happens in systematic archaeological surveys, the options were between undertaking a full-coverage or a sampling survey. In fact, discussion of archaeological survey, since its inception, has revolved around the problem of area coverage and its concomitant implications in terms of the quantity and quality of archaeological data recovered. Full-coverage survey versus sampling survey, thus, has been the focus of debate.

Briefly, full-coverage survey is the complete survey of certain area with a relatively high degree of intensity (the distance between surveying crew members). Sampling survey, on the other hand, is the survey of certain portions of an area (sampling fraction) done in different parts of the study area (sample size) by location of sampling units of different sizes and shapes (mainly quadrants or transects) sampled through different sampling procedures (i.e., randomization, systematization, stratification, and cluster sampling), and undertaken at a certain degree of intensity. Estimation of population parameters (e.g., sites size, density of sites, etc.) through statistical procedures is one of the main goals of sampling survey.

Over the years, the advantages and disadvantages of both approaches have been discussed. In general, the main critique of full-coverage advocates (e.g., Kowalewski 1990; Kowalewski and Fish 1990) to sampling survey focuses on the area surveyed: the smaller the area surveyed (sampled), the fewer the sites discovered. They argue that full-coverage survey ensures the discovery of the totality of recognizable sites in a population within a certain area. Also, they note that it is more unlikely to find rare sites or items with a sampling survey approach. Further, full-coverage survey may permit recovery of a larger and broader range of data than sampling survey.

Yet, as supporters of sampling survey have claimed (e.g., Plog 1976b), sampling survey is primarily not a discovery technique but rather a tool for estimation of population parameters. A main concern of the sampling survey is thus adequately controlling its main components mentioned above (sample size, sample fraction, etc.) to assure the high quality (and quantity) of data recovered. To gain such control, archaeologists (e.g., Plog, et al. 1978; Schiffer, et al. 1978) have suggested careful and detailed planning of multi-stage survey design, that implies making decisions at every step. Research designs geared toward sampling surveys were devised mainly on the basis of archaeologists' experience doing survey in the Southwestern US where ground conditions are optimal to undertake archaeological surveys in general and sampling survey in particular. Application of sampling survey has not been favored since the 1970s and has been rare in, for instance, studies in the Central Andean region (e.g., Higueras 1996).

In contrast, full-coverage survey or a variation of it has been exercised essentially where research questions required the most complete inventory of archaeological sites within a certain region or regions. In fact, full-coverage surveys have played a key role in studies of social evolution and complexity at the regional and macro-regional level. This has been true since the inception of settlement pattern studies with the Virú Valley Project (Willey 1953) that were refined and enhanced over the years (e.g., Billman and Feinman 1999). In Mesoamerica, it led to long-term archaeological projects (currently active) concerned with social evolution and change allowing gathering of large data sets and almost full macro-regional coverage and incorporation of these data sets (e.g., Balkansky, et al. 2000; Blanton, et al. 1982; Kowalewski 1983; 1990; Sanders, et al. 1979; Santley and Arnold 1996; Stark 1991). In the Andean region, full-coverage surveys have also been significant, having being undertaken to study aspects of social evolution and complexity (e.g., McAndrews, et al. 1997; Stanish 1997; Wilson 1988), as well as sociopolitical and socioeconomic organization (e.g., Tschauner 2001), the relationship between land, water, and power (e.g., Hayashida 2006), and social and cultural responses to environmental change (e.g., Dillehay and Kolata 2004). Unlike

Mesoamerica, however, in the Andes efforts to undertake a macro-regional analysis incorporating different but complementary projects and data sets have not been pursued. This is a challenge that still remains to be done by archaeologists working in this area.

Population estimates were not a research goal in this dissertation and hence a sampling survey approach was not carried out. Rather, as explained in Chapter 5, a more comprehensive understanding of the prehispanic cultural and sociopolitical landscapes was one of main goals of this dissertation requiring recording the maximum number or archaeological sites possible. Accordingly, a variation of the full-coverage survey approach was the strategy I pursued. As argued by different archaeologists (e.g., Higueras 1999), surface strategies vary depending on the diverse research questions that can be posed. Also, strategies will vary according to the type of environment and surface terrain on which pedestrian surface survey will take place. Insofar as systematic and adequate recording methodologies are applied, all survey strategies are valid.

The adopted survey strategy is akin to that applied by Tschauner (2001:75-80) where a full-coverage survey was not undertaken. Still, the strategy carried out was a walking strategy that aimed to cover the maximum area possible within the timetable allocated for this research stage. A walking transect strategy was precluded not only by the time factor but by the characteristics of the terrain as well. In fact, as explained in Chapter 2, the image of a "dry desert Peruvian coast" is not applicable to this area of the Far North Coast. In the Upper Piura Valley, the tropical dry forest has much denser vegetation coverage than other areas of the North Coast south of the Sechura Desert. Even after a rainy season of normal average precipitation, tall grass and thorny weed bushes grow very fast. This vegetation coverage remains as such for a few years, drying, even if precipitation is below normal rates. This is true not only for the valley margins but for the valley bottom as well where cultivation plots abandoned or in fallow are thus covered. A walking transect strategy within this context and for these reasons would be very time-consuming and thus impractical.

Therefore, the walking strategy used in this dissertation research was a combination of both a vertical and horizontal dimensions. These dimensions parallel the two paths of interpretation for this dissertation described in the previous chapter. Indeed, as suggested by scholars (Casey 1996:30-31; Ingold 2000:219-242) the vertical dimension is the god-like perspective in which the world is conceived as a pre-prepared almost lifeless surface on which discrete beings move from one location to another in space. This is the way modern cartography and conventional settlement pattern studies conceive, organize, and represent space. On the other hand, the horizontal or lateral dimension is a relational process conceiving the world not as an integration of discrete entities in space but of places (locations charged with history). This integration of places (conceived as connected nodes in a region) is operated through the experience and constant journey of inhabitants to, from, and around these places. This horizontal dimension is thus the phenomenological experience of the world on which the dwelling perspective –the other path of interpretation in this dissertation- rests.

The limits of the study area were first traced onto the 1/100,000 scale national topographic map of Perú (*Carta Nacional*; maps Chulucanas 11-C and Morropón 11-D). Then, this area was further subdivided in 1 km^2 units with a total of 255 units and thus an area of 255 km^2. This was the initial targeted area to be surveyed. Yet, since this total area exceeded the time allocated for the survey, a total of 153 km^2 was the area actually surveyed. Hence, the area actually surveyed includes all the northern bank of the Upper Piura River and part of the southern bank (Figures 4 and 5). The 1 km^2 survey units were identified sequentially with numbers starting with Unit 1 at the northwest corner of the study area and then progressing east and south. Finally, each of these 1 km^2 units was traced in the 1/10,000 scale topographic maps that were the maps used daily to find and locate the sites.

The vertical dimension of the walking strategy was comprised of the detection of archaeological sites in the laboratory using the aerial photographs as well as the topographic maps. In the lab, pairs of stereoscopic prints were analyzed with a pocket stereoscope and possible sites located were marked with a circle made with a red wax pencil. After selecting common points (main roads, crossroads, etc.) both in the 1/10,000 topographic maps and aerial photographs, an angle of reference was traced using the true north as one of the lines, and another landscape feature (e.g., a main road) as the other. Also, the 1/10,000 scale on the aerial photographs was adjusted as suggested by Strandberg (1967:51-52). Using rulers and a protractor, an azimuth was obtained for the possible sites marked on the aerial photograph. These azimuths were then transferred to the 1/10,000 topographic maps using the same angle of reference also traced onto the map. In addition, with all the points marked on the topographic map, UTM coordinates were obtained for all possible sites and entered in a GPS *Garmin 12* hand-held receiver. Also, in few cases it was not necessary to transfer the points from the aerial photographs to the topographic map because the possible sites were already plotted as part of the original rural survey map. In those cases UTM coordinates were also obtained and added to the list of possible sites. Finally, in areas where no possible sites were detected through inspection of the aerial photographs (especially on the valley margins and first foothills of the cordillera), but where topographic characteristics (flat, gentle slopes), indicated possible human habitation areas, random points were selected. These points were marked either on the aerial photographs or topographic maps or both. UTM coordinates were then obtained for these "blind" points and became part of the list of targeted points during pedestrian navigation. It is important I should underscore here that this part of the strategy adopted may under-represent sites that have no readily recognizable surface structures (e.g., artifact scatters from preceramic and short-terms occupations). Yet, although that might well be the case, I believe this drawback does not significantly affect the main research concerns of this dissertation.

This procedure was followed in each and every one of the 153 1 km^2 units surveyed. Survey units were not surveyed sequentially starting with Unit 1 and so forth. The decision to which units were surveyed first was rather random. The survey, however, started with units closer to Chulucanas. All units on the northern bank of the river were surveyed first progressing from west to east and from north to south. Units located on the southern bank of the river were surveyed last.

The horizontal dimension of the walking strategy was comprised of the actual pedestrian survey. In fact, with all the points inserted in the GPS receiver, navigation within each survey unit moved along point after point. Yet, as the survey progressed, the primary function of the GPS was recording rather than navigation. At this point a crucial aspect of the horizontal dimension came into play: information obtained from local inhabitants.

Local inhabitants' knowledge of their landscape was contributed primarily in two forms. First, knowledge was obtained from local workers (usually one or two) who were temporarily hired to assist in the survey. Some of the main modern villages (*Centros Poblados*) were considered as centers of reference for hiring the assistant workers. Indeed, each time we arrived at a *Centro Poblado*, the *Teniente Gobernador* (the major political authority in the village) was contacted to inform him about the ongoing survey project, present credentials and permits, as well as ask him to recommend individuals from the area to join the survey crew. In two instances the *Teniente Gobernador* offered himself to work in the survey. Hence, usually the survey crew was comprised of 4 or 5 members: two archaeologists, a permanent worker from Chulucanas who was also the *mototaxi* driver, and one or two local inhabitants from the *Centro Poblado* closest to the units being surveyed. Once survey was finished within the units around the *Centro Poblado* (usually after two or three weeks), the crew arrived at a new *Centro Poblado* and followed the same procedure as explained above. The other form of knowledge from local inhabitants came from almost daily encounters with farmers or herders working in the area. Most of the time the local member of the survey crew knew personally the farmers and herders, which facilitated communication.

The knowledge from local inhabitants was crucial to the survey strategy for two main reasons. First, it complemented the vertical dimension helping to find sites missed during the laboratory inspection either because they were not recognized on the aerial photographs, or because it was not possible to get all aerial photographs sets for a determined survey unit. Indeed, either by information from the local crew member, or from farmers encountered during survey, the survey crew was directed to these possible new sites. Secondly, and more importantly, knowledge obtained from local (living or working within the survey unit) inhabitants was crucial to the horizontal dimension of the survey strategy. It helped in my experience and perception of the landscape within the study area. In fact, my engagement with the landscape was facilitated through daily walking by the same paths local inhabitants take, by the way they described their landscape while giving directions, and by the almost daily encounters and casual conversations with local inhabitants learning from their accounts on their daily domestic activities.

Upon reaching an archaeological site and defining it as such, the recording process began. It followed a series of steps. First, for a better and more effective recording, sites were enumerated sequentially within each survey unit (e.g., U53S1 and U 53S2 standing for Unit 53 Site 1 and Unit 53 Site 2 respectively). A printed recording form was used for each site (see Appendix A). These forms compiled information on location of the site, topographic characteristics, vegetation coverage, state of preservation, and characteristics of architecture (if present). Also, a more general description was written on the form including some preliminary interpretations on dates and cultural affiliations, and the nature and characteristics of the site in relation with other surrounding sites and their location. Then, a sketch map of the site and its perimeter was drawn taking measurements with a 50 m or 100 m measuring tape. In addition UTM coordinates were obtained with a GPS both at approximately the centre of the site to locate and plot them, and at their perimeter to obtain a polygon. General views (slides) from the sites were taken as well as some details of architecture when applicable.

Finally, a random collection of surface diagnostic materials (especially ceramics) was also carried out. Workers were trained in the field to help in the surface collection zigzagging across the entire site and to recognize diagnostic ceramic fragments (form and decoration). Surface ceramics were mainly collected to help date the archaeological sites. Diagnostic ceramics are primarily comprised of rims, bases, and handle fragments, as well as decorated sherds. All surface materials collected were separated by category (ceramics, lithic, etc.) and bagged; each was tagged and numbered sequentially, this time for the entire study area, beginning with bag No. 00001 and finishing with bag No. 00461 by the end of the surface survey.

6.2 Test Excavations

Test excavations were undertaken at two sites for a period of two months (one month each). Their goals were to obtain data on construction style and techniques that would reflect local traditions and (if present) evidence of foreign influence. Also, test excavations were oriented to recover samples for radiocarbon dating, and to offer stratigraphic support for the relative dating of settlements. The criteria used to select sites for test excavations were the presence of multicomponent (more than one chronological period) occupations as observed from surface remains, and preserved architecture. The two sites tested were U15S6 and U194S1.

U15S6 is an extended mound located next to the modern village of Talandracas (Figure 6). Four excavations units were opened for a total area of 10 m^2 reaching a maximum depth of 2.15 m below the surface for a test pit situated almost at the center and highest part of the mound. Overall, 1,807 diagnostic sherds were recovered. Also, 21 features were found: 4 floors, 15 post holes, and 2 fire pits, as well as one artifact (neckless olla).

Site U194S1, comprised of two platform mounds (Mounds A and B) also known as *Huaca Mica*, is located at the fringes of the modern town of La Matanza (Figure 7). Test excavations were undertaken only at Mound A. Mound A was of particular interest because it contained a good deal of looters' pits exposing architectonic features (i.e., adobe walls). Eight excavation units were defined but only five were actually excavated for a total area of 34 m^2. Together, they yielded 3,085 diagnostic sherds. Sixteen features were recorded (1 occupation level, 5 walls, 6 mud seals, 2 burnt surfaces, and 2 wooden posts) and one artifact (wooden implement).

A topographic map was drawn for each site indicating the location of excavation units. Also, for purposes of tridimensional recording a "Datum 0" point was established at the highest location on each site. Further, secondary "datums" (D1, D2, etc.) – correlated with "Datum 0"- were scattered throughout the sites close to the excavation units. Moreover, UTM coordinates were read and recorded for the NE and SW corners of excavations units and for the location of all "datums". Artifacts and features were recorded and numbered sequentially and independently for each site. Finally, all digging was done following the natural or cultural layers found during the process.

Artifacts, features, and details of excavations were recorded in separate printed recording forms annotating information on location (unit, layer, depth, etc.), type of feature or artifact, film roll number and shots taken, numbering of drawing (profiles, maps, usually at scale 1/10), description (including Munsell colors) of layers excavated, number of bags tagged (and bag numbers) during the day, number and weight of non-diagnostic sherds, provenience, depth, bag number of samples recovered (e.g., for ^{14}C dating), and written and preliminary observations on the materials recovered, architecture (if present), and the nature and associations of artifacts and features (see Appendix A).

6.3 Ceramic Analysis

Preliminary sorting and examination of diagnostic ceramics was conducted in the field. Yet, more detailed analysis was conducted later in the lab at the research facilities of the Sicán National Museum in Ferreñafe, Lambayeque. A total of 17,626 diagnostic sherds (12,734 from the pedestrian survey and 4,892 from test excavations) were recovered. From this assemblage, a sample of 1055 sherds was analyzed systematically. Fifty seven percent of this sample is comprised of ceramic diagnostics from both excavated sites. As multicomponent sites (especially U194S1), they provided a good sense of the range of stylistic variation in the study area. The remaining 43 percent of the sample is comprised of ceramic diagnostics from some of the sites recorded during the surface survey. Moreover, this detailed analysis was further supported by lab work comprised of digital (photographic) recording of the most informative diagnostic fragments from all sites recorded in the survey. Therefore, it was possible to date all sites with the collected sherds with the exception of the very few sites where diagnostic pottery was scant or absent.

The detailed analysis consisted of an attribute analysis of a total of 65 categories of attributes of morphology, decoration and paste features. Each sherd was analyzed and coded observations were entered in a printed recording form (see Appendix A) which in turn were later entered into an Excel spreadsheet. This is a more simplified version of the recording form and codebook designed by Tschauner (2001:85-101, Appendix B) which in turn was adapted from the original procedure by Mohr Chávez (1977) following the Berkeley feature method (e.g., Menzel, et al. 1964; Rowe 1959). Obviously, not all of Tschauner's coded attributes were found among the material from the Upper Piura Valley, and some new attributes were coded when pertinent. The ceramic analysis had two major aims: 1) to help better characterize traditional ceramic styles of the Upper Piura Valley complementing previous but insufficient efforts (e.g., Bats 1990; 1991); and 2) perhaps more importantly, to chronologically order the recorded sites.

Although test excavations provided valuable information on the history and dating of the sites, they failed to be a reliable source in establishing a chronological sequence for the study area. Establishing a regional chronological sequence was precluded by the number of sites tested (only two), and the nature of contexts unearthed (sequence of architectural fills with mixing of ceramic styles).

Therefore, the ceramic analysis has been used solely to date the sites recorded in the study area. This process proceeded by visually comparing (using drawings and photographs) the ceramics analyzed for this research (emphasizing form and decoration attributes) with previously proposed sequences (or partial sequences) for the region of Piura and especially for the Upper Piura area. The latter were constructed on the basis of sherds collected either during surface surveys (Bats 1990; 1991; Lanning 1963), or through systematic excavations (e.g., Guffroy 1989; 1994; Guffroy, et al. 1989a; Kaulicke 1991).

Sites were dated using the nine period terminology (see Endnote 4 in Chapter 3) of the regional chronology proposed by Bats (1990; 1991). Yet, this does not mean that Bats' classification and sequence was directly applied to the sample used for this dissertation. Since the different proposed sequences are based on an emphasis on different classificatory attributes (i.e., either on paste, morphology, or style) Bats' sequence (i.e., his paste descriptions and range of forms as shown in his drawings) was cross-referenced with the illustrations and descriptions presented in the other schemes as well as with those of my ceramic analysis (see Appendix C). That is, the process of dating the sites recorded in this dissertation was long and cumbersome and was literally a one-to-one comparison between the diagnostic sherds I analyzed and the published descriptions and illustrations of the other sequences. Therefore, since Bats' sequence is based on a surface survey next to the study area and encompasses the entire prehispanic occupation, and since the ceramics recovered and analyzed for this dissertation are not sufficient to refine and propose a different chronological scheme, I decided that is pertinent, for heuristic purposes, to use Bats' terminology.

6.4 Classification of Sites and Settlements

Morphological criteria were used to establish the terminology and classification of sites. Other kinds of criteria (e.g., functional) were impossible to use due to the characteristics and preservation of sites. Most sites show a great deal of homogeneity (i.e., earthen mounds) and -on the basis of evidence from both test excavations- were multifunctional (e.g., burial and residential) through time. Therefore, systematic excavations at a larger scale than test pits at more sites would be the only reliable way to propose a functional classification. The following morphological attributes were used in the classification: topographic characteristics (e.g., degree of slope), volume, extension, location, and presence or absence of pre-established architectonic features (e.g., walls or wall foundations); yet the latter ultimately prove to be not a significant difference (see below). Thus, initially 14 site types were established. Below is a brief description of these types. Further details of these sites (measurements, UTM coordinates, etc.) are provided in a summary table for all 270 recorded sites (see Appendix B).

1) Simple Mounds: They are circular or oval-shaped earthen mounds that are readily recognizable elevations from the valley bottom. Their slopes are regular with no dramatic angle changes; commonly moderate and steep in few cases (Figure 8).

2) Extended Mound: These are oval or rectangular-shaped earthen mounds, generally low, and commonly over 100 m long. Mound slopes are regular and gentle. In general they are larger in length than width and the height/area ratio is smaller than on Simple Mounds (Figure 6).

3) Platform Mound: Oval or rectangular-shaped earthen mounds. The topography clearly shows different levels suggesting the presence of both multiple, superimposed platforms, and architectonic constructions more significant than on the first two types above; slopes are moderate and sometimes abrupt (Figure 7).

4) Double Mound: These are single mounds (similar to simple mounds or sometimes to platform mounds), but with two clear peaks found at each end of the mound, linked by an earthen "bridge" or a lower elevation area (Figure 9).

5) Wall/wall foundation on Simple Mound: These are single or double-lined stone alignments located on top of simple mounds. Sometimes two alignments that represent a wall corner are observed. These features seem to be the remains of terraces, rooms, and retention walls.

6) Wall/wall foundation on Extended Mound: Similar to features described above but located on top of Extended Mounds.

7) Wall/wall foundation on Platform Mound: Similar to features described above but located on top of Platform Mounds.

8) Wall/wall foundation on ridgetops: Features similar to those described above but located on top of ridgetops of the Cerro Pilán mountain chain or first foothills of the Andean cordillera adjacent to the valley bottom. These ridgetops are spur-like projections of the mountains perpendicular to the valley bottom with gentle slopes or sometimes almost flat surfaces (Figure 10).

9) Wall/wall foundation on slope: Features similar to those described above but located on mountains slopes especially on those of the Cerro Pilán mountain chain either on its western or eastern part.

10) Room(s) on Ridgetops: This type is characterized by an enclosed area defined by low stone walls or wall foundations that may consist of just one room with or without internal divisions. Walls or wall foundations can be single or double row, the latter filled with soil and small stones. Apparently, mud mortar was

used as a cement between stones but only a few well preserved cases were found as erosion has taken a heavy toll. Commonly walls have preserved only to a height of one or two courses. The stone walls or walls foundations thus seem to have supported structures made with *quincha* or *bahareque* that obviously have not been preserved. For the same reason the height of the walls cannot be estimated. Wall width varies between 0.30 m and 0.80 m (Figure 11).

11) Room(s) on slopes: These are similar to those described above but are found on mountain slopes, especially along the western drainage of the Cerro Pilán mountain chain (Figure 12).

12) Room(s) on hilltops: These are sites on hills found along the valley bottom and adjacent to the Piura River. The characteristics of stone constructions found are similar to those described above. The main features of these sites are their difficult access to the summit, terracing on one or more of their steep sides, and the presence of concentric stone walls, in some cases up to 4 or 5 concentric walls surrounding the summit, such as at U134S1. Due to the difficult access, preservation is better than near or on the valley bottom (Figures 13 and 14).

13) Room Complex on Ridgetops: These sites consist of a number of rooms or stone alignments. Walls and wall foundation characteristics are the same as those described above. They are found on top of gentle or flat-sloped ridgetops (sometimes leveled by terracing) especially on the first hills of the Andean cordillera (Figure 15). This type is certainly very similar to the Room(s) on Ridgetops type since the main difference between them is in the number and complexity of the rooms. Yet I consider that in terms of the nature of the site

(i.e., its potential difference in the number of inhabitants), this variation is significant and thus the separation into two different types.

14) Room Complex on Slopes: Similar to the above but located on slopes of the western drainage of Cerro Pilán mountain chain. This category is represented by just one site: U99S1 or "Piura La Vieja" (Figure 16).

After further review of the data I considered that the separation of wall/wall foundations on Simple, Extended, and Platform Mounds types from the Simple, Extended, and Platform Mounds types was not relevant and thus the former were considered as just the last three mentioned types. Overall therefore, there are 11 site types and their distribution is as follows: 117 sites are Simple Mounds; 51 Extended Mounds; 46 Platform Mounds; 6 Double Mound; 16 wall/wall foundation on ridgetop; 4 wall/wall foundation on slope; 18 room(s) on ridgetop; 6 room(s) on slopes; 3 room(s) on hilltops; 2 rooms complex on ridgetops; and 1 rooms complex on slope (Figure 17, Table 3).

Finally, to define settlements I have used what cultural geographers (e.g., Roberts 1996:24) call the "hailing distance" (150 m) also used by Tschauner (Tschauner 2001:80-81); this distance is used to distinguish between isolated farmsteads and larger, agglutinated villages. For the purposes of this research I slightly modified the "hailing distance" to 200 m to cope with the fact that the areas of most sites have been reduced because modern destruction have cut their edges. That is, all contemporaneous sites (dated by the ceramic analysis) were considered a single settlement (and thus possibly a social unit of some sort) if they were found within 200 m from each other. Several of the recorded sites are multicomponent; i.e., they were occupied through several chronological periods. Therefore, in some of those cases some of the contemporaneous, adjacent sites in one chronological period may not be part of the same settlement in another chronological period. Some of the settlements or group of settlements defined in this way constituted the centripetal forces mentioned in Chapter 7. That is, their recurrence in time and space, their increase in size over time, and their overall ability to attract other sites around them point to their social and political significance and thus their definition as centripetal forces.

Obviously the use of the "hailing distance" and the dating of contemporaneous sites may not be the perfect analytical parameters. Yet, they are used conventionally in settlement patterns studies and they are also pertinent tools for the kind of data I collected. In addition, considering the transformations observed in the settlement organization through time (see Chapter 7), I believe the settlement classification applying the criteria mentioned above is significant. Finally, this classification led to a diachronic settlement size analysis (see next chapter) that was pursued to divide the settlement size distribution for each chronological period into no arbitrary (i.e., statistically significant) rank groups. Such analysis was necessary to interpret the spatial distribution of settlements through time and to address the research questions of this dissertation.

Settlement patterns studies have certainly its detractors. For instance, some scholars (e.g., Shimada 1990a) have criticized D. Wilson's (1988) settlement pattern study in the Santa Valley, one of the most comprehensive works of this type carried out in the southern part of the Northern North Coast. Shimada (1990a:222-223), after praising the methodological rigor and spatial coverage of Wilson's study, undermines part of his interpretations arguing a weakness in the temporal control. Shimada finds two main flaws. First, he argues that Wilson's adoption of the ceramic chronology proposed for another valley (the Virú Valley) of the Northern North Coast is not adequate and precise enough to determine the intricacies and developments of the social and political complexities in the Santa Valley. And second, criticizing Wilson's interpretation of a Mochica polity conquest of the Santa Valley in just one episode during the Mochica Phase III, Shimada claims that the five-phase Mochica chronology lacks (with the exception of Mochica Phase V) enough support from ^{14}C dates and that the "… inferred long duration of Phase III (ca. A.C. 250-400) may well mask critical short-term events and processes, such as military conquests and reconquests (…) rather than the implicitly assumed, single successful conquest" (Shimada 1990a:223).

I have not had the opportunity to review all settlement patterns studies done to date in the history of the archaeological discipline to ascertain, as Shimada (1990a:222) does, that Wilson's research "…shares the weaknesses of many settlement pattern studies, including temporal control". Yet, on the basis of cases I know (see for instance Section 6.1), it is clear that there is variability in the methodologies and strategies used as well as in the nature of the work and quality of the results. For example, there are instances in which several seasons or even decades of survey and mapping have helped to detect important transformations in the landscape with significant sociopolitical connotations. These kinds of investigations have demonstrated that if significant, dramatic changes took place, it does not matter if they occurred in long or short periods of time because they, without a doubt, will leave an imprint in the landscape. Such is the case, for instance, with the kingdom of Urartu during its expansion and Imperial period between ca. 850-643 B.C (Smith 2003:149-183); i.e., a period of 207 years, longer than the 150 years of the Moche III phase mentioned above. Moreover, the conquest of the Ararat plain in 750 B.C until almost the end of the Imperial period in 714 B.C. left an undeniable mark on the landscape. Smith (2003:169-180) argues that the transformation of the political landscape (vital for the empire political agenda) during this period, characterized by an intensive building program in this conquered region -entailing dramatic changes in settlement pattern including settlement location and site topography- are clearly distinct from the political landscape of the previous pre-Urartian polities of the Late Bronze and Early Iron age as well as from those of the subsequent Reconstruction period. Similar changes in settlement patterns during short periods of time that left undeniable testimonies on the landscape have been detected (in late prehispanic times) after several seasons of fieldwork carried out by teams of archaeologists working in the central highlands of Perú (e.g., Earle, et al. 1980; Parsons and Matos Mendieta 1978; Parsons, et al. 2000). In other words, either if data from inscriptions or ethnohistorical records are not available, or regardless how well the sites are dated (i.e., if chronological periods are too long or too short), real, significant sociopolitical changes will leave clear archaeological manifestations in the landscape.

The words I just penned above intend to say that the analyses and interpretations I present in this dissertation can be compared to the magnitude and caliber of the investigations by Smith and his colleagues, Parsons and his colleagues, or even Wilson, just to mention a few. I will leave that judgment for the individual(s) that would kindly read this dissertation. I do want to stress, however, the variability (in terms of nature and results) that exists in settlement pattern studies. In this context, I have to say that my settlement pattern study certainly has strengths and weaknesses. As mentioned in Section

6.3, an obvious weakness is that, first, sites were dated on the basis of pottery fragments recovered on the surface of sites, and, second, in the limited excavations I carried out, I did not encounter primary contexts or radiocarbon dated stratigraphic columns that could further refine the chronological scheme used. Another weakness is that due to the state of preservation of the architecture in many of the sites and their nature (i.e., residential, domestic and even funerary functions in the same site in many instances), a functional classification was not possible. Yet this is a problem that could be fixed, in the future, with a program of excavations.

Paradoxically, one of the strengths of this dissertation (also mentioned in Section 6.3; see also Chapter 3) is that, unlike the chronological scheme used by Wilson, the dating of sites is based on a local and regional chronological scheme that encompasses the entire prehispanic period. Moreover, the chronological scheme was cross-referenced with other local and regional chronological schemes, some of them based on partial stratigraphic columns; i.e., not encompassing the whole prehispanic sequence. There is no doubt that in the future, obtaining both, data from excavations of primary contexts and more radiocarbon samples from stratigraphic columns, will allow refinement of the local and regional chronology.

Another strength of this dissertation, even after considering both the strengths and weaknesses of the chronology mentioned above, and the possible factors of disturbance in the archaeological record (see Section 6.5 below as well as Section 8.5 in Chapter 8), is the temporal coverage of the present settlement pattern study. In fact, as shown in Chapter 7, this investigation covers the entire prehispanic sequence. As the period-by-period analysis progressed, clear patterns and changes in the spatial organization were observed which in turn, as I have interpreted them, reflect concomitant sociopolitical transformations. Overall, I do not consider that a lack of refinement of the current local and regional chronology precludes my observations of significant sociopolitical changes as reflected in the settlement and landscape organization.

Finally, I concur with critics of settlement pattern studies that this kind of investigation has to be the initial step of long-term, regional studies and that they "… must go hand-in-hand with continuing efforts to establish and refine regional chronologies,…" (Shimada 1990a:223). In this sense, I have to reiterate that, since I do not harbor the pretense of owning the absolute truth, my interpretations of the settlement patterns could be debated or modified by myself or other colleagues upon further research is done in the study area.

6.5 Preservation and Formation of Sites

Most archaeological research that encompasses a settlement pattern study has to be cautious when interpreting data from surface surveys. It is especially important to remember that the cultural materials and monuments recorded during research most likely do not represent completely the actual past reality but have arrived to us modified and impinged by a series of natural and cultural processes. The Peruvian desert coast is no exception and indeed it is very dynamic where short and long-term landscape processes such as sea-level fluctuation, tectonic uplift, dune-field migration, desertification, river displacement, unstable drainages, and ENSO flash flooding have been observed (e.g., Craig and Shimada 1986; Dillehay and Kolata 2004; Moseley

1983b; Shimada, et al. 1991; Wells and Noller 1999). These environmental challenges have created an array of human responses that vary in scale, time, and space and that have been continuously shaping the landscape.

Site preservation on the Upper Piura region has been affected by these processes and human responses to them. As a result, the state of preservation of all archaeological sites in the study area is very poor. All sites have been affected to some degree, some of them very seriously, and others have even completely disappeared in modern times as evidenced by contrasting aerial photographs with field observations, or are on the verge of disappearing. Just for descriptive purposes I shall say that the processes affecting the sites are both natural and human in origin.

Among the natural processes, erosion caused by rainfall during the normal rainy season and even more during ENSO episodes is one of the main factors. Precipitation washes away the surface of sites and creates and deepens even more already existing fissures and cleavages caused by former erosion and pits left open by looters. Also, dense vegetation growing on sites (especially on mounds located on the valley floor), alters the sub-surface layers due to plant root penetration. Moreover, plants and fissures function as niches for different species of reptiles and other fauna that dig and disturb the stratigraphic deposits. Another important natural process is erosion caused by flooding originated by overflowing of the Piura River especially during ENSO episodes. As a product of these transient but cyclical events parts of the banks of the river are stripped of their vegetation coverage and soil matrix. Consequently, several of the archaeological mounds located right on the river bank have partially or completely disappeared while others most likely will be washed away during the next years.

Among the human process impinging on site preservation, looting is one of the most serious problems. Large scale looting has been relentless since the 1950s taking a heavy toll on archaeological sites. All sites present a high density of looter's pits on their surfaces. Some of these sites have been destroyed not just by looter gangs working with shovels but also, in the recent past, they have been bulldozed. In some instances looting has been so intense that the height of mounds has been reduced to ground level. This destructive activity is a direct consequence of the poverty in which most small farmers of the area are living. Impoverished farmers become the providers and the lowest (and weakest) link of a chain that feeds precolumbian antiquities into the black market and private collections all over the world. Looting especially intensifies after serious ENSO episodes and long-lasting droughts when usually the poorest farmers lose farmland and crops crucial to their subsistence.

Another important human process responsible for the destruction of sites is modern farming activities around the mounds, especially on the valley bottom. Almost all sites on the valley bottom are located within cultivation plots that belonged to the *hacendados* first and then, after the 1969 Peruvian agrarian reform, to different small landowners. Since the introduction of modern, mechanized agriculture, mounds have been continuously cut along their margins or ploughed to increase the area of cultivation plots. In some instances mounds were leveled and wiped out. Usually, for very practical reasons (e.g., the larger the volume, the higher the fuel costs required for bulldozing the mounds), the smaller mounds were those marked by this ill fate. Further, sometimes the mounds were cut through during the construction of the road network of former haciendas, and brick and concrete facilities were built on top of the mounds leveling the surface. These constructions were related to the local agricultural activities and used as warehouses, storage facilities, pump stations, and guardian houses. Currently, these facilities are abandoned or are used as the temporary or permanent residences of small landowners who took possession of the land after the agrarian reform at the end of the 1960s. Small landowners perform other activities that affect the sites such as digging and building temporary and very rudimentary wattle-and-daub shacks used as storage and as places to rest during daily farming activities. Moreover, farmers also clear and burn the vegetation on the surface of mounds, and sometimes they also fell the trees growing on the mounds to obtain fuel as well as to make wooden charcoal, a high-demand commodity in the local, regional, and national markets. Likewise, herding is a very significant activity among the local population and thus sites are heavily affected by the permanent traffic and grazing of livestock (e.g., cattle, goats, sheeps).

Finally, as mentioned above, another important cultural process affecting the preservation of sites is the settlement of modern populations on the archaeological sites. This phenomenon is more commonly observed on the Andean cordillera slopes adjacent to the valley floor as well as on the slopes of the western drainage of the Cerro Pilán massif. Modern *caseríos* found on top of the sites first appeared during the hacienda era (inhabitance permits granted by *hacendados*) as just a handful of houses. As time went on and due to a demographic explosion, these few homes and resident families expanded and almost completely covered some of the archaeological sites. Consequently, modern inhabitants have been continuously extracting stones from the walls and wall foundations of the prehispanic sites to be used in the construction of their own houses and other types of domestic constructions. Due to Perú's serious social, political, and economic centralization concentrating wealth and large-scale economic activities in coastal cities, migrating populations (from adjacent highland regions such as Frías and San Jorge) and thus settlement on coastal areas has increased in recent years. Therefore the inhabited area of *caseríos* has kept expanding and is expected that the remaining archaeological sites will completely disappear in a few years.

6.6 Summary

Intense, pedestrian survey of selected areas, test excavations, and ceramic analysis are the main research methods applied in this research. The pedestrian survey strategy also included examination of air photos and maps. Moreover, the survey had two dimensions (vertical and horizontal) that parallel the two paths of interpretation proposed in this research. Test excavations were undertaken mainly to get information on chronology. Ceramic analysis provided the tools to dates most of the sites recorded in the surface survey. A total of 270 sites were recorded and classified in 14 site types according to morphological criteria. Finally, it has been pointed out that site preservation affected by past and present human and natural processes has to be born in mind when undertaking settlement and landscape studies.

Figure 6: Site U15S6 (Loma Villalta); Extended Mound

Figure 7: Site U 194S1, Mound A (Huaca Mica); Platform Mound

Figure 8: Site U146S6; Simple Mound topped by Modern Construction on Top

Figure 9: Site U142S5; part of Double Mound topped by Modern Construction

Figure 10: Site U4S2; Wall/Wall Foundation on Ridgetop

Figure 11: Site U177S2; Room(s) on Ridgetop

Figure 12: Site U81S4; Room(s) on Slope

Figure 13: Site U199S1 (Cerro Santo Tomé); Room(s) on Hilltop

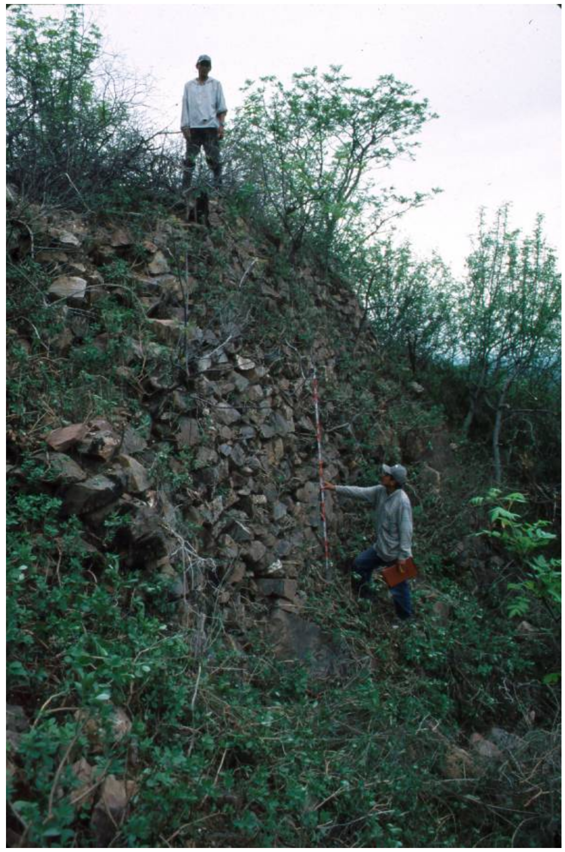

Figure 14: Detail of Architecture in Site U199S1

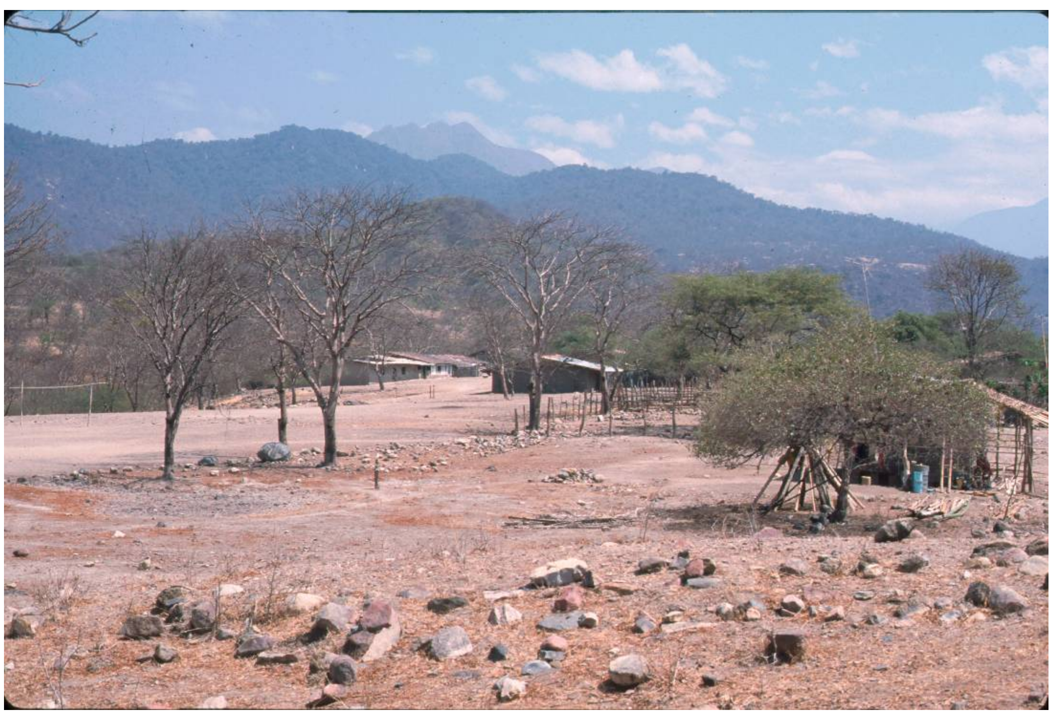

Figure 15: Site U12S2; Room Complex on Ridgetop

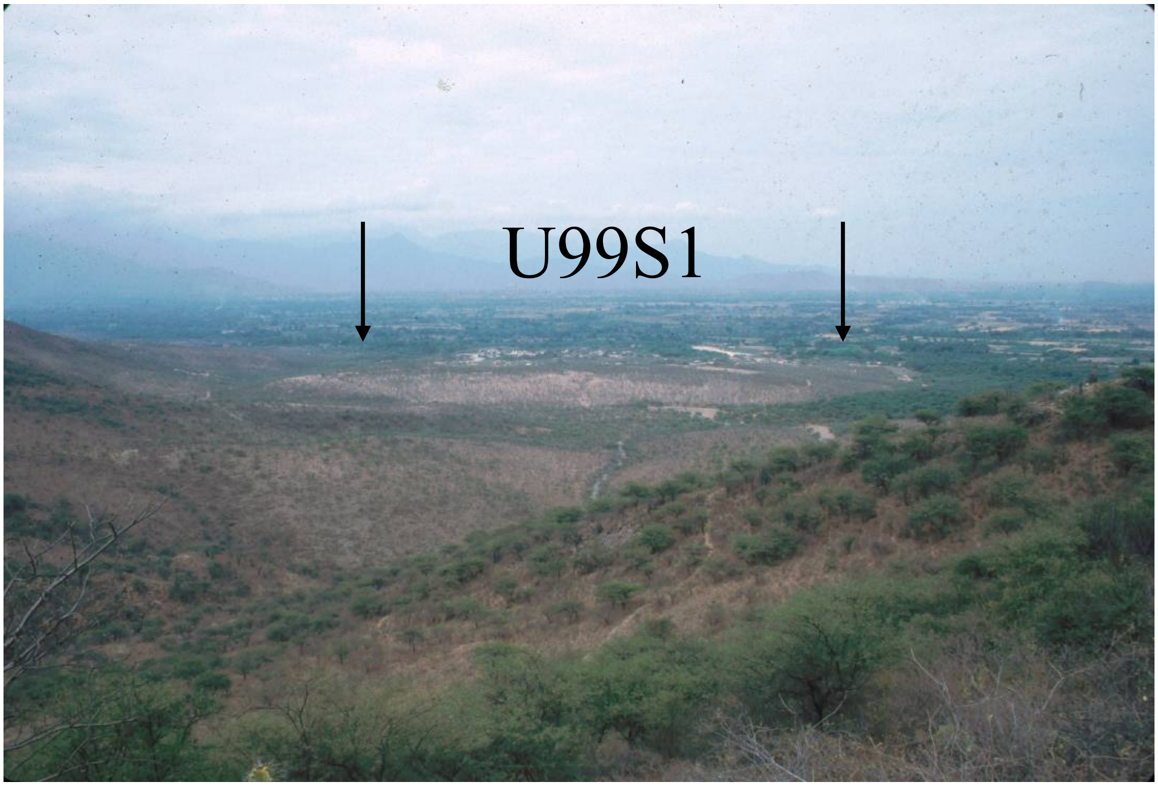

Figure 16: Site U99S1 (Piura La Vieja); Room Complex on Slope; View (towards N-NE) from the southwestern end of the Massif of Cerro Pilán

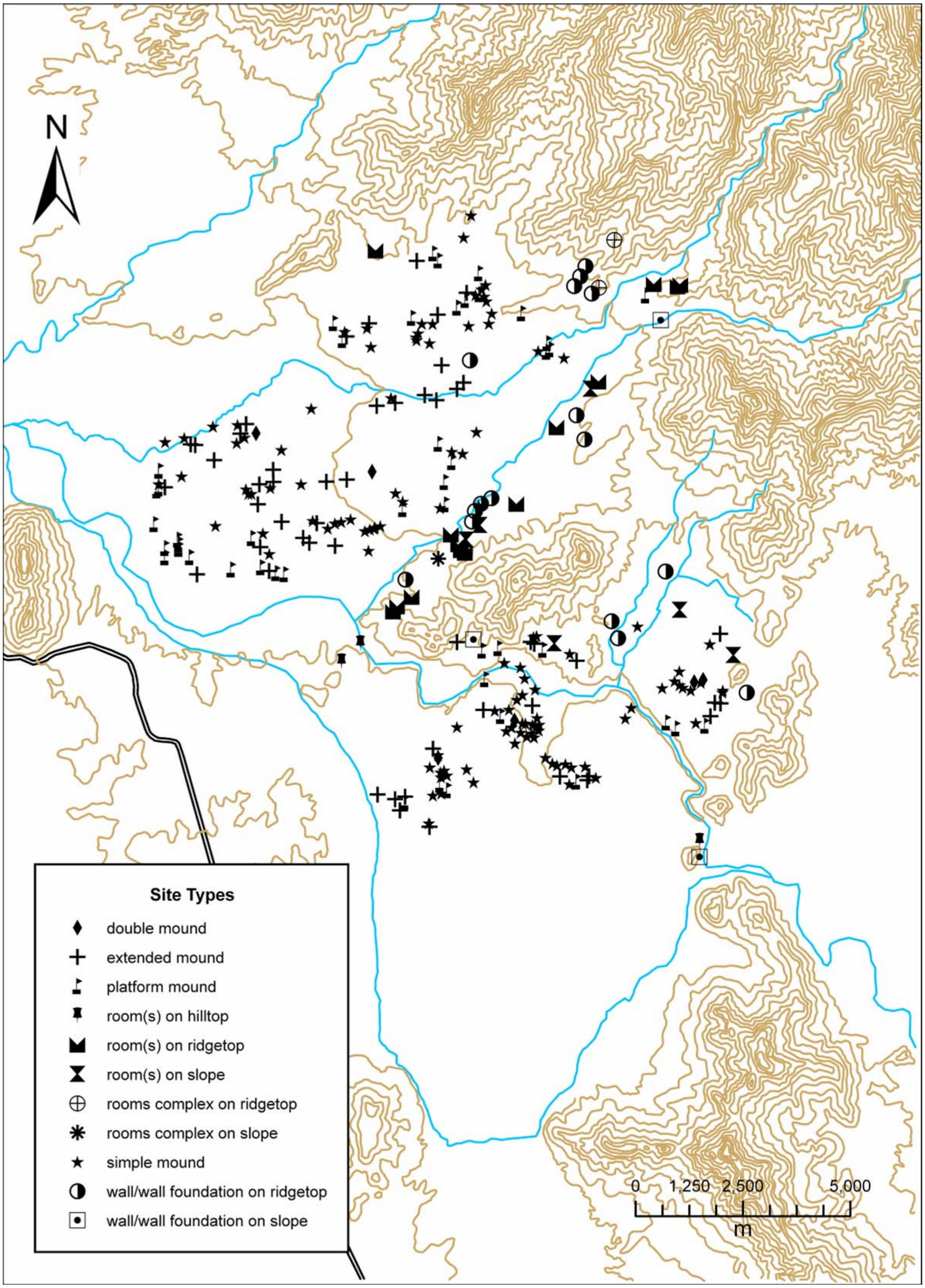

Figure 17: Distribution of Site Types

Table 3: Distribution of Site Types by Number and Percentages

Site Types	N	%
Simple Mound	117	43.3
Extended Mound	51	18.9
Platform Mound	46	17.1
Double Mound	6	2.2
Wall/wall foundation on ridgetop	16	5.9
Wall/wall foundation on slope	4	1.5
Room(s) on ridgetop	18	6.7
Room(s) on slope	6	2.2
Room(s) on hilltop	3	1.1
Rooms complex on ridgetop	2	0.7
Rooms complex on slope	1	0.4

CHAPTER 7

ANALYSIS AND INTERPRETATION OF SURVEY DATA

This chapter analyzes and interprets data obtained from the surface survey. The main outcome is the settlement pattern analysis of all prehispanic periods (Ñañañique through Inca) detected within the study area and its relation with the topograms and overall spatial structure of the landscape. The two paths to interpretation therefore overlap.

This chapter starts with a brief description of the geomorphology of the study area. This description then allows the analysis of the spatial structure of the landscape. The latter is shaped by my view of the landscape as part of the dwelling perspective that in turn serves as the background to interpret the landscape both in terms of possible topograms and their relation with results obtained from the settlement pattern data.

7.1 Geomorphology of the Study Area

The geomorphology of the study area described here is presented on the basis of publications by Guzmán (1994) and the Peruvian Ministerio de Agricultura (Instituto Nacional de Ampliación de la Frontera Agrícola del Ministerio de Agricultura 1983; Ministerio de Agricultura 1974). According to these publications, the topography of the area has been shaped by tectonic events that mainly affected the Palaeozoic and

Mesozoic era formations until the Pleistocene epoch. Various geomorphological agents then acted on the subsequent landscape evolution shaping the modern valley topography. Four geomorphological units are defined in the study area: 1) alluvial plain; 2) mountainous structure; 3) aeolian deposits, and 4) colluvium deposits.

The alluvial plain is located along the Piura River and is divided in two zones: first, the point from where it originates up to Carrasquillo where it is narrow and flanked by the mountainous structure (Zone 1); secondly, from Carrasquillo up to Tambogrande (Zone 2). Boundaries in this second zone are the mountainous structure (or first Andean foothills) to the NE, and aeolian deposits to the SW. Furthermore, the alluvial plain presents five sub-units: river shores (*playa or playones*), floodable lower terraces, non-floodable lower terraces, middle terraces, and alluvial cones.

The mountainous structure includes the first Andean Cordillera foothills whose long pediments, like fingers of gigantic hands, penetrate and extend on the alluvial plain. Top soil completely covers this unit. Although not very deep, top soil pairs with adequate climatic conditions to favor the proliferation of abundant flora, yet it also causes a pronounced diagenesis process.

The aeolian deposits unit covers a large area since it is composed of the *despoblado* fringes crawling into the alluvial plain. It is characterized by a system of fossil dunes covered by natural vegetation. The daytime wind (*virazón*) blows a fair amount of material from the fossil dunes that are deposited on the alluvial plain. The alluvial plain Zone 1 is not affected by these aeolian deposits since it is protected by the mountainous structure on all sides. On the other hand, aeolian deposits in Zone 2 have easily pushed forward into the alluvial plain.

Finally, two kinds of deposits form the colluvium (non-fluvial process) unit. The first one is found on hill slopes and is composed of angular material; the deposition is a result of mass movement by slide processes (such as rock falls, rock slides, etc.) under the influence of gravity. The second kind of deposit is also caused by mass movement but through flow processes (debris avalanches, mud flows, etc.), also influenced by gravity; deposits are formed by cobblestones of various sizes embedded within a sand-clay soil matrix. These deposits (especially those originated by slide processes), are not uniformly distributed on the landscape and are located among the mountainous and alluvial plain units and surrounding the latter.

7.2 The Spatial Structure of the Landscape in the Study Area

The geomorphological units described above and their slow processes of change make up what was referred to as the skeleton of the past and present landscape (see Chapter 4). These units thus contain the elements that give shape to the spatial structure of landscapes (e.g., mountains, hills, rivers, etc.) in different regions where human populations live or have lived in the past. As argued in Chapter 4, this spatial structure combined with the human-made built environment can give us hints to interpret the prehistoric conceptualizations of space.

To better describe and characterize the spatial structure of the landscape in the study area I will use the four elements proposed by Higuchi (1983:182-185): boundary, focus-center-goal, directionality, and domain. Briefly, boundaries should be physical spaces that are difficult to access; they should be, at the same time, a barrier to the view from outside but also highly visible from its domain, and should show continuity in its structure. Mountains chains and rivers are good examples of boundaries. The focus-center-goal should have a distinctive form; the difference between it and its surroundings should stand out, and should also be prominent (large solid masses) in reference to its spatial location. Examples of focus-center-goal are mountains and hills that can be clearly seen from the surrounding flatlands. Directionality is the sense of direction given by the relation between the physical elements (and other non-physical configurations) of the spatial structure (boundaries, focus-center, elements that mark the cardinal points, prevailing winds, etc.); this direction has a meaningful spatial conceptualization for the people that inhabit any specific domain or landscape. Different types of directionality with ideological/cosmological connotations could thus be created by rising mountains, sloping terrain, flowing water, prevailing winds, and the opening and closing of space such as in the case of valleys or basins. Finally, the domain is the overall space organized and that has acquired an identity by the combination of the other three elements.

The description of the spatial structure that follows could be applied to most of the area encompassed by the alluvial plain Zone 2 mentioned above. Yet it specifically refers to the study area comprised by the third and part of the fourth "pockets" of fertile land (and surrounding landscape elements) in which the Upper Piura Valley is divided (see Chapter 2) (Figure 18). Also, some components of the spatial structure described below show dual roles; i.e., they could be boundaries and focus-center-goal at the same time, and both could also show directionality.

7.2.1 Boundaries

There are seven elements that can be considered boundaries. First, the section of the Andean Cordillera that runs north, northeast, east, and southeast in the study area forms a clear barrier to enter the alluvial plain from the highlands with the access being restricted by narrow roads that run parallel to the course of the also narrow tributary rivers. Also, these narrow roads are the only effective way to penetrate into the alluvial plain since the topography is rough with very steep slopes especially above the 300 or 400 m asl elevation. Furthermore, the southeast portion of the Andean Cordillera branches off forming a short projection completely enclosing (at both margins) the second and first fertile "pockets" of the Upper Piura River alluvial plain. In fact, this phenomenon makes this section of the valley practically impenetrable from the lowlands or *despoblado*. Overall, this section is a portion of the large mass of the Andean Cordillera that clearly shows continuity in its structure fulfilling thus the characteristics of a boundary.

Two mountains, Cerro Vicús and Cerro Tongo, are two landscape elements that act as markers of the limits between the *despoblado* and the fertile alluvial plain. Aligned in a southeast-northwest axis, these two prominent hills also mark the limits of dense human occupation in the area both in the past and present. Also, Cerro Tongo is less than 3 km from the western tip of the southeast branch of the Andean Cordillera, thus forming between the two a passageway that also controls the entrance to the valley from the *despoblado*.

Two other mountains, the massif of Cerro Pilán and Cerro Piedra Blanca, are landscape elements that also clearly set boundaries in the study area. Both have a southwest-northeast orientation and are thus perpendicular to both the alluvial plain and the Andean Cordillera. Moreover, both mountains are paired with another adjacent landscape element with boundary characteristics and located across the Upper Piura River on the southern bank. These landscape elements are the hills known as Cerro Loma Negra and Cerro Santo Tomé.

Cerro Loma Negra is located across the southwestern end of the massif of Cerro Pilán. These two landscape features, standing at opposing banks of the Upper Piura River, form the valley neck separating the fourth and third valley “pockets”. Also, Cerro Santo Tomé is found across the southwestern end of Cerro Piedra Blanca. These two landscape features, standing at opposing banks of the Upper Piura River, form the valley neck separating the third and second valley “pockets”. Moreover, the northeastern limits of both the massif of Cerro Pilán and Cerro Piedra Blanca are at a higher elevation than their southwestern ends (adjacent to the alluvial plain) and adjacent to the pediment of the Andean Cordillera which thus facilitates the entrance to the alluvial plain only through the valley necks. In other words, the orientation, volume, and prominence of Cerro Piedra Blanca and especially the massif of Cerro Pilán clearly serve as barriers that determine the spatial organization of the valley and block the view between the “pockets” of fertile land in this portion of the valley.

Finally, although the Upper Piura River itself could also be considered a boundary, rivers (especially narrow ones) are usually less effective to fulfill this characteristic since they can hardly (if at all) block the view to the opposite bank (Higuchi 1983:183). In addition, the Upper Piura River is not just a relatively narrow river but its discharge volume is very low during most of the year; it can be easily waded at very shallow fords. In general, most Peruvian coastal rivers can be easily crossed with no need of any kind of bridge except during times of above normal precipitation caused during the rainy season or during the ENSO phenomenon. It is only then when Peruvian coastal rivers become truly (temporary) boundaries. In sum, all seven landscape elements presented above clearly define the spatial structure in the study area marking boundaries and organizing space.

7.2.2 Focus-Center-Goal

There are eight landscape elements that fulfill the requisites to be considered focus-center-goals or landmarks. These are Cerro Vicús, the massif of Cerro Pilán, Cerro Tongo, Cerro Piedra Blanca, Cerro Loma Negra, Cerro Santo Tomé, Cerro Venado, and Cerro Franco. Cerro Vicús has a distinctive oval shape and is aligned along an almost perfect north-south axis. It measures ca. 3.5 km x 2.0 km and its maximum altitude is 469 m asl. Cerro Vicús has thus a distinctive prominent form and clearly contrasts with its background and surroundings comprised by the flatlands of the *despoblado* and alluvial plain.

The massif of Cerro Pilán is a mountainous chain ca. 5.5 km long and 2.0 km wide with a maximum altitude of 519 m asl. It is aligned along a southwest-northeast axis perpendicular both to the Andean Cordillera and the Upper Piura River course. It is definitely a prominent landmark that shows the highest elevation in the study area. This mountainous structure has several peaks known by different names: for instance, the lowest one located at its southwestern end adjacent to the Upper Piura River course (across from Cerro Loma Negra) is known as Cerro Punta Guaraguao, while the peak at its mid section is known as Cerro Horqueta. Yet, the highest, most prominent and notorious peak is located next to its northeastern end and has a distinctive triangular-pyramidal shape as seen from various angles (Figure 19). In addition, the massif of Cerro Pilán clearly stands out from its surrounding flatlands comprised by the fourth and third fertile "pockets" in the alluvial plain.

Cerro Piedra Blanca and Cerro Tongo are also two conspicuous landmarks in the spatial structure of the study area. Although they are not quite as prominent as the first two above, they do have the characteristics that define them as focus-centers. For instance, Cerro Piedra Blanca is not as voluminous as the massif of Cerro Pilán, yet it clearly contrasts with its surrounding flatlands mostly comprised by the third and second fertile "pockets" in the alluvial plain. It has an elongated shape measuring ca. 4.0 x 1.5 km, aligned along a southwest-northeast margin almost parallel to the massif of Cerro Pilán, and has a maximum elevation of 300 m asl. In addition, a smaller southwest projection of this mountain known as Cerro Huaquilla is located adjacent to the northern bank of the Upper Piura River across from Cerro Santo Tomé defining one of the boundaries mentioned above. Cerro Tongo has a somewhat rectangular shape, measures ca. 3.0 x 2.0 km, has a maximum elevation of 378 m asl, and is aligned along an almost north-south axis similar to Cerro Vicús. Unlike the other three landmarks, Cerro Tongo is surrounded exclusively by the flatlands of the *despoblado* and located at a farther distance from any other landmark, which makes it very prominent.

The other four landmarks are much smaller than the first four above yet they have the required characteristics to be considered as such. Cerro Loma Negra is a short, foot or boot-shaped low hill that is ca. 1 km x 0.7 km and has a maximum elevation of 200 m asl. It is aligned along a southwest-northeast axis, the southwest end (the "foot" and heel" of the "boot") being the widest section of the hill. Its narrower northeast end faces Cerro Punta Guaraguao (the southwest tip of the Cerro Pilán massif) that is located across the Upper Piura River. As mentioned above, these two landscape elements form the valley neck that separates the fourth fertile "pocket" from the third one. Its location in front of the massif of Cerro Pilán and surrounded by the flatlands of the alluvial plain clearly defines it as a prominent landmark.

Cerro Santo Tomé is a small yet perhaps most prominent landmark. It has an almost oval shape; measures ca. 0.6 km x 0.4 km, and has a maximum elevation of 275 m asl. Its position is very distinctive; it is not just located surrounded by flatlands of the alluvial plain and adjacent to the Upper Piura river, but it is found at the very mid point of the valley neck (between Cerro Huaquilla, the projection of Cerro Piedra Blanca, and the end of the southeast branch of the Andean Cordillera). In other words, it actually functions as a check point to the entrance to the second fertile "pocket" of the alluvial plain. In addition, due to its position it is very visible from many of the modern and prehispanic settlements located in the second fertile "pocket".

Cerro Venado is aligned almost along the same southwest-northeast axis as Cerro Santo Tomé, but is located on the north bank of the Upper Piura River. It also has an almost oval shape measuring ca. 0.7 km x 0. 4 km with a maximum elevation of 200 m asl. It is also surrounded by flatlands on all four sides which clearly makes it a prominent feature within a portion of the third fertile "pocket". In addition, located between the northeast end of Cerro Piedra Blanca and the Andean Cordillera, it serves as a check point to the entrance to the third fertile "pocket", not along the Upper Piura River, but through the upper terrace of the alluvial plain.

Finally, Cerro Franco is an elongated and narrow hill that measures ca. 1.0 km x 0.2 km. It is aligned along an almost north-south axis and has a maximum elevation of 150 m asl. It is located within the third fertile "pocket" south of the massif of Cerro Pilán on the northern bank of the Upper Piura River. Although it is the lowest of all landmarks presented above, it still shows prominence since it is surrounded by flatlands. Yet, perhaps its significance resides more on its location than on its volume. In fact, it could also almost be defined as a boundary considering its relation with both the adjacent section of the Upper Piura River and Quebrada Franco, a large, seasonal, dry gully that is an important landscape feature as described later in this chapter. In sum, all eight focus-center-goals presented above show the characteristics that are required to define them as such and thus I also consider them important elements of the spatial structure in the study area.

7.2.3 Directionality

Upon defining the directionality of the spatial structure of the landscape we are entering the realm of the phenomenological experience and dwelling perspective as argued in Chapters 4 and 5. As claimed in these chapters, this approach is not a process of empathy (i.e., an attempt to reconstruct meanings or the minds of past people) but a process of analogy in which the relation with a past world (landscape) is reworked through one's own body. Moreover, conceiving landscapes as such allows archaeology to embark into the process not of putting meanings on landscape forms but of discovering keys to meaning in every landscape feature through dwelling. This is a viable process inasmuch as archaeological fieldwork (and fieldwork in general) is in itself an act of dwelling.

The directionality of the spatial structure of the landscape in the study area is thus defined on the basis of three main elements: topography, prevailing winds, and flowing water; in other words: earth, wind, and water. Obviously, these elements are not static but have been (and are) in constant motion at their own rhythms for thousands of years. All of them contribute in one way or another to the formation and configuration of the core of the spatial structure which is the alluvial plain, the ultimate source of life, where life begins and ends, where seeds are planted and people are buried.

The relation thus between all the elements of the spatial structure presents two main cardinal orientations: southeast-northwest and southwest-northeast. Only two topographical elements have an almost perfect north-south orientation: Cerro Vicús and Cerro Tongo. Obviously the most significant aspect of directionality is not the orientation towards the cardinal points *per se*, but the possible cultural (ideological, cosmological, social, political, economical) connotations that are represented and materialized by these directionalities.

7.2.3.1 Topography. As for the element of topography, the sense of directionality is given by two main factors: direction and steepness of slopes, and the visibility of certain areas of certain prominent landmarks. The direction of slopes is clearly marked by spurs that project from mountainous structures such as the Andean Cordillera and the massif of Cerro Pilán. For instance, spurs on the north and northeast section of the Andean

Cordillera have a NE-SW orientation whereas those on the western slopes of the massif of Cerro Pilán have a NW-SE orientation. Usually the steepness of these spurs is low to moderate (less than 30°) contrasting sharply with the rest of the very steep mountainous structure and topography. The lower steepness of the spurs further enhances the sense of directionality since it creates a walkable (and habitable) area that is incorporated by the body through motion. These spurs, always alternating with adjacent and parallel gullies, are akin to the fingers of a gigantic hand that descend to and connect with the alluvial plain and are almost always below 300 m asl (Figure 20).

The topography element also shows directionality as given by the visibility of some parts of certain landmarks. For instance, the triangular, pyramid-shaped summit of the massif of Cerro Pilán is visible from almost everywhere in the study area but in particular from the different archaeological earthen mounds found on the alluvial plain. Moreover, the particular triangular, pyramid-shaped summit maintains this form if looking towards the western slopes of Cerro Pilán; that is, looking from any point within the fourth fertile alluvial plain "pocket" (Figure 21 and 22). This particular form is not as evident if looking towards the eastern slopes of the massif of Cerro Pilán, i.e., from within the third fertile "pocket". Furthermore, the visibility and thus directionality of the western slope of the massif of Cerro Pilán is further enhanced by the amount and succession of the spurs described above, unlike the eastern slope where the topography is steeper and with fewer lower-gradient spurs. In addition, the sense of directionality provided by the spurs oriented towards the presence (and visibility) of the pyramid-shaped summit of Cerro Pilán further enhances the directionality of this prominent landmark which could favor it as a landscape element that represents a key for discovering meaning[1].

Another instance of directionality can be perceived looking at the eastern slopes of Cerro Vicús, another of the prominent landmarks in the study area. Cerro Vicús' eastern slopes are not only smoother than those on the western slope, but face the alluvial plain (and not the *despoblado*) on the fourth fertile "pocket". On these lower, smoother slopes human transit and occupation have occurred since prehispanic times enhancing further its directionality. Moreover, all the slopes of Cerro Vicús and especially the eastern slopes looking to the west (from the alluvial plain) have, at a distance, a symmetrical, almost pyramidal shape that easily attracts and directs the attention of the human eye[2].

Obviously Cerro Pilán and Cerro Vicús are not the only landmarks that can offer possible keys to discover meanings. I use them as an example here for they are the most prominent elements among modern local and regional folklore. In sum, then, the directionality of topographic elements are defined by the slopes (and spurs) of mountains and hills that show lower gradients and hence possibly a closer physical and visual interaction between these sides of the landmarks and human populations. Finally it is worth underscoring here that directionality in all landmarks is further enhanced by the fact that they harbor the highest diversity of fauna and flora in the study area. In fact, the view of these forested slopes sharply contrasts with the adjacent less forested flatlands (i.e., the alluvial plain and *despoblado*) where most human economic activities (e.g., farming, logging, etc.) have taken place in the past and present.

7.2.3.2 Prevailing Winds. As for the prevailing winds, the sense of directionality is given by the direction in which the south prevailing winds blow. As explained in Chapter 2 the south prevailing winds on the Peruvian coast blow in a SW-NE direction and are particularly strong on the Far North Coast. Yet, these winds have both seasonal and, most importantly, daily rhythms. In fact, due to the thermal gradient, the land is warmer than the ocean and thus winds (the south prevailing winds plus marine breeze, and valley winds) blow inland during daytime; these winds are known as *virazón*. On the other hand, the ocean is warmer than the land during nighttime and thus the direction of the winds reverse blowing NE-SW from inland; these winds are known as *terral* (from *tierra*, soil), and depending on their strength, they can produce quite a sight at dusk by stirring up dust clouds that move towards the west.

This daily rhythm is clearly incorporated, although perhaps somewhat unconsciously, as part of the daily life and activities of local inhabitants as it marks the change from daytime to nighttime as well as the passage of daily human domestic activities. Yet perhaps this daily activity of the prevailing winds has had an even more important role in the landscape configuration in the study area. In fact, as explained in Chapter 2, the SW-NE direction of the prevailing winds has played a crucial role in the formation and motion of sand dunes for thousands of years. These dunes at some point reached the study area from the *despoblado* creating a series of fossil dunes especially on the south bank of the Upper Piura River that were later used and modified at the beginning of the human occupation of the area. This phenomenon explains why most archaeological earthen mounds within the alluvial plain in the study area have a NE-SW orientation and sometimes form a succession of mounds along this axis that is consciously recognized by local inhabitants. In some instances local members of the survey crew referred to them as a *línea de lomas* (an alignment of mounds). These landscape features, in part formed and shaped by the prevailing winds, thus contribute to the sense of directionality within the spatial structure of the landscape.

7.2.3.3 Flowing Water. The directionality of flowing water is perceived in three main elements: the course of the Upper Piura River itself, the course of its tributary rivers within the study area (the San Jorge (or Charanal) and Quebrada de las Damas Rivers), and the direction in which runoff after precipitation runs through the various gullies that are characteristic of the topography of the landmarks.

As described in Chapter 2, this portion of the Upper Piura River follows a SE-NW orientation marking the overall direction of the valley. Yet, directionality of the river course is not marked by the cardinal direction itself but by a succession of river meanders that, following this orientation, are found along the first and lowest terraces of the river in the alluvial plain, especially in the third and fourth fertile "pockets" (Figure 23). These meanders in this portion of the valley have a significant area and evidently constitute a prominent feature of the spatial structure of the landscape and are incorporated into the local population's everyday activities (economic, recreational, etc.).

The courses of the Charanal and Quebrada de las Damas tributary rivers also show directionality. These rivers run almost perpendicular to the alluvial plain and the Upper Piura River, and show a NE-SW direction. Yet again, the cardinal direction of the flowing water itself is not the most significant aspect of these rivers. In fact, as explained in Chapter 2, directionality of these rivers is perceived in the underflow and the water table (and even springs) of these intermittent tributary rivers. Alluvial activity at these streams has allowed the formation of these interior, fertile non-flooding deltas (that are part of the fertile "pockets") right at the first slopes of the Andean Cordillera. Rivers are not just perceived for their importance to annual (Charanal River) and seasonal (Quebrada de las Damas) economic (i.e., agricultural) activities, but because they represent a change in spatial configuration upon their entrance into the alluvial plain. In fact, these rivers show a drastic contrast in the width of their alluvial plains upon entering the fourth fertile "pocket". This change in spatial perspective takes place at the point where water from these rivers leaves the entrenchment of the Andean Cordillera to penetrate the alluvial plain. This phenomenon occurs at the modern villages of Hualtacal and San Pedro and can be considered as an internal valley neck for these tributary rivers. From this point to the northeast (i.e., towards the highlands) sight is directed to a narrower, secluded valley that dramatically contrasts with the view towards the southwest characterized by the opening up and width of the fourth fertile "pocket" within the alluvial plain.

Finally, directionality is also perceived in the direction in which runoff during and after precipitation runs through the various gullies that run parallel to the slopes and spurs in the various mountainous landmarks found within the study area. There is evidence that in the past there was a conscious use of these runoff waters, which were managed and incorporated within irrigation systems (e.g., Montenegro Cabrejo, et al. 1998) as well as stored in reservoirs as documented by Hocquenghem (1998) and confirmed by our survey. In addition, it should also be considered that the relation between these flowing waters and their origins at the slopes or summit of mountainous landmarks could have had further ideological/cosmological connotations in the past.

In sum, directionality in the spatial structure of the study area is defined by the three main elements (and the relation among some of them) described in this section. These elements and the sense of motion they create all point to the definition and creation of the center of life within the study area that is mainly comprised by the flatlands of the alluvial plain.

7.2.4 Domain

As argued above, the domain is the overall space organized that has acquired an identity, through the combination of the other three elements. In a few words, the domain are the flatlands of the alluvial plain defined by the confluence of the other three elements: the borders created by mountainous structures, the several landmarks that organize space and function as reference points within it, and the sense of direction created by topography and the motion of other natural elements.

7.2.5 Summary of the Spatial Structure of the Landscape

The configuration of the spatial structure of the landscape in the study area is characterized by certain elements (mostly mountainous structures) that define boundaries, by focus-center-goals (landmarks) that stand up as prominent elements of the landscape (sometimes with a dual role as boundaries as well), by the directionality (predominantly SW-NE or SE-NW) given by the topography (slopes and spurs) of the landscape, prevailing winds and the direction of flowing water), and by the domain or spatial entity created by the other three elements; i.e., the flatlands of the alluvial plain. All of these elements create the space that human populations (past and present) have related to and embodied for hundreds of years. They also allow reworking, through the experience of dwelling and considering the survey data as presented below, of the relation with a past world. This reworking process (as analogy and not empathy) opens up a myriad of possibilities of interpretation by revealing in the landscape possible keys to its meanings.

The spatial structure described above is analogous to two and perhaps three of the seven types of landscapes propounded by Higuchi and that can be applied not just on Japanese landscapes but cross-culturally (Higuchi 1983:192). These types are the Zōfū-Tokusui, the Sacred Mountain, and the Domain-Viewing Mountain types (Higuchi 1983:146-181). As for the Zōfū-Tokusui type, the study area has clearly at least two domains (the flatlands of the fourth and third fertile "pockets") marked and enclosed by boundaries. The fourth "pocket" is framed on the north and northeast side by the Andean Cordillera; on the east and southeast by the Andean Cordillera, the massif of Cerro Pilán and the valley neck the latter forms together with Cerro Loma Negra; on the south by the Upper Piura River (when its discharge volume creates a real boundary) and the *despoblado*; and on the southwest and west by Cerro Vicús and the *despoblado* as well. On the other hand, the third "pocket" is framed on the north and northeast by the massif of Cerro Pilán and the Andean Cordillera respectively; on the east and southeast by Cerro Piedra Blanca, the valley neck of the latter forms with Cerro Santo Tomé, and the southeastern projection of the Andean Cordillera; on the south by the *despoblado*, the westernmost tip of the southeastern projection of the Andean Cordillera, and Cerro Tongo; on the southwest by the *despoblado* too; and on the northeast by part of the *despoblado* and the valley neck formed by Cerro Loma Negra and the southwestern end of the massif of Cerro Pilán. Both domains are thus areas that clearly have a directionality marked by the fanning out of the alluvial plain towards the northwest. Also, in both domains, the vertex of this fan is clearly marked by prominent landmarks (the Cerro Loma Negra and massif of Cerro Pilán valley neck for the fourth "pocket", and Cerro Santo Tomé for the third "pocket") that very likely had special significance in the social, political, economic, and ideological organization of past societies.

In the case of the Sacred Mountain type, the study area contains at least two prominent landmarks (Cerro Vicús and Cerro Pilán) that fulfill the characteristics suggested by Higuchi (1983:165-171). That is, their shape and appearance (independent, massive) set them apart from their surrounding landscape and function as landmarks that organize the space around them giving them an spatial entity; they mark directionality by capturing and drawing human attention and sight towards their forested heights giving them an otherwordly quality; are clearly marked by boundaries (between the *despoblado* and the alluvial plain for Cerro Vicús, and between Quebrada de Las Damas and Quebrada de Franco for the massif of Cerro Pilán); and their best side is presented (at short range) in front of their surrounding flatlands.

Finally, as for the Domain-Viewing Mountain type, there are at least four landscape landmarks (Cerro Loma Negra, Cerro Santo Tomé, Cerro Venado, and Cerro Tongo) that fit Higuchi's (1983:172-181) definition. Unlike the Sacred Mountain type, the Domain-Viewing Mountain type entails a different kind of interaction between the surrounding flatlands (and inhabiting populations) and the landmark. To start, the landmarks on this type of landscape do not have the otherwordly essence as the Sacred

Mountain type and thus are (can be) visited by human beings for "viewing". The nature of "viewing" could have different purposes ranging from nature worship, to political inspection, or just to admire the beauty of the landscape. Also, these landmarks have to be an independent hill or a protruding hill from a mountain in the middle or overlooking (and surrounded wholly or partially by) a broad flatland, respectively. In other words, the landmark becomes a strategic locus and access to it offers the observer the sense of domination. According to Higuchi (1983:181) this type of interaction with this type of landscape is due to a direct special relationship between just two levels: the top of the hill and the flatland below, a relationship that also determines directionality between these two levels.

The four landmarks in the study area that belong to this type of landscape are indeed good examples. Unlike the Sacred Mountain types (Cerro Vicús and Cerro Pilán), these landmarks display significant prehispanic constructions on or near their summits. Moreover, unlike the Sacred Mountain types, the aforementioned Domain-Viewing Mountain types are considerably less massive and lower thus enhancing the closer relationship between the two levels mentioned above. Finally, the idea that this type of landscape generates the sense of domination is further reinforced by the fact that on at least three of these four landmarks the constructions at or near their summits are products of a planned policy of imperial (exogenous) expansion as later explained in this chapter[3].

7.3 The Topograms in the Study Area

The lines below present the topograms, landscape elements with potential significant meanings, as a result of my interpretation of the spatial structure of the study area and generated through the process of dwelling, which also encompasses the actual fieldwork done. Yet before presenting these topograms it is important to underscore the fact that describing the spatial structure of the landscape mostly on the basis of topography and other nature elements is not, by any means, a free exercise of capricious naïveté. As argued by Higuchi (Higuchi 1983:188-192) reverence and admiration for nature is not just restricted to the Japanese people, past or present. History, ethnography, and even archaeology have taught us that cross-culturally, and especially in the context of pre-industrial societies, people have developed a close, respectful kind of relationship with their surrounding nature, very different than the one developed by modern, urban industrial societies. It is not surprising then that these societies have incorporated (and mingled) the elements of their natural environment (mountains, hills, rivers, dunes, etc.) as part of their total worldview and thus through this process of embodiment have loaded their landscapes with different meanings through time.

The New World (e.g., Staller 2008) and especially the Central Andean area (coast, highlands, and tropical lowlands) are not exceptions. As described in Chapter 5, folk narratives of the Peruvian North Coast clearly show this kind of relationship. Furthermore, ethnographic (e.g., Bastien 1978; Platt 1986; Urton 1981) iconographic (e.g., Hocquenghem 1987; Jiménez Borja 1938), and ethnohistoric and archaeological (e.g., Sherbondy 1993; Thompson 1982; Van de Guchte 1999) studies have demonstrated this intrinsic relationship between Andean social groups and their surrounding nature (even astronomical) elements, a relationship that have shaped their social organization, ideology, and in general all other cultural features of these societies.

Finally, before presenting the topograms let me go back and reiterate what this concept means. As explained in Chapter 5, topograms and topographs is what Santos Granero (1998: 140), following J. Goody's (1993) concepts of pictograms and pictographs, refers to as "…elements of the landscape that have acquired their present configuration as a result of the past transformative activities of human or superhuman beings" (topograms), while topographs are defined "as landscape signs that 'stand in opposition to or in conjunction with other such signs', forming a 'wider semiotic system" (Santos Granero 1998:140-141).

In other words, this topographic writing is comprised of human-made or natural ("superhuman") landmarks (topograms) that are fully loaded with symbolic meanings (topographs); that is, topograms become topographs when the former are combined in sequential or non-sequential forms. Yet, evidently these symbolic meanings and the ways in which they were combined (in the form of indigenous myths, legends, rituals, etc.) were lost upon the Spanish conquest. For instance, traditional folk narratives from the Peruvian North Coast show a high degree of syncretism and even acculturation with most elements derived from the Spanish culture; this acculturation process left a deeper imprint in the *yunga* populations of the North and Far North Coast than in the *Quechua* and *Aymara* speaking populations of the highlands (Arguedas and Izquierdo Ríos 1947).

In the specific case of the study area, this lack of knowledge of indigenous prehispanic belief systems can be further explained by particular historical circumstances.

In fact, people of the Far North Coast, like many pre-Columbian populations, were wiped out by epidemics and violence brought by Westerners resulting in a dramatic demographic decline during the sixteenth and seventeenth centuries that was not reversed until the last decade of the seventeenth century and early eighteenth century. As Schlüpmann (1991:464) has demonstrated, the region of Piura was at the bottom of this demographic depression as reflected in the negligible (economic) significance that Piura represented for the Spanish crown: the number of indigenous tributary individuals was so low that the tribute gathered was only a seventh of that obtained from, for instance, the Cusco or Quito regions.

In addition, the North and Far North Coastal indigenous populations were affected during the sixteenth and seventeenth centuries not just by diseases but by a policy of forced population resettlement imposed by the Spanish empire and local Spanish (and *criollo*) elites. Entire communities were disrupted, moved, and aggregated into a series of new communities known as *reducciones*. One of the underlying reasons for this resettlement policy was the intention by local Spanish and *criollo* elites to take possession of and amass the best lands and water resources to guarantee their social and material reproduction. This new land tenure system was the beginning of private property in colonial Perú and led to the formation of the large haciendas of the eighteenth century that persisted into the twentieth century.

In local landscapes, this resettlement policy created what several ethnohistorians (e.g., Hocquenghem 1994; Huertas Vallejos 1996; Ramírez 1991; Schlüpmann 1991) have described as "empty spaces" that were no other than the land formerly managed and inhabited by local indigenous populations and now appropriated (but not inhabited in most cases) by the Spanish invader elites. By the end of the sixteenth century the entire (surviving) indigenous population of Piura was thus forced and organized to live in eight *reducciones* (Schlüpmann 1991:465).

Unlike other areas in the Piura region, the study area in the Upper Piura Valley became desolated during the sixteenth and seventeenth century. In fact, ethnohistoric research has shown that the totality of the early Colonial indigenous population in the study area was relocated into two nearby *reducciones*: San Sebastián de Malingas and Frías. Yet by the mid seventeenth century San Sebastián de Malingas (where most of the population was displaced) had completely disappeared as a consequence of either disease or the interest of Spanish intruders to appropriate the valley lands that control and benefit from highland runoff (Schlüpmann 1991:465, 483). A smaller portion of the population was relocated to the *reducción* of Frías that, unlike San Sebastián de Malingas, was located not in the lowlands but in the highlands adjacent to part of the Upper Piura Valley. Yet, as Huertas (1996:95-97) has suggested, the original names of the relocated communities are unknown and, most likely, epidemics also took a very heavy toll impeding residents from ever returning to their original settlements.

The “empty space” in the study area started to be repopulated only in the last decade of the seventeenth century and early eighteenth century. This repeopling stemmed from the necessity that new (Spanish and *criollo*) *hacendados* had for a labor force for their large estates in the Upper Piura Valley. This new labor force (mainly used for livestock husbandry and some agriculture) –known first as *mitayos* and later as *yanaconas*- were primarily brought from the *reducciones* of Catacaos and Olmos that in turn were comprised of resettled populations displaced from their original communities of the Lower Piura and Chira Valleys. In other words, these new populations with their indigenous social and political organization and belief systems already disrupted, had to face (and relate to) a landscape absolutely different from that of their original communities. Moreover, new populations were part of the equation of this resettlement process, including African slaves -mainly brought to work in the sugar cane industry- as well as mixed-blood descendants (European, Indigenous, and African), constituting a new kaleidoscopic cultural amalgam that can be perceived in the study area today.

In sum, as Moseley (1990:2) has argued, the Peruvian North Coast (and I have to say, the Far North Coast and in particular the study area) does not present "uninterrupted ethnic and demographic continuities" between the modern, (semi) industrialized populations and the prehispanic and Colonial past, thus hindering the ability to securely apply ethnographic analogies to understand the archaeological past.

The particular historical circumstances and the lack of more ethnohistoric research on and data from the study area thus preclude reaching reliable knowledge of the indigenous prehispanic belief systems and therefore the topographs. Yet, as I have claimed above, we still have the topograms, which could help both in the interpretation of the prehispanic past and the relation between past and present. We may not have knowledge of the sequence in which the landscape signs were combined (topographs), yet we do have the presence of the topograms that can be understood in themselves and "evoke a single thing, event or idea" (Santos Granero 1998:140). Topograms can be human-made or (super) natural. Examples of human-made topograms are graves, garden sites, old buildings, battlefields, bridges, trails, mines, etc. On the other hand, topograms ascribed to supernatural beings are natural elements that are clearly distinguishable in the landscape due to their conspicuous characteristics such as shape, size, color, etc.

Before presenting the topograms it is important to underscore the fact that the areas where archaeologists usually do fieldwork were (and are) loaded with meanings. The ways these meanings are generated is through mythical, legendary or ritual narratives, individual performance of bodily acts such as looking (sight), and walking, for which some landmarks in the landscape constitute an embodiment. Yet, while doing an archaeological study of landscape from the dwelling perspective, the idea is not to get into the minds of prehistoric people to get at those meanings. Rather, it is possible to find clues to those meanings in the landscape, which could be used as another venue of interpretation. In other words, and using Santos Granero's terminology, I contend that it is possible to do archaeology of the topograms through the dwelling perspective.

At this point it is important to remember that the topograms presented below are drawn from one of the two methodological (and concurrent field strategies) paths of interpretation used in this dissertation as explained in Chapters 5 and 6. As explained in these chapters, one of these paths of interpretation (developed in the next section in this chapter) is a traditional approach in settlement archaeology that uses data recovered during surface survey. The other path of interpretation, from where the topograms below are drawn, is shaped by the dwelling perspective and thus interpretations were generated on the basis of the perceptions I acquired from my relation with my surroundings (topographical features of the landscape, etc.) during the daily practice of fieldwork. Also, as developed below, this second path of interpretation merges with the first one and thus functions as the canvas on which the human prehispanic occupation in the study area is depicted to interpret sociopolitical change.

In addition, as explained in Chapter 6, the vertical and horizontal dimensions of the field strategy parallel the two paths of interpretation mentioned above. The vertical dimension (parallel to the first path of interpretation) is the god-like perspective in which the world is conceived as a pre-prepared almost lifeless surface on which discrete beings move from one location to another in space (Casey 1996:30-31; Ingold 2000:219-242). On the other hand, the horizontal or lateral dimension is a relational process conceiving the world not as integration of discrete entities in space but of places (locations charged with history). This integration of places (conceived as connected nodes in a region) operates through the experience and constant journey of inhabitants to, from, and around these places.

Finally, for the purpose of this dissertation I am not making, *a priori*, a distinction between human-made and (super) natural topograms. I believe all topograms at one point in time or another (or through time) were important for the prehistoric societies of the Upper Piura Valley not just from an ideological perspective but likely had an overall significance in every aspect (social, political, economic, etc.) of their lives. The topograms presented below (Figure 24) are thus my interpretation that stem from the experience I had reworking the landscape (after understanding its spatial structure as explained above) through the process of dwelling while doing the actual fieldwork.

7.3.1 The *Lomas*

The *lomas* are perhaps one of the most conspicuous topograms in the study area. They are comprised by the artificial (or partially artificial) earthen mounds (see Chapter 6, Section 6.4) that constituted the preferred settlements of the prehispanic inhabitants in the study area. They probably were and still are key elements in the formation of a sense of place around and through which social life revolved. For the same reason they are crucial elements for mapping and wayfinding -as opposed to mapmaking and navigation- (see Ingold 2000:219-242), and therefore excellent points of reference of the landscape. They are also very important topograms since, as explained below, most of them represent a continuous, long human occupation (even used as both cemetery and residence) and thus very likely configured key elements of the social and historical memory of their prehispanic inhabitants.

7.3.2 The Spurs

The spurs in the mountains and hills, as described in the spatial structure of the study area, are also significant topograms. Obviously the significance of this topogram resides not just in the physical structure itself but in the fact that they also were preferred locations for human settlement throughout history and therefore have the same importance as pointed out for the *lomas* above. Yet, unlike the *lomas*, occupation on the spurs is not common, though, some of them present a long term occupation. In addition, the spurs could entail a somewhat different kind of interaction between human populations and their natural surroundings. In fact, unlike the *lomas* in which occupation revolved around soil and water as main construction elements, the spurs offer ready access to stone. In addition, the spurs function as an intermediate area between life in the flatlands of the alluvial plain and the diverse plant and forest resources (among other features) available on the slopes above the spurs. Finally, movement is more restricted on the spurs than between *lomas*. In fact, due to topographic characteristics, movement between *lomas* more freely encompasses different routes to get to the same point, whereas the spurs offer very few options.

7.3.3 The Underflow

This topogram is represented by the land that benefits from the water obtained from the underflow (or shallow water table or springs) of the tributary rivers of the Upper Piura River as is characteristic of the interior deltas formed in this area (see Chapter 2). Although this feature occurs at several locations in the Upper Piura Valley, in the study area it happens mainly on its north corner where the underflow of the San Jorge (or Charanal) River waters the area north and northwest from its northern bank. As an area that is almost permanently wet, it visually represents a sharp contrast with the rest of the landscape, which is drier, more typical of a tropical dry forest landscape.

7.3.4 The Valley Neck of the Interior Delta

As mentioned in the description of the spatial structure, this topogram is a key element in the landscape. Within the study area there are only two major interior valley necks, represented by the entrance into the alluvial plain of the San Jorge River and Quebrada de las Damas, respectively. Among these, the valley neck of the San Jorge River is the most significant since it is associated with a perennial flow of water (Figure

25). Furthermore, it is a very important node within the regional road network, both as a gateway from the alluvial plain to the interior highlands (or vice versa), and as an important post within the prehispanic coastal road system that ran along the pediment of the Andean Cordillera in this part of the Far North Coast (e.g., Hocquenghem 1994). In fact, a possible segment of this road passed through one of the settlements detected in the surface survey done for this dissertation research. The valley neck of the Quebrada de Las Damas does not seem to have represented a major point of interest for prehispanic populations if the evidence for human settlement is considered. This could be explained by the lack of permanent water in this otherwise dry, seasonal gully. Yet, this valley neck, and especially the spurs adjacent to it, is a key location to view the transit along the entrance of the San Jorge River into the alluvial plain, as well as movement on the road that ran along the pediment. Finally, the interior valley necks are also located at the limits of two different kinds of spatial structures and therefore could represent different spatial conceptualizations. On the one hand, there is the spatial structure of the study area as described in this chapter. On the other hand, the spatial structure of the more secluded valleys of the tributary rivers such as the San Jorge River and Quebrada de las Damas. These secluded valleys are, however, off the limits of the study area and thus not described in this dissertation.

7.3.5 The Massif of Cerro Pilán[4]

The massif of Cerro Pilán is clearly one of the most prominent topograms in the study area. Due to its location, size, orientation in the spatial structure, and dense forest compared to the adjacent flatlands, it has been the focus of attention of inhabitants through history and is a central axis in the landscape around which life is generated. This large landscape feature, besides the spurs on its western slope, contains other topograms as explained below. Also, its position in the landscape as a counterpart of Cerro Vicús is evident.

7.3.6 The Triangular Pyramid-Shaped Summit of Cerro Pilán

This topogram is part of the larger massif of Cerro Pilán. It refers to the highest point in this mountainous structure and in the study area in general. The triangular, pyramid-shaped summit is created by a huge fracture of the rock that constitutes the geological matrix of the massif. If looked at from the east, this crack in the rock can be perceived at a short distance from the adjacent flatlands. The highest point is actually the tip of the pyramid-shaped summit. Yet, this section is very narrow and steep and almost impossible and extremely dangerous to climb, since it is surrounded by deep crevices on most of it sides. Approximately two or three meters below this tip, and still on the summit, there is a small, 5 m x 5m flat area with a large boulder on top that is the highest, walkable point of the summit. We reached this summit, one of the sections surveyed on the massif of Cerro Pilán. There is no significant evidence of prehispanic human occupation or activities in this small area. This lack of evidence is not surprising: if regarded as a supernatural higher force, the summit was probably not visited by a significant number of people during prehispanic times. Yet, some specialized, ritualized activity should not be ruled out. Possible evidence of human modification in this small area on the summit (terracing stones and few diagnostic sherds) seems to point towards such activity. These possible contexts, however, have been badly disturbed and obliterated during modern times by looters, modern shamans, campers, etc., thus preventing certainty of their role during prehispanic times. The view from the top of the boulder –that I could enjoy just for a few seconds at a time since a very protective mature colony of ants engaged in a nuptial flight resented my presence- is spectacular. It includes all four cardinal directions within the fourth and third "pockets" and beyond. Yet, although the view from this point is astounding, it is also evident that from this altitude the landscape loses its visual texture (clear perception of the topography of the surrounding flatlands). For this reason, as explained above, this topogram could be considered as part of a Sacred Mountain type of landscape but not as a Domain-Viewing Mountain type. Still, this topogram is clearly the main focus of the study area in general and in particular of the whole massif of Cerro Pilán, giving it its character as the counterpart of Cerro Vicús.

7.3.7 The *Boliche*, the *Peña*, and the *Chorro*

This topogram is also within the massif of Cerro Pilán and is in fact comprised of three different locations, but since they are located close to each other and are of the same nature, they are considered as just one topogram. These topograms are all related to water since they are features through which the latter flows and is deposited. As explained above, the massif of Cerro Pilán is traversed by a series of gullies that run along its slopes. Some of these gullies seem to have had more significance than others for the prehispanic inhabitants in terms of their size, water discharge, and concomitant material and ideological connotations. The *Peña* and the *Boliche* are two features that are located along and adjacent to the same gully, upslope of the former and downslope of the latter, on the western slope of the massif. *Peña* is a word used in Perú and especially in northern Perú that usually refers to a rock cliff located at a certain altitude that has a precipice on most of its sides or a very steep slope. It also usually has a distinctive color and shape and often could be part of a waterfall. In the case of this topogram, the *Peña* (Figure 26) is located not on the summit of Cerro Pilán but on one of its upper slopes: it is an enormous boulder very bright white in color that has been eroded by the waterfall of a gully into different shapes and angles, even creating small deep pools. On one of its sides there is even a small niche in which, according to local modern inhabitants, the Virgin sometimes appears. It is not difficult to imagine the fascinating sight of this feature both at a closer and more distant view when, during heavy rainfall, water runs down the slope through the gully. The *Boliche* is located along this same gully but ca. 1,200 m further down-slope (Figure 27). Modern local inhabitants use this name (difficult to trace etymologically) to refer to a very large water reservoir (130 m x 120 m on its upper rim, and ca. 17 m deep) that collects rainfall water and runoff from the gully (see also Hocquenghem 1998). It seems that this feature initially was a deep natural pool created by waterfall erosion similar to the *Peña* but larger, which was artificially modified by local inhabitants who built retention walls abutted to the natural rock and thus increased the pool capacity during prehispanic times. The connection between these two features along the same gully seems evident and probably had significant ideological and material connotations for prehistoric settlers in the area. These are very likely the same connotations that the *Chorro* had. The *Chorro* (literally, the stream) is another bright white-colored (contrasting with the surrounding rock matrix of the massif) *peña* but smaller and located at a lower elevation and on a slope not as steep as the *Peña*'s. It is found ca. 700 m northeast from the *Boliche* along another gully. It actually has the shape of a small waterfall with two levels; i.e., a small cliff and below it a very shallow pool. The *Chorro* and the other two features are located amid a significant population concentration in both prehistoric and modern times. In fact, to give an idea of the ideological (religious) connotations that these features entail both in the past and present, the name of the modern small village in the area is San José del Chorro (Saint Joseph of the Stream).

7.3.8 The Meanders

The Piura River does not show a course defined by a straight line. All along its mid course and in part of the upper course, a concentration of several wide meanders has formed. In the study area there are clearly two such concentrations within a distance of circa 15 km. One of these groups of meanders is found between Cerro Loma Negra and Cerro Vicús. Although within the study area, part of this section falls into the survey blocks that were not surveyed. The Upper Piura Project undertook survey and excavations in the 1990s within a portion of this area (e.g., adjacent to Cerro Vicús and in the Tamarindo area) (e.g., Kaulicke 1991). The other group of meanders falls into sections almost fully surveyed and is located from Cerro Loma Negra to the area next to Cerro Franco and Quebrada de Franco with sections of these meanders adjacent to the southwestern end and slopes of the massif of Cerro Pilán (Figure 28). These meanders have been created by both the natural dynamics of the Upper Piura River (including events of heavy flooding during ENSO times), and human activity. In fact, since the earliest human occupation of these areas, these activities have combined to create lower flooded terraces known as *playas* (beaches) on either bank of the river. A significant concentration of population along these meanders is evident throughout history. During normal years (i.e., without major ENSO floods), cultivation is possible in the *playas* as well as other activities, both domestic (e.g., water fetching, laundry, bathing, etc.) and recreational (e.g., swimming etc.) that play an important role in the social life of inhabitants past and present.

7.3.9 Cerro Franco

This topogram is not as conspicuous as other features of the spatial structure (e.g., a landscape landmark in a Domain-Viewing Mountain type). It is a low hill with no discrete shape and no prominence, perhaps dwarfed by the presence of the adjacent massif of the Cerro Pilán. Neither presents any significant evidence of human occupation on or next to it. Yet, it is an important landmark for several reasons. It marks the eastern end of the area of the meanders and thus could be considered a border. Also, it is a necessary reference point in the route that runs along the northern bank of the river in this section of the valley. In addition, together with the Quebrada de Franco, it defines and marks the border of three topograms; the Meanders and two other topograms that are explained below.

7.3.10 Quebrada de Franco

This topogram is defined by a large broad gully comprised of two parallel branches that run through the pediment in a NE-SW direction. This feature had and still has a geomorphological and cultural importance for local populations. Both branches of this gully are the main channels through which the adjacent section of the Andean Cordillera drains during the rainy season (or during ENSO events) discharging the runoff at its southwest end next to the Upper Piura River. This natural phenomenon has hindered major destruction of the area during periods of heavy rainfall and floods. In addition, our survey observations have determined that at some point during prehispanic times this feature, especially its eastern branch, was used to drain an irrigation canal that watered cultivated fields in the Franco Valley, an area within the third fertile "pocket" and defined as a topogram as well, as explained below. The two branches join again becoming a single gully near its southwestern end, next to the Cerro Franco and the north bank of the Upper Piura River. It is precisely at this point that the Quebrada de Franco, together with the Cerro Franco, marks the border between the area of The Meanders (on the west) and the Franco Valley (on the east). The Quebrada de Franco is thus a conspicuous feature of the landscape that probably had a significant place in the social memory of inhabitants. It is important not just because of its functions as described above but also because of its appearance when water is running through it. Moreover, even when it is dry, walking through it is quite an experience. There are areas where small *peñas,* or waterfalls and shallow pools, with stones eroded by water with curious shapes can be found. It also cuts deep into one of the highest points of the pediment leaving between its two branches a long, high, and gentle slope projection of the pediment that allows a good view to the east towards the Franco Valley and the rest of the pediment. Finally, the Quebrada de Franco cuts through the middle of The No-Man's (or Woman's)-Land, the next topogram.

7.3.11 The No-Man's (or Woman's)-Land

Before describing this topogram it is important to underscore an important geomorphological characteristic in this part of the study area. This topogram is located on the northern bank of the Upper Piura River and inside the third fertile "pocket" of the alluvial plain. Yet, the only actual flat, alluvial plain within this "pocket" is the land on the southern bank of the river and just a small area within the northern bank. This small area of flat, fertile land on the northern bank is comprised of both the Franco Valley (see below) and the *playas* in The Meanders. The rest of the land surface in the northern bank is comprised of both the pediment of the Andean Cordillera and that between the latter and the northeast and eastern slopes of the massif of the Cerro Pilán. In fact, in this section of the study area the Andean Cordillera approaches the river bank and therefore presents a longer pediment that almost reaches the river bank leaving just a small area for the alluvial plain represented in this area by the Franco Valley. Likewise, unlike what happens on the western slope, the northeastern and eastern slopes of the massif of Cerro Pilán do not end at an alluvial plain but connect with the pediment of the Andean Cordillera. This topogram is therefore characterized by an elevated terrain with a gentle slope oriented towards the southwest and is cut through its middle section by both branches of the Quebrada de Franco. This extensive area (ca. 5 km NW-SE and between 2-4 km NE-SW) runs, NW-SE, all along the slopes of the Andean Cordillera from the area in front of the massif of Cerro Pilán to the point where the former borders with Cerro Piedra Blanca, and NE-SW, from the actual Andean Cordillera to Cerro Franco and the Franco Valley. The nature of the terrain (elevated, sloped, rocky, and without ready access to water during normal years) has perhaps precluded human settlement both in the past and the present. Only two very small non-residential prehispanic sites, perhaps associated with the management of the Caracucho Canal (see below), were located during our survey. In addition, since colonial times this area has been used only for pasture to feed livestock and hence does not present evidence of any significant human occupation. It has also been used as an alternative route east to the town of Morropón following the pediment without approaching the actual valley. This topogram (and therefore its name) seems to have represented an actual border (at least in the northern bank of the river) between human groups settled in the fourth "pocket" and those on the third and even the second "pockets".

7.3.12 The Franco Valley

As explained above, the Franco Valley (Figure 29) is the only area of flat, alluvial plain within the third fertile "pocket" in the northern bank of the Upper Piura River. It is within the area known to modern dwellers as Franco Alto. During the survey I named this area the Franco Valley to describe its discrete nature enclosed by the pediment of the massif of Cerro Pilán and the Quebrada de Franco to the west and northwest respectively, by the No-Man (or Woman's)-Land to the north, by the border between the third and second fertile "pockets" represented by Cerro Piedra Blanca to the east, and by the northern bank of the Upper Piura River to the south. The configuration of this area and the presence of human occupation through various prehispanic periods clearly reflect its significance. Also, as described below, at some point in time life in this topogram was closely associated with an irrigation canal, another topogram as presented below.

7.3.13 Cerro Venado

As explained earlier in this chapter this topogram characterizes a type of landscape defined as the Domain-Viewing Mountain type. Cerro Venado is a small hill located on a flatland adjoined to the northeast side of the Franco Valley as well as next to the eastern end of the No-Man's (or Woman's)-Land. The sight from its summit dominates the passageway between the Andean Cordillera and the northern end of Cerro Piedra Blanca and thus is a necessary point of reference for one of the routes that lead to the area of the second fertile "pocket". Also, some evidence of archaeological constructions was found on its northwestern slopes and were thus probably associated with the social and domestic activities of the Franco Valley inhabitants.

7.3.14 Cerro Piedra Blanca

The main characteristic that defines this topogram (and Cerro Huaquilla, its southwestern projection) is that it is a conspicuous element in the spatial structure of the landscape that acts as a barrier separating the third from the second fertile "pocket". Its presence as seen from either side of its adjacent flatlands likely was a reference point in the social memory of early inhabitants. Yet, this landscape feature was not surveyed since it was outside the study area.

7.3.15 Cerro Santo Tomé

This topogram also characterizes a type of landscape defined as Domain-Viewing Mountain type. It is a small, low mountain (Figure 30) strategically located at the valley neck of the Upper Piura River between the third and second fertile "pockets" of the alluvial plain. It is steep-sided on all fronts with some of the sides becoming even steeper as the result of prehispanic architecture built on its slopes and summit. This is one of the best points within the study area for a general view (i.e., not just of roads but also of settlements and irrigation and agricultural systems) of the alluvial plain, in this case of both the third and second fertile "pockets" (Figures 31). Evidence of human presence at this landscape feature along various chronological periods attests to the significant role it had in the social life of prehispanic inhabitants.

7.3.16 The Irrigation Canals

There are two major prehispanic irrigation canals that pass through or end in the study area. These are important and conspicuous landscape features and thus likely had significant connotations in the material and social life of local inhabitants at least during part of the prehispanic occupation of the area; they are therefore considered as topograms. One of these canals is the Hualcas Canal already mentioned in Chapter 3. This canal was discovered in 1894 by Víctor Eguiguren (Hocquenghem 2001:54) and visited and mentioned by Hocquenghem (e.g., 1998; 2001) several times in her interpretation of the history of agricultural systems in the area. It is ca. 150 km long, starts at the headwaters of the Piura River, the drainage region of the Huarmaca region in the highlands, and ends well into the fourth "pocket" next to the area known as Malinguitas. It waters land located on the southern bank of the river. The other canal was found during this dissertation research survey and I named it as Caracucho Canal (Figure 32). It is a maximum elevation canal found on the northern bank of the river, and is ca. 20 km long and only the last section (ca. 2 km) runs through and ends in the study area at the Quebrada de Franco. The remaining section of the canal falls well outside the study area and thus was not part of the survey. Yet, I learned from modern local inhabitants that this canal has its intake at the area known as Caracucho from the Las Gallegas (Santo Domingo) River, the next tributary river east of the Charanal River. It then passes through the La Rinconada plains, a section of the alluvial plain that penetrates into the pediment of the Andean Cordillera in the second fertile "pocket". It then leaves La Rinconada through the passageway between the Andean cordillera and Cerro Piedra Blanca and enters (already in the study area) into the No-Man's (or Woman's)-Land to finally end at the Quebrada de Franco. Although no secondary canals were detected during the survey, it is very likely that this canal played a key role in the settlements of the Franco Valley.

7.3.17 Cerro Loma Negra

This topogram is another example of the type of landscape defined as Domain-Viewing Mountain type. Similar to Cerro Santo Tomé, it presents very steep slopes on all fronts especially on the southern section of the hill. It is located at a strategic position forming the last valley neck in the study area between the fourth and third fertile "pocket" of the alluvial plain. From its summit the view dominates not just the valley in a southeast-northwest direction but also the pediment of the massif of Cerro Pilán to the northeast and the *despoblado* to the south and southwest (Figure 33). It thus represents a nodal location in the valley from which human activities and movement can be monitored. Its presence around flatlands and its location within the spatial structure of the landscape definitely point to the significance it could have had for prehispanic inhabitants in the area.

7.3.18 Cerro Tongo

This hill also defines a Domain-Viewing Mountain type of landscape. As pointed out earlier in this chapter, it marks the border between the *despoblado* and the alluvial plain. This feature is already outside the limits of the study area and thus was not systematically surveyed. On a previous surface reconnaissance (Montenegro Cabrejo, et al. 1998) of part of the hill, prehispanic human occupation was detected as well as the hill's association with the Hualcas Canal (Figure 34).

7.3.19 Cerro Vicús

Cerro Vicús is also outside the study area, yet, as explained above, it is evident that it has all the required characteristics to be defined as a topogram. Survey blocks next to Cerro Vicús not covered in my survey partially fall within the area studied by the Upper Piura Archaeological Project (see Chapter 3) and thus there is some published information that can be compared to the information gathered during my dissertation research. Finally, although I have walked on more than one occasion by Cerro Vicús (and Cerro Piedra Blanca and Cerro Tongo too), systematic survey was not carried out for this research. They are mentioned none the less due to their undeniable role as important features within the spatial structure of the landscape and thus can be later integrated into the discussion of the prehispanic human settlement in the study area.

7.3.20 Summary of the Topograms in the Study Area

The above presentation and description of topograms seems to be a compartmentalized one; yet it is presented as such just for heuristic purposes. Usually classification schemes tend to set apart elements from totalities as discrete individuals whose intrinsic characteristics are claimed to be enough to explain not only the constitutive elements themselves, but the overall nature of the totalities. In other words, such compartmentalized perspectives deemphasize the relational aspect of the world and its understanding that is generated precisely by the interaction of its constitutive elements.

The topograms of the landscape above are thus presented under a relational framework that is characteristic of the dwelling perspective. On the basis of my experience walking while doing the surface survey I felt another component of the landscape that, through my body movement, was threading together the spatial elements of the landscape. I believe that, through time, the landscape in the study area had different spatial configurations of which the topograms are major components.

As mentioned early in this chapter (and in Chapters 4, 5 and 6), it is not the purpose of this dissertation to uncover the meanings the landscape had for people in the past. Yet I do intend, by reworking the past landscape via my phenomenological experience, to create an analogy and offer possible interpretations of past landscapes and thus suggest some keys to the meanings the landscape had for people in the past that can only be complemented by gathering further information through archaeological practice.

The topograms formed -through various combinations that vary through time- meaningful spatial (social and cultural) configurations for the prehispanic inhabitants in the study area. For instance, on the basis of fieldwork and readings of ethnohistoric sources (e.g., Hocquenghem 1994; 1998) we know that during the Inca (and perhaps late pre-Inca) and early Colonial periods two major *curacazgos* (chiefdoms) or *provincias* (the term used by Spanish chroniclers) were major components of the landscape in the study area and beyond. The limits of these *curacazgos* seem to have coincided with the topograms and elements of the spatial structure formulated here. In fact, Hocquenghem (1994:44-49) has argued that the land worked by the population subordinated to the *curaca* of Pabur encompassed the fourth and third fertile "pockets" and the northern half of the second, while that of the *curaca* of Serrán included the southern half of the second and all of the first, fertile "pockets" and even beyond this area to the east including the drainage of major tributary rivers in the Upper Piura Valley such as the Bigote and Pusmalca Rivers.

The landscape scenario elicited above for the late Prehispanic and early Colonial periods might well have been different from all other earlier prehispanic periods and offering some insights into these scenarios is one of the purposes of this dissertation. It is important to underscore that the analysis of early Colonial ethnohistoric sources from the North Coast (e.g., Ramírez-Horton 1985) indicate that during late prehispanic times territoriality of *curacazgos* was marked not so much by physical space (and its limits) the *curacas* (*caciques* or chiefs) supposedly controlled, but by the actual land worked (within or outside his/her territory) by his/her social base (i.e., his/her subjects). Yet, although territoriality in the prehispanic North Coast seems to have been in a state of flux, it is quite clear that most of the social base of the *curazagos* lived and worked the land within their territories. It is obvious then, to conclude, that studies of sociopolitical organization of prehispanic societies should center their attention not on the loci where elites lived or administered but first on the "less significant", "less spectacular" sites where this social base lived, worked, and died.

Ethnohistoric sources from the late prehispanic North Coast also indicate that ancestor veneration played a key role in the definition of territoriality. In fact, S. Ramírez (1996) has suggested that the allegiance of the social base to their *curacas* depended not on the territory controlled by the latter (and thus the area where their subjects lived) but on the perception their social base had about them as good or bad rulers. That is, *curacas* (and the loci where they lived and were buried) might or might not have been considered ancestors by their subjects or, in any case, their veneration could have been ephemeral depending on how successful their succeeding lineages were as rulers. More importantly, however, was the veneration of ancestors at the level of the social base of the *curacazgos*. In other words, ancestor veneration at the grass roots level had more continuity and tradition and thus the very long occupation loci where the social base of *curacazgos* lived and died are better markers of territoriality than those of the elite. Yet again, these loci are most of the times the “less important” “less impressive” archaeological sites where “commoners” lived and died and that are largely disregarded by current archaeological research in northern coastal Perú influenced by the Mochica Factor (see Chapter 3).

In sum, in the relational process of this first path to interpretation I look at the relationship between the human occupation and the topograms and elements of the spatial structure of the landscape in the study area. By so doing, through a process of analogy, I look at all these elements as an integration not of spaces but of places (locations charged with history) that might have become so through constant and secular travelling to, from, and around these locations. The first part of this first path of interpretation is the above presentation of topograms. The second part overlaps with the second path to interpretation, which is, the vertical dimension (the settlement pattern analysis) as explained earlier in this section and in Chapter 6. Using the first part of the first path to interpretation as a canvas I will now try to understand how people in the past were distributed in space. A diachronic analysis of settlement patterns will thus help to infer if there are continuities or discontinuities in the uses of space, their role as part of the landscape, and to determine how the spatial configurations may have grown, changed, and restructured over time. Finally, overlapping these two paths to interpretation is relevant to the other research question of this dissertation; i.e., the sociopolitical changes (or lack thereof) during the EIP and the early LIP. This last issue will be discussed in more detail in the next chapter on the basis of the history of the spatial configuration and sociopolitical organization as presented below.

7.4 Settlement and Landscape during the Ñañañique Period (ca. 1100-700 B.C.)

Settlements were defined and dated as mentioned in Chapter 6. Eighteen sites were occupied during the Ñañañique period. These sites form a total of 17 settlements that altogether total 22.74 ha of occupied area. The settlement size analysis undertaken helped to better understand the regional settlement system during this period. This analysis shows a settlement size hierarchy divided into four classes. In fact, the rank-size analysis represented in the rank-size graph (Figure 35) presents three conspicuous changes in slope defining a four-level hierarchy. Class 1 comprises two settlements (Ranks 1-2) ranging from 3.02 to 2.52 ha in size. After the Rank 2 settlement of this first class a clear change in the slope is observed at around the 2.28 ha or the point at which Class 2 begins. Class 2 comprises four settlements (Ranks 3-6) ranging from 2.29 to 1.89

ha in size. After the Rank 6 settlement in Class 2 another clear change in slope is observed, a change that starts at 1.55 ha or when Class 3 begins. Class 3 comprises six settlements (Ranks 7-12) ranging from 1.55 to 1.01 ha in size. Within this class there is a plateau in the slope that creates a false impression of a drastic break; yet this effect is caused by the fact that three settlements (Ranks 9, 10, and 11) are the same size. Taking the area of these three settlements as a single point however concurs well with the homogeneity of the slope in this class. Finally, another conspicuous break in the slope is observed between the 1.01 ha (the last ranked settlement in Class 3) and the 0.40 ha when Class 4 starts. Class 4 comprises five settlements (Ranks 13-17) ranging from 0.40 to 0.07 ha in size. The grouping of these classes can also be clearly observed in the frequency distribution of the settlements sizes as shown in the histogram in Figure 36.

To demonstrate that the class groupings above are non arbitrary observations from the settlement size plot, they were subjected to independent-samples *t* tests of significant differences of mean settlement size; these tests are important since sometimes a large spread in a group could blur (statistically) the difference between a class and ranked settlements from adjacent classes. All independent-sample *t* tests comparing the difference in mean settlement size between Classes 1 and 2 ($t(4) = 3.432$, $p < .05$), Classes 2 and 3 ($t(8) = 6.945$, $p < .05$), and Classes 3 and 4 ($t(9) = 10.552$, $p < .05$) are highly significant (see Tables 4-6 and Figure 37). Finally, the spatial distribution of the classes is plotted (Figure 38) to help interpret the landscape and sociopolitical organization; the same analysis was followed for the other periods.

There are two Class 1 settlements, four Class 2 settlements, six Class 3 settlements, and five Class 4 settlements in the Ñañañique period size hierarchy. This distribution shows some regularity across the study area. The distance between the two Class 1 settlements (Settlements 1 and 2) is 13.5 km. At this point it is important to say that if another major Ñañañique period site (Cerro Ñañañique, adjacent to but outside of the study area) was included in the settlement size analysis, three and not two almost equidistant sites would constitute the first tier settlements. In fact, Settlement 1 is located 14.2 km away from Cerro Ñañañique which in turn is located 16.2 km away from Settlement 2.

Unlike the first tier settlements, the other size class settlements do not show a regular distribution across the study area. In fact, in spite of the regular spacing (2-5 km) of the Class 2 settlements, they as well as most of Class 3 and Class 4 settlements, tend to cluster next to the Class 1 Settlement 1 (Site 125, U4S3). In other words, Settlement 1 and Settlement 2 are centers that do not conform to a regular hexagonal distribution as would be expected in a canonical Central Place Theory model[5]. As Tschauner (2001:103-104) has argued, although north coastal Perú is characterized by a flat landscape, it does not conform to the ideal flat, unbounded area that is assumed by Central Place Theory; coastal valleys are linear, fan-shaped, and as presented in Chapter 2 and in this chapter, bounded, surrounded, or even intruded by sections of the Coastal and Western Andean cordillera. In addition, it is believed that orthodox Central Place Theory is difficult to apply and perhaps not suitable to prehispanic cases in the Andes since, as I have been contending in this dissertation, factors other than politics and economics play a key role in the settlement and social organization of past societies.

The distribution and location of settlements in the landscape, however, do show certain patterns that could have connotations for the sociopolitical organization during the

Ñañañique and later periods. First, as mentioned above, two centers (Class 1 settlements) are separated by a considerable distance with one of them exerting a centripetal force (Settlement 1). Second, the preferred location for settlements of all classes (44.4 percent) is on the ridges or slopes of the pediment of the Andean cordillera. Although ten sites (55.5 percent) are located on the alluvial plain, five of them are next or adjacent to the pediment (ridges or slopes) of the Andean cordillera reinforcing the preference for this location. Third, in spite of the preferred location mentioned above, it is important to underscore that one of the Class 1 settlements (Settlement 2, Site 207, U194S1) is located well within the alluvial plain and even bordering the *despoblado* on the south bank of the Upper Piura River. The location of this settlement helps then to better explain the placement of four sites (two Class 3 and two Class 4 settlements) clearly amid the alluvial plain. The latter are located at a nearly rather equidistant distance between Settlement 2 and the cluster that revolve around Settlement 1 and even between them and the site of Cerro Ñañañique. Finally, though there is some occupation of the alluvial plain next to the Upper Piura River, it is also clear that economic activities (i.e., agriculture) mainly relied on the soil and water resources from the tributary rivers (and underflow) such as Charanal River and Quebrada de las Damas.

In sum, Ñañañique period settlement organization is characterized by an array of settlements that can be divided into a four-tier settlement hierarchy. One of the two Class 1 settlements clearly dominates and is the focus of the settlement organization with the pediment and adjacent land chosen as the preferred location for social and economic activities. In addition, this location at the entrance of the tributary rivers (and route to and from the adjacent highlands) into the alluvial plain may indicate that the cluster of sites around Settlement 1 may represent a node in a contact or trade route. Finally, the placement of a Class 1 settlement (Settlement 2) at the fringes of the settlement system points to the inception of a complex sociopolitical organization that will be far more evident in later periods.

To integrate the two paths to interpretation that I have proposed in this dissertation it is necessary now to overlap the settlement organization presented above with the topograms and overall spatial structure of the landscape as described earlier in this chapter. First, the *lomas* and spurs, as the preferred locations for human occupation, are obviously two of the most conspicuous topograms in the landscape. The highlight of these topograms though, is not the physical characteristic of the surface or constructions on them, but the length and continuity of occupation. Here I argue that the duration of occupation conferred on these location a significant meaning and role within the social memory of past people within the study area. As underscored in the next chapter, continuity of occupation is considered a critical factor while analyzing changes in settlement patterns and their concomitant sociopolitical transformations (or lack thereof). It is sufficient to mention at this point that there are 36 sites that present a long occupation (from six to eight periods) and that among all the nine periods of prehispanic occupation, the Ñañañique period displays the largest percentage of long occupation sites (i.e., 12 out of 18 sites or 66.6 percent; see Table 23). It is clear then that these sites (Sites 125, 207, 124, 86, 144, 111, 143, 17, 133, 99, 60, and 135) had a sense of place since the earliest human occupation in the study area and therefore embedded in the worldviews of past people as transit to, from and around them was effected.

A third topogram related to the Ñañañique period is the underflow of the right margin of the Charanal River, especially the area next to the pediment slopes. As explained before this is a lowland area at a contour level lower than most other locations in the study area, and constitutes a natural drainage, prone to floods, and thus a patch of land that annually preserves water and humidity for a longer period of time than other locations. It is thus a microenvironment that differentiates itself from the rest of the study area and that very likely further contributed to the material and ideological life of past indigenous societies. The location of this topogram contrasts with that of the fourth topogram; i.e., the valley neck of the interior delta. This topogram is an area where settlements are about 100 m above those on the underflow and, unlike the latter, which are surrounded by an open space, it is found in a more secluded position. In addition, in spite of its secluded location surrounded by a denser forest and foothills, it is the gateway that connects the narrower San Jorge and Quebrada de las Damas Rivers with the open plain of the fourth fertile "pocket" of the alluvial plain. Finally, this topogram coincides with the settlement's centripetal force in this period as explained above and five of the 17 settlements are clustered around it representing 34.5 percent of the total occupied area during this period.

In sum, three main conclusions are drawn from the presence of these four topograms during the Ñañañique period. First, material and ideological features of the culture of the society were partially shaped by a landscape and ecology characterized by its proximity to hill slopes, forested areas, and perennial water sources; second, the landscape is embodied through the movement of people mostly between the third and fourth topograms located adjacent to or on the pediment including a transit towards the more mountainous headwaters of the tributary rivers (especially the San Jorge River); and third, the significance of the occupation of spurs and especially the *lomas* as topograms is manifested in their long occupations and transit around them, including those located (five settlements) well within the alluvial plain at a further distance from the pediment.

Finally, the settlement organization and location of topograms for the Ñañañique period presented above configure a spatial structure that falls into a variation of the Zōfū-Tokusui landscape type. In fact, the structural elements of this type of landscape are comprised of a boundary that is the pediment and Andean foothills in the north, northwest, and northeast within the fourth fertile "pocket" creating a domain characterized by a v-shaped area that encompasses most of the settlements. The directionality is defined by the gentle slope of the domain that descends towards the north bank of the Upper Piura River and by the flow of the tributary rivers both in a NE-SW orientation. Those four settlements located apart from the pediment and especially Settlement 2 already within the third fertile "pocket" seem to be outliers that do not match this spatial structure. Yet, at the same time these seeming outliers might well indicate the inception of new spatial configurations that will be evident in later periods.

7.5 Settlement and Landscape during the Panecillo Period (ca. 700-500 B.C.)

Thirty sites were occupied during the Panecillo period. These sites form a total of 26 settlements that altogether total 33.48 ha of occupied area. The settlement size analysis shows a settlement size hierarchy divided into four classes. In fact, the rank-size analysis represented in the rank-size graph (Figure 39) presents three conspicuous changes in slope defining a four-level hierarchy. Class 1 comprises four settlements (Ranks 1-4) ranging from 3.92 to 3.02 ha in size. Ranks 3 and 4 are similar in size forming an angle in the slope that gives a false impression of abrupt change. Yet, the real change in the homogeneity of the slopes is observed between 3.02 ha and 2.53 ha; the latter marks the point at which Class 2 begins. Class 2 comprises five settlements (Ranks 5-9) ranging from 2.53 to 1.89 ha in size. After the Rank 9 settlement in Class 2 another clear change in slope is observed, a change that starts at 1.38 ha or when Class 3 begins. Class 3 comprises six settlements (Ranks 10-15) ranging from 1.30 to 0.74 ha in size. Within this class there is a small plateau on the slope and a slight change in angle created by the similarity in size among four of the settlements (Ranks 11-12 and 13-14) within this otherwise homogenous class. Finally, another conspicuous break in the slope is observed between the 0.74 ha (the last ranked settlement in Class 3) and the 0.44 ha when Class 4 starts. Class 4 comprises 11 settlements (Ranks 16-26) ranging from 0.44 to 0.05 ha in size. The grouping of these classes can also be clearly observed in the frequency distribution of the settlements sizes as shown in the histogram in Figure 40. In this histogram a gap between ca. 3.50 ha and 3.70 ha is evident. Yet, this gap is not statistically significant (see below) and thus does not disrupt the classification of Class 1.

The above settlement size classification was subjected to tests of significance. All independent-samples *t* tests comparing the difference of mean settlement size between Classes 1 and 2 ($t(7) = 5.451$, $p < .05$), Classes 2 and 3 ($t(9) = 7.266$, $p < .05$), and Classes 3 and 4 ($t(15) = 9.571$, $p < .05$) are highly significant (see Tables 7-9 and Figure 41). Finally, the spatial distribution of the classes was plotted as shown in Figure 42.

There are four Class 1 settlements, five Class 2 settlements, six Class 3 settlements, and 11 Class 4 settlements in the Panecillo period size hierarchy. The spatial distribution clearly shows that the Panecillo settlement organization is already determined by the layout of the former Ñañañique period. Yet at the same time some obvious changes are observed. For instance, there is an increase in the number of Class 1 settlements, one next to the Andean pediment (Settlement 18) and another closer to the northern bank of the Upper Piura River (Settlement 19). Also, it is important to underscore that, apart from Settlements 18 and 21 that are very close to each other, the Class 1 settlements are equidistant as in the former Ñañañique period. In fact, the distance between Settlements 18 and 21 and Settlement 19 is 9.0 km, and that between the latter and Settlement 20 (the one in the third fertile "pocket") is 8.1 km. In addition, it is important to observe that the occupied area in the alluvial plain closer to the northern bank of the Upper Piura River, which was sparsely settled with only two Class 3 and two Class 4 settlements during the Ñañañique period, shows an evident growth. In this area the aforementioned Class 1 Settlement 19 appeared as well as a Class 2 settlement (Settlement 22) joining the two Class 3 settlements from the Ñañañique period, and three new Class 4 settlements.

Although the Classes 2, 3 and 4 settlements also show a seemingly irregular spatial distribution as during the Ñañañique period, some changes and patterns are also observed. The number of Class 2 settlements grows by one settlement as represented by the already mentioned Settlement 22. This settlement breaks the spatial patterning of Class 2 settlements during the Ñañañique period since for the first time a Class 2 settlement appears on the alluvial plain next to the northern bank of the Upper Piura

River. In addition, although the number (6) of Class 3 settlements is the same as during the Ñañañique period, there is an evident change in their spatial distribution. In fact, during the Ñañañique period all Class 3 settlements on the northern portion of the study were located on the Andean pediment east of Class 1 Settlement 1. During the Panecillo period, however, two of the aforementioned Class 3 settlements were abandoned and, in turn, two new Class 3 settlements appeared west of both the Ñañañique period Class 3 settlements and Class 1 Settlement 1. Furthermore, the most apparent change is perhaps the growth of Class 4 settlements, from only five settlements during the Ñañañique period to 11 settlements during the Panecillo period. It is also evident that these Class 4 settlements are appearing adjacent to other Class 4 settlements or even next to other upper hierarchy settlements. A case worth mentioning is Settlement 36, a Class 4 settlement that seems to be isolated in relation to the general settlement organization but that nevertheless represents the first human occupation of the slopes of the massif of Cerro Pilán. Finally, Settlement 20 (Settlement 2 during the Ñañañique period) continues to be an outlier isolated within the third fertile “pocket”. Yet, this settlement shows an increase in its area from 2.52 ha during the Ñañañique period to 3.10 ha at the Panecillo period.

The settlement distribution presented above has obvious implications for the sociopolitical organization during the Panecillo period. First, the centripetal force exerted by Settlements 1 and 3 during the Ñañañique period continues during the Panecillo period (now Settlements 21 and 23) and it even strengthens further with the addition of Class 1 Settlement 18. Second, the preferred location for settlements is on the alluvial plain (70 percent) versus the slopes or ridges of the pediment (30 percent). Yet, as in the Ñañañique period, a significant 42.9 percent (9 sites) of the alluvial plain settlements are adjacent to the Andean pediment in the north section of the study area. These settlements thus very likely belonged to the sphere of influence of the settlements that exercised a centripetal force since the Ñañañique period. These settlements are nonetheless outnumbered (21 sites or 57.1 percent) by those located in the alluvial plain but not adjacent to the pediment. Third, the significant presence of sites on the alluvial plain away from the pediment is explained in part by a new centripetal force that arose during the Panecillo period and represented by the Class 1 Settlement 19. In fact, in this area Settlement 19 is the center and focus of a group of settlements (from all four classes) that surround it and that are evidently forming a locus that counterbalances the centripetal force represented by the cluster of settlements next to the pediment. Finally, the sole settlement within the third fertile "pocket" is again, as during the former Ñañañique period, an outlier in relation to the overall settlement configuration. Yet, as mentioned above, this settlement (Settlement 20) increased its area during the Panecillo period emphasizing its role as an outpost that may have spearheaded early land colonization in this area; it may have also functioned as a very early node of an interaction network that linked the settlements of the pediment with social groups from the highlands to the east and even from the Northern North Coast to the south and southeast.

In sum, the Panecillo period settlement organization is composed of a group of settlements that can be divided into a four-tier settlement hierarchy. Three Class 1 settlements clearly dominate the settlement organization; yet only two are true centripetal forces attracting lower echelon settlements that are around or adjacent to them. The centripetal force of the settlements commanded by Settlement 19 shows that as early as the Panecillo period the alluvial plain next to the northern bank of the Piura River -and not just the pediment or adjacent flatlands- becomes an important area for the social and economic activities of the population; this preference is also indicated by the increase in area of the outlier settlement (Settlement 20) within the third fertile "pocket". In addition, this last settlement together with the still strong centripetal force located next to the pediment (led by Settlements 21 and 23) point to their function as nodes of an interaction network that has the pediment as its most important route.

The relation between the above settlement organization and the topograms does not show a significant difference from the Ñañañique period. First, the *lomas* and spurs continue to be two of the most apparent topograms in the landscape with a slight preeminence of the former as reflected in their number. As argued before, however, the most significant aspect of these topograms is the duration of occupation of these locations. In fact, the Panecillo period (after the Ñañañique period) presents the second largest percentage of long occupation sites (from six to eight periods); i.e., from a total of 30 sites, 16 (53.3 percent) are long occupation sites (see Table 23). Evidently, these sites (Sites 34, 207, 208, 125, 83, 124, 86, 144, 111, 17, 105, 38, 99, 60, 135, and 94) imbued the study area with a sense of place very early in time. Ten of these sites were already occupied since the Ñañañique period and only six of them (Sites 34, 208, 83, 105, 38, and 94) appeared during the Panecillo period.

The third (the underflow) and fourth (the valley neck of the interior delta) topograms also continued to be locations in which perhaps more than half of the population walked through and lived during the Panecillo period. The significance of these topograms is noticeable as marked by the growth in population around them during this period. It is also clear that populations next to these topograms may have perceived their affinity by being connected to one of the main sources of life; i.e., water from the San Jorge River that sustained these populations at their west margin on the interior valley neck then flowing into the underflow. Also, their sense of affinity may have been marked by their position as a central location of the interaction route that passed through the study area.

Perhaps three other topograms started playing a significant role in the worldviews of local populations during the Panecillo period. These are the triangular pyramid-shaped summit of Cerro Pilán, Cerro Vicús, and the massif of Cerro Pilán. These topograms were probably part of the landscape conceptualization already during the Ñañañique period; yet it is with the Panecillo period spatial configuration that they gained prominence. The most distinctive aspect of these topograms (especially Cerro Vicús and the triangular pyramid-shaped summit of Cerro Pilán) is their overall discrete shape as seen from certain distance. Even though the triangular pyramid-shaped summit of Cerro Pilán was observable for the populations that dwelled and moved around the pediment (i.e., by the underflow and the valley neck of the interior delta), the distance and the angle at which it is seen probably did not cause an effect as significant as for those dwelling at closer distances. In fact, this was the case for those populations living on the Andean pediment on the east margin of Quebrada de las Damas located at a much shorter distance from the triangular pyramid-shaped summit of Cerro Pilán than those inhabitants settling on the settlement centripetal force located on the pediment. On the other hand, unlike the latter, the populations that dwelled on and around the second centripetal force on the alluvial plain had a closer and direct view of both, the triangular pyramid-shaped summit of Cerro Pilán and Cerro Vicús. It is therefore possible to suggest that the affinity to these topograms was a factor that could explain some social and ideological differences between the people that dwelled on and next to the pediment and those on the alluvial plain. This may help to explain a ca. 20 km^2 unsettled rectangular-shaped spatial gap or corridor (already observed during the Ñañañique period but far more evident during the Panecillo period) that existed between these two settlement concentrations. Finally, the massif of Cerro Pilán is the seventh topogram that started playing an important role in the lives of the local population. Its sheer size makes it observable from every point in the study area containing other topograms within it such as a number of spurs and of course its triangular pyramid-shaped summit. Yet its overall shape is not as discrete as Cerro Vicús or its pyramid-shaped summit and may not have caused the same effect as the other two topograms just mentioned above. It is more likely, that its significance resided in its perception as a landscape barrier and later as source of life (water) beginning in the Panecillo period, as reflected in the first settlement located in its foothills during this period.

In sum, some conclusions can be drawn from the presence of these seven topograms during the Panecillo period. First, the distribution of the topograms follows a pattern already noticed during the former Ñañañique period; second, the configuration of the topograms in relation to the settlement distribution clearly points towards possible differing material, social, and ideological conceptualizations of the landscape between social groups living on or around the pediment and those living on the alluvial plain proper; and third, the long occupation of a significant number of *lomas* and spurs confirms once again that the sense of place in the study area was established very early in time.

As during the Ñañañique period, the settlement organization and location of topograms in the Panecillo period configure a spatial structure that falls into a variation of the Zōfū-Tokusui landscape type. That is, it is composed of the same structural elements (boundaries, domain, and directionality). Though the v-shaped area of the domain is larger and unlike the former period it clearly incorporates the settlements of the centripetal force in the alluvial plain. In addition, the directionality (NE-SW) is also marked by the alignment of most of the settlements, especially those on or adjacent to the pediment. On the other hand, and though part of the same domain, the alignment of the settlements on the alluvial plain next to the northern bank of the Upper Piura River seems to have an overall NW-SE orientation, a phenomenon that indicates potential changes in the spatial configuration during later periods. Finally, during the Panecillo period there is an evident overlap of two types of landscape: the aforementioned Zōfū-Tokusui, and the Sacred Mountain type as represented by the Cerro Vicús and the massif of Cerro Pilán.

7.6 Settlement and Landscape during the La Encantada Period (ca. 500-300 B.C.)

During La Encantada period 41 sites were occupied forming a total of 34 settlements that altogether total 38.0 ha of occupied area. A settlement size hierarchy divided into four classes is evident in this period. The outcome of the rank-size analysis is a rank-size graph (Figure 43) that presents three noticeable changes in slope defining a four-level hierarchy. Unlike the two former periods, Class 1 includes just one settlement

(Rank 1) that is 5.59 ha in area. The difference between this settlement and the largest settlement of Class 2 is almost 2 ha, which is reflected in the gap and abrupt drop in the slope. Class 2 comprises four settlements (Ranks 2-5) ranging from 4.09 to 2.52 ha in size. After the Rank 5 settlement in Class 2 there is a slight change in the slope starting at 2.29 ha or when Class 3 begins. Unlike Class 3, settlement sizes in Class 2 are evenly distributed and thus the smoothness of the slope. Class 3 comprised 10 settlements (Ranks 6-15) ranging from 2.29 to 0.93 ha in size. A group of low-ranked settlements within this class cluster between ca. 1.20 and 1.40 ha thus causing a much more uneven slope as compared to Class 2. Finally, another manifest break in the slope is observed between 0.93 ha (the last rank settlement in Class 3) and 0.53 ha, the area of the top-ranked settlement in Class 4. Class 4 comprised 19 settlements (Ranks 16-34) ranging from 0.53 to 0.01 ha in size. Settlement sizes in this class are better distributed and thus the slope in this section is also smoother than in Class 3. In addition, the rank-size graph shows that for the first time Class 4 settlements clearly outnumbered the settlements from the other classes, a tendency that will be far more evident as time progresses. The grouping of these classes is also represented in the frequency distribution of the settlement sizes as indicated in the histogram in Figure 44. Class 1 is clearly separated from Class 2; the latter presents two gaps but as a group is consistent and statistically different from Class 3 (see below). Finally, the peaks in Class 4 differentiate it from Class 3.

Independent-samples *t* tests comparing the difference of mean settlement size between Classes 2 and 3 and between Classes 3 and 4 are highly significant. A significant difference between Classes 2 and 3 ($t(12) = 6.172$, $p < .05$) and Classes 3 and

4 ($t(27) = 11.764$, $p < .05$) is obvious (see Tables 10-11 and Figure 45). An independent-samples *t* tests comparing the difference of mean settlement size between Classes 1 and 2 could not be performed since standard deviations of the samples are required for this test, and there was not one for the Class 1 since it consists of only one variate. Yet, as mentioned above, looking at the histogram in Figure 44 the separation between Class1 and Class 2 is very clear. Finally, the spatial distribution of the classes was plotted as shown in Figure 46.

Although the spatial distribution of settlements during the La Encantada period almost follows the same Ñañañique and Panecillo pattern, there is change in the hierarchical composition of the settlement arrangements. During the La Encantada period there is just one Class 1 settlement, four Class 2 settlements, 10 Class 3 settlements, and 19 Class 4 settlements. The most conspicuous difference is the loss of strength of the overall settlement system as reflected on the reduced number of Class 1 and Class 2 settlements. On the other hand, as also noticed in the rank-size graph, there is an increase in Class 3 settlements and especially Class 4 settlements.

The settlement pattern analysis thus yielded some significant results. For instance, there is the aforementioned apparent loss of power of the settlement system as reflected in the presence of just one Class 1 settlement. Yet, in spite of this settlement system enfeeblement, the centripetal force next to the Andean pediment seems to have maintained its strength. In fact, the only Class 1 settlement (Settlement 44) located here increased slightly its size and is 1.5 ha larger than its Panecillo period Class 1 settlement counterpart (Settlement 18). In addition, although its adjacent Class 2 and Class 3 settlements (Settlements 47 and 49 respectively) descended within the settlement hierarchy (formerly Class 1 and Class 2 settlements respectively, during the Panecillo period), their proximity still shows their cohesion as a force that attracted the other settlements from the adjacent pediment and alluvial plain. Moreover, a Class 3 settlement (Settlement 51) formerly settled during the Ñañañique period reappeared at a nearby location further reinforcing the interpretation that this centripetal force, albeit seemingly weakened, is still strong and influential.

The apparent loss of strength in the settlement system could also be understood as a process of reinforcement and stability as a result of settlement dispersion (and relocation in same cases) that is slightly more evident than during the previous two periods. For example, a new Class 2 settlement (Settlement 45) appeared at a critical location next to the center of the centripetal force of the pediment. In addition, on the alluvial plain adjacent to the centripetal force of the pediment on the west bank of the Charanal River there is no Class 2 settlement. Out of the two Class 2 settlements in this area during the Panecillo period, one disappears completely while the other descends from a Class 2 to a Class 4 settlement. Yet, this change spawned four new Class 4 settlements not inhabited during the two previous periods. Unlike the two previous periods, it is not the Class 1 (because is represented by just one settlement) but the Class 2 settlements that maintain a regular spatial distribution. In fact, the distance between Settlement 48 (the outlier within the third fertile "pocket") and Settlement 46 (in the settlement cluster next to the north bank of the Upper Piura River) is 8.1 km, while that between the latter and Settlement 45 (next to the centripetal force of the pediment) is 7.6 km. In addition, population dispersion was also generated from Settlement 48, now no longer the sole outlier in the settlement system since one Class 3 and two Class 4 settlements also within the third fertile “pocket” appeared.

Finally, the location and distribution of Class 3 and Class 4 settlements also point to the aforementioned stability and dispersion of the settlement system. As mentioned above, the number of this class of settlements increased during this period. On the alluvial plain next to the north bank of the Upper Piura River, two new Class 3 settlements appeared, most likely generated from a formerly adjacent Class 2 Panecillo period settlement not occupied during this period. Also, Class 3 settlements continue to serve as an attracting force for Class 4 settlements. This phenomenon is evident in the cluster of settlements on the alluvial plain next to the pediment on the west margin of the Charanal period. In this area there is only one Class 3 settlement (Settlement 58) surrounded by eight Class 4 settlements. Class 4 settlements, at the same time, continue to act as the satellite settlements that spearhead the occupation of new areas. For instance, the single occupation at the foothills of the massif of Cerro Pilán during the Panecillo period moved slightly down the slope and to the east during the La Encantada period (Settlement 64). Moreover, a new settlement just ca. 1.5 km across Settlement 64 is occupying for the first time the alluvial plain on the empty corridor between the two main settlement clusters within the fourth fertile “pocket”. In addition, two aforementioned new Class 4 settlements (Settlements 59 and 66) separated ca. 1.0 km from each other appeared as outliers to the overall settlement system within the third fertile “pocket” on either bank of the Upper Piura River.

The settlement organization during the La Encantada period points towards certain significant observations on the sociopolitical organization during this period.

First, there is an apparent weakening of the overall settlement system inasmuch as, unlike previous periods, there is only one Class 1 settlement. Second, this ostensible loss of strength is in fact a local process of dispersion and growth that suggests its stability rather than its decomposition. Third, this stability is also manifested by the preferred location for settlements. In fact, the distribution of settlements on the alluvial plain and the slopes and ridges of the pediment is almost the same as during the Panecillo period. That is, 34.1 percent (14 sites) is located on the ridges or slopes of the pediment and 65.9 percent (27 sites) on the alluvial plain. Even more, if we consider only the settlements on the alluvial plain in relation to the distance to the pediment, the proportions are, again, the same as during the Panecillo period; i.e., a significant 40.7 percent are still located adjacent to the Andean pediment in the north section of the study area while 59.3 percent are on the alluvial plain closer to the banks of the Upper Piura River in both the fourth and third fertile "pockets". There is a slight but perhaps very significant difference, though. Unlike the two previous periods, during the La Encantada period the cluster of settlements on the alluvial plain in the north part of the study area, albeit still attracted by the centripetal force of the pediment, seems to be approaching the west bank of the Charanal River slightly apart from the pediment proper and approaching a new key settlement (Settlement 45, see below).

Fourth, the latter phenomenon is very likely related to another aspect of the settlement system. In fact, even though the settlement configuration during this period may point to its stability rather than its breakdown and disruption, it also seems to indicate some sort of sociopolitical tension. Clearly, the balance between the two centripetal forces radiating during the Panecillo period was somewhat decreased. That is, although the centripetal force of the alluvial plain next to the north bank of the Upper Piura River still comprised nine settlements as during the former Panecillo period, it nonetheless lacked a Class 1 settlement. On the other hand, the centripetal force of the pediment although also losing a Class 1 settlement, still maintained its strength. Moreover, the latter as a whole gained sociopolitical vitality with the appearance for the first time of a critical settlement (Settlement 45) at a key location. Settlement 45 is a Class 2 settlement located adjacent to the east bank of the Charanal River and on the alluvial plain but is located at only ca. 1.2 km down slope from the center of the pediment centripetal force represented by Class 1 Settlement 44. An important feature of Settlement 45 is that is located on the 140 m asl contour level, the highest among all the settlements placed on the alluvial plain within the fourth fertile "pocket". In fact, all the settlements located in the cluster of settlements west of Settlement 45 are below the 125 m asl counter level and all those in the cluster next to the north bank of the Upper Piura River are below 102.5 m asl. It would not be a far-fetched idea thus to assume that if any incipient gravity-fed irrigation system existed during this period, it was controlled by the centripetal force of the pediment with Settlement 45 playing a key role at controlling the distribution of water to either bank of the Charanal River[6]. In other words the emergence of Settlement 45, serving as a plug and closely associated with the core of the pediment centripetal force, indicates how and why the centripetal force next to the north bank of the Upper Piura River was kept under control during the La Encantada period. This loss of balance may also be indicative of certain power relations that were being negotiated by local groups since very early in time, and hence of changing dynamics that were reflected in the settlement configuration during later periods.

Finally, another significant observation related to the sociopolitical organization during this period is the presence of not just one but four outliers to the settlement system within the third fertile "pocket". As mentioned before, these new outliers are very likely settlements spawned out of Class 2 Settlement 48 (and thus its slight reduction in area and descent in the settlement hierarchy) occupied since the Ñañañique period. Although these new outliers do not constitute any discernible settlement organization by themselves, the location of at least two of them has significant connotations. Settlement 59 is a Class 4 settlement that appears for the first time in an area that will later become the location of an important population concentration on the north bank of the Upper Piura River. Also, Settlement 52 is a Class 3 settlement on the south margin of the Upper Piura River and located at the foothills of an important landscape feature (Cerro Santo Tomé) at the valley neck between the third and second fertile "pockets". An important aspect of this settlement is its long, continuous occupation during seven periods from the La Encantada to the Inca periods. These long occupation settlements served as population vectors indicating, despite the irregular and scattered settled areas, that the third fertile "pocket" during the La Encantada period was undergoing its own social dynamics independent from those occurring within the fourth fertile "pocket".

In sum, the La Encantada period settlement organization is composed of an array of settlements that in turn form a four-tier settlement hierarchy. The presence of only one Class 1 settlement reflects an ostensible weakness of the settlement system. However, it also reflects a process of stability and dispersion. Yet, a potential sociopolitical conflict is reflected in the loss of balance between the two former (during the Panecillo period) centripetal forces. The centripetal force of the pediment maintained its strength and influence and this power seems to have entailed the control of water distribution to land located around the centripetal force next to the north bank of the Upper Piura River. Irregular settlement distribution in the third fertile "pocket" indicates the beginning of an independent population dynamic not yet clearly integrated to that on the fourth fertile "pocket". Finally, the vitality of the settlement on the pediment in these first occupation periods and the attending scarcity of population in the south part of the study area confirm that the direction of interregional interactions was far more obvious from north to south than from south to north.

During the La Encantada period there are no major changes in the relation between the settlement organization and the topograms. All seven topograms from the former period are still active in the landscape structure. Moreover, four new topograms start to become components of the embodied landscape for the local social groups. The *lomas* and spurs, especially those that represent long human occupations, continue to imprint the sense of place in the landscape. The La Encantada period has the third largest percentage of long occupation sites (from six to eight periods); i.e., from a total of 41 sites, 20 (48.8 percent) are long occupation sites (see Table 23). Eleven of these sites were already occupied during the former Ñañañique or Panecillo periods while nine appeared during this period. It is important to underscore that these new long occupation sites emerged all over the study area; i.e., Site 133 in the core of the pediment centripetal force; Sites 95, 118, and 129 on the alluvial plain next to the pediment; Sites 61, 79, 80, and 82 in the settlement cluster next to the north bank of the Upper Piura River; and Site 203 on the alluvial plain and valley neck in the third fertile "pocket".

The third (the underflow) and fourth (the valley neck of the interior delta) topograms still continued to be the places around which life revolved for more than half of the population during this period; these social groups may have bonded for reasons explained in the Panecillo period section above. Yet, the slight retreat of the population from the underflow in favor of life closer to the alluvial plain may point to the inception of changes in social and ideological features that become more evident during later periods.

The other three topograms (the triangular pyramid-shaped summit of Cerro Pilán, Cerro Vicús, and the massif of Cerro Pilán) continued to play significant roles in the landscape conceptualization as explained in the Panecillo period section above. For instance, the 20 km^2 unsettled spatial gap or corridor and its connotations mentioned in the aforementioned section are still present during this period with only one exception. A small (0.41 ha) Class 4 settlement is found within this corridor but at only 1.1 km from the massif of Cerro Pilán foothills and could be an indicator of changes to come in the landscape conceptualization during later periods. In addition, the massif of Cerro Pilán seems to be perceived as a barrier and protector as well as the realm and container of other significant topograms. As mentioned before, within its massive, lush, and jagged structure it contains a triangular pyramid-shaped summit and a series of ridges and slopes that were starting to be walked upon and embodied since the Panecillo period; all were likely important elements in the social memory of the local populations. It also contains one of the new topograms that emerged during the La Encantada period: the *Boliche*, the *Peña*, and the *Chorro*.

In fact, the *Boliche*, the *Peña*, and the *Chorro*, together with the Franco Valley, Cerro Santo Tomé, and No-Man's (or Woman's)-Land are the four new topograms already described in the topogram description section above. It is important to underscore, however, their possible social and ideological connotations and their relation with the settlement configuration during this period. The *Boliche*, the *Peña*, and the *Chorro* started to acquired significance in the Panecillo period due to the presence of a nearby small Class 4 settlement; it is confirmed during this period when a new Class 4 settlement (Settlement 64) appeared a few meters down the slope replacing (or relocating) the former Panecillo settlement. It is thus evident that by this period a small group of people settling next to this topogram on the western foothills of the massif of Cerro Pilán began to interact and intermingle with this landscape feature. This topogram and its close association with running water during the rainy season or from springs and water storage (i.e., the *Boliche*) further imbues the massif of Cerro Pilán with qualities not just of a barrier and protector but also as a source of life. If combined with the daily walking on spurs and ridges, its forested terrain, and its imposing pyramid-shaped summit, suggest that the sacred nature and embodiment of this landscape hallmark become manifest.

The No-Man's (or Woman's)-Land topogram is defined not just by its physical characteristics as presented in the description section but also by its relation with the settlement organization. Although it could be traced back to the Ñañañique period, it is the alignment of settlements during this period on the pediment along the east bank of the Quebrada de las Damas that confirms the realization for local societies of the existence of this space. It is thus possible to infer that this ample and more elevated area was considered a frontier or transitional space perhaps with sacred connotations representing the unknown, death, or the wild as opposed to the known order of life within the settled area. The Franco Valley is another of the new topograms. This small but vital center began to be embodied during this period by a very small population represented by the Class 4 Settlement 59. A more vibrant human occupation during later periods will further define it as a discrete topogram articulating with other topograms located within it or at its borders. Finally, the last of the new (and overall eleventh) topograms is Cerro Santo Tomé. It is defined by the human occupation at its foothills (Settlement 52) representing a long and continuous occupation during seven periods, by its location at a valley neck between the third and second fertile "pocket" in the middle of the alluvial plain and bordering the *despoblado*, and by its discrete shape visible virtually from any point within the flatlands of the third fertile "pocket". It is apparent that since this period social groups regarded this landscape landmark with special consideration and unlike any other settlement: throughout all occupational periods, it is distant from other settlements, with its closest neighbor located 2.3 km away.

In sum, some conclusions can be drawn from the presence and interplay of the eleven topograms observed thus far. First, the conceptualization of the landscape on the basis of both the life within it and around the topograms builds up from the very first occupation of the study area; second, the possibly differing material, social, and ideological conceptualizations of the landscape between social groups living on or around the pediment and those living on the alluvial plain observed during the Panecillo period are still present; third, a still tenuous but new influence of the massif of Cerro Pilán and its contained topograms is the inception of the breakdown or incorporation of the dichotomy mentioned above; and fourth, the articulation of new topograms in the third fertile “pocket” points to a new landscape conceptualization in this area anchored in two key topograms such as Cerro Santo Tomé and an eight-period occupied *loma* (Settlement 48 during the La Encantada period).

As during the former two periods, the settlement organization and location of the topograms in this period configure a spatial structure that fulfills the characteristics of a Zōfū-Tokusui landscape type. There is no change in the features that define the boundaries, the v-shaped area of the domain, and the overall NE-SW directionality. It should be underscored that the scant occupation at or near the western slopes of the massif of Cerro Pilán and the significance that this and its contained topograms had for these small occupations may be indicative of changes in the overall spatial structure of the landscape within the fourth fertile “pocket” during later periods. In addition, during this period the overlap of the Zōfū-Tokusui and the Sacred Mountain types observed during the Panecillo period continues. Finally, the settlement organization and location of the topograms in the third fertile “pocket” seem to start configuring a new spatial structure (or structures) not articulated (or at least not yet) with those in the fourth fertile “pocket”. It is not clear yet if one or two independent Zōfū-Tokusui landscape types are starting to form; i.e., one that includes the entire third fertile “pocket” including areas on both margins of the Upper Piura River, or rather two separate Zōfū-Tokusui types, one defined by the enclosed Franco Valley on the north margin of the river and another on the south bank that has Cerro Santo Tomé at its apex.

7.7 Settlement and Landscape during the Chapica Period (ca. 300 B.C.-A.D. 300)

During the Chapica period 105 sites were occupied forming a total of 63 settlements in 105.1 ha of occupied area. A settlement size hierarchy divided into four classes is observed in this period. The result of the rank-size analysis is a rank-size graph (Figure 47) that shows three changes in slope defining a four-level hierarchy. Class 1 comprises two settlements (Ranks 1-2) almost similar in area; i.e., 8.26 ha and 8.20 ha, respectively. The difference between these settlements and the largest settlement of Class 2 is over 2.5 ha which is reflected in the gap and abrupt drop in the slope. Class 2 comprises three settlements (Ranks 3-5) ranging from 5.61 to 4.92 ha in size. The gap between the last ranked settlement in Class 2 and the largest Class 3 settlement is slight (0.6 ha) and thus it does not create a clear-cut break in the slope. Yet, this gap does exist as demonstrated below in the frequency distribution of settlement sizes and the *t* tests of significance. Class 3 comprises seven settlements (Ranks 6-12) ranging from 4.32 to 2.61 ha in size. Finally, a more obvious change in the direction of the slope is observed between 2.61 ha (the last ranked Class 3 settlement) and 2.46 ha, the size of the top-ranked settlement in Class 4. Class 4 comprises 51 settlements (Ranks 13-63) ranging from 2.46 to 0.05 ha in size. The number and distribution of Class 4 settlement sizes as observed on the slope escalates the growing tendency of this class group, which already started during the former La Encantada period. The distribution of the four class groups is also observed in the frequency distribution of the settlement sizes as shown in the histogram in Figure 48. Classes 1 and 2 are clearly separated from each other and in turn the gap between the latter and Class 3 is evident. Although there is no gap between Class

3 and Class 4, the higher peaks of the latter as compared to the former definitively set these groups apart.

All independent-samples *t* tests comparing the difference of mean settlement size between Classes 1 and 2 ($t(3) = 9.731$, $p < .05$), Classes 2 and 3 ($t(8) = 4.149$, $p < .05$), and Classes 3 and 4 ($t(56) = 9.781$, $p < .05$) are highly significant (see Tables 12-14 and Figure 49). Finally, the spatial distribution of the classes was plotted as shown in Figure 50.

The settlement organization during the Chapica period is clearly the result of a gradual local process of human occupation and interaction with the landscape understood only after considering the spatial configurations observed during the previous three periods. The settlement configuration during this period also confirms the process of dispersion and stability of the settlement system observed during the former La Encantada period. At the same time, the Chapica period represents a moment of transformation and departure of the settlement system, a transition between the overall settlement configurations of the former three periods, and those of the succeeding five periods. In general, even though there is again more than one Class 1 settlement and barely a difference in the number of Class 2 and Class 3 settlements, there is, however, a striking difference in the number of Class 4 settlements; i.e., 51 settlements representing a growth of 168.4 percent as compared to the former La Encantada period.

There are some significant observations that can be drawn from the settlement pattern distribution and hierarchy during this period. For instance, it is clear now that the ostensible settlement system enfeeblement detected during the former La Encantada period was in fact the beginning of a process of dispersion and growth of the overall settlement and its results are partially observed during the Chapica period. For instance, there are again two Class 1 settlements (Settlements 78 and 79) and one of them (Settlement 79) is a location occupied for the first time during this period. More importantly, however, is the size or increase in size in these Class 1 settlements and hence their component social groups as pointed out below. In addition, during the Chapica period there are three Class 2 settlements (one less than during the La Encantada period) and their number, length of occupation period, and location have important connotations in the sociopolitical organization in this period. Furthermore, there are seven Class 3 settlements (four less than during the La Encantada period) and, similar to the case of Class 2 settlements, this decrease in number is related, for the most part, to the process of dispersion and spawning of new settlements, i.e., new Class 4 settlements. The increase in number of Class 4 settlements is very conspicuous and their distribution points to evident transformations in the sociopolitical organization during this period. In general, the most striking fact is not only the number of Class 4 settlements but the growth and strength of the overall settlement system. In fact, while the total occupied area during the Panecillo and La Encantada periods increased 47.2 percent and 13.5 percent respectively, from the La Encantada to the Chapica period it categorically increased by 176.4 percent.

The Chapica period settlement configuration has important sociopolitical connotations that are worth discussing. First, the aforementioned reinvigoration of the Class 1 settlements points to at least five important facts: 1) a considerable increase in the size of the Class 1 settlements as compared to the former La Encantada period; i.e., the largest Chapica period Class 1 settlement (Settlement 78, in the third fertile “pocket”) increased 47.8 percent in relation to the largest La Encantada period Class 1 settlement; moreover, Settlement 78 (formerly a 2.52 ha Class 2 settlement during the La Encantada period and comprises one site) grew and during the Chapica period is a 8.26 ha Class 1 settlement (an increase of 127.7 percent) and comprised not by one but four sites; i.e., an increase in the component households is very likely; 2) the other Class 1 settlement (Settlement 79) is almost as large (at 8.20 ha) as Settlement 78 and represents a sudden appearance as a first-time occupied settlement considering that only one small Class 4 settlement appeared nearby in the same area (the western slopes of the massif of Cerro Pilán) during each of the two previous periods; 3) the beefing up of the Class 1 settlements (especially of Settlement 79) seems to have taken place to the detriment of the centripetal force of the pediment; i.e., there is no longer a Class 1 settlement at its center and its main components (Settlements 81, 88, and 91) descended to Classes 2, 3, and 4 respectively in the settlement hierarchy; 4) yet again this weakening of the pediment centripetal force is ostensible since, if these main settlements were considered as a unity (they are very close to each other), they in fact reveal a significant occupation (11.02 ha) even larger than the area of the Class 1 settlements; as argued below, the core of the pediment centripetal force, though with no Class 1 settlement, still exerts a significant sociopolitical influence on the overall settlement system; and 5) the reinvigoration of the settlement system is confirmed when again Class 1 settlements or even the core of the pediment centripetal force are somewhat equidistant from each other; i.e., the distance from Settlement 78 to Settlement 79 is 6.9 km and that between the latter and the center of the pediment centripetal force is 5.5 km.

Second, the settlement configuration during this period also shows evidence of the possible persistent conflict between the two centripetal forces within the fourth fertile "pocket". In fact, even though both centripetal forces lost all Class 1 settlements (the centripetal force of the pediment) or even both Class 1 and Class 2 settlements (the centripetal force next to the north bank of the Upper Piura River), and although the gap between them is now occupied by five new settlements (never occupied during previous periods), the clustering of settlements that define these centripetal forces are still discernable. The centripetal force of the pediment grew more conspicuously out of its core area (at the entrance of the Charanal River into the alluvial plain) on the west margin of the Charanal River and especially (and unlike the previous period) closely approaching again the pediment on the north part of the study area. It also expanded slightly towards the southwest and three of the new settlements in the former "gap area" (on the east margin of the Charanal River) seem to cluster with the rest of the settlements of the pediment centripetal force. On the other hand, the centripetal force next to the north bank of the Upper Piura River grew radially not only towards the northwest and southeast as during previous periods, but also towards the northeast (three of the new settlements in the "gap area" seem to cluster with it) and, for the first time, towards the south and southwest even crossing to the south bank of the Upper Piura River and thus initiating the human occupation on areas adjacent to this location[7].

The potential social tension between the two centripetal forces is observed not only in their spatial arrangement but also in the situation of the former "gap area" or corridor. In fact, as mentioned above, a set of two and a set of three settlements in this "gap area" seem to be associated (due to their proximity) with either the centripetal force next to the north bank of the Upper Piura River or that from the pediment respectively. The growth of the cluster of settlements in the centripetal force next to the north bank of the Upper Piura River very likely entailed not just an obvious population increase but also a concomitant increased use of land and water resources needed for their social and biological reproduction. Its two settlements -a Class 3 settlement (Settlement 87) and a Class 4 settlement (Settlement 92) - in the “gap area” may well reflect an attempt for further land and water control. The response of the pediment centripetal force to this expansive attempt by its counterpart was, not surprisingly, predictable. It not only increased its occupied area (and cultivable land) on the west margin of the Charanal River but also on the east bank. In fact, there were three newly occupied settlements in the “gap area”: a Class 2 (Settlement 82), a Class 3 (Settlement 83), and a Class 4 settlement (Settlement 104). Altogether, these three new settlements represent an area of 10.52 ha which is almost twice the combined area (5.83 ha) of the other two new settlements in the “gap area” associated with the centripetal force next to the north bank of the Upper Piura River. The larger area of these settlements compared to the other two is not their only significant feature. Also, their location points to a very direct strategy by the pediment centripetal force to control the now evident expansion of its counterpart. In fact, the settlements next to the east margin of the Charanal River could have further increased the control of the water intake of an incipient gravity-fed irrigation system that started during the former La Encantada period as mentioned in the previous section. That is, the pediment centripetal force would now have not only one (Class 2 Settlement 80, located upstream and occupied since La Encantada period and at 133.5 m asl) but two plugs (Settlements 82 and 83 in the “gap area”) that curbed access to water for irrigation.

These two settlements are situated at the 125 m asl and 126 m asl contour levels respectively and clearly differ from the elevation of the highest settlement (Settlement 87 at 106 m asl in the "gap area") of the centripetal force next to the north bank of the Upper Piura River. This strategy by the pediment centripetal force is also reflected on the increase in size of Settlement 80 (1.5 ha larger than during the La Encantada period) and its concomitant larger social group living at this location since, unlike the former La Encantada period, not one but four sites formed the bulk of this key settlement. In general and as pointed out below, the distribution of the settlements on the pediment or next to it also reflects the potential social conflict between the two centripetal forces.

Third, transformations of the settlement system and its connotations for the sociopolitical organization are also evident by the preferred location for settlements. During this period there is a clear-cut difference in the distribution of settlements. Unlike the former three periods, 18.1 percent of the sites that make up the settlements are located on the ridges or slopes of the pediment or on those of the western foothills of the massif of Cerro Pilán, whereas a categorical 81.9 percent are found on the alluvial plain. This distribution seems to indicate a predominance of social groups (and especially those next to the north bank of the Upper Piura River in the fourth fertile "pocket") settling on the alluvial plain. Still, this transformation, evidently different from the situation during previous periods, is not an indication of any sociopolitical preeminence of the social groups dwelling on the alluvial plain over those on the pediment. In fact, if only the sites on the alluvial plain (n=86) were considered, 39.5 percent are located on the alluvial plain next to the north bank of the Upper Piura River in the fourth "pocket" whereas 37.2 percent are next to the pediment on the west margin of the Charanal River also within the fourth “pocket”. That is, in terms of the number and hierarchy of settlements (in both cases most of them Class 4 settlements) there is an evident balance between the two centripetal forces. An indication of the transformations is found on other distributions observed, though. For instance, on the aforementioned occupation of the “gap area” representing 5.8 percent of alluvial plain sites as well as a significant 17.5 percent within the third fertile “pocket”, almost all of them are on the north margin of the Upper Piura River where only one small Class 4 settlement was occupied during the former La Encantada period. Finally, another indication that the centripetal force of the pediment counteracted the growth of its counterpart is evident in the distribution of its settlements. As mentioned above the growth of the centripetal force next to the north bank of the Upper Piura River was radial whereas that of the pediment was more dispersed (west of the Charanal River) and vector-like. The latter is manifest in the aforementioned projection towards the “gap area” and, more importantly, towards the western slopes of the massif of Cerro Pilán. This trend was already apparent during the previous periods with the tendency by social groups to settle along the slopes of the pediment on the northeastern part of the study area. Yet during this period it is apparent that these settlements as well as those of the core area of the pediment centripetal force reduced their size and some of its inhabitants moved towards the western slopes of the massif of Cerro Pilán. For instance, during this period almost all settlements (formerly Class 3 settlements) along the northeastern section of the pediment became Class 4 settlements while at the same time the sudden rise of the Class 1 settlement on the western slopes of the massif of Cerro Pilán is more than obvious. In other words, the centripetal force of the pediment tried to maintain its preeminence over its counterpart by occupying and encircling a larger area of land within the fourth fertile "pocket". Perhaps this centripetal force created another (or shifted its) center of gravity from the interior valley neck of the Charanal River to a more medial position on the massif of Cerro Pilán to better oversee the social, economic, and ideological activities as well as to keep in check the movement and activities of its counterpart next to the north bank of the Upper Piura River.

Fourth, sociopolitical transformations during the Chapica period are also apparent in the settlement configuration within the third fertile "pocket". The settlements in this area can no longer be considered as "outliers" of the overall settlement system as they were during the erstwhile periods. There are only two settlements on the south bank of the Upper Piura River. These are the formerly and long occupied Class 1 Settlement 78 and Class 4 Settlement 100 that, as argued before, are important for having been the driving impulse behind the first human occupation on the north bank of the river. It is thus in this latter area where changes are more evident during this period. In fact, in the area of Franco there is now not one (as during the La Encantada period) but three Class 4 settlements and a Class 3 settlement. Perhaps it is even more significant that from this (now more populated) area occupation of a formerly unoccupied land to the west was launched. This newly occupied area comprised four aligned Class 4 settlements (Settlements 90, 96, 113, and 120) enclosed between part of the eastern slopes of the massif of Cerro Pilán and the north bank of the Upper Piura River. These four settlements indicate the beginning of a new kind of settlement within the overall settlement system characterized by the human occupation right at the banks of the Upper Piura River. This new configuration is also confirmed by the placement adjacent to both river banks of settlements of the centripetal force next to the north bank of the Upper

Piura River. In addition, these four settlements corroborate once again that independent small groups of households represented by these Class 4 settlements are the pioneers of newly occupied territories. It is not clear yet to what extent the independent sociopolitical dynamics of the third fertile "pocket" were, if so, integrated with that of the fourth "pocket". Still, the location of the aforesaid four new settlements indicates an unprecedented close interaction and exchange of information between the societies settling at both fertile "pockets". In fact, these four settlements had, literally right around the corner, the only Class 1 settlement of the fourth fertile "pocket". Also, as argued below, they played a key role in a new interaction network that used both banks of the Upper Piura River as a main route.

Finally, transformations in the settlement configuration during this period also point to changes or an increase in the interregional interaction the study area had with other areas. Previous investigations mostly based on pottery stylistic analyses (e.g., Guffroy 1994; Hocquenghem and Kaulicke 1995) have claimed that interregional interaction with various ethnic groups from the north, east, south, and west took place since very early in time (i.e., the Formative period). As the settlement distributions in this dissertation research have shown, during the former three periods the interaction with the west, north, and possibly the east and south also followed the route along the pediment. During the Chapica period, however, interregional interaction, especially to the west with the littoral and the Lower Piura Valley, increased following the aforementioned route along the banks of the Piura River. As mentioned above within the study area this new route is represented by the appearance, for the first time, of new settlements along both banks of the Upper Piura River at both the fourth and third fertile "pockets". In this sense, the four new settlements that emerged in the third "pocket" between the north bank of the river and the eastern slopes of the massif of Cerro Pilán played a key role. They are indeed at the juncture of both main interaction routes; i.e., the one coming from the north and northwest via the pediment and the western slopes of the massif of Cerro Pilán, and the one coming from the west along the banks of the Upper Piura River. Furthermore, they were also an important node that connected the societies in the fourth pocket and beyond with social groups from the North Coast that arrived from the south following the pediment of the Andes flanking the *despoblado*. At least three of these four sites have long occupations that go from the Chapica through the Chimú or even Inca periods thus supporting their strategic location and the key roles they played in the interregional interaction of the local polities in the study area.

In sum, the process of dispersion and stability of the settlement system initiated during the former La Encantada phase continued during the Chapica period showing some evident transformations. There is once again a four-tier settlement hierarchy with at least two Class 1 settlements which had areas considerably larger than former Class 1 settlements. Also, this process indicates an obvious population growth reflected in the highest percentage (156.1 percent) growth of sites by period of the entire prehispanic sequence as well as an unprecedented increase (176.4 percent) of the total area occupied compared to that of the previous three periods. An obvious result is the expansion of the two centripetal forces and thus the continuing potential social tensions among them revolving around the control of land and water resources or even of interregional interaction routes. The centripetal force of the pediment sought to maintain preeminence over its counterpart by a vector-like expansion down the Charanal River and Quebrada de las Damas. It tried to control not only a larger area of land than before, but also approaching the new interaction route along the banks of the Upper Piura River. This route was connecting social groups coming from the south, passing through the third fertile “pocket”, and interacting with those on the centripetal force next to the north bank of the Upper Piura River in the fourth “pocket”. These changing configurations were only possible with the new settlement organization that was forming in the third fertile “pocket”, pointing to an incipient integration of both “pockets” within the overall settlement system that will be clearer during later periods.

During the Chapica period an increasing interaction between the settlement system and the topograms is perceived. All 11 topograms presented thus far are still viable and some of them even better defined by the new landscape configurations of this period. Moreover, there are five new topograms, all of them materialized directly or indirectly through their relationship with a topogram already existent during the former La Encantada period.

The *lomas* and spurs with long occupations continue to give a sense of place to the landscape, transforming and incorporating previously unoccupied areas. The number of long occupation sites (from six to eight periods) even increased from 20 to 36 in relation to the former La Encantada period; yet since the overall number of sites also grew conspicuously during the Chapica period, these long occupation sites represent 34.3 percent (see Table 23) of all the sites, unlike the 48.8 percent during the La Encantada period. Among the 36 long occupation sites, 16 are new; in turn, from these 16 sites, six were formerly occupied during either the Ñañañique or Panecillo periods (or both) reappearing during the Chapica period, and 10 are sites occupied for the very first time.

A significant aspect of these newly occupied long occupation sites is that they continue emerging all over the study area; i.e., at both fertile "pockets". For instance, Sites 21, 22, 26, and 62 in the settlement cluster next to the north bank of the Upper Piura River; Sites 21 and 22 are settlements or part of settlements located on an area in which the centripetal force next to the Upper Piura River had spread; Site 62 is adjacent to another long occupation site (since the La Encantada period); and Site 26 together with two other sites constitute one of the three Class 3 settlements (all of them with long-occupation sites since the Panecillo or La Encantada periods) of this centripetal force found very close to each other and confirming that this is the core of this centripetal force and with a deeply rooted sense of place. Also, Sites 14 and 40 in the "gap area" that, interestingly enough, are associated with the centripetal force next to the north bank of the Upper Piura River and that on the pediment respectively. Moreover, Site 147, which is the main component of Class 1 Settlement 79 on the western slopes of the massif of Cerro Pilán, and that, as explained below, further consolidates the interaction between other topograms. In addition, long occupation sites in the third fertile "pocket" such as Site 210 (a component of Class 1 Settlement 78), Site 167 (on the north bank of the Upper Piura River in the transition zone between the fourth and third "pockets"), and Site 196 (in the Franco Valley) further imprint the sense of place not just by their mere presence but via the constant walking towards and from them indicate the beginnings in this period of a buoyant sociopolitical activity in the area.

The underflow and the valley neck of the interior delta are evidently still part of the landscape conceptualization. Unlike the former La Encantada period, there is even an apparent further perpetuation of the underflow. Yet this phenomenon might just be a reflection of the struggle for social, political, and ideological influence between both centripetal forces. True, life around these topograms will last, to some degree, until very late in prehispanic times but, as pointed out below, the embodiment of these landscape elements began to attenuate during the Chapica period as other topograms and the relationship between them and with the human population start to become the focus around which life revolve.

Among the topograms that became major focuses during this period is the already present massif of Cerro Pilán and the other topograms contained by it, such as its triangular pyramid-shaped summit and the *Boliche*, the *Peña*, and the *Chorro*. It is thus not a surprise that the stronger connection between the divine connotations of the pyramid-shaped summit, the *Peña*, the *Boliche*, the *Chorro*, and their essence as a source of life, is reflected in the fact that the very first major human settlement (Class 1 Settlement 79 composed of at least one long occupation site) is located right below the *Boliche*. The strength of the massif of Cerro Pilán and its comprising topograms could also be understood as a response to the now manifestly pulsating Cerro Vicús topogram. In fact, by this period the Cerro Vicús is clearly a center, focus, and an attraction force of the centripetal force next to the north bank of the Upper Piura River. In addition, if an east-west interaction route along the banks of the Piura River was established during this period as argued above, it would not be a surprise that Cerro Vicús became an obvious landmark (at the border of the route between the *despoblado* and the alluvial plain) and object of reverence and pilgrimage.

Another abiding topogram from the former La Encantada period is Cerro Santo Tomé in the third “pocket”. As argued before this is a very important landscape feature yet the still scarce occupation of the south bank of the Upper Piura River (where it is found) indicate that its influence was not felt as much as it was during later times. Similar to Cerro Vicús, its location nonetheless also points to its significance as a landmark along the interaction route the linked the study area with the south flanking the *despoblado* and the Andean pediment. Also continuing from the La Encantada period are the No-Man's (or Woman's)-Land and the Franco Valley topograms. These topograms, which during the La Encantada period appeared somewhat isolated from the rest of the landscape configuration, became better defined and articulated during this period due to both the relevant role that the massif of Cerro Pilán started to play, and the articulation with the new emerging topograms.

There are five new topograms and they are the meanders, the Cerro Franco, the Quebrada de Franco, Cerro Venado, and Cerro Piedra Blanca, all of which have been presented in the topogram description section above. All of these topograms border or are contained within the Franco Valley and thus life around the latter and movement through it articulate and define them. Another important aspect of this new configuration of topograms is that for the very first time there is evidence of an articulation between the topograms of the fourth "pocket" and those in the third (at least those found on the north bank of the Upper Piura River) and thus perhaps reflecting the inception of a social, political, and ideological integration.

It is therefore evident that by this period the Franco Valley was the embodiment of a discrete social entity well embedded into the social memory of the population dwelling in the third fertile "pocket" or even in the fourth "pocket". The Franco Valley contains the people facing the wild uninhabited side of the massif of Cerro Pilán, the people separated from the population of the fourth "pocket" by the mysterious and mystic No-Man's (or Woman's)-Land, the people that feared the furious and roaring Quebrada de Franco that from time to time cut through the latter washing it down but that at the same time protects them, the people also protected by the Cerro Piedra Blanca which separates them from the second fertile "pocket", the people that can only be accessed, from the east, through the neck formed by the northern tip of Cerro Piedra Blanca and the southernmost tip of the Andean pediment and passing through Cerro Venado as a natural checkpoint, and finally, the people that can only be accessed, from the west, through the also natural checkpoint created by the juncture of Cerro Franco, the southern end of Quebrada de Franco draining into the river, and the north bank of the Upper Piura River. This checkpoint connects the Franco Valley with the meanders. The meanders will become a critical topogram serving as the backbone of social interaction in the study area. The meanders are in fact not only essential for the economic and social welfare of the population but also they overlap with the east-west interaction route that followed the banks of the Upper Piura River. The meanders and its *playas* thus attracted population from the study area and beyond becoming the venue of social and economic interaction and the locus of domestic and mundane activities and festivities and as such remained embedded in the social memory of the local population. With its shallow waters easy to ford and its cultivation fields and people dwelling around them they were also regarded as the natural bridges to cross the Upper Piura River and thus vectors of information exchange.

In sum, the interplay of the16 active topograms presented thus far indicates several things. First, the conceptualization of the landscape continues to mirror a gradual process of interaction between local populations and their natural surroundings; second, the existing social and ideological dichotomy between both centripetal forces is represented by the seemingly equal drawing power exerted by both the Cerro Vicús and the massif of Cerro Pilán and its comprising topograms; third, at the same time the conspicuous presence and role of the massif of Cerro Pilán and its central position in the fourth "pocket" point to the continuing process of social, political, and ideological integration of the population of both centripetal forces; fourth, the hitherto nebulous landscape configuration(s) of the third "pocket" started to reveal itself with the discrete presence, on the north bank of the Upper Piura River, of the Franco Valley and its interlinked topograms connected to the rest of the conceptualized landscape via the meanders; and fifth, the topograms of the third "pocket" on the south bank of the Upper Piura River (i.e., Cerro Santo Tomé and especially the long occupation *lomas* of Settlement 78) remain relatively isolated although their location at the limits of the overall landscape configuration underscores their significance.

The settlement organization and location of the topograms in this period mirroring the outlined spatial transformations (with concomitant social, political, and ideological connotations), configure a new spatial structure of the landscape. This new spatial structure in the fourth "pocket" still fulfills the characteristics of a Zōfū-Tokusui landscape type yet it reveals changes in orientation and in the features that define the boundaries, directionality, and the domain. The new spatial structure changed its axis and the new orientation is SE-NW. The area of the domain now is u-shaped and has as its borders the massif of Cerro Pilán at the base of the "U", and two lateral sides; the Andean pediment to the north and the *despoblado* to the south. The directionality (SE-

NW) is given by the smooth slant of the alluvial plain (the domain), the direction of the western slopes of the massif of Cerro Pilán, and the course of the Upper Piura River. Moreover, the overlap of the Zōfū-Tokusui and the Sacred Mountain types continues during this period even more manifested as reflected in the evident role as focus and center of both the Cerro Vicús and the massif of Cerro Pilán.

Unlike the former La Encantada period, there is now a discrete spatial structure of the landscape on the north bank of the Upper Piura River in the third fertile "pocket". There is a Zōfū-Tokusui landscape type defined by the enclosed Franco Valley. Similar to the fourth "pocket" it also has a u-shaped domain but smaller, and has as borders the Cerro Piedra Blanca at the base of the "U", and two lateral sides; the Andean pediment to the north and the north bank of the Upper Piura River to the south. The directionality is also SE-NW and is provided by the slope of the alluvial plain and the course of the river. Yet unlike the spatial structure of the fourth pocket, this one is not open at its northwest end but closed and flanked by the Quebrada de Franco. There is also an overlap with the Sacred Mountain type since the massif of Cerro Pilán and especially the view of its pyramid-shaped summit from the Franco Valley is very conspicuous. Finally, the spatial structure in the south bank of the third "pocket" is still difficult to discern. The important presence of Cerro Santo Tomé, a landscape landmark with intrinsic directionality, has characteristics that confer upon it a somewhat divine and mystical aura, and although it does not have the features that define a Sacred Mountain type, reverence towards it should not be ruled out. It rather matches the features that characterize the Domain-Viewing Mountain type but it cannot be said yet that such landscape type was present during this period because no human presence on its summit has been recorded.

7.8 Settlement and Landscape during the Vicús Period (ca. A.D. 300-A.D. 700)

During the Vicús period 134 sites were occupied constituting a total of 75 settlements adding up to a total of 129.2 ha of occupied area. A four-class settlement size hierarchy has been observed for this period too. The rank-size plot (Figure 51) shows three changes in the slope. Class 1 comprises three settlements (Ranks 1-3) ranging from 9.78 to 8.21 ha in size. The difference of 2.6 ha between the smallest Class 1 settlement (8.21 ha) and the largest Class 2 settlement (5.61 ha) is manifested in the large gap and abrupt drop in the slope. Class 2 comprises seven settlements (Ranks 4-10) ranging from 5.61 to 3.97 ha in size. The top three settlements of this class have almost exactly the same size and thus create a small plateau in the slope but give a false impression of an abrupt change within it. The size difference between the last ranked settlement in Class 2 and the largest Class 3 settlement is very small (0.2 ha) and thus there is only a tenuous change in the slope between these two groups; the gap is not very discernible in the frequency distribution of settlement sizes either, yet the difference between these classes is significant as demonstrated in the *t* tests of significance (see below). Class 3 comprises eight settlements (Ranks 11-18) ranging from 3.73 to 2.41 ha in size. Finally, there is a more obvious change in the slope direction between Class 3 and Class 4. Class 4 comprises 57 settlements (Ranks 19-75) ranging from 2.08 to 0.01 ha in size. The distribution of the four class groups is also represented in the frequency distribution of the settlement sizes as presented in the histogram in Figure 52. There are gaps among the sizes in Class1 and Class 2 themselves but they are not statistically significant. Also, as mentioned before, the histogram does not present an evident separation between Classes

2 and 3. Finally, although with no gap visible, the higher peaks of the number of settlements grouped in Class 4 set them clearly apart from those of Class 3.

All independent-samples *t* tests comparing the difference of mean settlement size between Classes 1 and 2 ($t(8) = 7.194$, $p < .05$), Classes 2 and 3 ($t(13) = 5.260$, $p < .05$), and Classes 3 and 4 ($t(63) = 9.549$, $p < .05$) are highly significant (see Tables 15-17 and Figure 53). Finally, the spatial distribution of the classes was plotted as shown in Figure 54.

The settlement organization during the Vicús period reflects the end of a moment of transition detected during the Chapica period, which in turn is understood as a long and gradual process of spatial organization and rearrangements initiated by the local populations since the very first period of human occupation. The settlement organization during this period thus represents the consolidation of the process of dispersion and stability (i.e., a process of landscape embedding and efforts of social and biological reproduction by local polities without apparent foreign political or militaristic disruption) observed during previous periods. An obvious result of this transformation process is the existence, for the very first time, of clear evidence of the sociopolitical integration of both the fourth and third fertile "pockets".

This transformation process and other important observations can be elicited from the settlement pattern distribution and hierarchy of this period. In general, one of the most conspicuous features reflecting the end of this transformation moment is the clear slowdown in settlement growth. In fact, the total area occupied also increased (23 percent) during this period, yet it nonetheless pales when compared to that observed during the former Chapica period (176.4 percent). Obviously this phenomenon is also reflected in the change in the number of sites constituting the settlements. Unlike the growth of sites noticed during the former Chapica period (156.1 percent), this period witnesses an increase of only 27.6 percent.

The end of this transformation process is also observed in the number, size, and location of the settlements in the settlement hierarchy. There are again three Class 1 settlements equidistant from each other. Settlement 141 on the western slopes of the massif of Cerro Pilán is found 6.7 km away from Settlement 142 (on the third "pocket" adjacent to the *despoblado*) and 6.8 km from Settlement 143 in the Franco Valley whereas the latter in turn is located 7.0 km away from Settlement 142. Other issues related to these Class 1 settlements worth pointing out are, for instance, the growth in size of these settlements; i.e., 18.4 percent in reference to the largest Class 1 settlement during the former Chapica period that is not as dramatic as the growth witnessed during the Chapica period (47.8 percent) indicating, once again, that at the end of the transformation a plateau in the increment of settlement size was reached. In addition, as explained below, the Class 1 settlements during this period represent a change in the axis of sociopolitical organization in the study area. Also, it is important to underscore that while Settlements 141 and 142 were already present during the Chapica period, Settlement 143 is a new mid-occupation (four or even five periods) settlement playing an important role in the settlement organization until the end of the prehispanic occupation of the study area.

The plateau in settlement size growth is perhaps more evident in the other class size settlements. In fact, unlike the Class 1 settlements, the mean settlement size of Class 2, Class 3, and Class 4 settlements during this period is slightly smaller than during the

Chapica period (see Tables 13-18). The number of sites by class, on the other hand, grew slightly as compared to the former Chapica period, with the aforementioned additional Class 1 settlement, four more Class 2, one more Class 3, and six more Class 4 settlements. The latter demonstrates that the manifest growth of Class 4 settlements observed during the Chapica period is no longer evident during this period and thus further indicates the end of the transformation moment. As will be evident later in this chapter, the culmination of this moment of transformation does not imply the hindrance of settlement growth during later periods. The number of settlements continued growing although not at the same rate as observed between the Chapica and Vicús periods. Yet, the settlement sizes, distribution, and location during the Vicús period represent the most stable, balanced, and homogenized moment of the settlement system of its entire prehispanic human occupation.

The end of this transformation moment and the correlated settlement configuration observed during this period has important sociopolitical implications. First, the role and significance of Class 1 settlements is not reflected in their size as mentioned above; this is also corroborated when the number of component sites is considered. For instance, both Settlements 141 and 142 kept the four constituting sites from the former Chapica period while the new Settlement 143 is composed of only two sites (one of them markedly larger than the other). The role and significance of the Class 1 settlements resides, rather, in the change of the sociopolitical axis that their location and distribution represents. In fact, during this period the three Class 1 settlements form a triangular-shaped axis creating a vortex around which the settlement system is drawn[8]. This means that by this period three new centripetal forces were created, all of them being a result of the long process of local social and political arrangements.

These new centripetal forces are: one on the western slopes of the massif of Cerro Pilán; on the border between the *despoblado* and the alluvial plain in the third "pocket" on the south bank of the Upper Piura River; and one in the Franco Valley. Although both the centripetal forces next to the north bank of the Upper Piura River and that of the pediment in the fourth "pocket" still seem to exist (with important population concentrations at their cores), they are nonetheless linked to that on the western slopes of the massif of Cerro Pilán. The latter, on a location overseeing the entire fourth "pocket" and found along the major communication route on the pediment, actually links the settlement system of the fourth "pocket" with the third one. The centripetal force at the border between the *despoblado* and the alluvial plain in the third "pocket" on the south bank of the Upper Piura River has its origins during the Ñañañique period. Yet it is only during this period that it started developing an obvious attracting force with lower hierarchy settlements radiating from it. This centripetal force is also the counterpart to that on the north bank of the river and located in the Franco Valley. The latter becomes the focus of the settlement organization in this area and was very likely an important social and political locus interconnecting the settlement system with that of the second fertile "pocket". Altogether, these centripetal forces represent the new axis of sociopolitical organization in the study area and are evidence, for the first time, of some level of sociopolitical integration between the two fertile "pockets".

Second, the preeminence of the centripetal force on the western slope of the massif of Cerro Pilán also indicates the sociopolitical consolidation of the fourth "pocket" and thus the cessation of potential social tension between the centripetal force of the pediment and that next to the north bank of the Upper Piura River, a conflict represented by the “gap area” observed during previous periods. In fact, the “gap area” now comprises of eight settlements (three more than the previous Chapica period) of which three (Settlements 178, 193, and 211- all Class 4) are occupied for the very first time. It is worth indicating that these three new settlements are all within the realm of the centripetal force of the pediment; furthermore, two of them are even close to the centripetal force of the western slope of the massif of Cerro Pilán represented by Class 1 Settlement 141. In other words, the space of the “gap area” is now blurred and not as evident as during previous periods. This phenomenon is most likely explained by the role of an attracting effect that the western slope of the massif of Cerro Pilán had as a centripetal force over both centripetal forces also in the fourth “pocket”.

The integration of both centripetal forces of the fourth “pocket” under the aegis of the one on the western slope of the massif of Cerro Pilán is also suggested by a better organization of the hypothesized gravity-fed irrigation system (see sections above). In fact, during this period an alignment of four Class 2 settlements traversed the fourth “pocket” in a northeast-southwest direction. One of these sites (Settlement 145) is located next to the core of the centripetal force of the pediment and was occupied since the La Encantada period, two (Settlements 148 and 144) are found in the former “gap area” and were occupied since the Chapica period, and the fourth one is located at the core of the centripetal force next to the north bank of the Upper Piura River and is also a long occupation (seven periods) settlement occupied since the Panecillo period. Also, as observed during the former periods, these settlements are located at elevations above the majority of their adjacent or surrounding settlements (all of them either Class 3 or Class 4 settlements) and thus could be considered as the plugs that controlled the management and distribution of water for irrigation. This settlement arrangement together with the continuing population growth (although not at the same rate as during the Chapica period) thus point to a better organization of agricultural production that in turn reflects a better understanding among the social segments that constituted the population of the fourth "pocket". Ergo, a more blurred "gap area" and a better integration of both centripetal forces under the new centripetal force on the western slope of the massif of Cerro Pilán reflect the sociopolitical integration of the fourth "pocket" that in turn is interlocked with the settlement organization of the third "pocket" as mentioned above.

Third, the end of the transformation moment and sociopolitical integration of the fourth "pocket" and overall settlement system is also reflected in the preferred location of the sites constituting the settlements. In fact, this period and the former Chapica period shared a similar distribution of sites on the landscape. That is, 13.4 percent (18.1 percent during Chapica) of the sites are located on the ridges or slopes of the pediment or on those of the western slopes of the massif of Cerro Pilán, whereas 86.6 percent (81.9 percent during Chapica) are found on the alluvial plain. In the previous section on the Chapica period I pointed out that this distribution favoring the social groups living on the alluvial plain did not imply the preeminence of the latter over those dwelling on the pediment or areas adjacent to it. Rather, I argued that the distribution was evidence of the counterbalance in action between the two centripetal forces and even with a slight preeminence of the social groups inhabiting the pediment or surrounding areas.

These counteractive forces seem to have no longer been in place during the Vicús period. True, if only the sites located on the alluvial plain (n=116) were to be considered, it is clear that the number of sites on the alluvial plain next to the north bank of the Upper Piura River (35.3 percent) is larger than those on the alluvial plain next to the pediment (25.0 percent). Yet, as observed during the Chapica period, most of the sites on the "gap area" (8.6 percent) spun off from the pediment and thus the number of sites associated with the pediment centripetal force (around 33.0 percent) would almost balance the percentage distribution of sites clustered around the north bank of the Upper Piura River.

It has yet to be considered that by this period there is a larger concentration of sites on the south bank of the river associated with the centripetal force next to the north bank of the Upper Piura River whereby it would increase its percentage distribution over 35.3 percent. Yet, as stated before (see Endnote 7), these sites on the south bank of the river during the Chapica and Vicús periods constituted mostly Class 3 and Class 4 settlements. That is, the centripetal force next to the north bank of the Upper Piura River, although with a larger number of constituting sites, was counterbalanced by the larger and more important settlements in the hierarchy (four Class 2 settlements) of the centripetal force of the pediment. In other words, in terms of their distribution over the alluvial plain in the fourth "pocket", both centripetal forces seem to have been neutralized as also evidenced in the more blurred space of the "gap area" as explained above. The settlement system in the fourth "pocket" was therefore very likely organized around the centripetal force of the western slope of the massif of Cerro Pilán as the new gravitational force.

The distribution of sites also shows the crystallization of the settlement transformation in the third "pocket". Occupation on the north bank of the Upper Piura River in the meanders and the Franco Valley grew considerably, amounting to a total of 20.7 percent of all the sites located (in both "pockets") on the alluvial plain. Obviously, the increase of sites in this area is not the only important fact that has to be underscored. More important perhaps is that this increment was accompanied by a more complex arrangement in the settlement hierarchy. Indeed, while during the former Chapica period only Class 3 and Class 4 settlements were present in this area, in this period, settlements from all four classes shaped the social and spatial dynamics with an apparent separation between Class 1 and Class 2 settlements. The increase in the distribution of sites on the south margin of the river in the third "pocket" is also evident. Here the sites represent 10.3 percent of all the sites found on the alluvial plain, which is a considerable increment if compared to the 4.7 percent observed during the former Chapica period. In addition, a settlement configuration as complex as that on the north margin, is not detected. There is only one Class 1 settlement (composed of four sites) and four Class 4 settlements (composed of one or two sites) that are satellites of the former. Finally, unlike what happens in the fourth "pocket" or on the north bank of the river in the third "pocket", the distribution of sites and settlement hierarchy on the south bank of the river in the third "pocket" shows that the settlement organization in this area did not reach its maturity during the Vicús period. Nevertheless, this area when considered within the context of the whole settlement system in the study area is clearly not isolated but incorporated into it.

Fourth, the settlement configuration during the Vicús period also indicates that the end of the transformation moment was accompanied by the consolidation of the regional interaction network that linked the study area with regions and ethnic groups to the west, north, east, and south. As mentioned before, this interaction network was well under way during the former Chapica period if not earlier. Clearly, the input of this interaction contributed to the bloom of the settlement organization during the Vicús period, reflected in the increase of human occupation along both banks of the Upper Piura River and on the population increase and sociopolitical complexity observed in the third "pocket". In fact, the settlements (four Class 4 settlements) between the north bank of the river and the eastern slopes of the massif of Cerro Pilán that started playing a key role in this interaction network during the Chapica period show an evident transformation. That is, a Class 2 (of a total of two) and the sole Class 3 settlement of the third "pocket" emerged in this area during this period. Clearly, its function as a transitional zone between both fertile "pockets" contributed to their growth and insertion into the overall sociopolitical complexity of the settlement organization. Very likely a bidirectional flow of information and goods between the societies inhabiting the study area and others such as the Mochica polity (or polities) to the south (in the Northern North Coast) had an effect on the lives of the people during this period. Yet, as discussed in the next chapter, the supposed impingement by the latter polity (or polities) could be interpreted in various ways.

Finally, another significant sociopolitical implication is related to the nature of the sites that constitute the hierarchy of the settlements and especially those of Class 1. By now it is very evident that the importance of the settlements in the hierarchy does not reside in their size, volume, or architectural characteristics but on the horizontal accretion of similar type of sites. Until now, there is not a single site that stood out (including the Class 1 settlements), by its physical characteristics, as the reflection of a powerful centralized administrative authority embodied in the place of residence of a single or of a small group of paramount chiefs. For instance, Class 1 Settlement 141 has three sites composed of low stone walls or wall foundations for wattle-and-daub structures on a ridgetop and one small simple mound that is actually the projection of the ridgetop at the foothills of the massif of Cerro Pilán; Class 1 Settlement 142 comprised one platform mound and three extended mounds; and Class 1 Settlement 143 is composed of one small platform mound and a very large (and low) extended mound. On the surface of the latter (the main component of this settlement) a great deal of burnt fragments of wattle-and-daub structures and domestic pottery was observed. In other words, significance in the settlement hierarchy (and what the size of the settlement represents) is marked not by the "monumentality" of the component sites but most likely by the number (and the prestige and respect gained) of the households inhabiting these sites. The reputation of these households could lie, among other factors, on their longevity and thus their strong sense of place and of ancestor origins; on their kinship ties with lower level settlements that spawned out of these Class 1 settlements; on their spatial placement within the new settlement order during this period; or on a combination of these factors.

In sum, the process of settlement transformation heightened during the former Chapica period ended during the Vicús period. This does not mean that the settlement organization froze in time from this moment on until the end of the prehispanic period. Rather, it does mean that the Vicús period marks the end of what could be called an "old system" of settlement configuration and the beginning of a "new system". That is, from the Vicús period on, changes in the settlement organization will be characterized by spatial rearrangements based on the settlement configuration observed during this period. This period is characterized by the formation of a new axis of sociopolitical organization that has at its core a vortex composed of three new centripetal forces. Also, this new spatial configuration and the preferred location of settlements is characterized by evidence (for the first time) of a certain degree of sociopolitical integration of the entire study area (both fertile "pockets"), the conspicuous sociopolitical consolidation of the fourth "pocket", and an evident sociopolitical complexity in the third "pocket". In addition, the end of this transformation moment is associated with the consolidation of the regional interaction network. Finally, by the end of this period it is also manifest that the importance and hierarchy of the settlements is marked not so much by the architectural "monumentality" of sites but by the number, longevity, and perhaps prestige of the inhabiting households.

It is not a surprise that the maturity of the settlement system reached during the Vicús period was also accompanied by a peak in the system of topograms. In fact, during this period no new topograms appeared and thus the 16 topograms already present during the Chapica period are still viable and interacting. In this sense, it is important to point out that 16 of the 19 topograms defined for the landscape of the study area were already present and probably active during and by the end of the Vicús period. It is also important to indicate that the appearance and complexity of the system of topograms occurring during this moment of transformation between an "old system" versus a "new system" is very likely paralleled by some changes and transformations in the belief systems of the local social groups. Indeed, a hint to these transformations is suggested by the type of pottery style. In general, it is evident that the pottery style during the "old system" (Ñañañique, Panecillo, and La Encantada periods) was representative but geometric (e.g., Guffroy 1989; 1994; Kaulicke 1998) whereas during the transition to and the early "new system" (the Chapica and Vicús periods respectively and beyond) the art style was more representative but figurative (e.g., Kaulicke 1991; Makowski, et al. 1994). It would not be too far-fetched to argue that by the Vicús period, after a significant population growth during the Chapica and Vicús periods, and a far more sedentary way of life relying heavily on agricultural production, a more cohesive belief system was consolidated. This belief system would have been characterized by both a more integrated conceptualization of the landscape embodying the social, economic, political, and religious order of the local people, and by the incorporation of foreign beliefs, values, or symbols acquired through the pervasive exchange of information that characterized the extensive interaction network already well established by this period.

Instead of elaborating on the interacting topograms during each period as I have done in the previous sections, I think it is time to reconstruct a more vivid picture of the landscape by painting (figuratively speaking) an allegory. It is early June in the Upper Piura Valley and the winter solstice is coming very soon. This means that the harvest time is well under way too and thus life in this part of the valley is more lively than usual. Men, women, and children move and walk at a faster pace than normal, the excitement flows in the air. They know it: as every year and as part of their calendrical cycle, these are weeks of festivities, times to remember those gone and to celebrate their memory by the rebirth or birth of any new life; fun, sorrow, laughter, tears, drinking, eating, parties, and rituals. The work is hard but the expectations are worth it.

The festivities of this time of the year are famous not just in the area but beyond. The fresh and delicious crops from these fertile lands are well known as well as the other exotic products and goods that arrive to this natural trading outpost especially during this time of the year, and the *chicha* is superb. Different kind of visitors are therefore expected, from the west, north, east and south; some are coming for the very first time accompanying other already familiar faces; some are regulars that thanks to hundreds of years of constant barter have developed amicable and even blood ties with local households.

The noise of firewood thrown on the ground, dogs barking, and voices are heard in the dark night well before dawn; the moonlight is not bright enough to draw the silhouette of people getting in and out of the adobe and wattle-and-daub (*quincha* or *bahareque*) homes, lighting the wood fires, going down the slopes of the pediment and *lomas* onto the sandy trails. Some men and children have already left to several points of the four corners for their shift in feeding the bonfires that, like lighthouses, show the path and greet the visitors entering the valley. From these high places the sight is breathtaking and soothing at the same time; down there in the valley amid the *algarrobo* forest the hearths in kitchens and patios turning on and off glow or dim like wooing fireflies.

Right before dawn and after following the stars and the light of the bonfires for a few hours, the visitors (and locals returning home) finally spot the majestic triangular-shaped silhouette of Cerro Vicús and that huge block like a dark curtain falling from the sky that is the massif of Cerro Pilán and its pyramid-shaped summit that, as if it were the head of the massif, oversees the life down in the valley. People walking and leading small loaded llama caravans start entering the valley from all four corners. They wear thick layers of cotton garments that keep them warm during the cool nights and early morning hours of the *despoblado* during this time of the year. These layers of clothing will be shed later in the day when the scorching sun starts to heat the soil, or shed altogether while refreshing themselves and having fun at the *playas* of the meanders, or at the shallow ponds adjacent to the household mounds still filled up with water from the last rainy season.

The sun is already up and as one enters into the valley proper and arrives at home or at those of the hosts, it is impossible to miss the sounds and smells that constitute the daily landscape and life of the people. As one ascends the mounds or the slopes of the pediment one is hailed by the clear blue smoke of a hearth drifting through the *quincha* and *bahareque* walls of the houses placed on the upper slopes or the summit of the mounds. Greeting voices and other utterances are heard from behind the *pájaro bobo* walls from mouths that you cannot see yet. After the welcoming greetings, the chat and meal offered along with water and fodder for the llamas in the corral, one is prepared for a deserved rest. Under the shadow of an *algarrobo* and lying on the floor cushioned with deer hides and reed mats or in hammocks and just before falling asleep, the voices and laughter of men and children arriving are heard. Some of them are returning home with Muscovy ducks caught early in the morning in the swamps of the underflow. The ducks in hand and still quacking will be put in small corrals as their purgatory. Some of them are quacking relentlessly as if knowing their fate; they will be slaughtered soon for the upcoming feasts and some others, luckier than the latter, will be kept for a later time or even perhaps as pets. The resting eyelids are half way down but still one can hear somebody breathing heavily while, stone knife in hand, he or she butchers a deer hunted during the early hours too; a deer that fatally ventured into the lower slopes of the pediment. The fresh and still warm flowing blood can be smelled; it is collected in gourd containers, part of it drunk by the household members, part of it ritually spilled on the floor, and the rest used in meal preparation. The tired eyelids are three quarters down already but sounds are still perceived. The hands are feverishly grating corn and manioc; some of the pottery graters are already badly worn and some of them even break and the clink of the thrown broken fragments are heard hitting the trash pile; the harmonious rattle of a weaver and her strap loom attached to a *algarrobo* beam on the patio nearby, as she tries to finish cotton garments and carrying bags, gifts that friends and families will take with them upon their departure; also children on the patio playfully dig up last years' shallow pits that once again will be used to settle the large *tinajas* where the *chicha*, after being boiled, will rest until it is ready to be drunk. The tired body has now shut its eyelids almost completely; the skin on the face and the hair start feeling the first caressing breezes of the *terral* under the *algarrobo*, and the smell of the boiling corn begins to sink in the soul and the sounds disappear. An unavoidable dream lurks behind the resting body that now sees itself apprehensively climbing the lavishly forested slopes of the massif of Cerro Pilán in the middle of the night; the climb turns to flight and the dreamer realizes that now, at the pyramid-shaped summit, he has become a flying ant immersed within the cloud of an ant colony that are now battling and performing a nuptial flight.

The breeze of the *terral* has intensified late in the afternoon; awakened by it and remembering the dream, one laughs and wonders at the same time; the ant has become a man again. The restorative nap brings energy back and thus an eagerness to walk to other mounds and visit people of the same household or of other nearby households. As the walk starts, a bath of now attenuated sunrays from the west goes along with the footsteps. They are not warm enough to interfere with the comfort brought by the wind of the *terral*, but they are bright enough, with their orange and reddish hues and contrasting shadows, to highlight the shapes of trees, mounds, and hills. They accentuate the intensity of the fire coming from one of the houses being visited now. In this series of houses similar tasks as those on the house where the nap was taken are being carried out. Unlike the other families though, this one has a mound that includes a compound –where there is an intense fire not seen in the other ones. Also made with *pájaro bobo* sticks and mud, the walls of this compound, unlike the houses, subdivide the space into more, smaller, and interconnected rooms. Beside these rooms at the end of the mound and away from the living area, there is an open space where the firing is burning. This is the workshop of a potter and also the head of one of the households. Although very close to the living areas, the entrance is restricted to other adults or children who are not the potter and his apprentices, especially when they are working. In the workshop and especially during this time of the year there is a quiet, peaceful, and almost mystical atmosphere in which the tasks are ritually performed. This is especially true while manufacturing those special pieces that are either conceived by the potter or requested by a patron and will take part of the potter's soul when they are taken far away as gifts to the visitors or to the other world as offerings to the dead that every year are venerated and reburied. In this almost ritual performance, the hands of the potters mold the clay with muscles not used for other activities and body movements akin to a slow dance, the delicate paintbrushes as soft as the feather touch of a fluttering hummingbird, and the depth of the gaze lost in the glow of the firing kiln. One piece that is personally being worked by the master potter with special care represents two men with swollen-drunk eyes hugging and buttressing each other to avoid falling to the ground. He is dedicating this creation to a companion who died this year after being swept away by a powerful flood of the river while tending his family cultivation plot next to the *playas* in the meanders. He will give this piece to the family of his friend who, like all households during these festivities, will venerate their dead and ancestors.

Dusk is approaching and the smoke of the now cooler pottery kilns rises from the ground as dark clouds dissipating in front of the orangey sunset. Heading towards another of the major clusters of families one passes a man that, before night falls, is finishing working on a new *quincha* home. He is coming out of the muddy shallow pit where he has been extracting and mixing the mud; as people pass by greet him shouting “bye *chilalo*” as people skilled in building tasks are nicknamed after the *hornero* bird. He smiles and utters some words before the group of people walking left him behind. It is getting darker and darker and as one crosses the small canals that water the cultivation plots on the alluvial plain of the Charanal River the croak of the toads reminds us of how essential water is as source of life. The plots, scattered randomly a few hundred meters around the dwelling clusters, are now bathed by the tenuous light of the moon and the stars, enough to distinguish the silhouette of their fruit trees and of the *faiques* and *algarrobos* that are marking the path. From the tallest *algarrobos* and next to the gardens adjacent to the houses the silent and ghostly flight of the barn owl and its screech and the winged agitation of its officiants, the bats, make us recall the souls mounted and then flown away to the other world.

We have just crossed Quebrada de las Damas, now with just a thread of water running, and start walking on the pediment of the massif of Cerro Pilán ascending towards one of the largest dwelling compounds of the entire area. These major compounds are composed of one large mound (or a series of clustered mounds) where several households live, or large concentrations of *quincha* and *bahareque* houses on the slopes of the pediment where a similar number of households dwell. Liveliness around these compounds is more notorious than at other smaller compounds. It is not only the people that live there but also other families that live beyond these compounds that come and move around them. They are well-known, well-regarded and highly esteemed families. The prestige and respect gained by these families reside in their abilities and skills mastering certain activities considered important and even vital by the rest of the population. The heads and other members of these households are skilled as, among others, potters, travelers that take journeys to either or both other supernatural worlds as shamans and to other geographic areas, as bearers of knowledge, information and exotic goods brought from these trips, as medicine men or women, and as catchers and tenders of *macanches* (*Boa constrictor*). They are reputed for producing the best and largest volumes of *chicha*, for throwing the best and most attended feasts, for being in charge of rituals and religious cults, and perhaps most importantly and synthesizing all the above, for residing in the places where the oldest ancestors are buried and venerated.

Early this morning the stir at the homesteads at which we are arriving was unusual. A small caravan preceded by the head of the household returned from a trip to the east after being gone for a while. There is always excitement at their arrival with all the eyes staring at the products and goods they unload: honey, small monkeys and colorful birds as new pets, feathered ornaments, strange fruits and vegetables, and herbs and barks that only the head of the household, who is also a shaman and a medicine man, knows how to use, among other things. Yet unlike early in the day the scenario is absolutely different now at night. No voices or laughter of children playing; no adults yelling from mound to mound teasing at each other or just asking about some domestic issue. No. The atmosphere now is solemn and even a quiet thrill can be felt in every pore of the skin. Present now are the head of the household and a handful of seniors. Standing at the foothills of the massif of Cerro Pilán they are dwarfed by its behemothic contours. The moonlight and the starlight of a constellation tenuously shroud it as a gigantic silvery spiderweb would do. Enchanted by the chants of the shaman, the properties of the *San Pedro* beverage, and the smoke and smell of the *Palo Santo* that they secretly get from the pediment beyond the No-Man's (or Woman's)-Land, the participants have started, motionless and abstracted, to ride the enormous mountain chain that is now a serpent. It is furious and they know they have to propitiate it. As the dry season peaks, its emissaries the *macanches* have started showing up in the houses, at the gardens and cultivation plots in the valley, thirsty and threatening. It is time to feed them with their favorite food, the much coveted reddish and thorny *Spondylus* oyster. A barterer arriving from the north for the festivities has brought the divine nourishment and has traded it to the officiants. Valves of the shell are handed to the shaman who is chanting, praying, dancing, and snorting; his face and body as well as the entire surroundings are shifting forms and colors before the eyes of the participants. By the end of the ceremony and as the dawn approaches, the now *macanche*/shaman and an apprentice carrying the precious shells ascend through a lush path slithering toward the pyramid-shaped apex of the massif of Cerro Pilán passing by the *Boliche* and the *Peña*. Once on the summit, with further rituals and chants the shaman will offer the food, burying the *Spondylus* shell next to the magic apex. Satisfying the deity as well as the sky serpent that descend onto it every year will make the much needed water flow in the springs of the massif and in the rivers of the valley during the dry season. At the same hour, similar ceremonies and rituals are being performed in the few villages at the foothills of the Cerro Vicús and at houses in the Franco Valley. The sunrise is here now; the body is tired, time to rest for a while and to recuperate some energy needed for the seemingly endless days to come.

There is no central day during these festivities. Yet everybody knows that the main reason they are here is to remember, venerate, and reunite with their dead. Ceremonies and feasts occur at virtually every household since the dead are buried underneath the houses or at locations adjacent to them either in the mounds in the valley or in the dwellings at the pediment. There is no definite date of beginning or ending and during these days there is a constant flow of people from village to village coming in and out to interact, celebrate, remember, eat, and drink. This kind of movement used to be more restricted but as generations grew and expanded, so did the friendships and family ties. Also, the younger the household, the more modest the feasts are. On the other hand, the older and more respected the household, the more lavish and well attended are the feasts. The most ancient ancestors are buried at these older households; they are the trunk from which the younger households branch out and are thus venerated not only by the people of that compound but also from other villages or clusters of villages that have a family or ancestral attachment. At every household compound the smoke leaking out of the thatched roofs of the kitchen hearths and the temporary *chicha* breweries is virtually continuous during these days; the smell of cooked food and fermented corn kernels permeates the air, and the aroma of the stored and processed *algarrobo* pods sweetens the spirit as one walks down the paths from village to village. The adobe and *quincha* and *bahareque* houses are full of people as well as the *ramadas* (gazebos) with their thatched roofs that as projections of the facades of the houses shelter the friends and families that are arriving; they sit on *algarrobo* logs transformed into benches or remain standing. The high spirits of the attendees are part of the palette complemented by the reds, oranges, whites, pinks, yellows, purples, and magentas of the bougainvillea flowers that, with their papery texture, creep on the walls of the houses and roofs of the *ramadas* colorfully decorating them. Gourd bowls and plates with food and *chicha* come in and out from the kitchen; people loudly chat, talk, laugh, and even sometimes argue; the *chicha* is served in large gourd bowls placed at the center of each circle of people; they in turn use a smaller gourd bowl to fetch the liquid from the larger one every time a person drinks, then pass in the empty small gourd to the next person for the operation to be repeated. As new people arrive or as some leave, circles are broken and new ones are created with people requesting new large gourds to be brought in. Every time a new large bowl of fresh *chicha* comes out from the patio where it is being stored, the head cook and brewer steps out from the house kitchen and, assured and proud of her product, asks somebody from the newly formed circles to drink with her; she dips the small bowl into the larger one, drinks a small quantity, shakes off the last tiny remaining drops onto the ground, and passes the now empty bowl to somebody at her side initiating a new cycle after which she goes back to the kitchen or patio behind a *bahareque* wall to continue supervising the kitchen. After several rounds and as the day and evening progress she can be more bold, gamely challenging attendees to drink larger quantities of *chicha* with her, tilting the larger gourd bowl and drinking the volume of the beverage found between the rim of the bowl and the central part of the bottom. These are very relaxing but at the same time very active and energetic days with people moving and active at every time of the day. The only things that seem to be motionless are objects such as the digging sticks or fishing nets that for a few days rest at some corner of the *ramada* or hang from a wall or fence at the house sometimes literally hanging out to dry.

Yet the food and drink that leave the host house does not only go to the merry *ramada* visitors. A few dozens of meters away tombs have been opened, skulls and bones from the loved ones unearthed, carefully arranged besides the now empty hole in an improvised simple altar made up with the clothes, objects, and tools the deceased used to possess, decorated with flowers, and served with small gourd plates and bowls full with the same food and *chicha* the living are enjoying. Small groups of people including men, women, and children and even pets encircle the burial place and altar of the body that they cherish the most. The atmosphere is blithesome although not mirthful and at some times it could even be solemn. An occasional laugh could be heard but in general the ambience is dominated by low voices, chants, sometimes a cry, and stories and anecdotes remembering and telling of the actions of the deceased during his/her lifetime.

It is a more quiet and peaceful atmosphere than the jocund *ramada*; people are more careful with the words coming out of their mouths, as the ancestors could be easily offended. It is even calmer as the night falls when some of the tired children and some adults fall asleep intermittently with half their faces illuminated only by the tenuous flame of a burning, wadded cotton rag soaked in animal fat that rest on a shallow pottery bowl, which projects an outline of their bodies onto the ground or onto the contiguous piled up grave fill.

There is another *ramada* adjacent to a lateral wall of the host house placed between the latter and the graveyard. Yet this one is different and smaller than the mirthful one where the visitors are refreshing their spirits and filling up their bellies. It has been modified and now it looks more like a roofed patio than an open *ramada*. It has three sides; one is formed by the wall of the house, and the other two by added *quincha* walls. It thus has a "U" shape with the entrance opened towards the same direction faced by the facade of the house. A large painted, thick cotton drape is hanging out from the last rafter atop the back wall. Elements such as the sun, the moon, stars, and stylized representations of certain animals and plants constituting altogether the meaningfulness of life in this world are depicted. In front and below this drape a large rectangular altar has been built using adobes, mud, stones, and wood sticks. On top of the altar ornamented with flowers and also fed with food and *chicha* rest the skulls of the most ancient ancestors of the household. Unlike the other two places where participants are gathering, here the atmosphere is grave and the attitude and behavior of people entering this space is ritualistic. Upon arriving at the host house visitors first go to this place. Quietly, at a slow pace, the worshipers approach the altar standing before it, their bodies assuming a position showing reverence. Words and songs are muttered and different kinds of offerings (food, clothes, metal or ceramic artwork, etc.) are left around the altar. Attendees then return to the *ramada* where the feasting is taking place. At different times of the day, especially when recently cooked food and drinks are offered to these ancestors, the participants return to this altar to attend rituals performed by the heads of the households. Sounds of chants, drums, ceramic pan pipes, bone flutes, and the shrill of pottery whistles are heard accompanying the body movements of the officiants. Friends and family that come to these festivities from long distances always bring special gifts for these ancestors. These offerings are sometimes comprised of fancy and prestigious metal, pottery, wood, or textile artwork manufactured in foreign styles. By the end of the festivities these objects are buried with the ancestors who are being reburied, or kept by the head of the household who in turn will be buried with them when he/she dies.

These have been long, intensive, exhausting but, at the same time, joyful days. Gradually, as the food supply reserved for the feasts is all consumed and the *chicha* production tapers, dwellers and visitors alike understand that the festivities are over and it is time for farewells. There will be other festivities during the year but not as large, massive, and well attended as this one. Little by little the inhabitants go back to their daily activities while the visiting friends and family, after gathering provisions for the first days on the trip back home, start treading on the sandy paths in all the four directions. It is thus time to also finish this allegory and get back to the surface through this rabbit (or iguana, in this case) hole.

The spatial structure of the landscape during this period does not change from that observed during the Chapica period (see section above). That is, at both fertile "pockets" there is an overlap of both the Zōfū-Tokusui and the Sacred Mountain landscape types with their concomitant changes in orientation and in the features that define the boundaries, directionality, and the domain in relation to the periods prior to the Chapica period. In addition, also similar to the Chapica period, the spatial structure in the south bank of the third "pocket" is not well defined yet. The increased settlement observed in this area during this period, however, indicates that further changes could occur in the spatial structure of the landscape in the third "pocket" considering the presence and role of Cerro Santo Tomé as a focus point.

7.9 Settlement and Landscape during the Campana Period (ca. A.D. 700-A.D. 1000)

A total of 186 sites were occupied during the Campana period composing in turn a total of 97 settlements occupying 137.90 ha in total. The settlement analysis for this period also shows a four-class settlement size hierarchy. As the rank-size plot (Figure 55) shows, three changes are observed in the slope. The rank-size analysis thus revealed that Class 1 is composed of three settlements (Ranks 1-3) ranging from 12.33 to 9.97 ha in area. There is a difference of 4.36 ha between the smallest Class 1 settlement and the largest settlement of Class 2. This difference is observed in the abrupt fall in the slope. The change in slope between the other class groups is not as drastic as in Class 1 yet the separation is statistically significant (see below).

Class 2 thus comprised four settlements (Ranks 4-7) ranging from 5.61 to 4.84 ha in area. The top three settlements of this class are very close in size and thus the difference between these and the area of the last and fourth settlement create the impression of a discontinuity in the slope whereas in fact all four settlements grouped well. There is again a clear drop in the slope (over 1 ha) between the last Class 2 settlement and the first settlement of Class 3. This class comprises seven settlements (Ranks 8-14) ranging from 3.75 to 3.02 ha. The smoothness of the slope is also altered by the clustering (in terms of size) of the top three settlements on the one hand, and the bottom three settlements on the other; as in the case of Class 2, the grouping is nonetheless statistically significant. The drop in the slope that separates Class 3 from Class 4 is very short and barely noticeable. Yet, it is the most evident break in this otherwise more homogenous and longest slope defined by this last class. Class 4 therefore comprises 83 settlements (Ranks 15-97) ranging from 2.59 to 0.01 ha in size. The distribution of these four class groups is also represented in the frequency distribution of the settlement sizes as shown in the histogram in Figure 56. As observed in this graphic, the separation between Class 1 and Class 2 is conspicuous as well as between the latter and Class 3. Such a gap is not evident between Classes 3 and 4 but the higher peaks of the latter clustered between 0.01-2 ha clearly set it apart.

All independent-samples *t* tests comparing the difference of mean settlement size between Classes 1 and 2 ($t(5) = 9.474$, $p < .05$), Classes 2 and 3 ($t(9) = 9.164$, $p < .05$), and Classes 3 and 4 ($t(88) = 9.733$, $p < .05$) are highly significant (see Tables 18-20 and Figure 57). Finally, the spatial distribution of the classes was plotted and is presented in Figure 58.

The settlement organization during the Campana period confirms the consolidation of the transformation detected during the Chapica and Vicús periods and thus the role of the “new system” (versus the “old system”) in the organization of space.

As pointed out below, this balanced settlement system continues its process of dispersion although at a slower pace compared to the former periods, especially during the Chapica period. This dispersion is manifested particularly in the settlement growth within the alluvial plain of the south margin of the Upper Piura River in the third fertile “pocket”. This distribution of settlements and changes in their size hierarchy both attests to the sociopolitical integration of both “pockets” and hints at further changes that will occur during later periods.

Evidence for the general outline of the settlement system during this period presented above is derived from certain facts. For instance, the trend initiated during the Vicús period characterized by a slowed settlement growth (compared to the Chapica period) continues during this period. The total area occupied thus increased only 6.7 percent, which is even lower than during the Vicús period; i.e., 23 percent (although nothing compares to the 176.4 percent increase during the Chapica period). Evidently this increment in the occupied area, although smaller than during the Vicús period, is correlated with an increase in the number of sites that constitute the settlements. During the Campana period there is thus an increase of 38.8 percent with respect to the former Vicús period. At this point it is important to underscore that much of this increase can be attributed to the increase in the number of Class 4 settlements (most of them in the third “pocket” especially on the south margin of the river) something that has sociopolitical implications as stated below. In fact, the Campana period has the largest increment of Class 4 settlements (45.6 percent) of the entire “new system” (i.e., from the Campana period on).

The consolidation, configuration, and the role of the "new system" can also be visualized by looking at the number, size, and location of the settlements in the settlement hierarchy. Again, there are three Class 1 settlements equidistant from each other. These settlements (Settlements 216, 217, and 218) are in fact located at the same loci as the Class 1 Vicús period settlements and are comprised, partially, by the same sites; these settlements are thus set between 6.7 and 7.0 km apart from each other. The main difference between them and their Vicús period counterparts is that they are ca. 2-3 ha larger and constituted by more sites. In fact, the largest Campana period Class 1 settlement is 26.1 percent larger than its Vicús period counterpart. In addition, this represents one of the largest increases in Class 1 settlement area during the "new system". In other words, there is a slight change with respect to the plateau in the increment of settlement size reached at the end of the transformation moment during the Vicús period. Yet, and even though this increase is obvious, it is still dwarfed by that witnessed during the Chapica period (47.8 percent). Finally, another important fact can be observed in the Class 1 settlements when compared to each other. During the former Vicús period a new Class 1 settlement (Settlement 143) appeared in the Franco Valley. It was expected that this mid-occupation settlement, very representative of the "new system", should have grown even more during the Campana period (now Settlement 218). It indeed grew more during this period. Yet, it grew less, (22.0 percent) vis-à-vis the other "older" Class 1 settlements (Settlements 216 and 217) that increased their size 25.5 and 30.1 percent respectively. In general, all these phenomena have sociopolitical connotations as discussed below.

In terms of location and similar to the other periods, the distribution of the Class 2, Class 3, and Class 4 settlements does not conform well with a central place model. Still, it is observed that Class 2 settlements, at least in the fourth “pocket”, maintain the same spatial distribution as during the Vicús period, as well as the distribution pattern they have in relation with the other lower (Class 3 and Class 4) settlements in the hierarchy. This is not the case in the third “pocket” however, where Class 2 settlements completely disappeared, only two new Class 3 settlements appeared, and there is a clear proliferation of Class 4 settlements between the two Class 1 settlements.

This slight change in the growth of settlement number and size between the Vicús and Campana periods observed in the Class 1 settlements is also noticed in the other class groups. In fact, the mean settlement size of Class 2, Class 3, and Class 4 settlements during this period grew slightly or even (as in Class 4) barely decreased (see Tables 15-17 and Tables 18-20). Moreover, if only the top size settlements from each class were compared, there is no increase in the size of Class 2, Class 3 increases its area only 0.5 percent, while Class 4, interestingly enough, increases by 24.5 percent. Yet, as pointed out above, the mean settlement size of the Class 4 settlements in this period even decreases (a negligible difference of 0.06 ha) vis-à-vis the Vicús period. This slight decrease is explained because though the number of Class 4 settlements during this period show a significant increase, most of these settlements are less than 1 ha in area (compare histograms in Figures 52 and 56). In fact, these slight changes can also be observed in the number of settlements by class. The number of Class 1 settlements remains the same, and there are three less Class 2, one less Class 3, and 26 more Class 4 settlements.

Two significant observations can be thus drawn: in terms of size, the only significant increase occurs at the extremes of the hierarchy; i.e, 26.1 percent in Class 1 and 24.5 percent in Class 4. Conversely, in terms of number, the only important change happens in Class 4 where there is a proliferation of these settlements (especially in the third “pocket”) with a 45.6 percent increase; the other classes remain the same (Class 1), or even decrease (42.9 percent in Class 2 and 12.5 percent in Class 3). As discussed below, the settlement sizes, distribution, and location during this period may have shown the stability, balance, and homogeneity reached during the former Vicús period. Yet at the same time it shows evidence of the inception of changes in the spatial configuration of these two periods (Vicús and Campana) that will be further evident later in time.

The outline of the settlement system during this period as presented above has significant sociopolitical connotations. First, unlike the former Vicús period, the role and significance of the Class 1 settlements is correlated with their size. In fact, during the Vicús period the Class 1 settlements kept the same number of constituting sites from the former Chapica period or comprised just one or two sites. On the other hand, during the Campana period, these same Class 1 settlements increased in size as pointed out above as the result of the accretion of more constituting sites. Settlement 216 thus now comprises two more sites, Settlement 217 by one more site, and Settlement 218 by three more sites. It is important to mention that with the exception of Site 150 in Settlement 216 (a site occupied before only during the Panecillo period), all these new constituting sites are occupied for the very first time. It is therefore not difficult to conclude that the size (and perhaps the importance and prestige) of the households inhabiting these settlements also grew concomitantly.

Second, the distribution and location of the Class 1 settlements clearly indicates the consolidation in the change of the sociopolitical axis already observed during the former Vicús period. Yet, unlike the latter, this sociopolitical axis is accompanied in turn by the strengthening of its constituting Class 1 settlements. In other words, the vortex of this triangular-shaped axis formed by the three centripetal forces (on the western slopes of the massif of Cerro Pilán; on the border between the *despoblado* and the alluvial plain in the third "pocket" on the south bank of the Upper Piura River; and in the Franco Valley) became stronger.

Third, during this period, the "new system" as represented by the role of the three centripetal forces, seems to have further defined the sociopolitical organization in the whole study area. For instance, the sociopolitical integration of the fourth "pocket" is now clearly confirmed. That is, the two former centripetal forces (next to the north bank of the Upper Piura River and on the pediment), no longer exist, absorbed by the centripetal force on the western slopes of the massif of Cerro Pilán. Three lines of evidence support this interpretation: 1) both former centripetal forces stopped growing and even lost strength politically; the one next to the north bank of the Upper Piura River still has a Class 2 settlement at its core but keeps just one Class 3 settlement; perhaps the most dramatic change is evident at the core of the former pediment centripetal force that comprised one Class 2 and two Class 3 settlements during the Vicús period plummeting down to just one Class 3 and two Class 4 settlements during the Campana period; altogether the area of these three settlements is just 6.7 ha a size dwarfed by the 12.33 ha of the largest Class 1 Settlement 216 (the core of the centripetal force on the western slopes of the massif of Cerro Pilán); i.e., an unambiguous difference in size of 54.3

percent; 2) the former “gap area” is even more blurred than during the former Vicús period; in fact, five more constituting sites were added to the settlements in this area during this period, dotting the landscape with an almost continuous arrangement of settlements. Yet it is important to observe that both, there is still a small unoccupied area between these two former centripetal forces, and that the new sites in the former “gap area” are again located close to the centripetal force on the western slopes of the massif of Cerro Pilán; and 3) the NE-SW alignment of Class 2 settlements along the hypothesized main irrigation canal in this “pocket” shows the same spatial configuration and sizes as during the former Vicús period, indicating that the functioning of the economic and sociopolitical organization (and now even more considering the above mentioned clear-cut enfeeblement of the core of the former pediment centripetal force) was organized around the centripetal force on the western slopes of the massif of Cerro Pilán.

Another indication of how the “new system” had determined the sociopolitical organization of the whole study area is shown by the clear attraction effect created by the vortex of the triangular-shaped axis of the three centripetal forces in the third “pocket”. In fact, the proliferation of settlements (especially Class 4 settlements) amid these three centripetal forces attests to their significant influence. True, this process was already perceivable during the former Vicús period yet not as uncontrovertible as during this period. Still, unlike the former Vicús period and similar to the situation in the fourth “pocket”, this proliferation of Class 4 settlements and the strengthening of the Class 1 settlements (the centripetal forces) seems to have been bolstered by the weakening or even loss of intermediate class (especially Class 2) settlements. Indeed, during this period in the third “pocket”, there are only three Class 3 settlements (only two more than during the Vicús period) and, interestingly enough, no Class 2 settlements at all. As will be suggested later in this section and chapter, these differential changes at the extremes of the settlement hierarchy between the Vicús and the Campana periods may be hinting at a very different sociopolitical landscape during later periods entailing a centralization of power as never seen before in the study area. Finally, it can be said that by the end of the Campana period both fertile “pockets” were doubtlessly wholly socially and politically integrated.

Fourth, significant sociopolitical connotations can also be drawn observing the preferred location of the sites constituting the settlements. This period and the former Vicús period display a similar distribution of sites on the landscape. That is, 11.8 percent (13.4 percent during Vicús) of the sites are located on the ridges or slopes of the pediment or on those of the western slopes of the massif of Cerro Pilán, whereas 88.2 percent (86.6 percent during Vicús) are found on the alluvial plain. In other words, the tendency towards a primary settlement on the alluvial plain (over 60 percent of the sites) observed since the Chapica period, continued (63.8 percent, 73.2 percent, and 76.4 percent during the Chapica, Vicús, and Campana periods respectively). Yet, as observed during the former Vicús period, if only the sites located on the alluvial plain (n=164) were to be compared, it is evident that sites on the alluvial plain next to the pediment maintained a significant presence. True, sites on the alluvial plain in the fourth “pocket” next to the pediment (18.3 percent) descended 6.7 percent as compared to the Vicús period. Still, if sites from the former “gap area” (9.8 percent) were to be added, considering their close association with the pediment of the western slopes of the massif of Cerro Pilán, settlements in the alluvial plain next to the pediment would add up to an important 28.1 percent. Moreover, if other areas of the occupied alluvial plain were to be compared, the situation as compared to the Vicús period is similar. That is, 26.8 percent (35.3 percent during Vicús) are located next to the north bank of the Upper Piura River in the fourth “pocket”, and 15.3 percent (20.7 percent during Vicús) in the north bank of the river in the third “pocket”, i.e., in the meanders and in the Franco Valley. There is one exception in which the difference between the Vicús and Campana periods is more than evident, though. Indeed, during the Vicús period the south margin of the Upper Piura River in the third “pocket” was occupied by just 10.3 percent of the sites on the alluvial plain, whereas during the Campana period it jumped to a conspicuous 29.9 percent. This significant change in this area attests to the aforementioned new settlement pattern direction of the ¨new system¨ as represented by its three centripetal forces. At the same time the change in this area and the overall settlement configuration in the third “pocket” show a slightly more volatile situation as compared to the more stable fourth “pocket”. After the settlement configuration observed during the Vicús period, it was expected that a more complex arrangement in the settlement hierarchy would continue during this period. That is, as during the Vicús period, settlements from all four classes were expected. Yet, unlike the former period in which a significant growth in the number of settlements was observed, during this period and despite an also evident growth in the number of settlements, a distortion in the settlement hierarchy is noticed. This distortion is characterized by the aforementioned lack of Class 2 settlements and the proliferation of Class 4 settlements. In other words, even though both “pockets” are clearly social and politically integrated by this period, most of the settlement configuration in the third "pocket" (which in turn is a hallmark of the "new system") indicates social and political differences (and perhaps fragility) as represented by the clear and differential distribution of Class 1 and Class 4 settlements. This configuration within the "new system" will have further sociopolitical connotations in later periods. In addition, as discussed in the next chapter, this particular situation in the third "pocket" (especially on the south bank of the river) together with the other points elaborated above, provide some evidence to assess Hocquenghem's (see Chapter 3, Section 3.3) hypothesis on the history of the agrarian expansion in the study area.

Finally, another sociopolitical connotation is that the overall distribution and settlement configuration during this period confirm that the route of the interaction network already well established during previous periods remains unaltered. That is, the placement of the settlements parallels or is always next to the road of the pediment, along the banks of the Upper Piura River, and even at the fringes of the *despoblado*. As has been suggested before, it is undeniable that the interaction of local social groups with societies from the four corners dates far back in time. This mutual interaction obviously influenced the lives of all individuals and families involved, which, at least for the study area, cannot be clearly recognized archaeologically with the available data. Yet, the broader social and political consequences of this interaction can indeed be recognized archaeologically. The nature of these contacts can arguably be manifested in the spatial organization of societies. In this sense (and as elaborated in the next chapter), it is evident that, until this period, the overall spatial structure of the landscape, the settlement configuration and its relation with its topograms and interaction routes show a gradual and local process of transformation. In other words, the transition from the "old system" to the “new system” responded to local dynamics with no indication in the landscape and settlement organization of any dramatic disruption that could have represented a social and political dominance by foreign sociopolitical entities such as the southern Mochica polity (or polities) and the Middle Sicán state from the North Coast. It therefore indicates that until this period the most likely interaction scenario was that of a coevolving and negotiated process rather than a hierarchical and coercive system (see Chapter 5, Section 5.3 and 5.4).

In sum, the settlement configuration during the Campana period confirmed both the change in the sociopolitical axis already observed during the former Vicús period, and the transformation from an “old” to a “new system”. Yet unlike the latter, Class 1 settlements started to clearly differentiate in size in tandem with a clear proliferation of much smaller Class 4 settlements at the other end of the spectrum. This new settlement scenario may have entailed social and political differences characterized by an already clear integration of both “pockets” but at the same time with certain predominance of the more stable and homogenized (in terms of settlement hierarchy) fourth “pocket” over the third one. These possible social and political changes may hint to a further process of political centralization during later periods unseen until now. Finally, the settlement configuration during this period confirms that it is founded on a very old and local process of social transformation with no indication (from the spatial organization standpoint) of any disruption caused by the arrival of foreign polities.

The sociopolitical picture elaborated above is mirrored by (and interrelated with) the system of topograms. In fact, resembling the situation during the former Vicús and Chapica periods, there is no addition of new topograms during this period. As argued in previous sections, the peak in the system of topograms (a total of 16) reached during the Chapica period may have started a process of transformation paralleling the transition from the "old" to the "new system" continuing during the Vicús and Campana periods. Obviously, it is very difficult to be able to understand all the implications that the system of topograms had in the intricacies of the belief system of the local populations. Yet, as I have argued before, the way people chose to organize their space through time, the relation among all the elements of this space that in turn creates places, and the recreation of this relation through bodily movements embodying the landscape, give us hints for the interpretation of the belief systems. In this sense, and at this point of the analysis and discussion, I think that is possible to argue for the existence of two types of places constituted by the topograms: sacred and secular.

Also, I contend that some of the topograms, through time, mutated from one type of place to the other. As populations grew and larger numbers of people started inhabiting, wandering around, and exploiting certain locations, they could have started losing their mystic aura, changing from a sacred to a secular place in nature. This could have been the case, for instance, of such topograms as the underflow and the valley neck of the interior delta. The change in the nature of these topograms is not just a change in the topogram; it rather has to be understood within the context of the overall belief system transformation. As I have pointed out above, a hint to these transformations may be detected in new landscape features that over time became the new focus and centers of attraction and direction of these landscapes.

I think that during the Campana period, the secular places represented by the topograms were the underflow, the valley neck of the interior delta, the meanders, the

Cerro Franco, the Franco Valley, Cerro Venado, and Cerro Piedra Blanca, whereas the sacred places were represented by the massif of Cerro Pilán, its triangular pyramid-shaped summit, the *Boliche*, the *Peña*, and the *Chorro*, the Quebrada de Franco, the No-Man's (or Woman's)-Land, Cerro Santo Tomé and Cerro Vicús. As stated above, it is very likely that over time the topograms of the aforementioned first group underwent a process of secularization based on daily proximity, living, and circulation through them. It is not a surprise then that the topograms of this first group are loci associated with, among other things, borders that possibly separate different concentrations of population, with areas through which the main interaction route passes, with actual settlement concentrations (e.g., the Franco Valley), and with areas critical for the subsistence of the population. On the other hand, the topograms that probably represented sacred places (or similar in nature) are characterized by areas that, in spite of the long occupation history in the study area, had remained virtually untouched with no visible or significant modification by human activities. These loci also seem to conceptually represent clear borders not between populations but between different worlds, as would be reflected on the line of occupied settlements on the foothills of, for instance, the Cerro Vicús and the massif of Cerro Pilán, in contrast to the space uphill and beyond this line on the higher elevations of the mid slope and summit of these landscape features. This contrast is further marked by the utter presence of such massive (and lush, and dangerous, and mysterious, and divine) features as opposed to the dwindling inhabitants and their daily activities that happened at their foothills and beyond. Even cases such as similar but smaller landscape features (e.g., Cerro Santo Tomé and, as shown later in this chapter, Cerro Loma Negra), could have had similar connotations. In addition, these topograms (e.g., the *Boliche*, the *Peña*, and the *Chorro*) were also associated with areas critical, in the more symbolic and ideological sense, for the procurement of such vital resources as water.

Two topograms, the *lomas* and the spurs, have not been included in the two groupings mentioned above. This is because it is somewhat more difficult to draw the line separating them as either kind of place. For the most part, I consider these topograms as secular places; i.e., as loci where individual and social life cycles of individuals and families engaged in their daily activities and beliefs occurred through time. As such, these topograms and the constant movement through them are crucial elements in both, the construction of the sense of place, and the overall conceptualization of the landscape that is contained by them and at the same time surrounds them. Yet I believe that over time some of these topograms also passed through a process of transformation becoming, if not completely sacred, at least having a dual sacred/secular substance. And I argue that such sacred/secular topograms are represented by those long occupation (6-8 periods) *lomas* and spurs that were likely the "heads" of kin groups and on which broader, community-scale rituals of ancestor veneration possibly took place. These topograms would have thus been key elements in anchoring the sense of place, belonging, and tradition, and maintaining the cohesiveness of the social and cosmological order.

The significance of these key long occupation *lomas* and spurs has been mentioned in sections above. It is time now, to take a look at the spatial distribution of these topograms to see their position in relation to the idea and connotations of their sacred/secular nature mentioned above. As mentioned before in this chapter, most of these long occupation sites were occupied since the very first occupation periods in which the number of long occupation sites constituted about 50 percent or over of the total sites (see Table 23). The number of long occupation sites (n=36) reached its peaks during the Chapica period maintaining, interestingly enough, about the same number (between 34 and 36) for the remaining four consecutive periods (from Vicús to Chimú) until the Inca period (see Table 23). During the Campana period, the distribution of the long occupation sites (n=35) is as follows: 17.1 percent on different parts of the pediment (including the massif of Cerro Pilán) in the fourth "pocket", 22.9 percent on the alluvial plain next to the pediment and on the west margin of the Charanal River (fourth "pocket"), 5.7 percent in the former "gap area" (fourth "pocket"), 37.1 percent on the alluvial plain next to the north bank of the Upper Piura River (fourth "pocket"), 2.9 percent in the meanders (third "pocket"), 2.9 percent in the Franco Valley (third "pocket"), 8.5 percent in the alluvial plain on the south margin of the Upper Piura River (third "pocket"), and 2.9 percent in the valley neck at the border between the third and second "pockets".

Several observations can be drawn from the distribution of these topograms above. First, it is clear that they are not concentrated at a single or few locations but distributed all over the study area. Second, in spite of this widespread distribution, it is also evident that the majority of these topograms are found in the fourth "pocket" (e.g., 54.2 percent if those on the pediment and on the alluvial plain next to the north river bank were added, or even 77.1 percent if those on the alluvial plain next to the pediment and west margin of the Charanal River were also included). Third, these topograms are located amid the alluvial plain on which the cultivable land was expanded, along the main interaction route, along the hypothesized main irrigation canal in the fourth "pocket", and at the limits between the inhabited valley and the *despoblado*, or between two fertile "pockets"; in other words, they are located along critical points for the biological and cultural reproduction (and even community identities if borderland topograms were to be considered) of the populations inhabiting the study area. And fourth, and assuming that these topograms (or at least some of them) had a critical role as sacred/secular places, their distribution and persistence may indicate that social and political transformations observed between the "old system" and the "new system" may not have necessarily been accompanied (or at least simultaneously accompanied) by changes in the ideological and belief systems.

Overall, I contend that by the Campana period the settlement and topograms systems reflect a local, historical conceptualization of the landscape built on a long process of interaction between local inhabitants and their embodied surroundings. Also, the system of topograms and their relation with the overall landscape configuration further points towards a cohesive social, political, and ideological integration in the entire study area. Finally, if this landscape configuration is indeed the product of a long and historical process, it would thus further indicate that if interaction with foreign polities took place (such as the Mochica and Sicán polities), it did not cause any social, political, and ideological disruptions.

The spatial structure of the landscape during this period is similar to that observed during both the former Chapica and Vicús periods. That is, in the fourth "pocket" a Zōfū-Tokusui landscape type with a SE-NW orientation still persists. It has a u-shaped domain area; its borders are the massif of Cerro Pilán at the base of the "U", and the

Andean pediment to the north and the *despoblado* to the south as the lateral sides. The directionality (SE-NW) is marked by the smooth slant of the alluvial plain (the domain), the direction of the western slopes of the massif of Cerro Pilán, and the course of the Upper Piura River. This landscape type overlaps with the Sacred Mountain types as represented by the role of focus and center of both the Cerro Vicús and the massif of Cerro Pilán.

Also, as in the former Chapica and Vicús periods, there is a discrete spatial structure of the landscape on the north bank of the Upper Piura River in the third "pocket". That is, there is a Zōfū-Tokusui landscape type defined by the encircled Franco Valley. It also has a u-shaped (though smaller than in the fourth "pocket") domain. Its borders are outlined by the Cerro Piedra Blanca at the base of the "U", and the Andean pediment to the north, and the north margin of the Upper Piura River to the south as the lateral sides. Its SE-NW directionality is marked by the slope of the alluvial plain and the course of the river. Unlike the spatial structure of the fourth "pocket", this one is not opened towards the northwest but rather closed and flanked by the Quebrada de Franco. In addition, the spatial structure of this "pocket" also presents an overlap with a Sacred Mountain type of landscape characterized by the utter presence of the massif of Cerro Pilán and especially the view of its pyramid-shaped summit from the Franco Valley.

Yet, unlike the former two periods, the spatial structure of the landscape during the Campana period shows a clear innovation. In fact, during the Chapica and Vicús periods the spatial structure in the south bank of the Upper Piura River in the third "pocket" was difficult to define. During this period, however, and considering the changes in the settlement patterns in this area outlined above, there is a new spatial structure of the landscape. This innovation may coincide perhaps with the social and political transformations that occurred during the Chapica and Vicús periods and with the overall sociopolitical integration of both fertile "pockets". Also, the appearance of this new spatial structure may not imply the disappearance of the others described above. Rather, this new spatial structure seems to be much broader and overarching.

This new spatial structure is thus also defined by a Zōfū-Tokusui landscape type. It also has a u-shaped domain area encompassing both river banks and the entire study area. Its boundaries are defined by the base of the "U" that is marked by the alignment of Cerro Piedra Blanca, Cerro Santo Tomé, and the western tip of the southeast branch of the Andean cordillera, with Cerro Santo Tomé clearly located as a focal point amid the base of the "U". The lateral sides are the Andean pediment to the north, and the portion of the *despoblado* that aligns between Cerro Vicús and Cerro Tongo, to the south. The directionality (SE-NW) is defined by the flow of the Upper Piura River and the slanting of the alluvial plain. In addition, this broader landscape type (as during the former Chapica and Vicús periods) overlaps with other Sacred Mountain types as represented by the Cerro Vicús and the massif of Cerro Pilán. It has to be pointed out that the latter, under this new landscape type, clearly becomes a focal central point falling right in the middle of the overall spatial structure of the landscape.

7.10 Settlement and Landscape during the Piura Period (ca. A.D. 1000-A.D. 1375)

During the Piura period 181 occupied sites constituted in turn a total of 98 settlements covering 127.90 ha of inhabited land. Similar to all previous periods, the settlement analysis also defined a four-class settlement size hierarchy. As displayed in the rank-size plot (Figure 59) three clear drops or breaks in the slope are evident. At the top of the settlement hierarchy Class 1 is represented by just one settlement (Rank 1) with an area of 12.01 ha. A sharp fall is then observed in the slope until Class 2 appears; it is also represented by one settlement (Rank 2) that is 8.26 ha in size. Another drop in the slope, though not as drastic and at a slightly larger angle is observed between 8.26 ha to around the 5.50 ha. This drop represents the size difference between the sole Class 2 settlement and the largest Class 3 settlement. Class 3 thus comprises 10 settlements (Ranks 3-12) ranging from 5.61 to 3.03 ha. Finally the last change in the slope smoothness is a short but perceivable break between the smallest Class 3 settlement at 3.03 ha and around 2.40 ha where Class 4 starts. It is the most evident break in the otherwise homogenous and long slope defining this class. Class 4 is therefore composed of 86 settlements (Ranks 13-98) ranging from 2.45 to 0.01 ha in size.

The frequency distribution of the settlement sizes as presented in the histogram in Figure 60 also shows the distribution of the four class groups. The separation between Class 1 and Class 2 is more than evident as well as that between the latter and Class 3. There is no gap between Class 3 and Class 4 yet the higher peaks on the latter clearly set it apart from the former. In addition, the separation between these two groups is statistically significant as pointed out below.

Independent-samples *t* tests were not performed between Classes 1 and 2 since they both comprise just one settlement each with an obvious difference in size. Yet the independent-samples *t* tests comparing the difference of mean settlement size between Classes 2 and 3 ($t(9) = 4.236$, $p < .05$), and Classes 3 and 4 ($t(94) = 14.413$, $p < .05$), show the clear separation between these groups (see Tables 21-22 and Figure 61). Finally, the spatial distribution of the size classes was plotted and displayed in Figure 62.

The settlement organization during the Piura period clearly shows a patent change compared to the former Vicús and Campana periods. It is evident that the consolidation of the transformation moment is no longer in place and that the “new system” is taking a very different direction. As mentioned in the previous section some aspects of the Campana period settlement configuration allowed foreseeing these transformations during the Piura period.

As elaborated below, these changes (and concomitant sociopolitical implications) are characterized, among other issues, by a loss of balance in the settlement hierarchy, by the slowed rate (for the very first time) of settlement growth, and by the dramatic transformation in the centripetal force around which the settlement system was organized.

Several facts point towards the above picture of the settlement system during this period. For instance, the settlement growth rate that started to slow down after the Chapica period stopped altogether during this period. In fact, for the very first time there is a decrease in the total area occupied. That is, the total area occupied (127.90 ha) decreased 7.3 percent vis-à-vis the Campana period (137.90 ha) descending to about the same levels of the Vicús period (129.20 ha). Obviously this decrease is accompanied by a decline (also for the very first time) in the number of sites that constitute the settlements; that is, there are 2.7 percent fewer sites than during the Campana period. As explained below, this slight decrease is related to the changes in the settlement size hierarchy occurred during this period.

The new changes in the settlement configuration during this period can also be observed when the number, size, and location of the settlements in the hierarchy are considered. The most striking difference is that now there are not three Class 1 settlements (as during the former Vicús and Campana periods) but just one settlement (Settlement 313). This settlement (which is one of the Class 1 settlements from the Campana period), and unlike the situation during the Campana period, did not grow further. Its size even decreased slightly by 2.6 percent (from 12.33 to 12.01 ha). In other words, unlike the Campana period when the three Class 1 settlements grew further in comparison with the Vicús period, during the Piura period two of them with the exception of Settlement 313, either dwindled to a Class 2 settlement or disappeared altogether. A hint of this phenomenon was perceived during the Campana period when it was expected that the Class 1 settlement in the Franco Valley would have grown at the same rate as the other Class 1 settlements. It did grow but just slightly. Now during the Piura period it wholly disappeared leaving the entire Franco Valley occupied only by Class 4 settlements. Finally, the presence of just one Class 1 settlement makes it difficult for the current settlement system to conform to the flexible central place model argued for the former periods. Yet at the same time it may also indicate that the study area as a whole is now, for the first time, integrated into a much broader and regional sociopolitical system.

Evidence of these changes in the new settlement configuration is also noticed observing the situation of the Class 2, Class 3, and Class 4 settlements. Following a pattern already observed during the Campana period, there is a decrease in the number of Class 2 settlements. During the Campana period this phenomenon was observed only in the third "pocket" where no Class 2 settlement was present. This same situation has now expanded to the fourth "pocket" too. In fact, in this "pocket" now there is not a single Class 2 settlement. Moreover, the only Class 2 settlement of the entire settlement system (Settlement 314) is now in the third "pocket"; yet it is not a new settlement or one that grew up from an older and lower class settlement, but a former Class 1 settlement during the Campana period that decreased its size by 23.1 percent. It is interesting to note that these now Class 3 settlements (formerly Class 2 during the Campana period) in the fourth "pocket", with one exception, did not reduce their actual size. They became Class 3 settlements as a result of being pushed down the hierarchy by the now larger (as compared to the Campana period) Class 2 settlement mentioned above. In addition, it is important to observe that the only Class 3 settlement that did decrease in size (by 0.6 ha) is the settlement located at the head of the aligned settlements along the hypothesized irrigation canal in the fourth "pocket". On the other hand, the only Class 3 settlement (also Class 3 during the Campana period) that did increase its size (also by 0.6 ha) is the only Class 3 settlement in the alluvial plain on the south margin of the Upper Piura River in the third "pocket". Overall, during the Piura period there are 10 (rather than 7) Class 3 settlements that represented an increment of 42.9 percent with respect to the Campana period. Also, and as a result of changes in the size of Class 2 settlements, they increased in size, the top Class 3 settlement being 49.6 percent larger than the top Class 3 settlement during the former Campana period. Finally, and unlike the former Campana period, during this period there is no conspicuous increment in the number or size of Class 4 settlements. There are only three more settlements (3.6 percent increase); the top Class 4 settlement is barely smaller than the top Campana period Class 4 settlement (2.45 ha versus 2.59 ha); and in general the difference in the mean settlement size is negligible. The difference in size for all classes pointed out above can be visualized comparing Tables 18-20 with Tables 21-22.

Two important observations can be made. First, unlike the former Campana period, the visible changes in the distribution of sites by size occurred not at the extremes of the hierarchy but at the center; i.e., in the growth in size of Class 2 and Class 3 settlements. On the other hand, in terms of the number of sites per size class, and also unlike the Campana period where the only evident change was represented by the increase of Class 4 settlements, during this period there is a salient decline in the number of Class 1 and Class 2 settlements whereas Classes 3 and 4 grew somewhat or even barely, respectively. In other words, it seems that during this moment of the "new system" a reverse process is in place in which a smaller number (just two) of top class settlements (Classes 1 and 2) separate themselves from lower echelon settlements.

The peculiarities of the settlement size hierarchy outlined above have important sociopolitical implications. First, unlike the Campana period Class 1 settlements, the only Class 1 settlement did not keep growing; it actually slightly decreased its size, losing a small constituting site occupied during the Campana period. Yet this ostensible stagnation or even weakening of this Class 1 settlement is understood, within the overall context of the settlement configuration, as a sign of its strength. In fact, it not only outlived its “competitors” in the same hierarchical level during the Campana period, but also initiated an irreversible trend (as shown in the next two prehispanic periods below) in which the settlement system would be spearheaded by just a single Class 1 settlement.

Second, the character and situation of the Class 1 settlement outlined above clearly indicates a dramatic change in the sociopolitical organization in the last part of the “new system”. That is, the former sociopolitical axis constituted by the three centripetal forces is finally broken. From the Piura period on, the triangular-shaped vortex ceases to exist leaving in its place a single centripetal force (on the western slopes of the massif of Cerro Pilán) that, from its central position, organized the settlement system in a radial pattern.

Third, this new order in the “new system” shows an unprecedented character. During the former Vicús and Campana periods, the settlement system showed a more decentralized character with (perhaps competing) Class 1 settlements located equidistantly and in general a more homogeneous distribution of the settlements within the settlement hierarchy. Yet, from the Piura period on, it is not just that a sociopolitical integration of both “pockets” (manifest since the Vicús or, even more clearly, during the Campana periods) is more evident, but, for the first time, it can be argued that a more rigid, centralized settlement system points to the social and political control exercised by the sole Class 1 settlement.

This new order can be detected by observing different aspects of settlement dynamics. For instance, if during the former Campana period it was clear that in the fourth “pocket” the former two centripetal forces (next to the north bank of the Upper Piura River and that on the pediment) were absorbed, now it is obvious that they were entirely obliterated by the centripetal force on the western slopes of the massif of Cerro Pilán. The core of the former centripetal force next to the north bank of the Upper Piura River thus lost its Class 2 settlement functioning as such until the former Campana period. Moreover, this phenomenon seems to have generated a slight dispersion of some of the Class 4 settlements moving away from the former core. Yet the most drastic change is observed again at the core of the former pediment centripetal force. The change is so extreme that it has almost completely vanished, passing from already having plummeted down to a Class 3 and two Class 4 settlements (Campana period) to a mere single Class 4 settlement. That is, the area of this former core is 2.3 ha contrasting with the 12.0 ha of the Class 1 Settlement 313 (the core of the centripetal force on the western slopes of the massif of Cerro Pilán), a gigantic difference in size of 80.8 percent.

The new order is also visible in the former "gap area". If during the Campana period a small unoccupied area between the two former centripetal forces was still visible, during this period such space is not perceivable. In fact, the percentage of sites that occupied this area further increased as five more sites were added with respect to the former Campana period. As a result the fourth "pocket" is now indeed blanketed entirely by the arrangement of settlements. In addition, changes brought by the new order are also detected observing the NE-SW alignment of settlements along the hypothesized main irrigation canal in this "pocket". These settlements present the same spatial location yet for the very first time (since the Chapica or Vicús periods) they descended to Class 3 in the settlement hierarchy. This transformation may indicate that while during the former Campana (or even Vicús and Chapica) periods the management of the irrigation system and thus the agricultural production administered by these settlements may have maintained certain autonomy, during the Piura period they may have fallen entirely under the control of the only Class 1 settlement.

The effects of the new order are also noticeable in the third “pocket”. The situation here is almost totally the opposite of that observed during the Campana period. In fact, during the Campana period the triangular-shaped vortex of the three centripetal forces seems to have been instrumental in the proliferation of Class 4 settlements. During the Piura period, however, the influence exerted by the sole Class 1 settlement, while still allowing for some further increase in the number of Class 4 settlements, absorbed the force formerly held by the Class 1 settlements of this “pocket”. This phenomenon is particularly evident in the Franco Valley. Up to the former Campana and Vicús periods the Franco Valley was a discrete sociopolitical entity integrated within the whole settlement system. During this period, however, it seems to have been completely subjugated by the centralized authority of the Class 1 settlement.

Fourth, the sociopolitical connotations outlined above also can be detected by observing the preferred location of the sites that constitute the settlements. In general, the distribution of the sites on the landscape is almost the same as that observed for most of the “new system” (from the Vicús period on). That is, during the Piura period 11.7 percent (11.8 percent during Campana) of the sites are located on the ridges or slopes of the pediment or on the western slopes of the massif of Cerro Pilán, whereas 88.3 percent (88.2 during Campana) are placed on the alluvial plain. Yet the consequences of the new order are seen by looking carefully at the sites located on the alluvial plain (n=160). For instance, the number of sites on the alluvial plain in the fourth “pocket” next to the pediment (11.9 percent) continued decreasing, this time descending 6.4 percent with respect to the Campana period. Despite this drop, this area contains the only Class 1 settlement of the entire settlement system, and the 25 percent of sites on this area (including the former "gap area") are mostly attributable to the influence exerted by the Class 1 site. Also, there is a slight increase (2.6 percent with respect to Campana) in the number of sites located next to the north bank of the Upper Piura River in the fourth "pocket". Yet, this increment is the result of the loss of the Class 2 settlement at the core of this area and the appearance of few Class 4 settlements. Moreover, perhaps the most striking consequence of the new order is visible at the situation on the north bank of the Upper Piura River in the third "pocket". It lost a Class 1 and a Class 3 settlement, leaving it occupied by only Class 4 settlements with the exception of one Class 3 settlement. That is, this area (the meanders and the Franco Valley combined) decreased in number of sites from 15.3 percent during the Campana period to 8.7 percent during this period. Finally, changes brought by the new order are also detected on the south margin of the Upper Piura River in the "third" pocket. Although not at the same rate as observed during the Campana period, the number of Class 4 settlements continued growing. Yet at the same time its major settlement descended to a Class 2 settlement. This situation therefore confirms what started to emerge during the Campana period. That is, the third "pocket", in general, seems to have been subjected to social and political forces that created distortions and more unpredicted changes in its settlement patterns than those in the fourth "pocket". The social and political differences that represent the almost complete loss of upper level settlements in this area may point towards a total social, political, and economic control of its populations by the single centripetal force of the fourth "pocket". In this sense, it is interesting to note that in this area only Class 4 settlements amid the alluvial plain keep growing, which in turn may imply that the agricultural production by small peasant households is being boosted by the central authority centered at the centripetal force of the western slopes of the massif of Cerro Pilán.

Finally, the distribution, sizes, and location of the settlements within this new order also had consequences in the route of the interaction network. The sharp decline in the number and size of settlements at key locations along the route (for instance, at the valley neck of the interior delta or on the north bank of the river in the third “pocket”) may reflect what might have been the efforts by the Class 1 settlement’s centralized political authority to eliminate any go-betweens in this enterprise.

In sum, the settlement configuration during the Piura period clearly shows the beginning of a new epoch within the “new system”. Inklings to the transformations observed during this period started during the former Campana period, indicating once again that sociopolitical permutations in the study area are the result of long, historic, and local social and political dynamics. The transformations during the Piura period thus reveal a distinction between two epochs within the “new system”. On the one hand, an early epoch (Vicús and Campana periods) characterized by a more decentralized sociopolitical organization and an integration of both “pockets”, and on the other hand, a later epoch, from the Piura period on, with a more centralized sociopolitical organization including the control (and perhaps subjugation) of the third “pocket” by the centralized authority centered in the fourth “pocket”. In this sense, early in this chapter I was tempted to argue that the inception of the “new system” (i.e. since the Vicús period) reflected the origins of the late prehispanic *curacazgo* of Pabur. As the reader may recall (see Section 7.3.20 above), it has been argued that the *curaca* of Pabur reigned over the territory comprised by the fourth and third fertile “pockets”. Yet such a statement (and considering the landscape configurations observed during the early epoch of the “new system”) would have entailed a dangerous extrapolation of the late prehispanic (or even early Colonial) sociopolitical organization into this epoch. The transformations noticed during the beginning of the late epoch of the “new system”, however, makes me more confident to claim that the origins of the *curacazgo* of Pabur can indeed be traced back to the Piura period.

It is symptomatic that, despite the evident sociopolitical transformations outlined above, the systems of topograms seem unaltered during the Piura period maintaining the same 16 topograms already present since the Chapica period. Yet there are some observations that can still be drawn from the situation of the topograms within the overall context of the settlement and landscape configuration during this period. First, the settlement configuration and sociopolitical transformations vis-à-vis the systems of topograms support the idea already presented above that changes in the worldview of the local populations did not necessarily occur at the same pace as the much faster sociopolitical mutations. In addition, the lack of detectable disruptions in the system of topograms support the idea that, similar to the sociopolitical dynamics, the ideological conceptions of the local populations are the result of long, historical, and local processes with no major disruption caused by foreign forces.

Second, the distribution of some settlements in relation to the topograms seems to further support the distinction between sacred/secular places elaborated in the Campana section above. For instance, it appears that during the Piura period the massif of Cerro

Pilán and its constituting topograms continued exerting significant influence as sacred places considering its increasing role as a central (both spatial and symbolic) landscape feature. On the other hand, the scarcity and distancing of settlements from topograms with former attraction force, such as the valley neck of the interior delta, point towards either the weakening of these topograms or the mutation of places from sacred to more secular in nature.

Third, it is clear that since at least the Campana period, a new spatial awareness started developing for a significant number of people inhabiting the alluvial plain in the south margin of the Upper Piura River in the third "pocket". I have been considering this area as the "alluvial plain" (denoting agricultural activities) yet technically it was, at least until the Vicús or Campana periods, the fringes of the *despoblado* adjacent to the south margin of the Upper Piura River. True, this area was (hardly) occupied since the very first prehispanic period. Yet it is not until the Vicús or Campana periods and due to its economic (agricultural) exploitation that the space began to open up (in the broadest sense of the term) becoming part of the alluvial plain. This new spatial conceptualization –that coincides with the beginning of the "new system"- may have recontextualized the topograms (i.e., Cerro Santo Tomé and long occupation *lomas* at the fringes of the *despoblado*) that until then were the frames of reference in the south bank of the Upper Piura River in the third "pocket". The reconceptualization of these topograms, still barely perceivable during the Piura period, may have entailed later in time their articulation with other topograms (not yet active) and in general their perception within a much broader (geographical and conceptual) context.

Finally, the long occupied *lomas* and spurs continue as sacred or sacred/secular places, as elaborated in the Campana section above. On the basis of their distribution on the landscape I argued that these topograms were key elements anchoring the sense of place, belonging, tradition, and the conceptualization of the landscape, and maintaining the cohesiveness of the social and cosmological order. Similar and related conclusions also can be drawn by looking diachronically at the presence of these sites or topograms within the settlements of which they had been a part.

As mentioned before, the number of long occupation sites basically remained unchanged between the Chapica and Chimú periods (see Table 23). Still, a further aspect of these sites worth underscoring is their placement over time within the settlement size hierarchy.

In fact, a careful look (see Table 24) at the settlements that contained these topograms reveals that in the majority of the periods these topograms were embedded in small Class 4 settlements; especially since the Chapica period on. The number and percentages of these Class 4 settlements therefore are 3 (25.0 percent), 5 (31.3 percent), 7 (35.0 percent), 24 (66.7 percent), 19 (54.3 percent), 22 (62.9 percent), 23 (67.6 percent), 22 (62.9 percent), and 10 (62.5 percent) during the Ñañañique, Panecillo, La Encantada, Chapica, Vicús, Campana, Piura, Chimú, and Inca periods respectively. It is hence interesting to observe that such important elements of the landscape configuration were, for the most part, the residences of small, probably peasant, households that nonetheless had a significant influence on the lives of local inhabitants for a long time. In addition, the presence and number of these topograms peaked and then became stable coinciding with the considerable increase of the cultivation area during the Chapica period and the further expansion of the agricultural frontier in later periods. Even at the time when the settlements containing these topograms had their largest area increment (see Table 25), most of them remained as small, Class 4 settlements.

In addition, in some cases, these topograms were the sole component of the settlement (i.e., composed of just one site) for the entire occupation sequence. In several other cases, they started as single components and then served as magnets for the addition of new sites to the settlements; yet even in these cases where settlements grew by accretion, their status as Class 4 settlements did not change. For instance, an interpretation in this direction can be elicited by examining Sites 94, 95 and 99 (see Table 25); the settlements of two of these sites grew the most during the Chapica period; i.e., 2080 percent (Site 94) and 2625 percent (Site 95). Site 94 is a small Simple Mound (0.05 ha) whose occupation started during the Panecillo as a Class 4 settlement. It was not occupied during the subsequent La Encantada period yet the adjacent Site 95 was indeed occupied during this period. Site 95, located ca. 97 m apart from Site 94, is also a small Simple Mound (0.04 ha) that was also the single component of the Class 4 settlement during La Encantada period.

During the Chapica period these sites joined with another highly influential topogram (Site 99) to attract other sites. Site 99 (the oldest, occupied since the Ñañañique period) is also a small Extended Mound (0.27 ha) that with respect to its settlement during the Chapica period did not grow as much (303.7 percent) as the other two, since it is larger in proportion to the other two. Site 99 was also the single component of the Class 4 settlement during the Ñañañique, Panecillo, and La Encantada periods. During the Chapica period these three sites joined forces and attracted other (shorter occupation) sites (Sites 100, 101, 102, and 103). Altogether, during the Chapica period these sites constituted a settlement of 1.09 ha, still a Class 4 settlement in the hierarchy. Spatial changes during the Vicús period split these three sites into two different though nearby settlements. Site 99 with two other sites constituted a 0.67 ha Class 4 settlement and Sites 94 and 95 together with two other sites constituted another 0.45 ha Class 4 settlement. These three sites became connected again through their association with other adjacent sites during the Campana period forming a 1.26 ha Class 4 settlement with a total of eight constituent sites. This was the largest accretion of sites of the entire sequence yet the settlement remained a Class 4 settlement. For the rest of the occupation sequence (the Piura and Chimú periods) the settlement split again with Site 99 constituting once again a single Class 4 settlement, and Sites 94 and 95 together also formed a Class 4 settlement.

There are of course some cases, though fewer, in which these topograms were parts of Class 1 or Class 2 settlements; the most conspicuous are those found in the third "pocket". For instance, this is the case of Sites 196, 207, 208 and 210. Their location in these settlement size classes can be understood considering that they were the oldest occupied loci in the third "pocket" from which the occupation of this area expanded. In the case of Sites 207, 208, and 210 which are found adjacent to each other, they also represented, since the earliest occupation periods, a significant population concentration in the *despoblado*, turning the latter later into the alluvial plain of the south bank of the Upper Piura River. In fact, as argued sections above, it is also possible that Site 196 (located in the Franco Valley) spawned from the aforementioned population nucleation. The case of the latter site is perhaps an exception and its placement in the settlement hierarchy along the occupation sequence of its settlements could reflect the more volatile situation of the sociopolitical organization in the third “pocket”. Yet in spite of all the fluctuations between its settlements’ size hierarchies (between Classes 1, 2, and 4 and growing exponentially not once but twice over 3,000 percent), this small 0.22 ha Platform Mound managed to remain as the element that bounded together time, space, and the social life in this part of the third “pocket”.

In sum, by looking over time at the size hierarchy of the settlements of which these sacred/secular places were a part, it appears that they were key elements in the formation of social and kinship ties and in the development of the social memory and historical consciousness of the local polities. It also appears that there is not a necessary overlap between political power, on the one hand, and cosmological beliefs, on the other. That is, there is no monopolization of these sacred/secular places by top class settlements. In fact, most of the time they have been part of just small Class 4 settlements. This phenomenon may indicate that cosmological beliefs of local social groups were not formal dogmas formulated and perhaps imposed by a small component of the society (i.e. “elite”) but the result of a more negotiated and decentralized process founded at a more basic grass roots level. In this sense, and as discussed above in Section 7.3.20, ancestor veneration likely played a key role in the definition of territoriality, especially the veneration of ancestors at the level of the social base of sociopolitical entities. That is, ancestor veneration at the grass roots level had more continuity and tradition, and thus the very long occupation loci where the social base of sociopolitical entities lived and died are better markers of territoriality and of the sense of place and belonging than those of the elite.

The spatial structure of the landscape during the Piura period did not change with respect to that observed during the Campana period; i.e., there were overlaps of Zōfū-Tokusui and Sacred Mountain types of landscapes at both "pockets". Also, the new spatial structure that appeared during the Campana period (also a Zōfū-Tokusui landscape type) seems to become even more overarching and perhaps started absorbing the other landscape types. The predominance of this newest spatial structure may be the result of both a greater awareness of the massif of Cerro Pilán and its constituent topograms as central elements of the landscape, while Cerro Santo Tomé becomes the evident entrance to a newly defined territory as may be the case of the *curacazgo* of Pabur.

7.11 Settlement and Landscape during the Chimú Period (ca. A.D. 1375-A.D. 1460)

The study area reached its maximum human occupation during the Chimú period when 193 sites were occupied constituting a total of 109 settlements covering 161.38 ha of land. The settlement size analysis for this period also revealed a four-class settlement hierarchy. The rank-size plot in Figure 63 shows three changes in the slope. Class 1 includes just one settlement (Rank 1) with an area of 15.07 ha. A sharp, almost 180° angle drop in the slope is noticed until the first Class 2 settlement appears. Class 2 is composed of three settlements (Ranks 2-4) ranging from 12.33 ha to 9.97 ha. The gap between Classes 2 and 3 is represented by the drop on the slope that goes from the last Class 2 settlement to about the mark of the 5.6 ha where Class 3 begins. Class comprises 12 settlements (Ranks 5-16) ranging from 5.61 ha to 2.59 ha. Finally, there is a very slight (though statistically significant; see below) change in the degree of slant in the slope between Class 3 and Class 4. Class 4 is hence composed of 93 settlements (Ranks 17-109) ranging from 2.45 ha to 0.03 ha in size.

The histogram in Figure 64 also displays the frequency distribution of the settlement sizes for the four class groups. The gap between Class 1 and Class 2 is obvious as well as that between the latter and Class 3. No separation is observed between Class 3 and Class 4 yet the higher peaks on the frequencies for the latter clearly set them apart. At first look, the frequency distribution of the settlement sizes in this period (with an exception in the number of Class 2 settlements) is very similar to that observed during the former Piura period.

Independent-samples *t* tests comparing the difference of mean settlement size between Classes 2 and 3 and between Classes 3 and 4 are highly significant. A significant difference thus between Classes 2 and 3 ($t(13) = 10.572$, $p < .05$) and Classes 3 and 4 ($t(103) = 15.608$, $p < .05$) is obvious (see Tables 26-27 and Figure 65). An independent-samples *t* test comparing the difference of mean settlement size between Classes 1 and 2 could not be performed since for such test standard deviations of the samples are required and there was not one for the Class 1 since it consists of only one variate. Yet, as mentioned above, looking at the histogram in Figure 44 the separation between Class1 and Class 2 is very clear. Finally, the spatial distribution of the classes was plotted as shown in Figure 66.

The settlement organization during the Chimú period confirms that the second epoch of the “new system” was characterized by rapid (if not tumultuous) sociopolitical transformations. Also, this is the first time the settlement organization and the spatial structure of the landscape show clear indicators of the intervention (if not intrusion) of a foreign political force such as the southern Chimú state from the North Coast. As presented below these changes (and their sociopolitical implications) are reflected in alterations within the same centripetal force, by a redefinition of the settlement hierarchy with respect to the former Piura period, and by evident modifications in the landscape.

Several facts suggest the situation of the settlement system outlined above. For instance, changes to the new order observed during the Piura period reversed the situation of the settlement growth stagnation detected during this period. In fact, during the Chimú period the total area occupied (161.38 ha) increased 26.2 percent vis-à-vis the Piura period. It increased a significant 17.0 percent with respect to the Campana period that in turn had the largest occupied area (until now) of the “new system”. This increment in the total occupied area has a concomitant increase in the number of sites that constitute the settlements; i.e., the number of sites grew 6.6 percent in relation to the Piura period.

Other facts pointing to the above characterization of the settlement configuration during this period are reflected in the number, size, and location of the settlements in the settlement hierarchy. There is no change in the number of Class 1 settlements with respect to the Piura period; i.e., there is only one such settlement. Perhaps the most significant change is that the new Class 1 settlement (Settlement 411) is not placed where the former Class 1 settlements (the same locus since the Chapica until the Piura periods) were located. Rather, this new Class 1 settlement (represented by Site 158, a.k.a. Piura La Vieja) was located ca. 1.0 km to the southwest. A striking and significant difference is that this settlement, unlike all the other Class 1 (or even other lower class) settlements, arose on a locus never occupied before. In addition, it does not grow by accretion like the other Class 1 settlements did; rather, it appeared in just one quick episode and was the largest settlement ever occupied in the entire study area. This phenomenon had consequences as discussed in the sociopolitical connotations section some paragraphs below. Finally, and as what would be expected in a central place model situation, the presence of just one Class 1 settlement during this period confirms that the entire study area (unlike before the Piura period) was more formally and rigidly integrated into a broader, macro regional sociopolitical system involving very distant areas (ca. 500 km to the south), such as the capital of the Chimú empire on the Northern North Coast.

Lines of evidence for the changes in the settlement configuration during this period are also manifest in the characteristics of the other size classes, especially in Class 2. Some important issues are clear regarding the latter. First, the situation is also the reversed of that observed during the Piura period. That is, although not at the same numbers as during the Vicús and Campana periods, there are again three Class 2 settlements unlike the Piura period when they decreased to just one. Second, the new Class 2 settlements are at the same locations (i.e., constituted by almost the same sites) that were the place of former Class 1 settlements during the Vicús, Camapana, and even the Piura periods. Third, these settlements recovered the dimensions they had during the Campana period or even surpassed those they had during the Piura period. For instance, the largest Class 2 settlement during the Chimú period is 49.3 percent of the area of the largest Class 2 settlement during the Piura period; this difference is also apparent in the mean settlement sizes, i.e., 8.3 ha during Piura and 11.0 ha during Chimú. Moreover, the Class 2 settlement in the Franco Valley (Settlement 414) even reappears with the same size and number of constituting sites as it had in the Campana period representing the most striking change in Class 2 settlements, considering that it disappeared altogether during the Piura period. Finally, although more Class 2 sites reappeared during the Chimú period, it is important to observe that none of them were on the alluvial plain in the fourth "pocket" as was the case before the Piura period. Actually, the only Class 2 settlement in the fourth "pocket" (Settlement 412) is located on the pediment of the western slopes of the massif of Cerro Pilán represented by the now downgraded and former Class 1 settlement.

Some changes can also be perceived when the Class 3 settlements are considered. These changes, however, are evident not so much by the number or size of the settlements but rather by their location. In fact, there are only two more settlements (a total of 12) compared to the Piura period and the size of the largest Class 3 settlement did not change with respect to the latter; also the mean settlement size barely differed. Two small but significant changes in size are worth pointing out. Settlement 419, located at the main, upper water distribution point (next to the valley neck of the interior delta) of the hypothesized irrigation system in the fourth "pocket", once again saw its size reduced, this time by 0.3, ha with respect to the Piura period. This settlement that reached its maximum size (5.6 ha) during the Chapica and Vicús periods, decreased its size consecutively during the Campana (5.3 ha), Piura (4.7 ha) and Chimú (4.4 ha) periods; i.e. a significant 21.4 percent from its largest to its smallest area. Another small but important change in the size of Class 3 settlements is observed in Settlement 417, at what used to be the core of the former centripetal force next to the north bank of the Upper Piura River. This locus, which is also the lower end of the alignment of settlements along the hypothesized main irrigation canal in the fourth "pocket", increased its size by 1.0 ha compared to the Piura period. Furthermore, this settlement, with the exception of the time between the Campana and Piura periods in which its size remained the same (4.8 ha), had progressively increased its area since the Panecillo (3.5 ha), La Encantada (3.6 ha), Chapica (4.3 ha), Vicús (4.5 ha), Campana and Piura (4.8 ha) and Chimú (4.9 ha) periods. That is, this represents a significant 40.0 percent increase (rather than decrease) from its largest to its smallest area. In other words, diachronically, there are two opposite scenarios occurring at both ends of the alluvial plain in the fourth "pocket" and its sociopolitical connotations during the Chimú period are discussed below.

As for the location of the Class 3 settlements during this period it should be noted that, similar to the Piura period, the alignment of settlements along the hypothesized irrigation canal in the fourth "pocket" continued. That is, there is no alteration in the spatial distribution or presence of these settlements other than size changes in some of them as presented above. Also, unlike all the other periods of the "new system", the distribution of Class 3 settlements across the landscape seems to be both orderly and spread out. That is, besides the aforementioned alignment of settlements in the fourth "pocket" and amid its alluvial plain, there are now Class 3 settlements at what could be considered border locations. For instance, Settlement 426 located in the underflow next to the pediment on the north part of the study area regained its Class 3 status lost since the Vicús period. In the case of this settlement, it is significant to mention that one of the constituting sites of this settlement is an important topogram composed of a long occupation site (seven periods) occupied since the Ñañañique period. Also, Settlement 420 located at the northern part of the Franco Valley next to Cerro Venado and thus at the border between the third and second "pockets" reappeared for the first time since the Vicús period. The reappearance of this settlement coincides in turn with the loss of the only Class 3 settlement present on the south margin of the Upper Piura River in the third "pocket" during the Piura period. Finally, a new Class 3 settlement is located on top of a new topogram (Cerro Loma Negra, see below) at the valley neck defining the border between the fourth and third "pockets".

As for the Class 4 settlements, the largest settlement of this class has the same size (2.45 ha) as its counterpart from the Piura period. In addition, the difference in the mean settlement size between these two periods is negligible; i.e., 0.77 ha during Piura versus 0.69 ha during Chimú. Some changes are observed in the number of settlements, though. In fact, and almost reversing the phenomenon observed during the Piura period, there are now seven more settlements representing an increment of 8.1 percent. More importantly however, is the 12.0 percent increase with respect to the Campana period when the largest surge of Class 4 settlements in the "new system" was recorded. Finally, for the first time (as explained below) the location on the landscape above the alluvial plain of small but important Class 4 settlements will play a key role in the overall settlement organization.

In sum, two significant observations can be made from the number, size, and location of the settlement size groups during the Chimú period. First, a trend initiated with the "new system" and especially in its second epoch continues during this period. That is, the breach in terms of their dimensions between Class1 and Class 2 settlements compared to Class 3 and especially Class 4 settlements becomes more apparent. And second, although the Class 1 settlements played an equally important central role during both the Piura and Chimú periods, the settlement organization during the latter seems to have displayed a more homogenous and more even distribution akin to the pattern observed during the Campana period.

The characteristics of the settlement size hierarchy presented above have some significant sociopolitical implications. First, the trend initiated during the Piura period in which the settlement system is headed by just a single Class 1 settlement continues in the Chimú period. Yet this time, and unlike the Piura period, the Class 1 settlement did grow in size; it increased by 25.5 percent with respect to the sole Piura period Class 1 settlement. Moreover, it not only became larger but was relocated to a completely new place, which implies social and political recomposition at the very core of the hypothesized *curacazgo* of Pabur.

Second, the above attributes of the Class 1 settlement thus indicate that the new order that started the second epoch of the "new system" during the Piura period, -i.e., a settlement system organized in a radial pattern around a single centripetal force-, continued during this period. Nonetheless, this new order displayed some evident adjustments (and even innovations) with respect to the Piura period. If a physiological and mechanical analogy is permissible here, it could be said that while the Piura period settlement organization depended on the pulsating effects of a single heart, the settlement organization during the Chimú period worked like clockwork with three (Class 2 settlements) gears wound by a single (Class 1 settlement) device.

Third, these adjustments to and innovations in the new order did not imply the cessation of the rigid, centralized settlement system and the social and political dominance by the sole Class 1 settlement already discerned during the Piura period.

Rather, I believe they entailed an even more rigid and further centralized (though better organized) sociopolitical system. The political decision makers maintained and strengthened the new order via two main policies: 1) resorting to a similar though not identical spatial organization experienced in the past (e.g., during the Campana period); and 2) obtaining (for the first time ever) visual control of the landscape by taking possession and transforming (physically and symbolicly) the heights of key landscape features.

Fourth, the materialization of these two policies can be observed in different aspects of the settlement organization. As for the first policy, it is clear that the triangular-shaped vortex of the former three centripetal forces during the Campana period was restored yet under a very different sociopolitical arrangement. That is, these former centripetal forces (no longer Class 1 but Class 2 settlements now) did not constitute a decentralized sociopolitical organization (as during the Campana period) but depended on and were functional to the radial settlement system commanded by the centralized authority residing at the Class 1 settlement.

As argued below, these Class 2 settlements, as the three gears of the clockwork, were a response to the impulse brought by innovations in the agricultural production and irrigation technology. Each of these three settlements served as hinges and monitoring agents of the social and economic activities within their own spheres of influence. Settlement 412 monitored the activities of the fourth "pocket". In this area, the status quo from the Piura period was maintained. That is, the former "gap area" remains entirely obliterated and the alignment of settlements along the hypothesized main irrigation canal remained as Class 3 settlements. Yet, unlike the Piura period, agricultural production was reinforced on the alluvial plain area next to the north bank of the Upper Piura River. In fact, during the Piura period a slight dispersal of some Class 4 settlements away from its core area was perceived. On the other hand, such dispersal is not observed during the Chimú period. Rather, four more Class 4 settlements appeared in this area. In addition, if the aforementioned growth and decrease in size over time of the settlements at both ends of the hypothesized irrigation canal are considered, it is clear that agricultural production in this area was promoted. On the other hand, such bolstering is not noticed on the alluvial plain next to the former centripetal force of the pediment around the valley neck of the interior delta. In fact, at this former core area and similar to the Piura period, there is just one small (2.3 ha) Class 4 settlement contrasting now even more with the 15.1 ha Class 1 settlement and further increasing the breach in size by 84.8 percent. In other words, the almost complete loss of political presence in this key area together with the weakening of the settlement at the top, main water distribution point, indicate that political decisions and management concerning the irrigation system was no longer (since the second epoch of the "new system") in the hands of the sociopolitical agents dwelling around this area. It was, rather, a prerogative of the political power and centralized authority radiating from the single centripetal force and Class 1 settlement.

Settlement 413 and Settlement 414 supervised the activities on the alluvial plain of the third "pocket", the former on the south bank of the Upper Piura River, and the latter in the Franco Valley on the north bank of the river. The existence of these settlements during this period depended to a greater extent on the interdependent relationship they had with two major maximum elevation canals: the Hualcas and the Caracucho Canals on the south and the north margin of the Upper Piura River, respectively. These canals were built and functioned during this period (dated by association with Chimú period key sites) and have to be understood to a great degree as part of a policy of territorial and economic control enforced by the southern Chimú state (see discussion below). Also, it has to be considered that these settlements contained the oldest, long occupation sites in their areas and therefore their ascendancy over their satellite, lower class settlements was a crucial underpinning in the sociopolitical and economic apparatus of this period. These changes were more evident in the Franco Valley where the number of sites that constituted the settlements increased from nine to 14 compared to the Piura period. On the other hand, the number of sites in the south bank of the Upper Piura River (in the area covered by my survey) did not grow with respect to the Piura period but in fact decreased from 59 to 53. Yet, at this point it has to be mentioned that the number of sites, settlements, and cultivated area did indeed increase in the south bank of the Upper Piura River. It occurred in the southern part of the study area not covered by my survey, where the agricultural production, taking advantage of the Hualcas Canal, was boosted reclaiming ca. 3000 ha of the *despoblado*. The major site in this area was located on the eastern slopes of Cerro Tongo. A brief reconnaissance in 1997 (Montenegro Cabrejo, et al. 1998) concentrated on the adjacent Hualcas Canal and on the surface collection of ceramics dating the site to the Chimú period. Yet as it was not a systematic survey no exact area measurement was obtained. Still, field observations allow a rough estimate of the site area within the range of the Class 2 settlements defined by the settlement size analysis. In this case, the settlement system during the Chimú period would have functioned like clockworks not with three but four gears.

The second policy (the visual control of the landscape), is evident not just in the presence of a new type of settlement, but also in the preferred location of the sites constituting the settlements. Unlike all the periods before Chimú (especially during the “new system”), sociopolitical changes from period to period are most evident not by comparing the location of sites found just in the alluvial plain, but by looking at the more general separation between the number of sites placed on the alluvial plain vis-à-vis the number of sites built on ridges and slopes. In fact, if the number of sites located just on the alluvial plain were compared, it is apparent that there is not much detectable transformation between the Piura and the Chimú periods. That is, from a total of 163 sites blanketing the alluvial plain, 11.7 percent (11.9 percent during Piura) were located in the fourth pocket next to the pediment and west of the western margin of the Charanal River, 12.9 percent (13.1 percent during Piura) were in the former “gap area”, 31.3 percent (29.4 percent during Piura) in the fourth “pocket” next to the north bank of the Upper Piura River, and 3.0 percent (3.1 percent during Piura) in the meanders. The only changes noticed (and explained above) were at the Franco Valley (8.6 percent during Chimú versus 5.6 percent during Piura) and at the south margin of the Upper Piura River (32.5 percent during Chimú versus 36.9 percent during Piura), both in the third “pocket”.

Yet a different picture is evident by analyzing both the number of sites on the alluvial plain vis-à-vis the number of sites on ridges and slopes, and the new type of sites. The proportion of sites on ridges and slopes started to decline consistently and consecutively during the last part of the “old system” (Chapica period) and throughout the “new system”. Therefore, while during the La Encantada period 65.9 percent of the sites were located on the alluvial plain and 34.1 percent on the ridges and slopes, the following Chapica period witnessed a dramatic turn, with 81.9 percent of the sites on the alluvial plain and only 18.1 percent on the ridges and slopes. Since then, the proportions went downslope for the sites on ridges and slopes. That is, 86.6 percent versus 13.4 percent (Vicús period), 88.2 percent versus 11.8 percent (Campana period), and 88.3 percent versus 11.7 percent (Piura period). During the Chimú period, however, this tendency stopped. For the first time in 16 centuries the number of sites on ridges and slopes increased; i.e. from a total of 193 sites, 163 (84.5 percent) were found on the alluvial plain and 30 (15.5 percent) on the ridges and slopes.

Even though this percentage increment might seem negligible, it in fact reflects a transformation in the settlement system, especially if analyzed in conjunction with the location and the type of the sites. The presence of these new types of sites is closely related, without a doubt, to the building and functioning of the major irrigation canals and their concomitant increment in the agricultural production and the expansion of the agricultural frontier. There are three new types of sites: extensive complexes of rooms on gentle slopes, hilltop massive walled structures at high elevations, and few (and small) rooms on mid to low elevations.

The main examples of the first type are in the Class 1 settlement itself and to a lesser degree the aforementioned site on the eastern slopes of Cerro Tongo. The existence of the latter clearly responded to the presence of the Hualcas Canal that wound through its eastern foothills and which was a secondary administrative unit in charge of agricultural production in that area. The Class 1 settlement, although not adjacent to a major canal, was obviously the nerve center of the entire settlement system. The types of walls or wall foundations of the rooms do not differ much from similar types of architecture observed in previous periods. On the other hand, a significant characteristic shared by both is that they were constructed on, until then, untouched terrain.

The hilltop sites were an unprecedented type of construction in the study area. They were built on top of two prominent landscape features (Cerro Santo Tomé and Cerro Loma Negra) modifying the original structure of the hills through quarrying to build massive, tall ring walls that contained interior rooms, small plazas, and platforms. These constructions were adapted to sections of the original already steep topography, making access to them not an easy task. In addition, they are at key locations. Cerro Santo Tomé is at the valley neck between the third and second "pockets" and at the point where the Hualcas Canal turns to the southwest towards Cerro Tongo. Cerro Loma Negra is at the valley neck between the fourth and third "pockets" and at the point where the Hualcas Canal enters into the former. There is no doubt that the visual control of the settlement, agricultural, and irrigation systems as well as of the road network was exercised from these sites. As discussed below, this type of site is the hallmark of the apparatus for territorial control exerted by the intrusive southern Chimú state.

Finally, the few and small rooms on mid to low elevations can be of two kinds. One of them seems to have functioned as lookout posts. For instance, this is the case of Sites 161 and 162. These sites are located on ridgetops at the southwestern end of the massif of Cerro Pilán also at the valley neck between the fourth and third "pockets". Yet while Site 161 overlooks the actual valley neck as well as the constructions at Cerro Loma Negra across the river, Site 162 (located 365 m to the northeast) overlooks a good section of the inhabited western slopes of the massif of Cerro Pilán and especially the location of the Class 1 settlement. The other kind of few and small room structures are placed at lower elevations than the lookout posts but higher than the alluvial plain. Unlike the lookout posts, these sites are locations closely associated with the farming and irrigation activities. They oversaw these activities at a closer range than, for instance, the summit of Cerro Santo Tomé. The main examples are found in the third "pocket" in or next to the Franco Valley. One of them (Site 145) is located on top of a ridgetop of the No-Man's (or Woman's)-Land between both branches of the Quebrada de Franco. It beholds the Franco Valley to the southeast and the course of the Caracucho Canal to the northeast and is found next to the point where the latter veers towards the Quebrada de Franco after irrigating the slopes of the No-Man's (or Woman's)-Land and the Franco Valley. The two other examples are sites that are found at the eastern border of the Franco Valley and are elevated ca. 10 m to 20 m over the cultivation fields. One of them (Site 201) is on the slopes of Cerro Venado, and the other (Site 193) on the ridgetop of a natural platform between Cerro Venado and Cerro Piedra Blanca. In addition, both served as checkpoints overlooking the exit towards the second "pocket" through the bottleneck created between the northern tip of Cerro Piedra Blanca and the first foothills of the Andean cordillera.

And fifth, another sociopolitical implication drawn from the characteristics of the Chimú period settlement size hierarchy focuses on the role that the hypothesized *curacazgo* of Pabur might have played in the overall organization of the sociopolitical system. At the same time, discussing the role of the *curacazgo* of Pabur implies incorporating the unquestionable presence of the intrusive Chimú state.

There is no doubt that the Chimú empire had an aggressive, though not necessarily violent, policy of territorial control, conquering, or at least intervening, in the social and political affairs outside (and expanding both north and south) Chan Chan, its core area and capital on the Northern North Coast Moche River Valley. Unlike previous expansive polities of the Northern North Coast such as the Mochica and Sicán, the Chimú state seems to have been interested in controlling not just the interregional trade networks but also (and perhaps more importantly) the agricultural production of its peripheries.

The imperial and expansive nature of the Chimú state has long been taken for granted or studied by North Coast archaeologists excavating primarily at Chan Chan and other provincial administrative centers. It was unknown, until relatively recent, how this imperial plan actually and physically operated at a landscape and regional level. This gap in understanding has been filled by investigations carried out by Tschauner (2001) and then Hayashida (2006), both in the Northern North Coast Lambayeque region (see also Netherly 1977; Nolan 1980). In fact, Tschauner demonstrated that a crucial device used by the Chimú state for its intrusive agenda in the Middle Lambayeque Valley was the establishment of administrative centers he labels as valley-margin centers[9]. As it name says, these centers (that housed Chimú-state elite, administrative, military and support force) are large, massive, parapeted, stone ring walled constructions overlooking the entire valley bottom from the summits and slopes of the flanking hills. In the case of the Middle Lambayeque Valley there is a chain of four such centers located equidistantly on the north margin paired with similar chain of centers on the hills flanking the south margin. These Chimú centers thus akin to a gigantic, mighty, and divine dual chainsaw running along and on top the jagged hilltops of the valley are the most clear example of the imperial machinery that kept local Lambayeque polities in check.

Tschauner carried out an exhaustive intrasite, spatial, architectural, functional, and ceramic analysis comparing the four centers (east to west; La Puntilla, Pátapo, Mesones Muro, and Cerro Salinas) flanking the major Taymi Canal. These centers broke the local Lambayeque architectural and settlement location patterns and crossed the boundaries of local polities. They have many architectonic features resembling the architectural style at Chan Chan. These main architectonic elements, among others, are the u-shaped *audiencias*, niched walls, winding corridors, baffled doorways, u-shaped benches adjacent to patios and small ramps leading to them (Tschauner 2001:115). The internal organization of these centers was ordered around the location of independent wall compounds on different terraces created by the ring walls. As another example of the careful, well-planned Chimú imperial project, the internal location and distribution of these structures followed the same pattern in all four Chimú valley-margin centers in the Middle Lambayeque Valley. That is, on the basis of his analysis, Tschauner defined three sectors (residential, public-secular, and public-religious) "… arranged in vertical tiers, with the public-secular and residential sectors sandwiched between two public-religious ones at the hill foot and on the summit" (Tschauner 2001:159).

The results of his analyses of both the valley-margin centers and the settlement patterns led Tschauner (2001:112-114, 158-174) to conclude that the Chimú state established its dominance of the Middle Lambayeque Valley through an effective and successful policy of territorial control and indirect rule. Yet, this state-level plan was not crafted replacing local elites and imposing foreign Chimú administrators and bureaucrats. Rather, the Chimú rulers chose to leave the government of local affairs in the hands of the local lords but co-opting the capitals of these local polities constructing massive, larger centers (such as the valley-margin centers) right above the (smaller) seats of these local elites and thus virtually and visually controlling them and the surrounding landscape. For instance, the capital of the local polity in the Middle Lambayeque Valley (possibly the *señorío* or c*uracazgo* of Cinto) composed of adobe mounds was located at the bottom of the hill on Cerro Pátapo with the massive, ring walls of the Chimú center right above it on the upper slopes and summit. Chimú rulers therefore opted to co-exist with local elites rather than annihilate them, yet displaced them by, literally, pushing them down in the settlement size hierarchy when they constructed their towering administrative centers. Changes were hence effected at the top level of the settlement system while leaving the local spatial organization of the lower echelons (Class 3 and Class 4 settlements), untouched. It is still unclear what kind of interaction the Chimú and the local elites had. Yet Tschauner has suggested that Chimú elite residents at the Chimú valley-margin centers enticed local elites by throwing lavish feastings entailing the consumption of conspicuous amounts of *chicha* behind the walls of their residential compounds on the upslope terraces of the ring wall centers. In other words, these feasts were selective and directed to the local rulers and thus different from the Inca model which targeted a larger social base and was oriented to recruit large labor forces to undertake corporate projects. Finally, and considering the very limited storage facilities in these Chimú centers, Tschauner posits that one of their main goals was the procurement of a significant amount of the local agricultural production to: 1) warrant the subsistence of the Chimú personnel at the centers and sponsor the profuse feasts; and 2) ship it (via the road networks also controlled by the Chimú empire) to Chan Chan, the capital of the empire, the place of residence of thousands of non-food producing full-time craft specialists, retainers, bureaucrats, elite, and royalty.

I contend that the Chimú state via the establishment of its valley-margin centers and other settlements was present in the study area in the Upper Piura Valley intervening in the sociopolitical and economic organization of the local polity, the hypothesized *curacazgo* of Pabur. These valley-margin centers are the aforementioned massive, ring-walled constructions and associated structures on the slopes and summits of Cerro Santo Tomé and Cerro Loma Negra[10]. Yet, the social, political, geographical, and demographic circumstances the intrusive Chimú state encountered on its way varied from region to region. In this sense, the imperial machinery implemented in the Lambayeque region was not necessarily the same as the one operated in the Upper Piura River Valley.

There are similarities and differences in the features defining the presence of the Chimú state in the Upper Piura region vis-à-vis the Lambayeque region. For instance, there is no doubt, on the basis of the style and the distribution of the architectonic elements, that the settlements on top of Cerro Santo Tomé and Cerro Loma Negra are similar to the Chimú valley-margin centers of the Middle Lambayeque Valley. That is, there is the presence of the reddish, massive (4-5 m tall, 3-5 m thick), stone ring walls, baffled doorways, structures on the terraces created by the ring walls, rooms with benches, narrow corridors, and small patios, among others. U-shaped *audiencias* were not detected but as mentioned in the Endnote 10 below, these sites deserve further detailed and in depth research.

These centers are also located equidistantly and at strategic positions. In fact, a distance of ca. 8.5-9.5 km separates Cerro Santo Tomé, Cerro Loma Negra, and Cerro

Tongo[11] from each other. Cerro Santo Tomé is found at the valley neck between the second and third "pockets" and at the point where the Hualcas Canal enters the third "pocket" and heads southwest towards Cerro Tongo. Cerro Loma Negra is placed at the valley neck between the third and fourth "pockets" and at the locus where the Hualcas Canal enters the fourth "pocket" and sets its course northwest towards Cerro Vicús. Moreover, both have "visual communication" (can be seen from each other) as well as visual control of both margins of the entire valley; i.e., of the second and third "pockets" from Cerro Santo Tomé, and of the third and fourth "pockets" from Cerro Loma Negra. Cerro Tongo is located along an ancient road and, more importantly, at a critical point where the Hualcas Canal makes a dramatic U-turn changing its direction from NE-SW to SE-NW. Furthermore, Cerro Tongo is positioned at the furthest and most marginal location of the recently expanded agricultural frontier.

On the other hand, there is a conspicuous difference in scale between the valley-margin centers of the Middle Lambayeque Valley and those of the Upper Piura Valley. Actually, among the four valley-margin centers in the Middle Lambayeque Valley there is a dramatic difference in scale between the largest, top ranked Chimú center (on the seat of the co-opted local polity) at Cerro Pátapo and the other three centers. That is, Cerro Pátapo is 184.2 ha in area while La Puntilla, Mesones Muro, and Cerro Salinas are 14.8 ha, 12.57 ha, and 17.29 ha respectively. This means that the Chimú centers at Cerro Santo Tomé and Cerro Loma Negra, even if the corrected measurements were to be applied (see Endnote 10), are dwarfed by its Middle Lambayeque Valley counterparts, reaching only half their sizes (with the exception of Cerro Pátapo) at best.

In this sense, it is pertinent to incorporate the Chimú administrative center of Cerro Arena (Figueroa and Hayashida 2004) into the discussion. Cerro Arena is 7.8 ha in size and thus also smaller than the four Middle Lambayeque Valley Chimú centers. On the other hand, its dimensions are about the same or slightly above of those of Cerro Santo Tomé and Cerro Loma Negra in the Upper Piura Valley. The sociopolitical organization overlooked by Cerro Arena at the Pampa de Chaparrí (between the Middle La Leche and Lambayeque Valleys) itself was not very complex with a settlement system mostly composed of residential units, with an average site size below 1 ha in each of its three occupational periods, and with no evidence of major monumental architecture. In fact, the inferred primary center of the local polity associated with the Pampa de Chaparrí settlement system is actually located outside the *pampa* at the site of Campamento de Paredones (Hayashida 2006:250-253) leaving Cerro Arena during the Chimú period as the clear central authority. The scenario at the Pampa de Chaparrí, and in spite of the difference in size of the study areas, is somewhat similar to that observed during the Chimú period at the study area in the Upper Piura Valley. That is to say, an area socially and politically dominated by a single local polity (with the difference that its primary center is found within its territory), with a slightly more complex settlement system but nevertheless comprised mostly of small area settlements, and a lack of monumental architecture. Both areas therefore seem to contrast to the situation observed in the Middle Lambayeque Valley where the Chimú rulers upon their arrival encountered a much more complex sociopolitical and demographic scenario with an intricate settlement system entailing a hierarchy of local level lords that in turn ruled a larger population than both at the Pampa de Chaparrí and the Upper Piura Valley. If the differing arrangements functioned as argued above, it would demonstrate the flexibility of the Chimú rulers to adapt their imperial policies to the social, political, and landscape realities of its provinces. It would also indicate that there is a directly proportional relationship between the magnitude of its valley-margin administrative centers and the degree of sociopolitical complexity of its incorporated territories.

Other similarities and differences with respect to the presence of the Chimú state in the Upper Piura region vis-à-vis the Lambayeque region are also apparent regarding other landscape elements. For instance, akin to the situation in the Lambayeque region, the Chimú state also imposed a chain of administrative sites (not all of them valley-margin centers, though) in the Upper Piura River Valley. Besides the valley-margin centers recorded in the study area there is, to the west, a Chimú hilltop site with massive retention walls and wall foundations of rectangular structures on the summit of Cerro Ñañañique (Guffroy, et al. 1989a). Also, on the nearby eastern lower slopes of the Cerro Vicús late prehispanic stone structures (possibly Chimú) overlooked the Hualcas Canal. To the east, the site of El Ala located next to the eastern end of the second "pocket" on the south margin of the Upper Piura River was the seat of the hypothesized local late prehispanic *curacazgo* of Serrán. This settlement dates back no further than the Chimú period and comprised residential areas defined by stone wall foundations of square and rectangular-shaped structures and elite residential/ceremonial areas characterized by small platform mounds and wall enclosures. The Hualcas Canal crosses this settlement at its southwestern end. A few meters northeast of this settlement there is a large, massive stone wall compound with rectangular enclosures and narrow corridors adjacent to a steep-sided platform mound both in turn adjoining the foothill of the southeast portion of the Andean cordillera separating the *despoblado* from the Upper Piura River Valley. It was difficult to situate this site chronologically during the 1997 reconnaissance. Considering the date of the adjacent El Ala settlement, the completely different architectural style vis-à-vis the latter, its architectural elements (more Chimú-like), its association with the overall Hualcas Canal system, and its location along an ancient road that threaded together both settlements with the area of Cerro Tongo, I suggest this wall compound and platform mound were a Chimú administrative site placed at the core of the local *curacazgo* of Serrán. In addition, similar massive, stone-walled constructions have been observed next to the modern town of Hualcas east from El Ala at the headwaters of the Upper Piura River and where the main intake of the Hualcas Canal is located (C. Seminario, personal communication 2005).

Similarities and differences between the Upper Piura region vis-à-vis the Lambayeque region can also be assessed comparing the irrigation and agricultural systems during the Chimú period. As pointed out above, Tschauner has argued that the feasts thrown by the Chimú elite residing at the valley-margin centers were directed towards the local elite and not to recruit large masses of people to carry out corporate projects such as the construction and maintenance of irrigation canals. That task was left in charge of the hierarchy of local lords and thus the Chimú state ruled indirectly as proposed by Tschauner. Likewise, Hayashida (2006:256-257) has argued that the maximum extent of the irrigation system at Pampa de Chaparrí was reached during the Middle Sicán and then the Late Sicán periods with no further expansion upon the arrival of the Chimú state administration.

Indeed, the Chimú state had no need to teach large scale irrigation technology to the equally expert polities of the Lambayeque region. Yet during its presence in the Pampa de Chaparrí it allowed an increase of 415.2 percent in the number of sites and of 131.1 percent in the total site area with respect to the former Late Sicán period (Hayashida 2006:252-253, see also Figures 3-5). There is no question therefore that if it did not represent an innovation in the irrigation system, the Chimú administration in Pampa de Chaparrí at least warranted a successful and effective management of the agricultural production, increasing and controlling its yield, and erecting the largest settlement (Cerro Arena) in the area.

On the other hand, the situation in the Upper Piura Valley is not exactly the same as that observed in the Lambayeque region. In the first place, I argue that no major, large scale irrigation system (i.e., the Hualcas Canal on the south margin of the Upper Piura River) was built before the Chimú period. All major settlements along the Hualcas Canal in the study area and to the east (Cerro Tongo, Cerro Santo Tomé, El Ala, Las Huacas and possibly Hualcas too) are dated no earlier than the Chimú period. In addition, in the Upper Piura region and unlike the southern Moche and Lambayeque Valley regions, there is no previous long tradition of building large scale irrigation systems. Furthermore, the three major settlements in the study area (Cerro Loma Negra, Cerro Santo Tomé, and Cerro Tongo) that supervised the operation of the Hualcas Canal and managed the agricultural production in the third "pocket" are unquestionably not just Chimú period but Chimú state administrative centers. In this sense, it is difficult to believe that the Chimú state would have successfully controlled the agricultural production in the third "pocket" without having control (either directly or co-opting local polities) of the water distribution at the eastern, upriver settlements.

The case of the Caracucho Canal is somewhat different. Although at some sections its dimensions (width and depth) can be as large as those of the Hualcas Canal, it is much shorter than the latter. Yet it is still a major irrigation project considering that the technology that entailed directing water (in this case, from an interior tributary river) is unprecedented in the study area. There is a significant presence of settlements in the Franco Valley (the area next to the Caracucho Canal) since at least the Vicús period. It could thus be argued that the Caracucho Canal dates back to at least this period. Yet, the Caracucho Canal was constructed not to just water the Franco Valley but more importantly to expand its farmland frontier by irrigating the gentle slopes of the pediment already within the No-Man's (or Woman's)-Land topogram, as well as other areas in the second "pocket". Still, the sites closely associated with this canal and related to the control of the irrigation and agricultural system (Sites 145, 193 and 201 mentioned above) all date to the Chimú period.

Overall, the current evidence does not allow determining whether the large scale irrigation systems of the Upper Piura Valley were due to the know-how brought by the Chimú state or if they were the product of independent technological efforts by the local late prehispanic polities. Yet, and considering that during the Chimú period the maximum number of sites and occupied area was reached, the presence of the Chimú state administration in the study area arguably played a critical role in the management of the irrigation systems and agricultural production as well as in the general sociopolitical organization.

Finally, similarities and differences between the Upper Piura and Lambayeque regions during the Chimú state expansion can also be detected in the transformations of the settlements and the settlement size hierarchies. As presented above and similar to the Middle Lambayeque Valley, upon the intrusion of the Chimú state in the study area, changes in the settlement size hierarchy are evident at the top echelon of the settlement system (Class 1 and Class 2) rather than at the lower ones (Class 3 and Class 4). Also, on these lower echelons there are no transformations in the type of sites or domestic architecture. Interestingly enough, this is not the case for the Pampa de Chaparrí. In fact, Hayashida and her colleagues (Hayashida 2006; Téllez and Hayashida 2004) have reported a dramatic change in the transition from the Late Sicán to the Chimú period characterized by the appearance of walled fields on the *pampa* floor and a shift in domestic architecture style from probably *quincha* structures defining open spaces to closed adobe-made compounds. No such changes have been detected either in the fourth or in the third "pocket" and these different scenarios between Pampa de Chaparrí and the Upper Piura Valley may imply a different kind of social and political interaction between the Chimú administrators and the population dwelling below them.

The changes at the upper echelons of the settlement hierarchy are characterized by the aforementioned shift in the seat of the sole Class 1 settlement, and on the reappearance of three former Class 1 settlements now as Class 2 settlements functioning as the gears of the clockworks that move the local settlement system. Yet unlike the situation in the Middle Lambayeque Valley, the seat of the local polity (the hypothesized *curacazgo* of Pabur) seems not to have been co-opted by a large Chimú ring-walled hilltop administrative center. That is, there is no such construction on the western slopes and summit of the massif of Cerro Pilán and above the Class 1 and Class 2 settlements. Further research is necessary to clarify this issue but four possible scenarios can nonetheless be entertained. First, the divine nature of the massif of Cerro Pilán was considered by the Chimú rulers and therefore was left untouched. Second, the summit of the massif of Cerro Pilán is at 519 m asl and therefore impractical for the supervising purposes of the Chimú administrators; the average highest point (between the four centers at the Middle Lambayeque Valley and two in the study area) of the valley-margin centers is 208.7 m asl. Third, the Chimú state elite residents did not feel the local polity and its population as any military threat and therefore decided to coexist, side by side, with the *curaca* of Pabur in a sort of "friendly co-option": the Chimú elite in the Class 1 settlement and the *curaca* of Pabur in the adjacent Class 2 (formerly the sole Class 1 settlement during the Piura period) settlement. And fourth, the Chimú elite and administrators lured the *curaca* of Pabur by building him a new place of residence in the Class 1 settlement and observed him from the heights of the Cerro Loma Negra valley-margin center. The Chimú administration thus did not co-opt the head of the local polity in the way that the valley-margin center at Cerro Pátapo did. It may have co-opted, however, other more symbolic landscape elements as explained below in the topograms section.

As for the reappearance of the three Class 2 settlements, I have argued above that this kind of spatial organization was promoted to improve agricultural production in all parts of the study area. The *curaca* of Pabur from its seat may have been in charge of such tasks in agreement with the Chimú administrators who also supervised the operations from the valley-margin centers. This three Class 2 settlement triangular-shaped vortex that has deep local organizational roots as has been demonstrated in this chapter, was juxtaposed by another triangular-shaped vortex, this time designed and exploited by the Chimú state administration. This juxtaposed vortex includes the settlements or administrative centers of Cerro Loma Negra, Cerro Santo Tomé, and Cerro Tongo and was oriented to capture most, if not all, of the agricultural production of the south margin of the Upper Piura River in the third "pocket". This arrangement, as explained below, created a new transformation in the spatial structure of the landscape. Overall, and unlike what some recent syntheses of the Chimú empire claim (e.g., Moore and Mackey 2008:789-797, Table 39.1), the presence of the Chimú empire in the Upper Piura Valley responded to an expansion and incorporation policy rather than a mere interaction one.

In sum, the sociopolitical connotations drawn from the characteristics of the settlement system observed during the Chimú period point to the continuation of a trend observed since the beginning of the second epoch of the "new system". This trend is characterized by rapid sociopolitical transformations led by a centralized political authority emanating from the seat of the hypothesized *curaca* of Pabur located at the single centripetal force on the western slopes of the massif of Cerro Pilán. The rulership of the *curacazgo* of Pabur during this period, and unlike the former Piura period, coexisted or was co-opted (though in a somewhat different fashion than at other regions) by the southern intrusive Chimú empire as part of its territorial control and incorporation policy oriented to control trade networks and the agricultural production of its peripheries. The cornerstone of this government or co-government rested on two main policies: 1) resorting to a similar though not identical spatial organization experienced in the past (e.g., during the Campana period); and 2) obtaining (for the first time ever) a visual control of the landscape by taking possession and transforming (physically and symbolically) the height of key landscape features. Finally, this was the first time in ca 2500 years of history that the long, historic, and local sociopolitical organization dynamics was disrupted by the evident intervention of a foreign polity.

The social and political transformations occurred during the Chimú period had obvious repercussions on the system of topograms. They were not dramatic changes since all former 16 topograms of the study area were still active and thus key elements in the conceptualization of the landscape. This fact also suggests that the local belief systems were not significantly altered at a large scale by the intrusion of the foreign Chimú state. Yet the few changes observed had significant implications especially since they are, unlike previous periods, undoubtedly interlinked with the social and political intricacies of the rulers and the ruled.

The changes during this period entailed the appearance of the last three topograms and the modification and secularization of others already present. The new topograms are: the irrigation canals, Cerro Loma Negra, and Cerro Tongo, all of which have already been presented in the topogram description section early in this chapter. In general, some trends already observed during the Piura period continued such as the possible secularization of the valley neck of the interior delta. Even though in general the area that represents this topogram was less favored by the population, it nonetheless contained three other key topograms; i.e., three long occupation sites on spurs. Other continuing trends were the confirmation of the massif of Cerro Pilán and its constituent topograms as sacred in nature and as decisive elements in the conceptualization and organization of the landscape, housing the seat of the polity center, and virtually left untouched by the Chimú state intrusion. Likewise, the corroboration of other topograms such as Cerro Venado and Cerro Piedra Blanca constituting points of access to the study area and boundary markers. In addition, the number of long occupation sites (see Table 23) maintained its maximum numbers meaning that the Chimú state did not interfere with such key elements of the local social organization and cosmological order. In fact, the Chimú state seems to have rather promoted their presence considering the bolstering by the political organization of the key Class 2 settlements (constituted by some of these topograms), a policy that makes perfect sense taking into account the interest of the Chimú state in warranting an efficient and larger agricultural production.

The presence of the new topograms and their connection with others already existing represented a change in the conceptualization of the landscape and, although it did not entail a dramatic reversal in the local cosmological order, it had a clear impact. Ultimately these topograms embodied (more palpable than before) the negotiations (or their results) for controlling the political power and authority in the sociopolitical system of the study area during the Chimú period.

The irrigation canals represented a dramatic alteration of the landscape. Even though the study area was not unfamiliar with small scale irrigation systems since earlier times as I have contended above, the magnitude of the Hualcas and Caracucho Canals is such that it is hard to believe they did not leave a distinct imprint in the mind-bodies and in the spatial perception of local inhabitants. For instance, the Caracucho Canal penetrated into formerly sacred topograms perhaps initiating their secularization. This is the case of the No-Man's (or Woman's)-Land (and by association, the Quebrada de

Franco too) that for thousands of years was a void space likely conceived mentally and physically as the realm of the forbidden, as a borderland, as the chaos in opposition to the order of the settled areas. A similar conception defined the relationship between the Hualcas Canal and the *despoblado* that, though not a topogram, could have had similar connotations as the No-Man's (or Woman's)-Land.

The appearance of the irrigation canals as topograms also served to expand the conceptualization of the landscape at a much broader, regional scale. There was a new awareness of the other places and people where the irrigation water was coming from. It thus fostered the creation of new social and cultural relationships that transcended the study area. Moreover, if the study area was in fact incorporated into the Chimú imperial agenda, this new awareness might have surpassed not just the regional but the supra regional level, involving not just the elite segments of the society. At the level of the study area, these topograms became loci with a sense of place around which social relations among the different echelons of society and worldviews were redefined in as much as the building, functioning, and maintenance of the canals and improved agricultural systems required these social interactions. In addition, the irrigation canals represented, together with two other topograms (Cerro Loma Negra and Cerro Santo Tomé) a new way of perceiving the landscape in which the vertical and horizontal dimensions were brought together. In other words, the irrigation canals could not be understood apart from the ground they watered and the heights from where such irrigation was controlled.

The new Cerro Loma Negra topogram together with the already existing Cerro Santo Tomé topogram are the clearest examples of the transformation in the system of topograms during this period. Cerro Loma Negra was probably a topogram already before the Chimú period. There are a significant number of settlements (dating as far back as the Chapica period) located beyond its western slopes. Yet since the latter area was not covered by my surface survey, I did not present it into the previous discussion.

These were very likely sacred topograms at least until the Piura period. In fact, one of them (Cerro Santo Tomé) contains another very important topogram on its slopes, i.e., a long occupation site (Site 203). The most striking feature of these topograms, however, is that their upper slopes and summits for ca. 25 centuries were left virtually untouched by the local inhabitants. This may attest to the sacred and divine connotations these topograms had. In this sense, the Chimú state arguably made a strong statement when, upon their arrival, they quarried, leveled, and in general transformed and secularized their peaks and thus changing the relation between the divine essence of these topograms and the populations living below them. In other words, local inhabitants were no longer watched by spirits or super natural beings but rather beheld by mundane, strategic, and very inquisitive human eyes.

I argue here therefore, the Chimú state incorporation plan of the study area look for co-opting not only the seat of the local polity but also certain key elements of the landscape that likely had special significance for the cosmological beliefs of the local population. The Chimú valley-margin center at Cerro Loma Negra hence not only had visual control of the western slopes of the massif of Cerro Pilán where the seat of the local polity was, but also had full possession with restricted access to the entire hill. The Chimú valley-margin center at Cerro Santo Tomé in turn, co-opted not just the whole hill but also the entire Franco Valley and, perhaps more importantly, the long occupation site (a key topogram) located right below it. Yet the purpose in co-opting these topograms (besides acquiring the obvious visual control of the valley) seems to have been co-opting the entire south river margin of the third “pocket” via the juxtaposed Chimú triangular-shaped vortex (Cerro Loma Negra-Cerro Tongo-Cerro Santo Tomé). In so doing, the Chimú administration encapsulated local and traditional topograms such as the long occupation sites on the lower slopes of Cerro Santo Tomé, and those in the Class 2 settlement in the south river margin of the third “pocket”. Complementing this vortex was the role played by Cerro Tongo as a topogram as well as serving as a boundary marker and checkpoint to the entrance to the valley, while setting the limits for the new spatial structure of the landscape. On the other hand, in the fourth “pocket”, co-option of similar important landscape features or topograms was not necessary in as much as the seat of the *curacazgo* of Pabur (a topogram in itself) was already co-opted. The Chimú administrators thus were not interested in building any major center at, for instance, the valley neck of the interior delta or above its long occupation topograms, a point where water distribution from the Charanal River starts.

Overall, the incorporation of the last three topograms during the Chimú period imprinted in the landscape the political agenda pursued by the intrusive Chimú state. Such agenda entailed the co-option of key local landscape features and topograms placed at strategic locations to achieve visual and territorial control of the entire valley.

The Chimú period saw the consolidation of the larger and overarching spatial structure of the landscape that started during the Campana period. It is a Zōfū-Tokusui landscape type. It has a u-shaped domain area encompassing both river banks and the entire study area. Its boundaries are defined by the base of the “U” that is marked by the alignment of Cerro Piedra Blanca, Cerro Santo Tomé, and the western tip of the southeast branch of the Andean cordillera, with Cerro Santo Tomé clearly located as a focal point amid the base of the "U". The lateral sides are the Andean pediment to the north, and the portion of the *despoblado* that aligns between Cerro Vicús and Cerro Tongo, to the south. The directionality (SE-NW) is defined by the flow of the Upper Piura River, the slanting of the alluvial plain, and the axis created by the alignment of the summits of Cerro Santo Tomé and Cerro Loma Negra. In addition, this broader landscape type also overlaps with other Sacred Mountain types as represented by the Cerro Vicús and the massif of Cerro Pilán. Finally, for the first time in the history of the spatial structure of the landscape, a new settlement type appeared and thus also overlaps with the main Zōfū-Tokusui landscape type. This new type is the Domain-Viewing Mountain type and is represented by Cerro Loma Negra and Cerro Santo Tomé. These landscape features are defined as this landscape type by the character given to them by the Chimú valley-margin centers that were built on their summits and upper slopes.

7.12 Settlement and Landscape during the Inca Period (ca. A.D. 1460-A.D. 1532)

The lowest human occupation density in the "new system" was recorded during the Inca period. It represents a sharp decline with respect to previous periods. Only 93 sites were occupied forming a total of 64 settlements and occupying a total of 102.17 ha of land. As during previous periods, the settlement size analysis defined a four-class settlement hierarchy. A sharp drop in the slope in the rank-size plot (Figure 67) separates the Class 1 from the Class 2 group. Class 1 is composed of just a single settlement (Rank

1) with an area of 15.07 ha. Class 2 comprises two settlements (Ranks 2-3) with an area of 9.97 ha and 7.88 ha respectively. Another gap in the slope though not as large and sharp than the previous one, divides Class 2 from Class 3. Class 3 is constituted by 10 settlements (Ranks 4-13) ranging from 5.61 ha to 2.53 ha. Four settlements within this group cluster between the 3.74 ha and 3.26 ha mark creating the impression of a false break in the slope. Finally, a short but conspicuous change in the angle of the slope separates Class 3 from Class 4. Class 4 thus comprises 51 settlements (Ranks 14-64) ranging from 1.91 ha to 0.04 ha in size.

The frequency distribution of the settlement sizes is also presented in the histogram in Figure 68. The separation of the class groups is manifest here too. A gap of 5 ha sets Class 1 apart from Class 2. There is a gap within Class 2 yet its grouping in comparison with the mean settlement size of Class 3 is statistically significant (see below). In addition, there is no gap between Class 3 and Class 4 yet the higher peaks on the frequencies for the latter clearly separate them.

Independent-samples *t* tests comparing the difference of mean settlement size between Classes 2 and 3 and between Classes 3 and 4 are highly significant. A significant difference thus between Classes 2 and 3 ($t(10) = 6.598$, $p < .05$) and Classes 3 and 4 ($t(59) = 14.838$, $p < .05$) is obvious (see Tables 28-29 and Figure 69). An independent-samples *t* test comparing the difference of mean settlement size between Classes 1 and 2 could not be performed since for such test standard deviations of the samples are required and there was not one for the Class 1 since it consists of only one variate. Yet, as mentioned above, looking at the histogram in Figure 44 the separation between Class1 and Class 2 is very clear. Finally, the spatial distribution of the classes was plotted as shown in Figure 70.

The settlement organization during the Inca period demonstrates once again that the second epoch of the "new system" was marked by swift changes in the social, political, and economic organization of the study area. The Inca period in particular shows a clear disruption of the social and political structure. This phenomenon in turn may be the outcome of the turmoil that engulfed the late prehispanic Far and North Coast societies upon the defeat of the Chimú empire at the hands of the Incas. Notwithstanding these changes, some other aspects of the sociopolitical organization followed a pattern that characterizes the second epoch of the "new system" in turn rooted in local and historical trends.

Several facts points towards the above characterization of the settlement system. For instance, there is an obvious 36.7 percent decrease in the total area occupied (102.17 percent) with respect to the former Chimú period. It is in fact the lowest occupied area during the entire "new system". This decline in the total occupied area is obviously accompanied by a decrease in the number of sites that constituted the settlements. That is to say, there is an outright loss of 51.8 percent of the sites with respect to the former period.

The similarities and contrasts as compared to the former Chimú period are also detected by analyzing the number, size, and location of the settlements in the settlement hierarchy. For instance, akin to the former Piura and Chimú periods, there is only one Class 1 settlement (Settlement 520). Moreover, this Class 1 settlement is the same (and has the same area) as the Chimú period Class 1 settlement. In addition and following a trend since the Piura period, the presence of a single Class 1 settlement indicates that the whole study area was integrated into a much broader, macro regional sociopolitical system.

Yet more evident changes are perceived by analyzing the situation of the other size classes. For instance, while during the Chimú period there were three Class 2 settlements, now there are only two. There are four important facts worth mentioning in relation to the Class 2 settlements. First, in general, there is a decrease in the size of the settlements; i.e., while the mean Class 2 settlement size during the Chimú period was 11.0 ha, during the Inca period it is 8.9 ha. In addition, the largest settlement is 9.97 ha while during Chimú it was 12.33 ha. Second, even though there is such a decline in the size of Class 2 settlements, it is important to note that this is the consequence primarily of changes that occurred in just one of those settlements. In fact, there is no change in the area (9.97 ha) of Settlement 521 (located in the Franco Valley) with respect to the Chimú period. On the other hand, Settlement 522 (placed on the western slopes of the massif of Cerro Pilán) decreased in area from 12.33 ha during Chimú to 7.88 ha in the Inca period; i.e., a significant loss of 36.09 percent of its area. Third, the most dramatic change is represented by the complete loss of the former Class 2 settlement (10.83 ha during the Chimú period) in the south margin of the Upper Piura River in the third "pocket"; it was downgraded to a small 1.05 ha Class 4 settlement; i.e., a categorical loss of 90.3 percent of its area. This is particularly important considering that historically this locus played a key role in the overall sociopolitical organization. And fourth, the balance and distribution of Class 2 settlements acquired during the Chimú period following past patterns finally broke down. In other words and following the analogy used in the Chimú period, the clockworks stopped working as one of its gears was lost.

Class 3 settlements also show some transformations with respect to the Chimú period. There are two fewer settlements (a total of 10) and a slight decline in their area; the mean settlement size is 3.75 ha while during the Chimú period it was 4.05 ha. The most conspicuous change is observed in the areas and the spatial distribution of these settlements, especially in the alignment of settlements along the hypothesized main irrigation canal in the fourth "pocket". As seen previously, this alignment maintained its consistency since at least the Chapica period first as an alignment of Class 2 settlements and then since the Piura period as one of just Class 3 settlements. Only two remain as Class 3 settlements while the other two reduced their size becoming Class 4 settlements. The decline in size in the last two is significant. Settlement 545 (upslope, next to the pediment) declined from 5.38 ha (Chimú period) to 1.06 ha; i.e., a loss of 80.3 percent of its area. Even more drastic is the decrease in Settlement 551 (downslope, in the alluvial plain next to the north bank of the Upper Piura River) from 4.94 ha (Chimú period) to 0.61 ha; i.e., a loss of 87.7 percent. The case of the latter is particular important. As pointed out in the Chimú section, this settlement was consistently increasing its area over time. It was even outgrowing the settlements at the northeast end of the alignment where the hypothesized main water distribution point was found. As discussed in the sociopolitical connotations section below, this scenario probably represents a visible disruption in the organization of the economy and agricultural production.

Perhaps the most arresting transformations in this period affected the Class 4 settlements. For the first time in the "new system" their numbers dropped conspicuously.

In fact, there are 42 less settlements with respect to the Chimú period or a loss of 45.2 percent. In addition, there is a decline in their size. The largest Class 4 settlement (1.91 ha) is 22.0 percent smaller than the largest Chimú period Class 4 settlement. In addition, the mean settlement size (0.62 h) declined 10.2 percent with respect to its Chimú period counterpart. This difference may seem negligible yet in fact it is not. It represents a loss of 707 m^2 in these small units that, combined with the decrease in number, points further towards a dramatic demographic decline during this period. The changes are also noticeable in the location of the settlements. In fact, all but one disappeared from the alluvial plain next to the pediment west of the west margin of the Charanal River. Similar voids are evident in the alluvial plain next to the north bank of the Upper Piura River and on the south margin of the river in the third “pocket”.

In sum, there are three observations that are worth making in relation to the number, size, and location of the settlement size groups during the Inca period. First, the tendency initiated in the second epoch of the “new system” of a predominating single Class 1 settlement continues. Second, unlike the former Chimú period, transformations in the settlement hierarchy impinged on settlements at the lower echelon especially the Class 4 settlements. And third, the more homogenous and balanced settlement distribution observed during the Chimú period has been clearly disrupted.

The above characteristics of the settlement size hierarchy have some important sociopolitical implications. First, the settlement system continues (since the Piura period) to be organized around a single Class 1 settlement. Yet unlike the former Chimú period, the single Class 1 settlement did not increase in area and stayed at the same locus since its relocation during the Chimú period. Notwithstanding this ostensible lack of change, its position as a Class 1 settlement understood within the general context of its adjacent settlements shows indeed that the process of recomposition at the very core of the hypothesized *curacazgo* of Pabur continued during this period.

Second, this recomposition during the second epoch of the “new system” at the very core of the local polity is characterized by an increasing concentration of settlements on the western slopes of the massif of Cerro Pilán and around the Class 1 settlement. This clustering began during the Piura period when a total of 15.97 ha were occupied representing in turn 12.5 percent of the total settled area in the entire study area. An important changed was then observed during the Chimú period when the cluster of settlements grew to a total of 32.73 ha or 20.3 percent of the total area occupied; i.e., the concentration of settlements doubled in size with respect to the Piura period basically due to the appearance of the new (in an area not settled before) Class 1 settlement. The cluster of settlements did not grow further during the Inca period (31.77 ha); it in fact decreased by 0.96 ha. In spite of this slight decrease, its percentage with respect to the total settled area jumped to a significant 31.1 percent. In other words, the centripetal force of the western slopes of the massif of Cerro Pilán became so not just due to the mere presence of a single Class 1 settlement but because of the progressive attraction force acquired by the latter.

Third, the recomposition mentioned above still indicates that the settlement system during this period was organized in a radiant pattern around the even stronger centripetal force of the western slopes of the massif of Cerro Pilán. At the same time, however, the centripetal force growing stronger itself did not necessarily mean the settlement system as a whole did likewise. Actually, there are several indicators pointing out to quite the opposite scenario.

To begin with, possible conflict, tensions, or a different (negative) kind of interaction may have existed between the foreign Inca rulers and administrators on the one hand, and the hypothesized *curaca* of Pabur, on the other. In fact, assuming that the single Class 1 settlement (first during the Chimú period and then during the Inca period) was occupied by the elite and administrators of the Chimú and Inca states respectively, and the adjacent Class 2 settlement during both periods by the *curaca* of Pabur, a different scenario is evident. While during the Chimú period a difference of 2.74 ha separated the sizes of these Class 1 and Class 2 settlements, during the Inca period this difference broadened to 7.19 ha. That is to say, during the Inca period the Class 1 settlement became double the size of the Class 2 settlement and the latter, as mentioned above, reduced its size by 36.09 percent.

It has to be kept in mind that this Class 2 settlement has been a key element in the sociopolitical organization of the study area since at least the Chapica period. It was the core of the centripetal force of the massif of Cerro Pilán as a Class 1 settlement between the Chapica and Piura periods. It contains a key topogram (a long occupation spur; Site 147) and is thus a crucial place in the definition of the local polity anchoring together space and time and thus hinging the “old system” with the “new system”. It is therefore very likely the seat of the *curacazgo* of Pabur.

Yet while during the Chimú period this settlement kept its constituents sites (grown by accretion over time), during the Inca period, on the other hand, it was split. This Class 2 settlement was now comprised by just one site losing five of its constitutive sites; three of them completely and two other became Class 3 settlements that were placed between it and the Class 1 settlement. In other words, the Chimú state and its representatives in the study area coexisted (perhaps peacefully) with the head of the local polity without disrupting its historical composition. On the other hand, the Inca state and its representatives disrupted the social composition in the seat of the *curaca* of Pabur reflecting a tense relationship and a severe political intervention. The Inca state therefore did not co-govern with the *curaca* of Pabur as the Chimú state did, but imposed its rulership vertically dismantling the social and political structure of the *curacazgo* of Pabur.

And fourth, the disruptions at the core of the local polity had repercussions for the overall sociopolitical and economic organization. Indicators of this are found by looking at the size, number, location, and distribution of the other settlements in the size hierarchy. In fact, it has to be remembered that the arrival of the intrusive Chimú state did not represent a dismantling of the local sociopolitical structure. Quite the opposite, the government or co-government of the Chimú state and the hypothesized *curacazgo* of Pabur refurbished the sociopolitical system. Politically, it resorted to local, traditional settlement arrangements; economically, it successfully and effectively managed the agricultural production promoting irrigation technology and acquiring the organizational and visual control (taking possession of the height at key landscape features) of the valley. The settlement organization during the Chimú period was thus described as a functioning clockwork with three (or perhaps four) gears wound from the centripetal force on the western slopes of the massif of Cerro Pilán.

Yet during the Inca period this clockwork was disassembled to a great extent. For instance, in addition to the aforementioned disruption at the seat of the *curaca* of Pabur, the extent of the agricultural production achieved during the Chimú period was substantially reduced. In fact, it could also be argued that even at some point during the Inca period the irrigation system stopped working altogether or at least worked deficiently.

Indications of a reduction in agricultural production are observed at both the fourth and third fertile "pockets". In the fourth "pocket" the decline in the agricultural production and the reduced operability (or cessation) of the hypothesized main irrigation canal is suggested by several facts. First, as noticed during the Piura and especially the Chimú period, the agricultural production as represented by the number of settlements in particular, in all likelihood, Class 4 farmer dwellings, did not decline but increased.

Second, during these periods the alignment of four Class 3 settlements (possible main distribution points for secondary canals) along the hypothesized main canal remained untouched and the only change observed was the slight increase or decrease in size of the settlements located at both ends of the alignment.

And third, the Piura and Chimú periods administrations politically neutralized the populations at the valley neck of the interior delta, where the point of water intake is located, by reducing the size of its settlements. Yet they left intact two key topograms (two long occupation spurs; Sites 124 and 133) on the west and east margins of the Charanal River at the head of the irrigation system each in charge of the agricultural production west and east of the main canal, respectively.

The scenario above described for the Piura and Chimú periods shows striking differences when compared to the Inca period. First, the agricultural production as reflected by the number of settlements declined considerably. This sharp contrast is conspicuous at the alluvial plain both next to the north bank of the Upper Piura River, and especially next to the pediment and the west margin of the Charanal River. The sites next to the former were 28.6 percent (31.3 percent during Chimú) of the total sites located on the alluvial plain, and those next to the latter only 4.3 percent (11.7 percent during Chimú). That is to say, there was a total loss (32.9 percent versus 43.0 percent) of 10.1 percent with respect to the Chimú period.

Second, the alignment of Class 3 settlements along the hypothesized main canal on the alluvial plain was disarranged. As mentioned above, the disarray consisted in the drastic decline in size (over 80.0 percent) in at least two of its constituent settlements. It was particularly obvious at the downslope settlement at the southwestern end of the alignment, a settlement that used to be the core area on the alluvial plain next to the north bank of the Upper Piura River. This settlement was not only degraded to a tiny Class 4 settlement but a loss and dispersion of its satellite settlements to the west and south it is evident. Yet perhaps the most significant fact is that this settlement no longer contained the key topogram (a long occupation *loma*, Site 34) that was the magnetic force around which this settlement grew historically by accretion.

Third, the settlements at the valley neck of the interior delta were now almost completely gone. The breach in size between the Class 1 settlement and the remaining settlement (on the east margin of the Charanal River) in this area further widened to a difference of 91.8 percent as compared to 84.8 percent during the Chimú period. The most important issue, however, is that unlike the former Piura and Chimú periods, one of the settlements (on the west margin of the Charanal River) containing a key topogram (the long occupation spur; Site 124) entirely disappeared. As argued above, each of these settlements located at each margin of the Charanal River was in charge of the irrigation and agricultural production at each side of the main canal. If that is the case then, it is not a coincidence at all that the observed social base and food producers west of the four settlement-alignment of the main canal were entirely gone or at least severely diminished.

And fourth and along the same lines, it is also not a coincidence that the only area in the fourth "pocket" that increased its population was the former "gap area". It is found east of the four settlement-alignment and adjacent to the seat of the local polity (now ruled by the Incas) at the centripetal force of the western slopes of the massif of Cerro Pilán.

There are also some facts indicating the clear reduction in the agricultural production and general sociopolitical disarray in the third "pocket". Hints towards problems in the agricultural system are noticed in the alluvial plain on the south margin of the Upper Piura River. In fact, in this area the agricultural production as represented by the number of sites also declined. During the Chimú period this area accounted for 32.5 percent of all the sites located on the alluvial plain. On the other hand, during the Inca period this proportion declined to 28.6 percent.

The disruption in the agricultural and sociopolitical system is noticed not just in the population decline in this area but also in other crucial factors. For example, observations during the 1997 brief reconnaissance on the settlement at Cerro Tongo and on the pottery fragments collected on the surface indicated that this dated basically to the

Chimú period. True, a permanent challenge in the archaeology of the northern coastal Perú is to differentiate stylistically between Chimú and Inca domestic pottery. Yet there are some unequivocal stylistic attributes (for instance the rim sherds of Inca *aryballo* jars) that can differentiate the Chimú from the Inca styles and occupational periods. In this sense, it is interesting to observe that while at the Class 1 settlement the Inca *aryballo* jars were conspicuously present, at Cerro Tongo, on the other hand, they were absent. Obviously, further research is needed. Yet assuming that the settlement at Cerro Tongo was not occupied during the Inca period, this would indicate that the Hualcas Canal stop functioning or was at least severely hampered. Consequently the ca. 3000 ha of farmland formerly reclaimed to the *despoblado* south of the line between Cerro Santo Tomé and the Class 2 settlement in this area (a gear of the clockwork) during the Chimú period would have been substantially (if not completely) lost.

The loss of the above mentioned Class 2 settlement in the south margin of the Upper Piura River is another key factor pointing towards the disrupted agricultural and sociopolitical systems during this period. In fact, this settlement (Settlement 547) was demoted to a small (1.05 ha) Class 4 settlement with respect to its former area during the Chimú period, a decline that represents a clear loss of 90.3 percent of its area. Yet perhaps in what now seems a recurrent pattern rather than a mere coincidence in the Inca period, this settlement lost two of its three long occupation (*lomas*) topograms. This is exactly the opposite scenario of that observed during the Chimú period. As I have argued above, the co-government of the Chimú state and the local Pabur polity buttressed the authority of this settlement by resorting to its legitimacy embodied in its constituent topograms. In this fashion this settlement as the gear of the clockwork was instrumental in the increase of the agricultural production in this area. It is not a surprise, therefore, that once this social order was disrupted during the Inca period, the settlement decreased in size; perhaps more importantly, it lost most of its surrounding satellite settlements, and in general saw diminishing agricultural production in this area.

Another indicator pointing to the disarray of the agricultural production is the abandonment of at least one of the key hilltop sites. It has to be remembered that the transformation and constructions on these hilltop sites was a crucial innovation during the Chimú period to warrant an effective management of both the irrigation system and the agricultural production. In this sense, the strategically located hilltop site on top of Cerro Santo Tomé oversaw the entire valley in both the second and third "pockets" and supervised the entrance of the Hualcas Canal into the third "pocket". Yet this site was abandoned during the Inca period.

The other hilltop site on top of Cerro Loma Negra however, was still occupied during the Inca period. Still, considering the manifest disruption at the social base of the agricultural system, and the abandonment of the hilltop site at Cerro Santo Tomé, it is valid to question the actual function of the Cerro Loma hilltop site. That is to say, it could be the case that this site (that faces the seat of the local polity) was geared more towards the political and military subjugation of the *curaca* of Pabur by the Inca rulers, rather than directed to the management of the irrigation and agricultural systems. In fact, this preference to surveillance and control of the local population instead of the agricultural production is also indicated by the ratio of sites located on ridges and slopes in relation to those on the alluvial plain. During the thriving demographically and agriculturally productive Chimú period, 15.5 percent of the sites were located on ridges or slopes and 84.5 percent on the alluvial plain. On the other hand, during the Inca period the number of sites of ridges and slopes increased; i.e., 24.7 percent on ridges or slopes and 75.3 percent on the alluvial plain, even though there was less land and agricultural production to control.

Finally, the situation on the north bank of the Upper Piura River in the third "pocket" and especially in the Franco Valley is counterintuitive and a further symptom of the sociopolitical disruption in the study area. Unlike all the other areas in the study area and in spite of losing one site with respect to the former Chimú period, the proportion of sites in the Franco Valley did not decline but increased. In fact, 8.6 percent of all the sites on the alluvial plain were located here during the Chimú period. On the other hand, this ratio jumped to 18.5 percent during the Inca period; i.e., a 9.9 percent increment. Furthermore, the size of its Class 2 settlement (a gear of the former Chimú period clockwork) remained the same.

Moreover, on the basis of the Inca period settlements associated with the Caracucho Canal it is inferred that the latter was operating and thus the agricultural production in this area did not diminish but was kept at least to its Chimú period levels. In other words, while two of the former gears of the clockwork were seriously disrupted in their organization, one of them remained seemingly untouched. Being the core of the Pabur polity subjugated by the Incas as I have argued above, it would arguably be expected that the Franco Valley, historically dependent on the core of the centripetal force, would have been equally affected. Yet it was not.

One possible explanation for this resides in the fact that since at least the second epoch of the "new system", the Franco Valley may have been a contested territory. In fact, this area was a borderland area between the *curacazgo* of Pabur (reigning over the fourth and third "pockets"), and the *curacazgo* of Serrán (ruling over the second and first "pocket"). And it is within the domain of the latter where the water intake and main section of the Caracucho Canal is located. Following a known Inca imperial policy upon conquering its provinces, it would not be a far-fetched idea to suggest the Inca empire administration favored one neighboring polity (Serrán) to the detriment of the other (Pabur). The fate of the Franco Valley thus fell into the hands of the *curaca* of Serrán during the Inca period.

In sum, the sociopolitical connotations drawn from the characteristics of the Inca period settlement system indicate a period of social and political turmoil. Rapid transformations during the second epoch of the "new system" are marked by shifting dynamics in the political power at the centralized authority emanating from the centripetal force on the western slopes of the massif of Cerro Pilán. Passing through a local autonomous government of the *caciaczgo* of Pabur during the Piura period, to a period of co-option and co-government with the Chimú empire during the Chimú period, to an entire political subjugation by the Inca empire during the Inca period. The outcome of these transformations during Inca rule was a conspicuous demographic and agricultural production decline. This final picture of the sociopolitical organization is arguably a consequence of Inca imperial policies of territorial and population control. These policies entailed uprooting and relocating a significant number of population (*mitimaes*) to other areas of the empire, and keeping conquered polities in check by forming alliances with some polities and disfavoring their neighbors or rivals.

The social and political transformations observed during the Inca period had clear impacts on the system of topograms. There are no new topograms beyond the maximum number (19) reached during the Chimú period. Some topograms followed from previous periods confirming their significance and role in the conceptualization of the landscape. This is the case, for instance, of the massif of Cerro Pilán and its constituent topograms (the triangular pyramid-shaped summit, and the *Boliche*, the *Peña*, and the *Chorro*) that as a source of life and protection continued housing the heart of the local polity. Similar to the Chimú period, its sacred nature seems to have been respected by the Inca intruders who also did not alter its summit or upper slopes. By association, Cerro Vicús also continued playing the same role. In addition, a similar scenario was the case for the Franco Valley and its interlinked topograms; i.e., the now secularized Quebrada de Franco and the No-Man's (or Woman's)-Land, the Caracucho Canal, Cerro Franco, Cerro Venado and Cerro Piedra Blanca.

Yet there are other topograms that did show the impact of the social and political transformations. For instance, the underflow and the valley neck of the interior delta appear now as almost empty spaces. The striking demographic decline and possible uprooting of its traditional inhabitants point towards an empty sense of place in this area and thus affect the conceptualization of the landscape and the essence of the local polity itself. In other words, these places were not secularized as during the Chimú period, but completely disappeared.

Similarly affected topograms are the Cerro Loma Negra, Cerro Tongo, the Hualcas Canal, and the Cerro Santo Tomé. As argued above, during the Chimú period this set of topograms formed a tight system that defined the life and existence of the nearby dwellers encircled by them. They were used and secularized by the Chimú state (fulfilling its political and economic agenda) to co-opt local traditional topograms that formerly defined the sense of place.

Disruptions during the Inca period disassembled the foreign, juxtaposing sense of place created by the Chimú state; at the same time, however, it did not reverse the situation to pre-Chimú state times either. The site on top of Cerro Santo Tomé was abandoned yet it remained secularized since its structure was left intact as a reminder of the profanation of a previously sacred topogram. In addition the intrinsic relation between this topogram and the Hualcas Canal was broken, assuming that the latter stopped functioning or at least barely nurtured the formerly reclaimed *despoblado* as well as the life at Cerro Tongo. Furthermore, the site on top of Cerro Loma Negra was still occupied yet similar to that on Cerro Santo Tomé, remained secularized, with the presence of the massive construction ever omnipresent and imposing over the formerly sacred topogram. Moreover, assuming a more tense and conflictive relationship between the Inca rulers and the local polity with the hilltop site of Cerro Loma Negra as a lookout post devoted exclusively to surveillance, its sense of place would have been further transformed in a negative way before the eyes of the local population.

The most affected topograms, however, were the key long occupation *lomas* and spurs. In fact, the Inca period shows the lowest percentage (17.2 percent) of long occupation sites of the entire "new system" (see Table 23). In addition, during this period, all these topograms or the settlements constituted by them decreased their area in contrast to the majority of all the other periods (see Table 25). Moreover, during the Chimú period the Chimú state did not touch these topograms, which are crucial elements anchoring the sense of place, and the definition and essence of the landscape and polity. Rather, the Chimú state coexisted and supported them. On the other hand, during the Inca period, the Inca state consistently and strategically affected them as elaborated above. It will not be a surprise therefore that by disrupting or destroying these topograms, or relocating its inhabitants, the Inca empire enforced its territorial and political control of the *curacazgo* of Pabur.

The disarray in the sociopolitical system during the Inca period brought obvious changes in the spatial structure of the landscape. That is to say, the larger overarching spatial structure of the landscape (a large Zōfū -Tokusui landscape type encompassing both the fourth and third "pockets") that started appearing during the Campana period and consolidated during the Chimú period was no longer in place. The collapse of this spatial structure of the landscape was basically caused by the severe rearrangement of the spatial organization in the alluvial plain on the south margin of the Upper Piura River in the third "pocket". This change in the spatial structure of the landscape thus reflects the process of social and political disintegration during this period. To some extent the spatial structure of the landscape returned to the situation of previous periods when the process of integration of both "pockets" was yet to be consolidated.

The spatial structure of the landscape during the Inca period was much the same as during the Chapica, Vicús, and Campana periods. The only difference is an overlapping Domain-Viewing Mountain landscape type in the fourth "pocket" (Cerro Loma Negra) remaining from the spatial structure during the Chimú period. The spatial structure of the landscape during the Inca period is therefore characterized by a Zōfū-Tokusui landscape type in the fourth "pocket" with a SE-NW orientation. It has a u-shaped domain area; its borders are the massif of Cerro Pilán at the base of the "U", and the Andean pediment to the north and the *despoblado* to the south as the lateral sides. The directionality (SE-NW) is marked by the smooth slant of the alluvial plain (the domain), the direction of the western slopes of the massif of Cerro Pilán, and the course of the Upper Piura River. Also, this landscape type overlaps with the Sacred Mountain types as represented by the role of focus and center of both the Cerro Vicús and the massif of Cerro Pilán.

Also, there is a discrete spatial structure of the landscape in the north bank of the Upper Piura River in the third "pocket". That is, there is a Zōfū-Tokusui landscape type defined by the encircled Franco Valley. It also has a u-shaped (though smaller than in the fourth "pocket") domain. Its borders are outlined by the Cerro Piedra Blanca at the base of the "U", and the Andean pediment to the north, and the north margin of the Upper Piura River to the south as the lateral sides. Its SE-NW directionality is marked by the slope of the alluvial plain and the course of the river. Unlike the spatial structure of the fourth "pocket", this one is not opened towards the northwest but rather closed and flanked by the Quebrada de Franco. In addition, the spatial structure of this "pocket" also presents an overlap with a Sacred Mountain type of landscape characterized by the utter presence of the massif of Cerro Pilán and especially the view of its pyramid-shaped summit from the Franco Valley.

7.13 Summary

The study area is characterized by a 2600-year long process of continuities and transformations of its landscape configurations. This process entailed the materialization of a system of topograms that was built over time as the local populations grew and started embedding themselves within and becoming part of their surroundings. The process also led to different landscape conceptualizations over time as well as the establishment of a sense of place as the daily life of people progressed over hundreds of years. These conceptualizations were long lived and left a strong imprint on the mind and bodies of local populations that incorporated them as part of their traditions and cosmological beliefs. This constant embodiment of the landscape was the canvas on which, over time, sociopolitical organizations and spatial structures of the landscape were built and transformed. For most of its history (from the Ñañañique to the Piura periods) these constructions and transformations responded to local dynamics with elements rooted deep in time. Obviously all along this time cultural interactions with foreign social groups were experienced and incorporated into the local lore yet without disrupting the local process of spatial, social, and political organization. These long local processes of landscape conceptualizations and settlement organization are marked by two main moments: an "old system" and a "new system". Social, political, and landscape transformations acquired a faster pace during the second epoch of the "new system" leading for the first time in the history of the study area (during the Chimú and Inca periods) to changes operated and enforced not by local but exogenous forces.

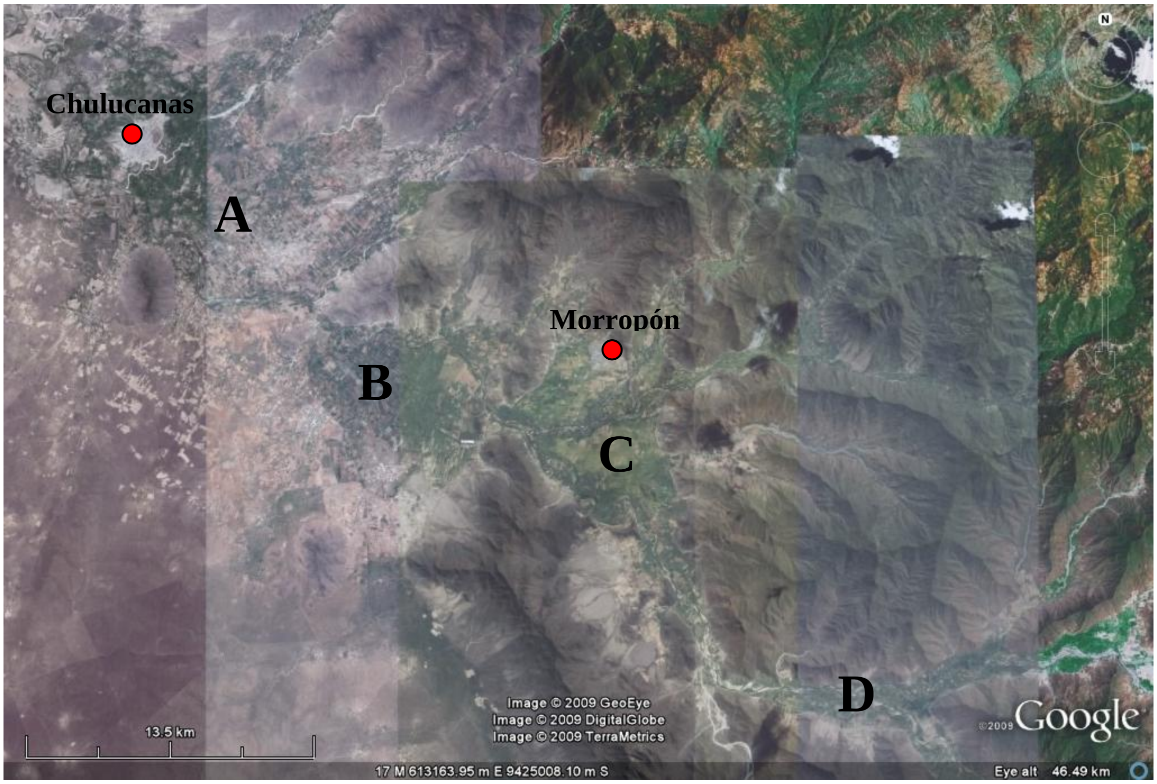

Figure 18: The Upper Piura Valley and the Four Fertile "Pockets". A: Fourth; B: Third; C: Second; D: First (Source: Google Earth)

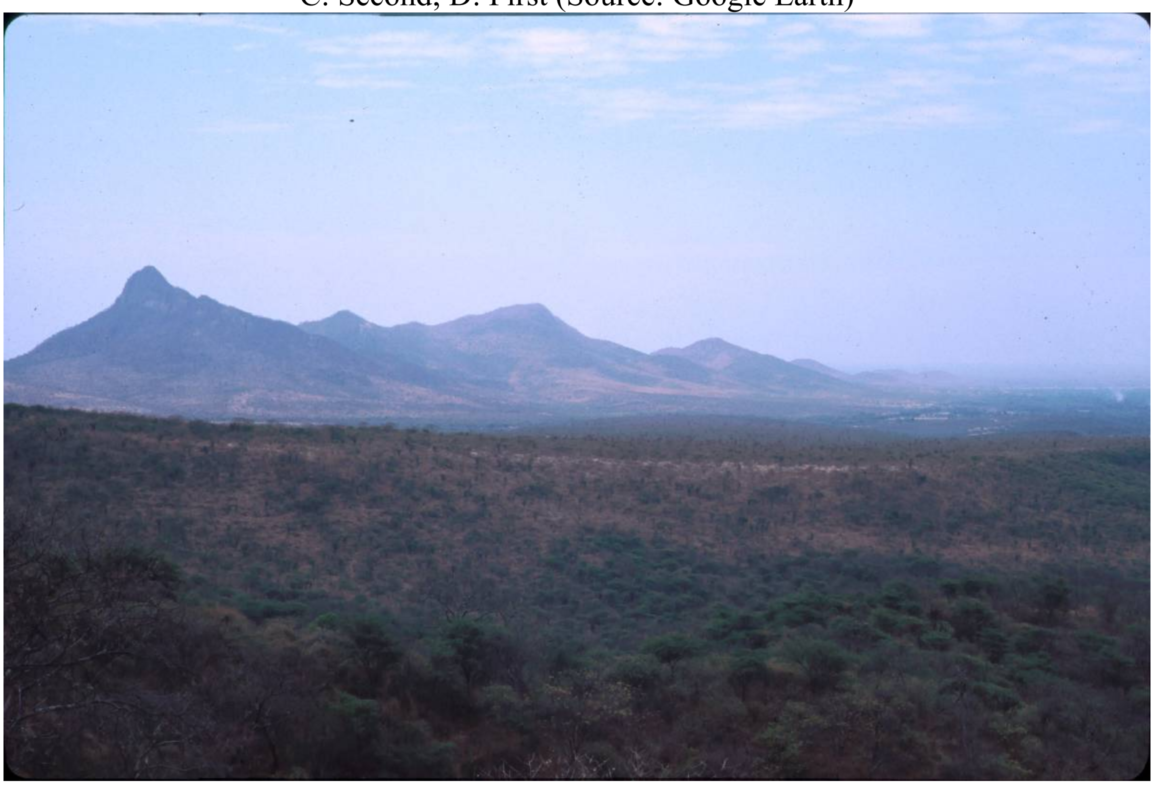

Figure 19: Massif of Cerro Pilán and its Western Slopes

Figure 20: Spurs on the Foreground (Modern Houses are Visible) and Mid Section Penetrating the Alluvial Plain; the Massif of Cerro Pilán and its Pyramid-Shaped Summit are in the Background

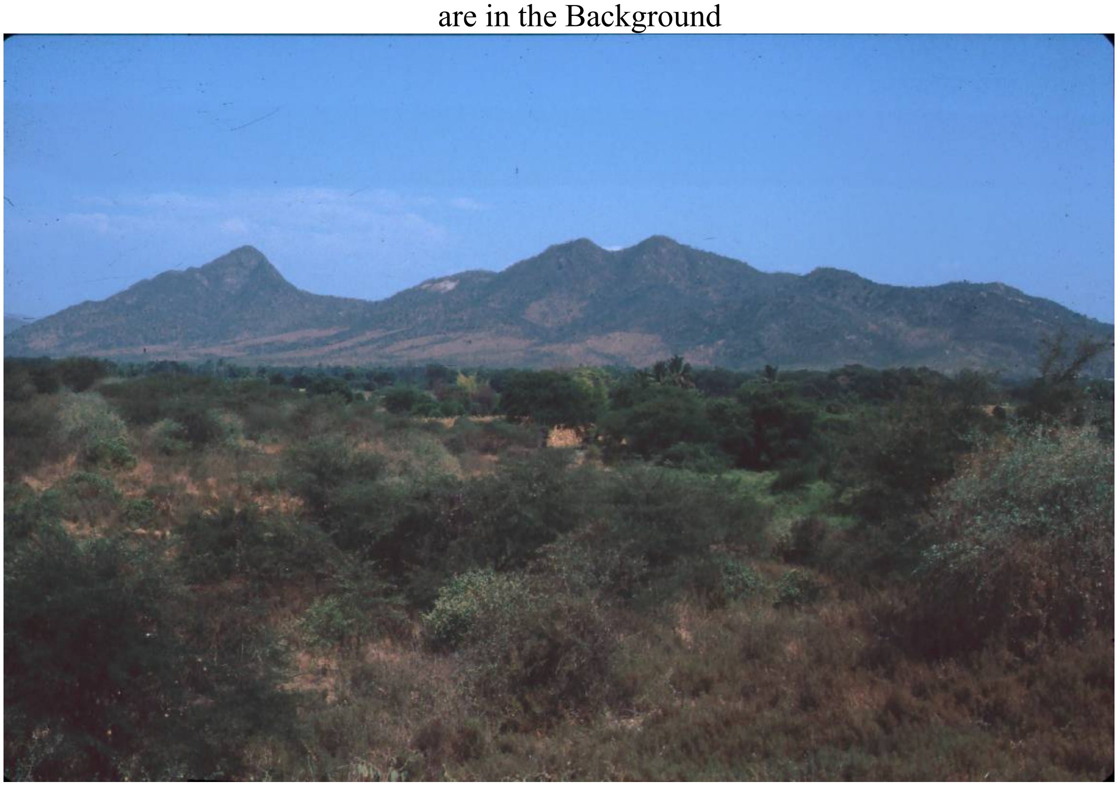

Figure 21: Massif of Cerro Pilán and its Pyramid-Shaped Summit from Site U67S1 (Mid Section of the Study Area in the Fourth "Pocket")

Figure 22: Massif of Cerro Pilán and its Pyramid-Shaped Summit from Site U23S5
(Northeast Section of the Study Area in the Fourth “Pocket”)

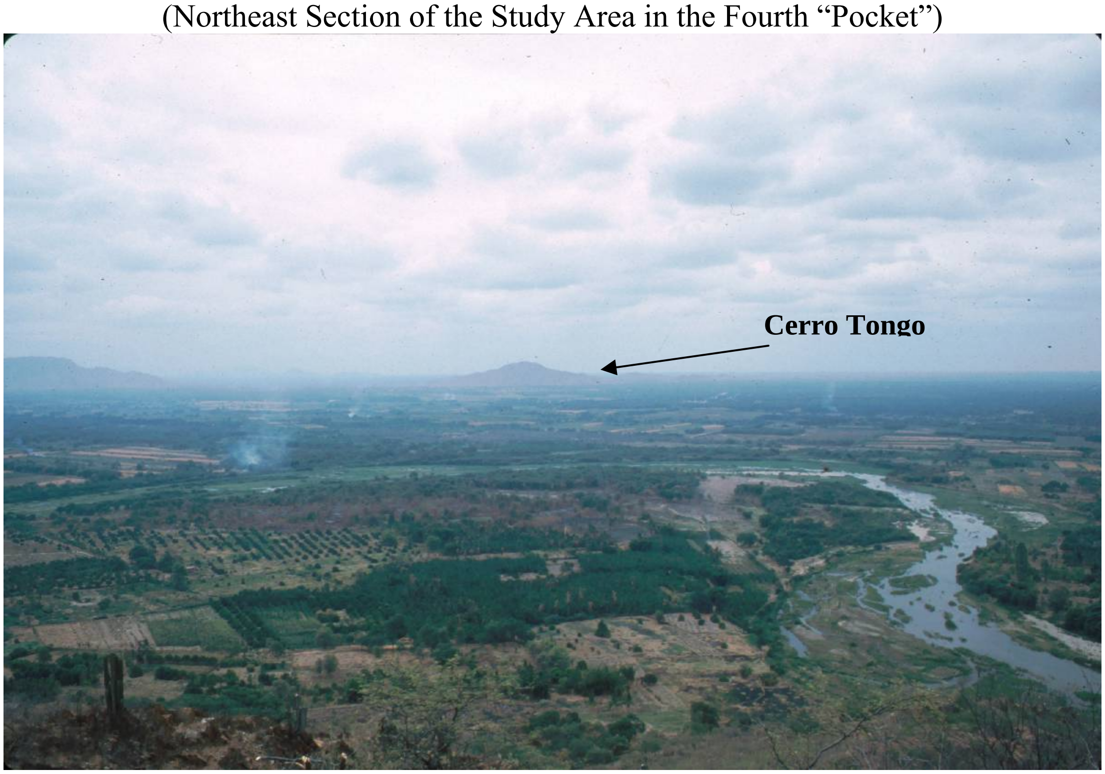

Figure 23: The Meanders of the Upper Piura River from Cerro Punta Guaraguao
(Southwest End of the Massif of Cerro Pilán; Cerro Tongo on the Background

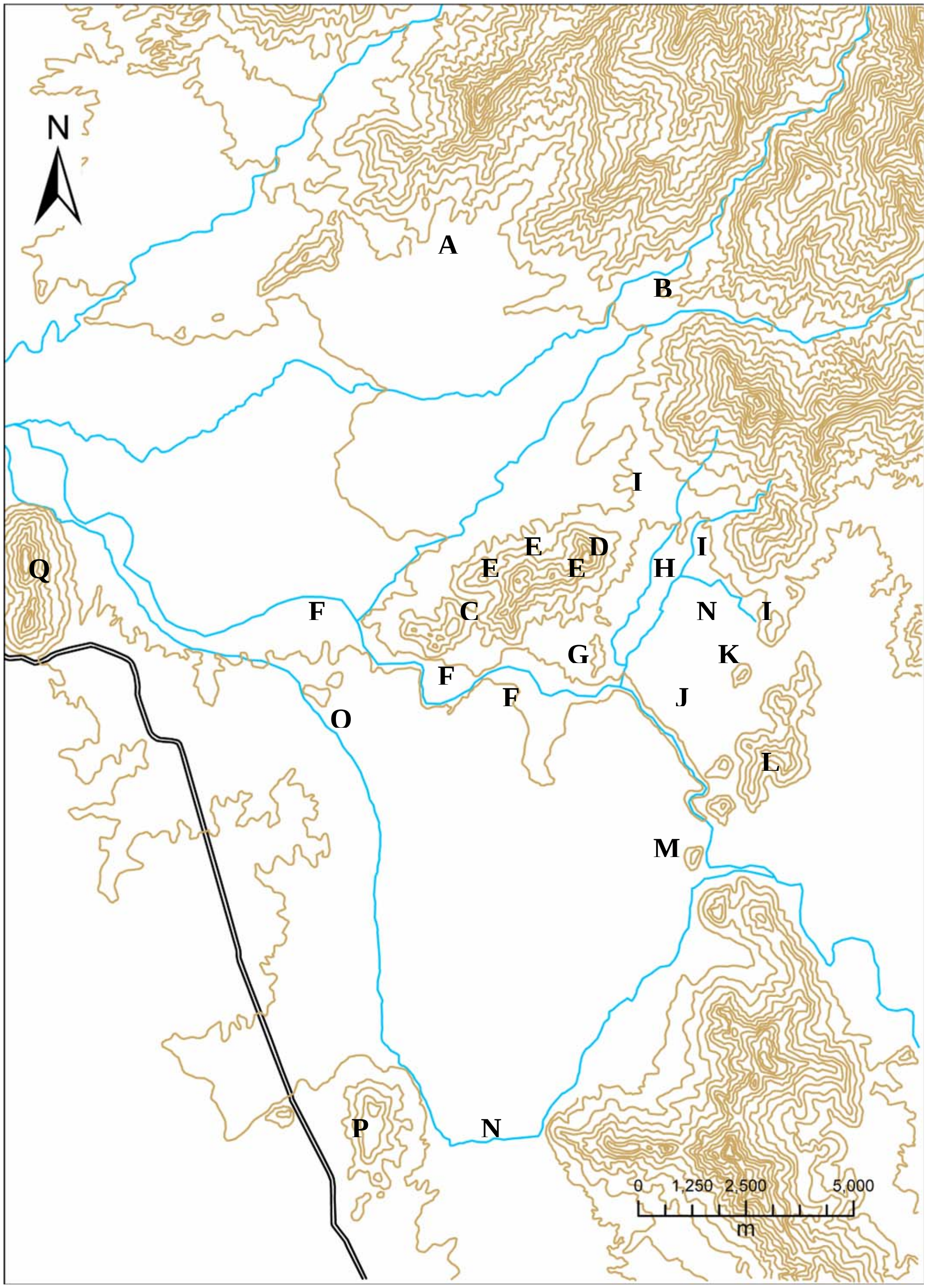

Figure 24: Location of the Topograms. A: The Underflow; B: The Valley Neck of the Interior Delta; C: The Massif of Cerro Pilán; D: The Triangular Pyramid-Shaped Summit of Cerro Pilán; E: The *Boliche*, The *Peña*, and The *Chorro*; F: The Meanders; G: Cerro Franco; H: Quebrada de Franco; I: The No-Man's (or Woman's)-Land; J: The Franco Valley; K: Cerro Venado; L: Cerro Piedra Blanca; M: Cerro Santo Tomé; N: The Irrigation Canals; O: Cerro Loma Negra; P: Cerro Tongo; Q: Cerro Vicús (Note: The *Lomas* and Spurs are not listed since they are constituted by the archaeological sites)

Figure 25: The Valley Neck of the Interior Delta: The Charanal (or San Jorge) River Before Entering in the Alluvial Plain (The Highlands of the San Jorge River Headwaters in the Background)

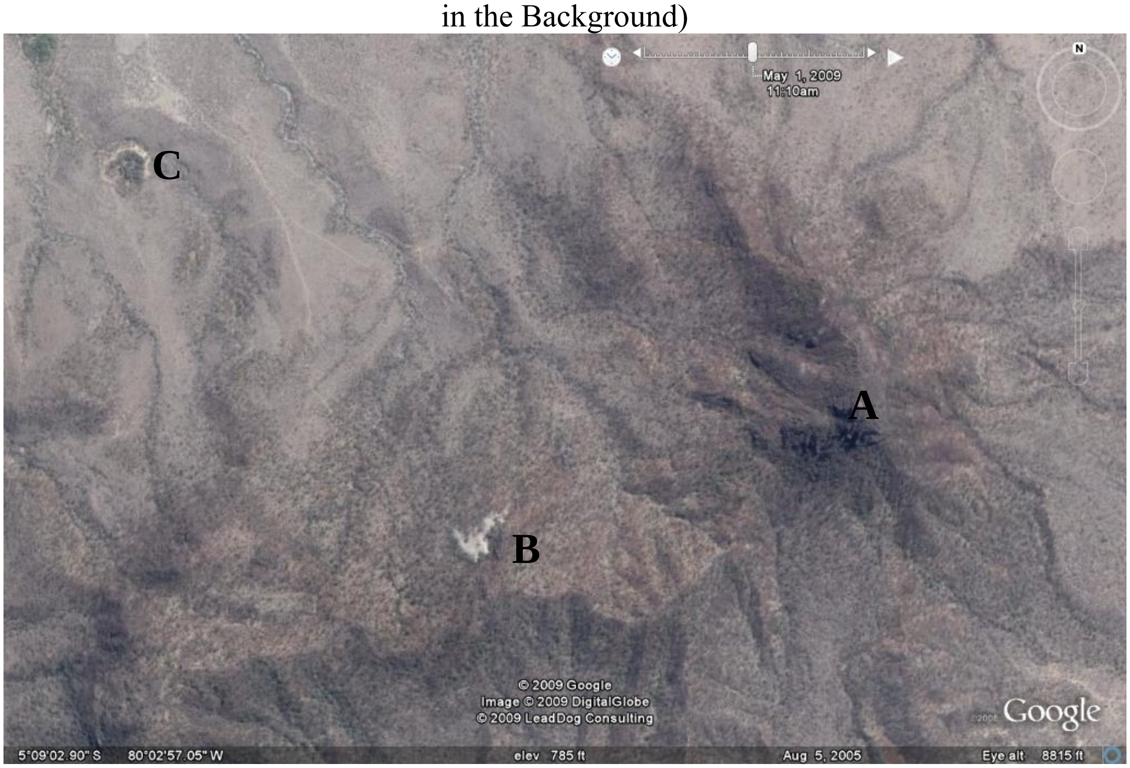

Figure 26: Zooming In in the Massif of Cerro Pilán. A: The Pyramid-Shaped Summit; B: The *Peña*; C: The *Boliche* (The *Chorro* is Not Visible) (Source: Google Earth)

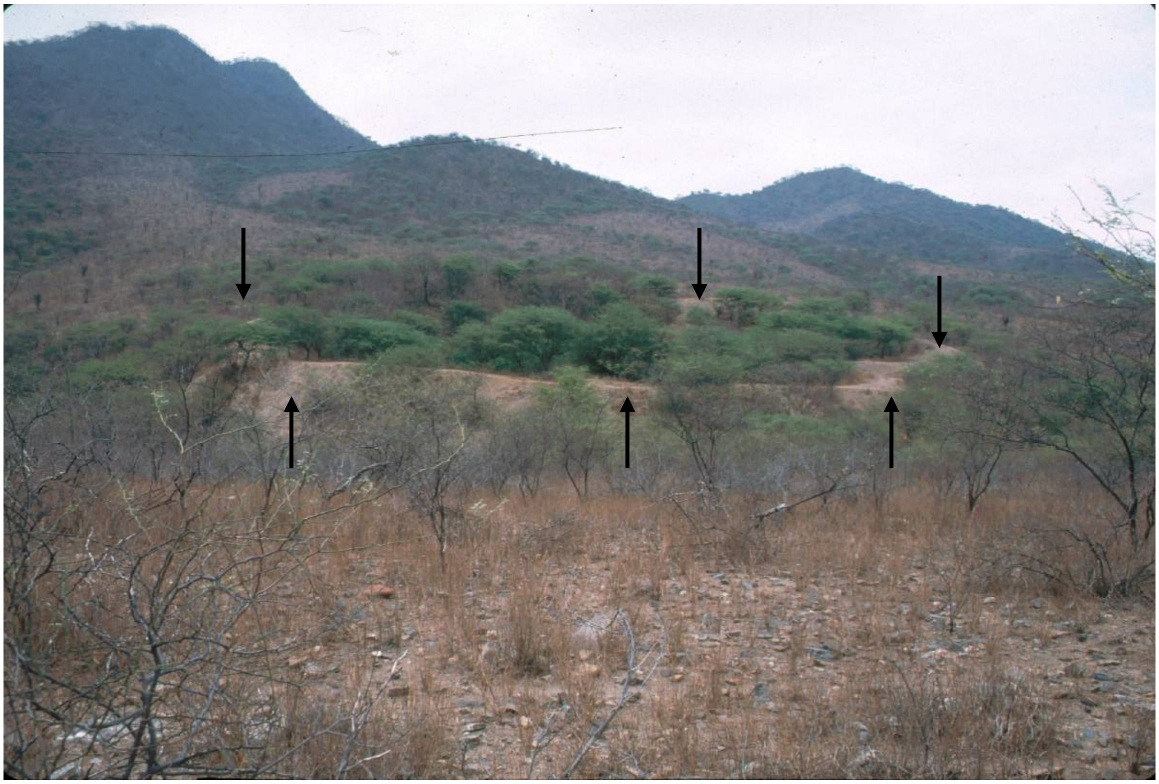

Figure 27: The *Boliche*. Arrows (Soil of Lighter Color) Mark its Outline

Figure 28: Detail of The Meanders with Cultivation Plots in *Playas*

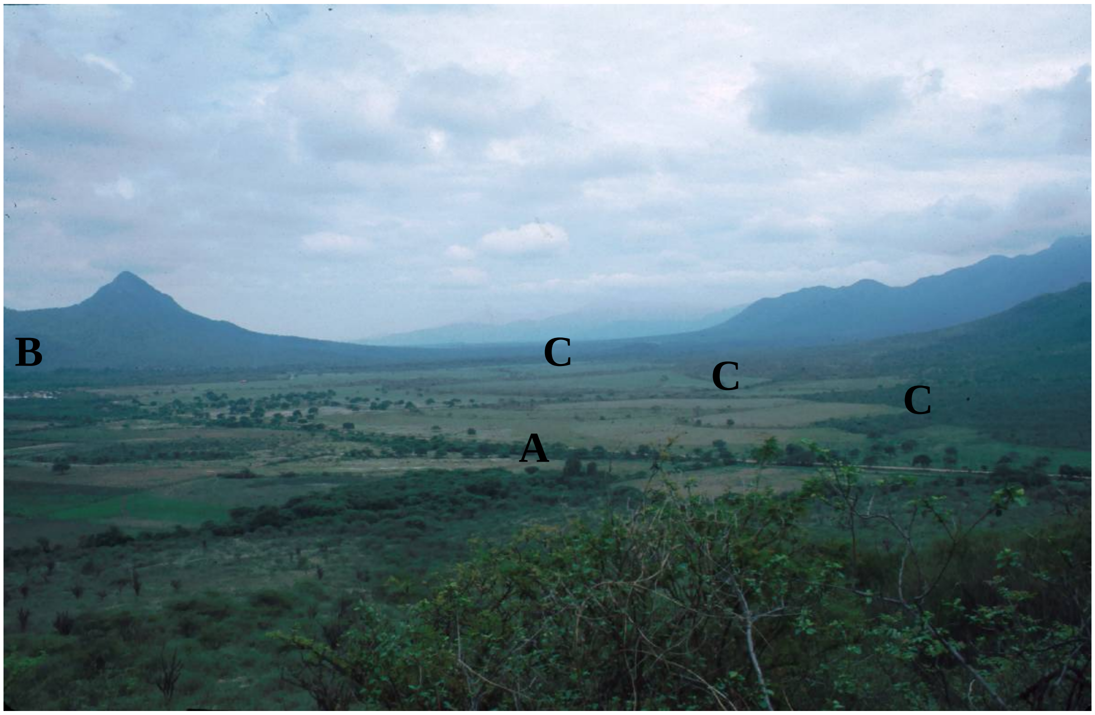

Figure 29: The Franco Valley in the Foreground (A) from Cerro Venado. Notice also part of The Massif of Cerro Pilán (B) and the No-Man's (or Woman's)-Land (C) in the Background

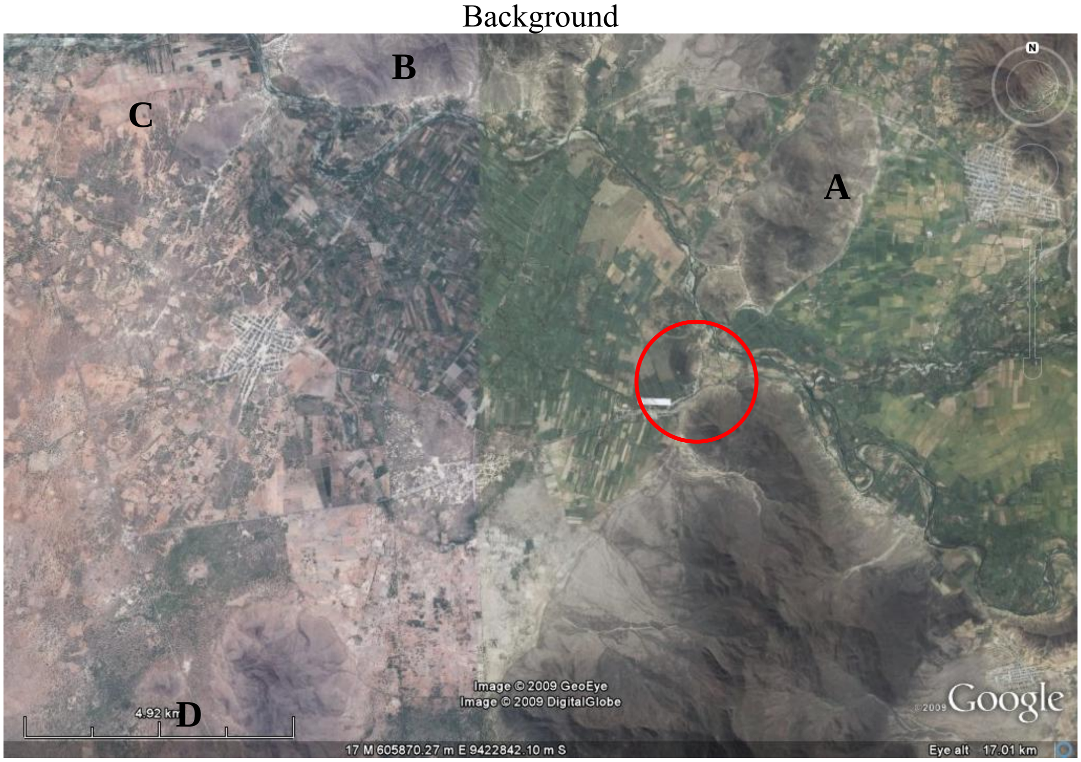

Figure 30: Cerro Santo Tomé (encircled) and the Third "Pocket". Also Cerro Piedra Blanca (A), The Massif of Cerro Pilán (B), Cerro Loma Negra (C), and Cerro Tongo (D) (Source: Google Earth)

Figure 31: The Third “Pocket” from Cerro Santo Tomé

Figure 32: The Caracucho Canal in the No-Man’s (or Woman’s)-Land

Figure 33: Cerro Loma Negra (A) and The Meanders (B) in The Upper Piura River (Source: Google Earth)

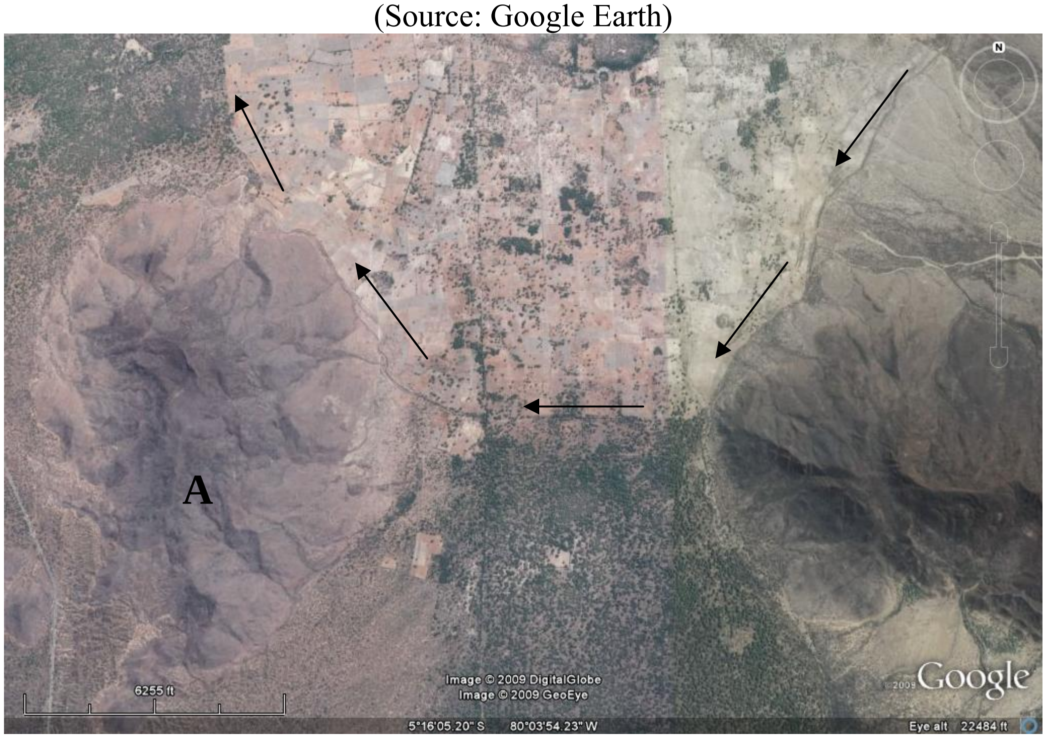

Figure 34: Cerro Tongo (A) and The Hualcas Canal (Arrows) (Source: Google Earth)

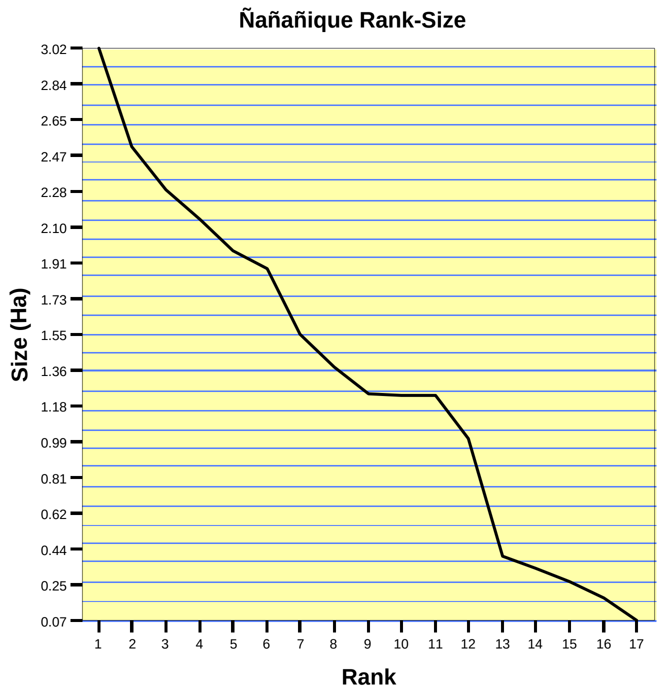

Figure 35: Ñañañique Period Settlement Size Plot

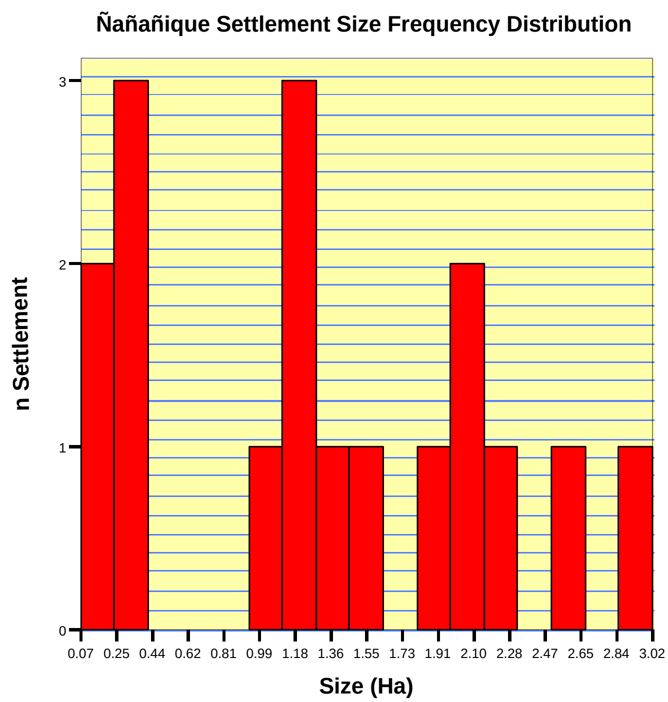

Figure 36: Ñañañique Period Frequency Histogram

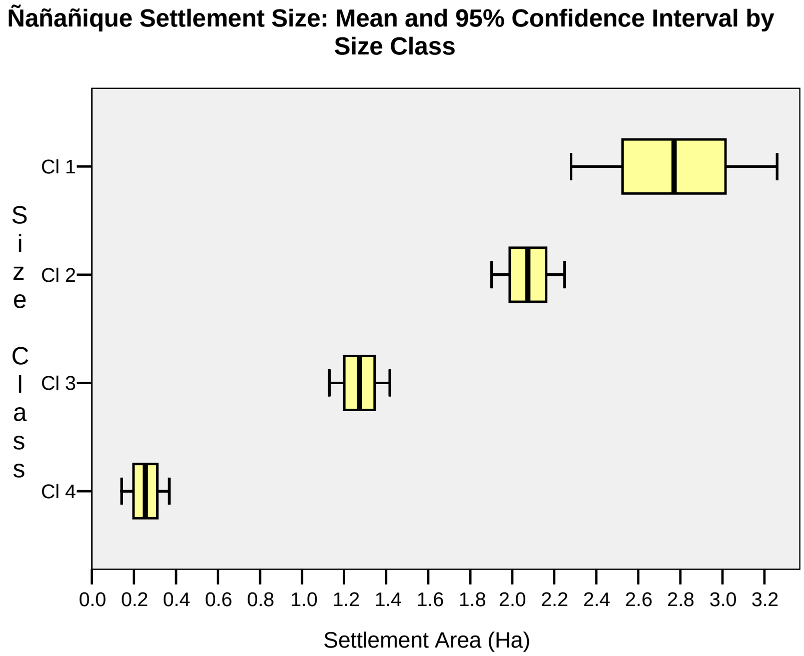

Figure 37: Ñañañique Period Mean Settlement Size by Size Class

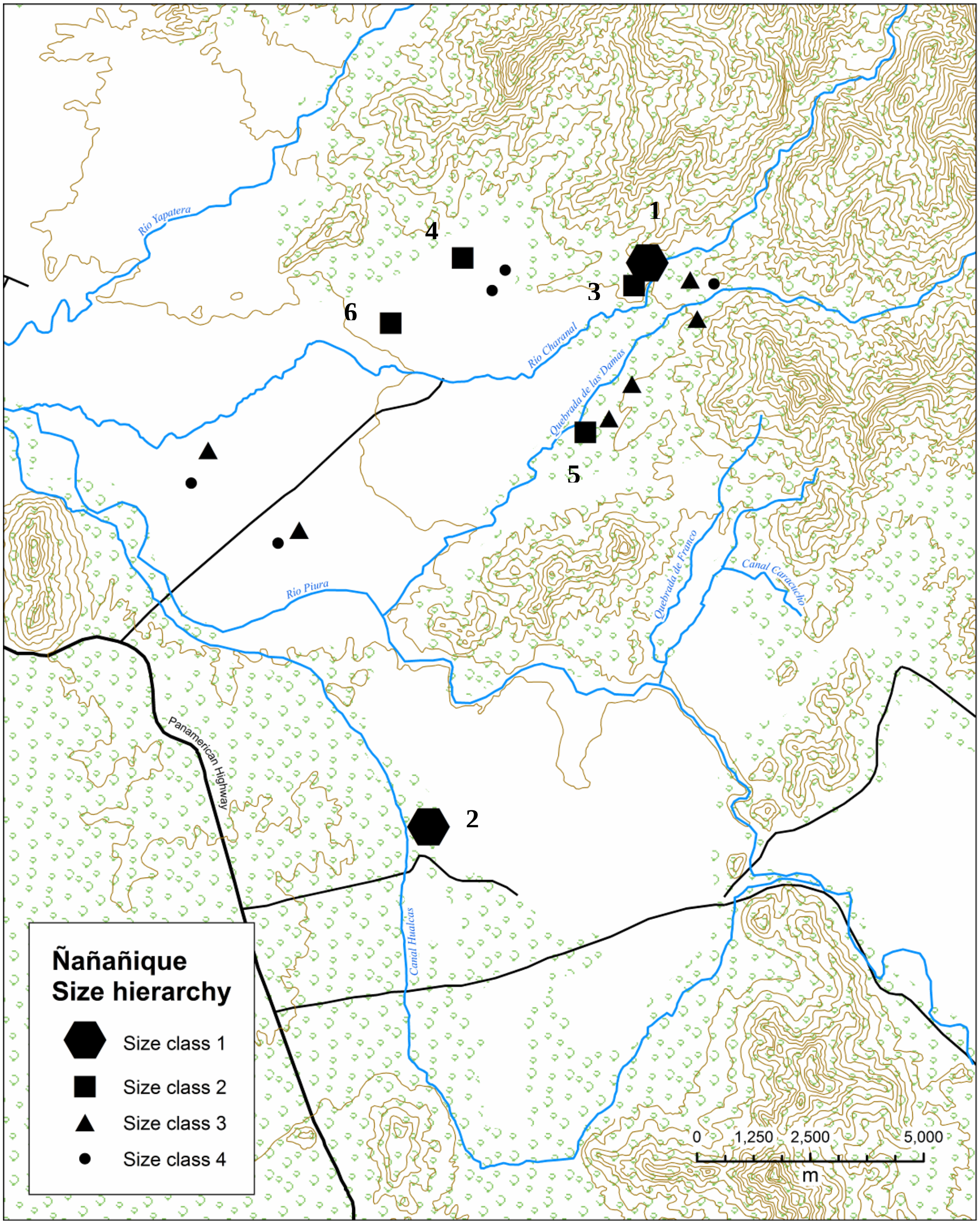

Figure 38: Ñañañique Period Four-Tier Settlement Hierarchy and Major Settlements

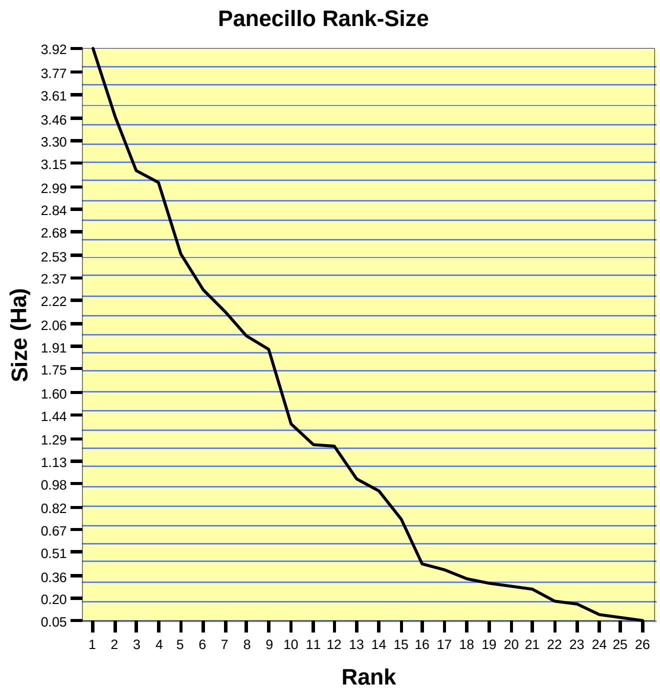

Figure 39: Panecillo Period Settlement Size Plot

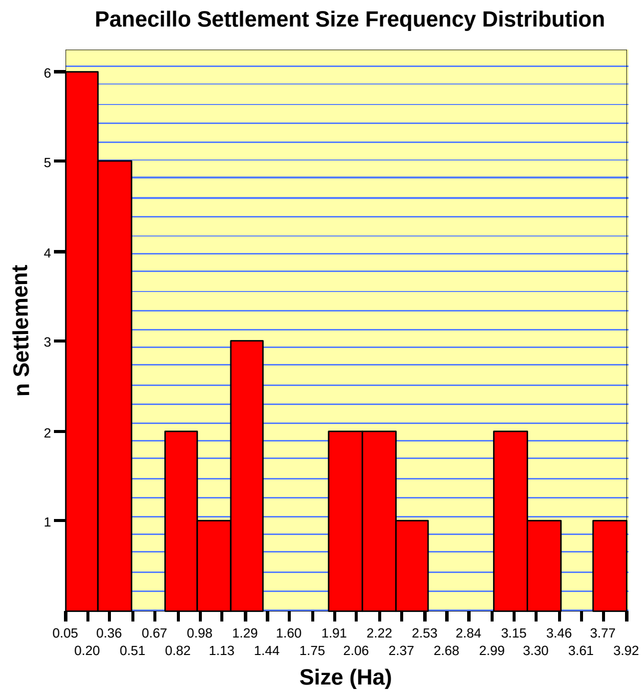

Figure 40: Panecillo Period Frequency Histogram

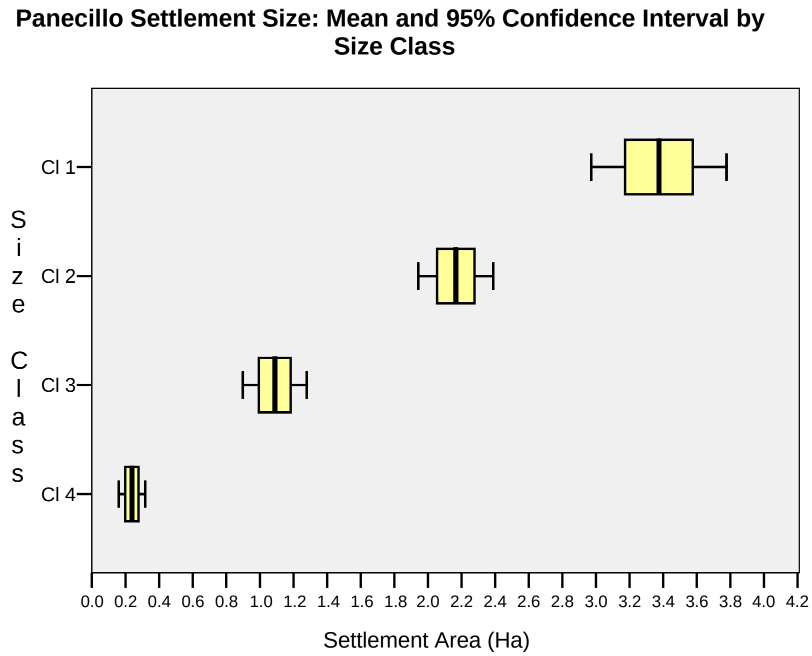

Figure 41: Panecillo Period Mean Settlement Size by Size Class

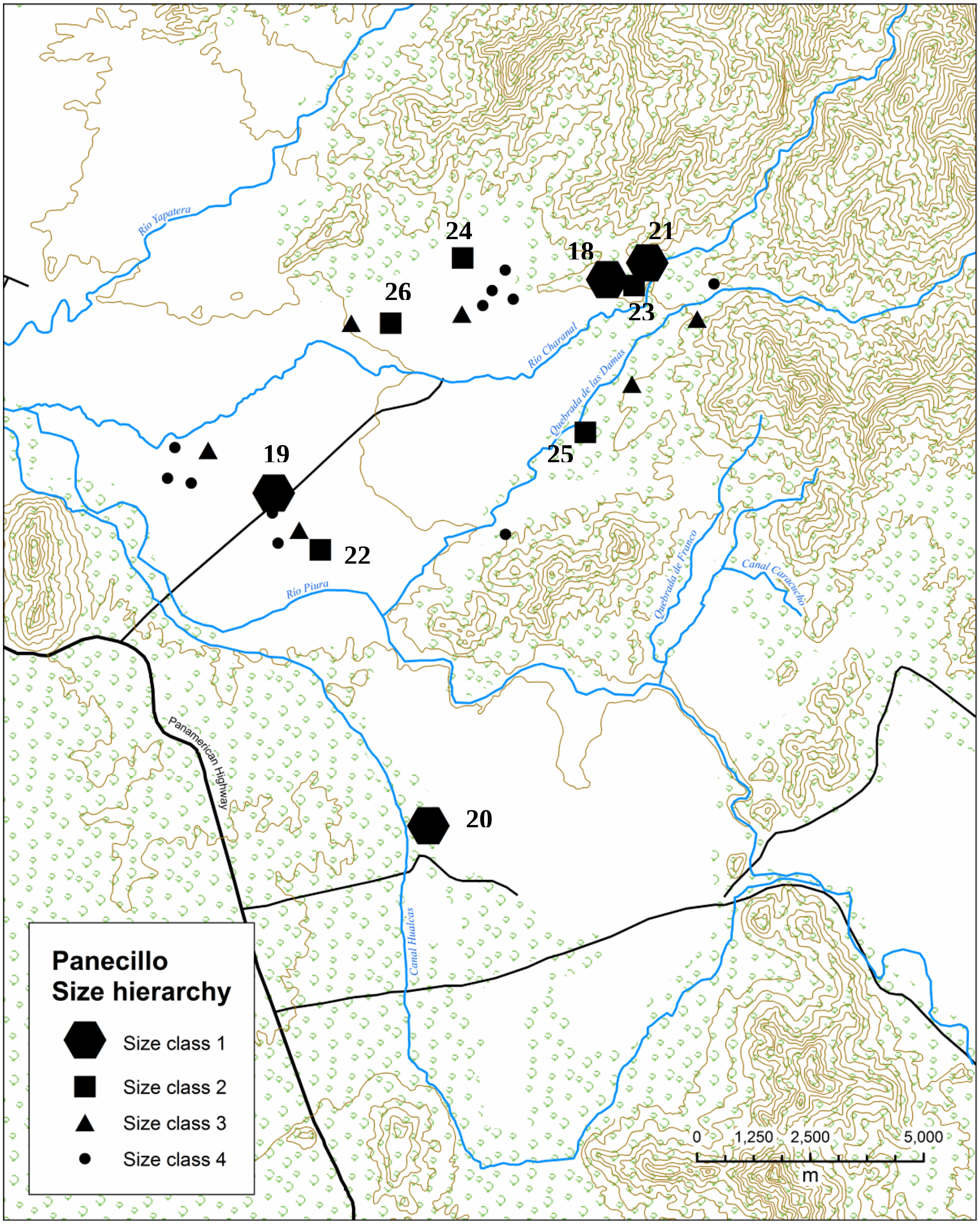

Figure 42: Panecillo Period Four-Tier Settlement Hierarchy and Major Settlements

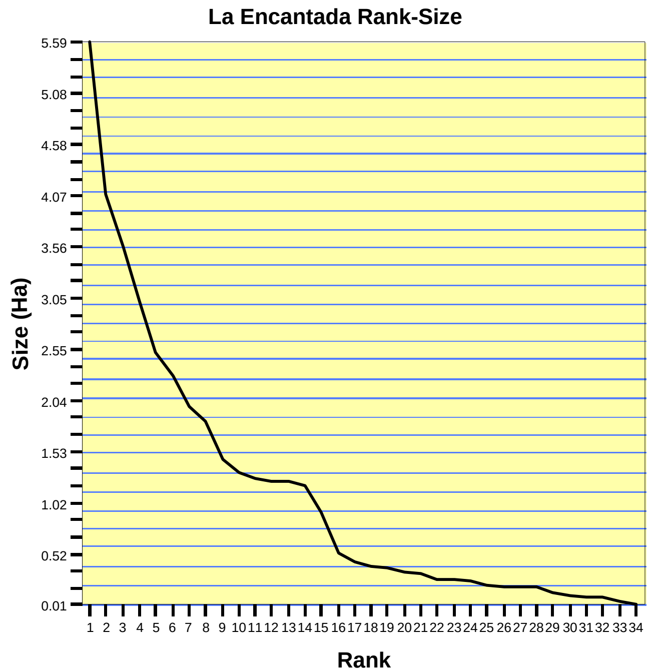

Figure 43: La Encantada Period Settlement Size Plot

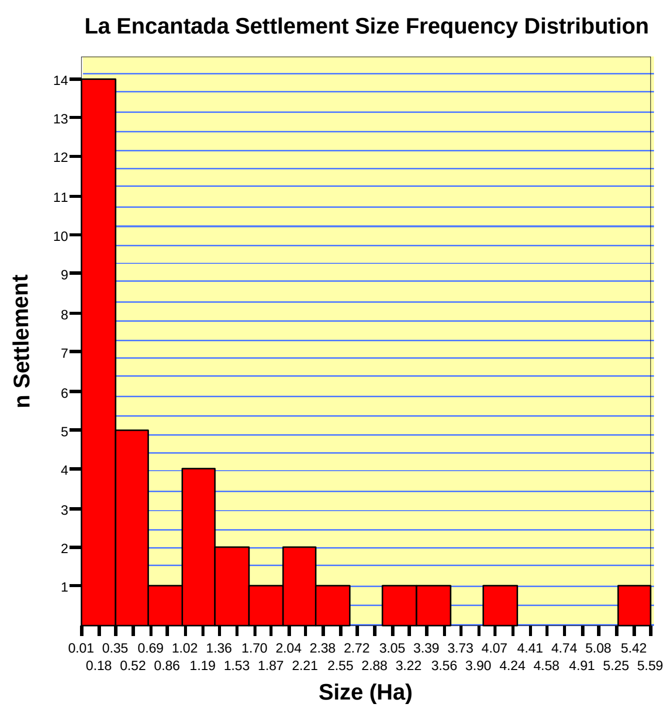

Figure 44: La Encantada Period Frequency Histogram

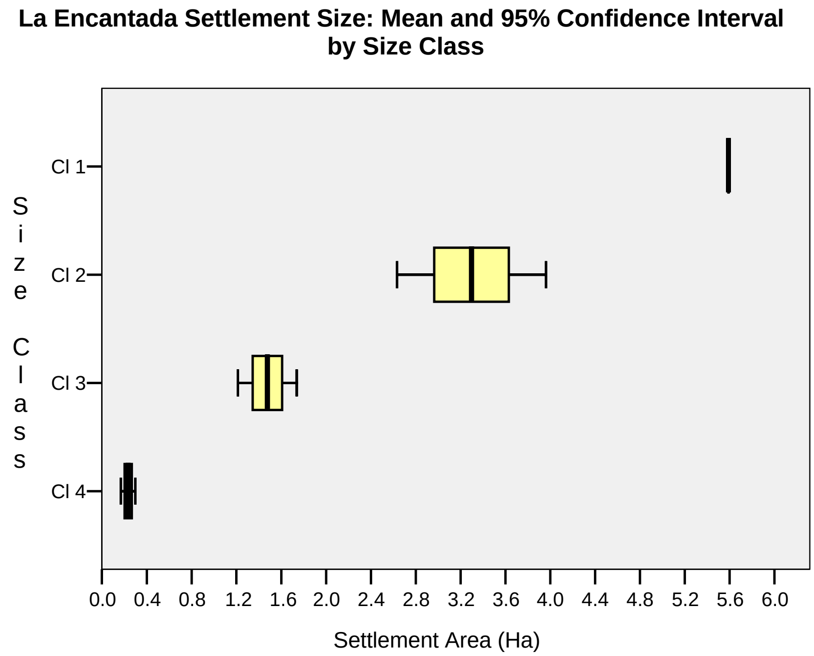

Figure 45: La Encantada Period Mean Settlement Size by Size Class

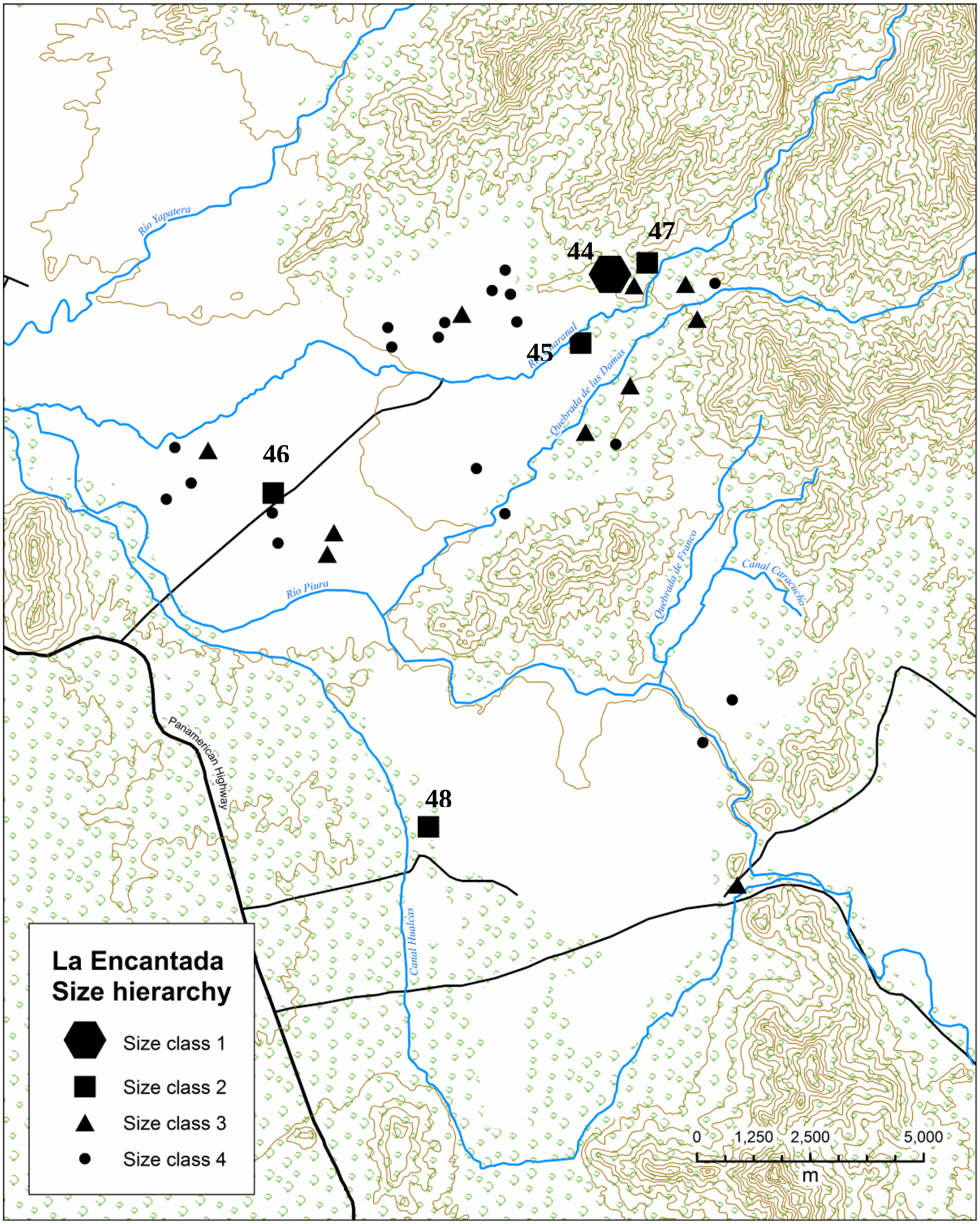

Figure 46: La Encantada Period Four-Tier Settlement Hierarchy and Major Settlements

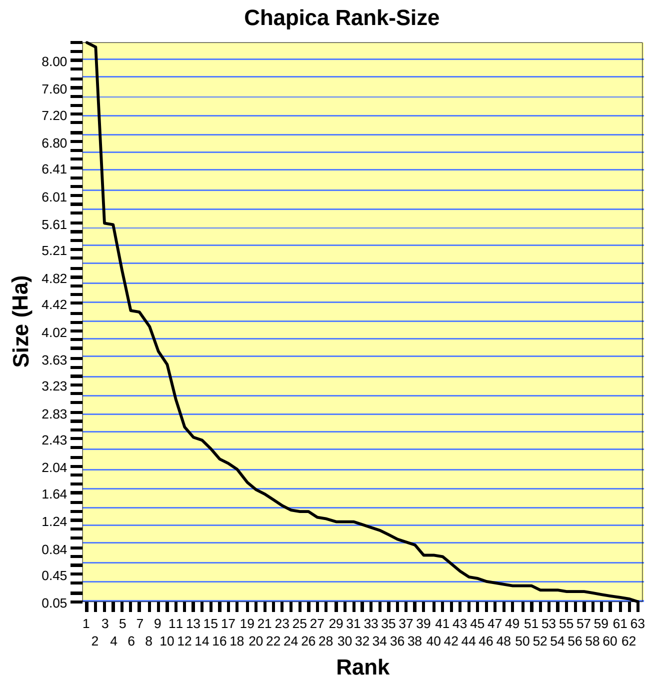

Figure 47: Chapica Period Settlement Size Plot

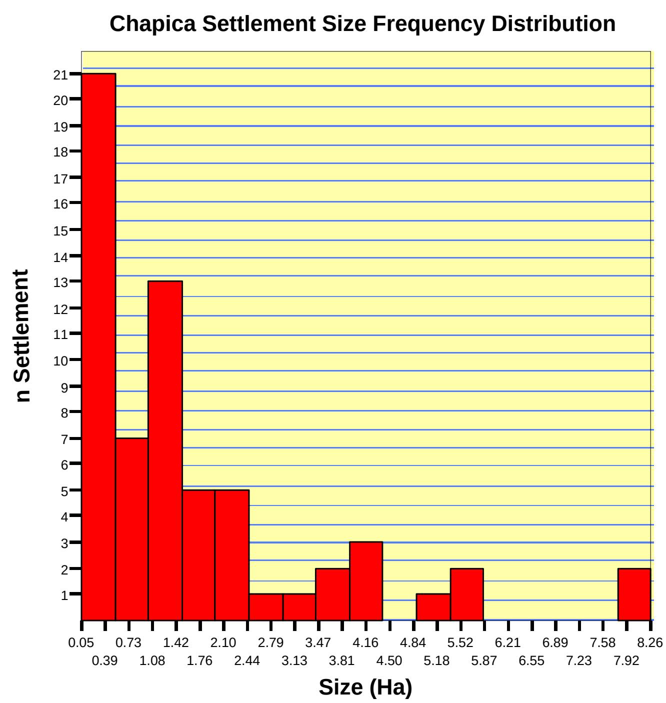

Figure 48: Chapica Period Frequency Histogram

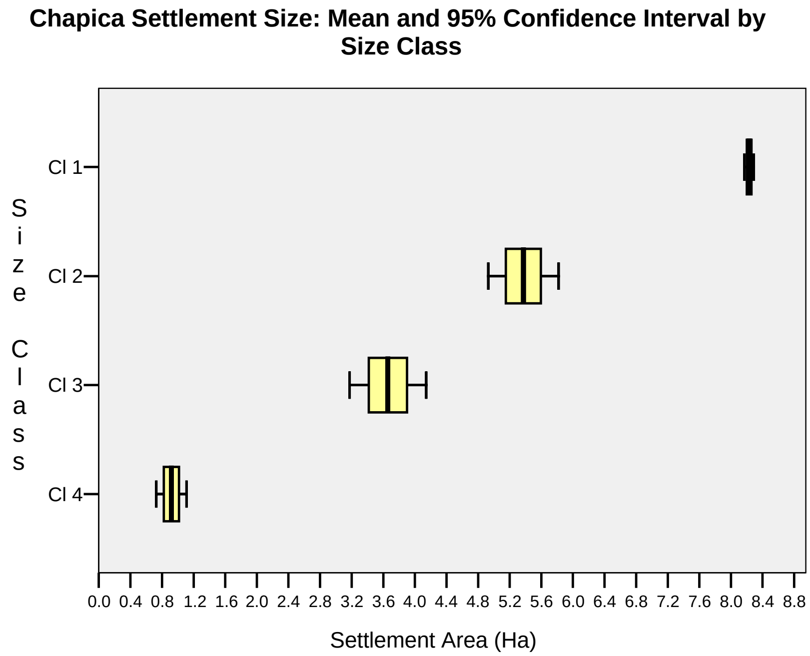

Figure 49: Chapica Period Mean Settlement Size by Size Class

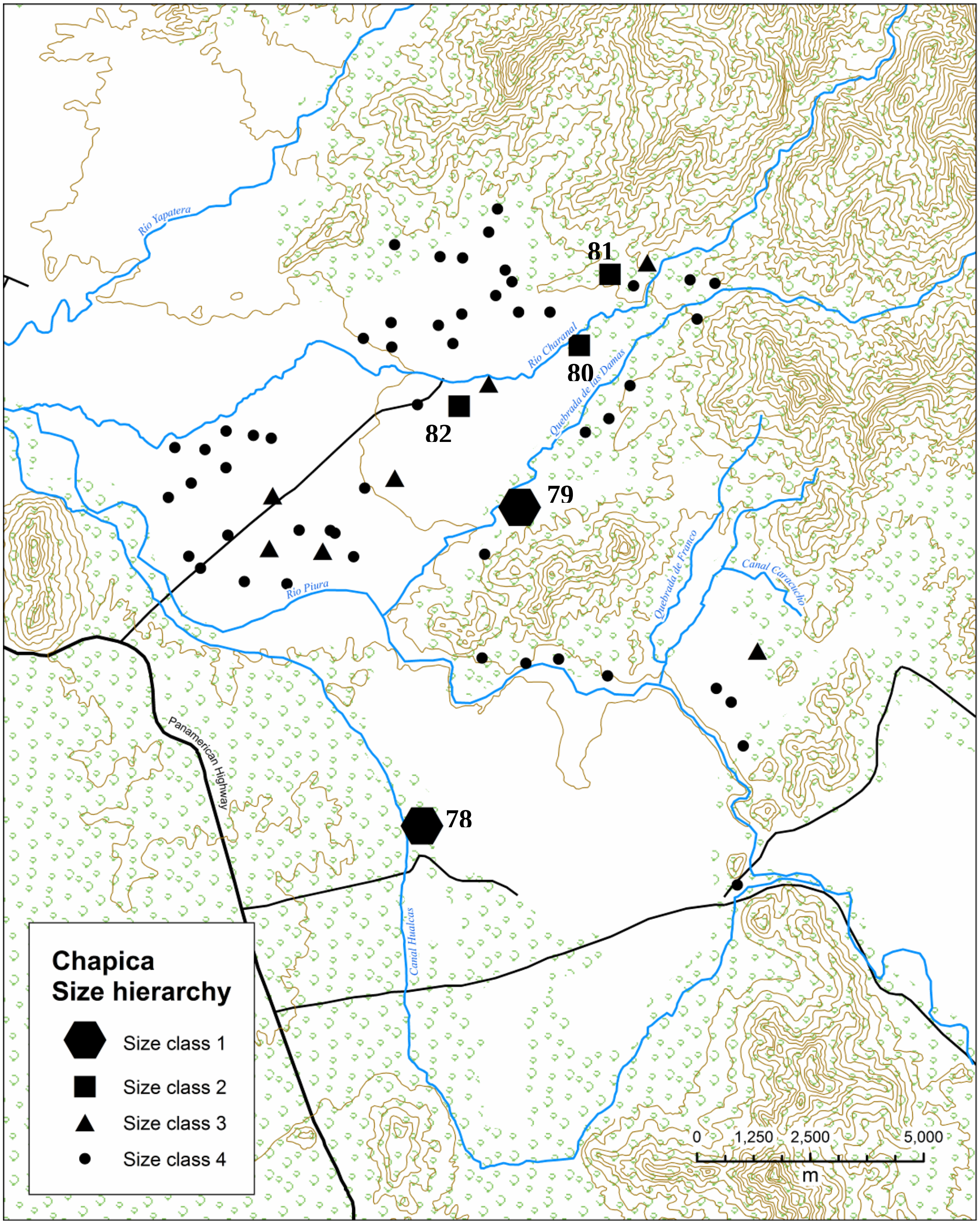

Figure 50: Chapica Period Four-Tier Settlement Hierarchy and Major Settlements

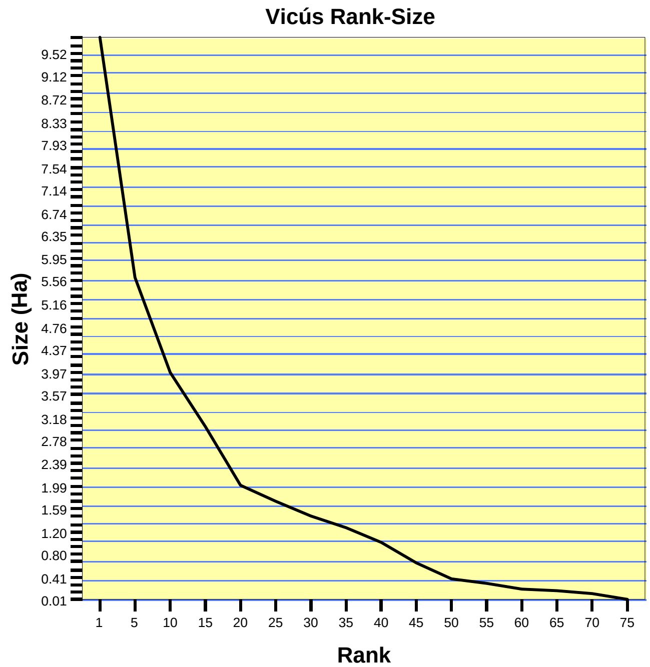

Figure 51: Vicús Period Settlement Size Plot

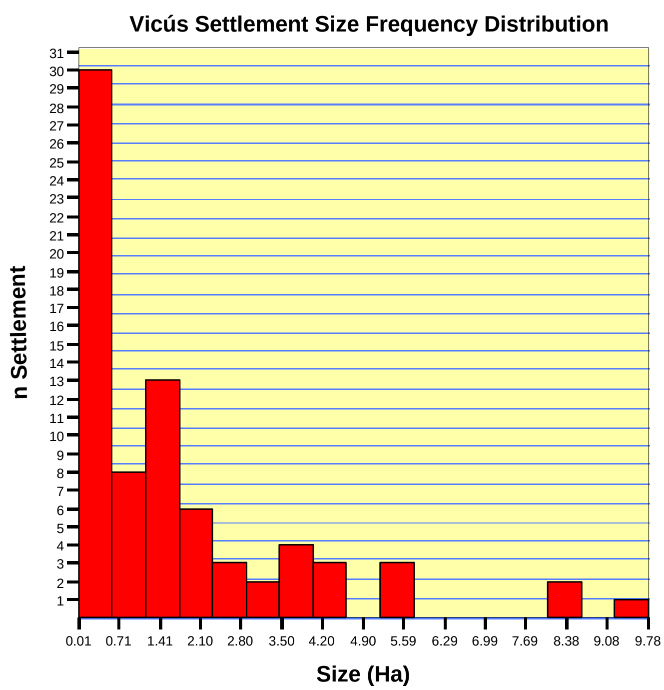

Figure 52: Vicús Period Frequency Histogram

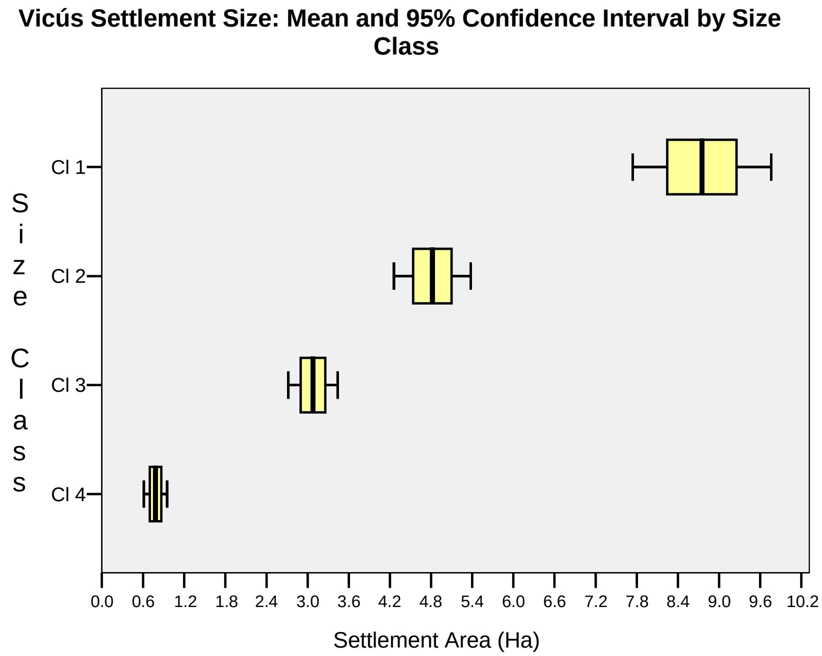

Figure 53: Vicús Period Mean Settlement Size by Size Class

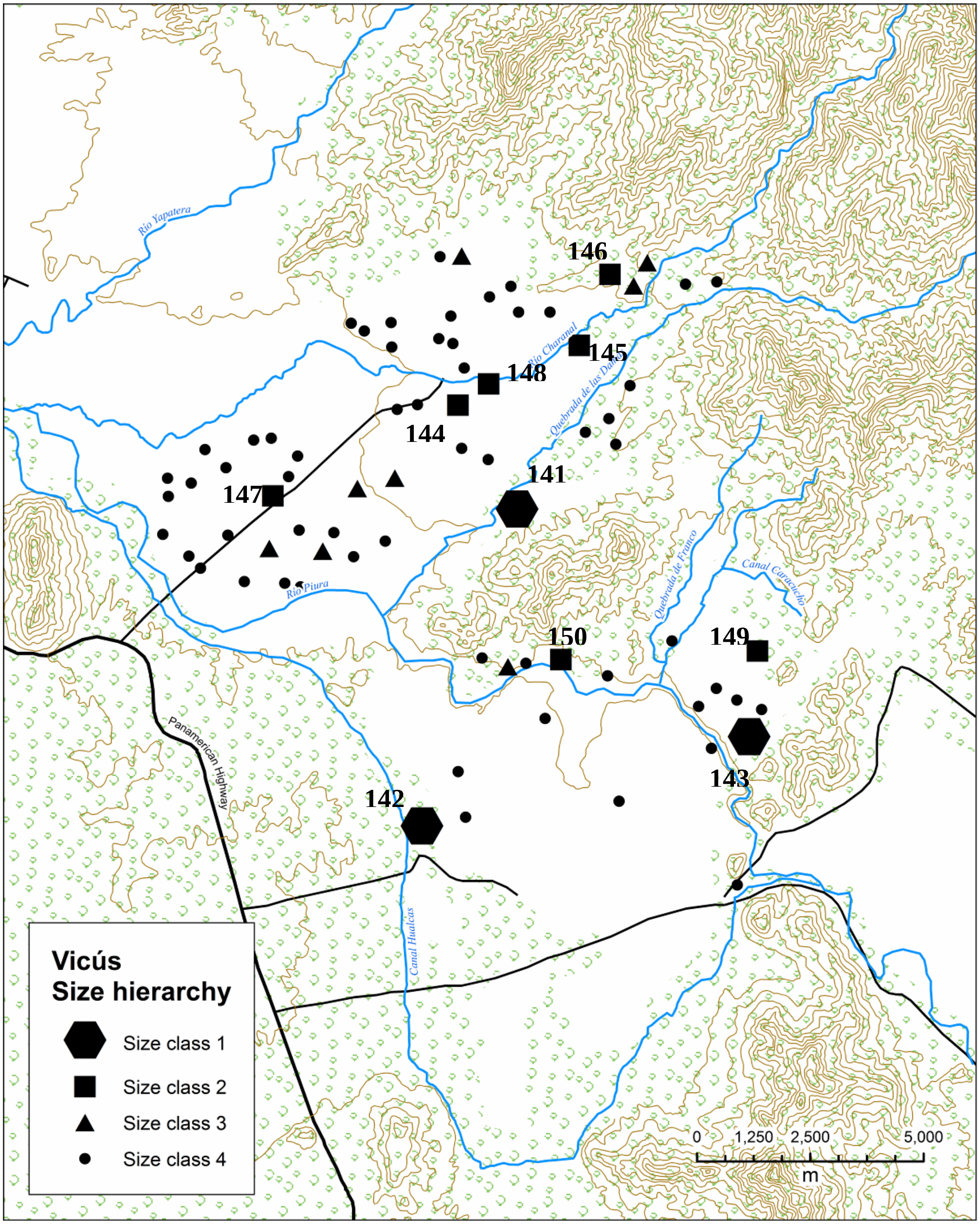

Figure 54: Vicús Period Four-Tier Settlement Hierarchy and Major Settlements

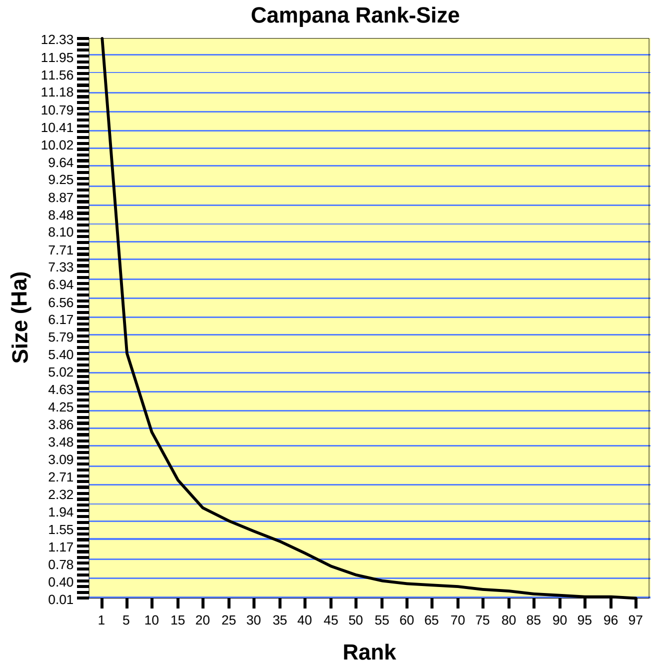

Figure 55: Campana Period Settlement Size Plot

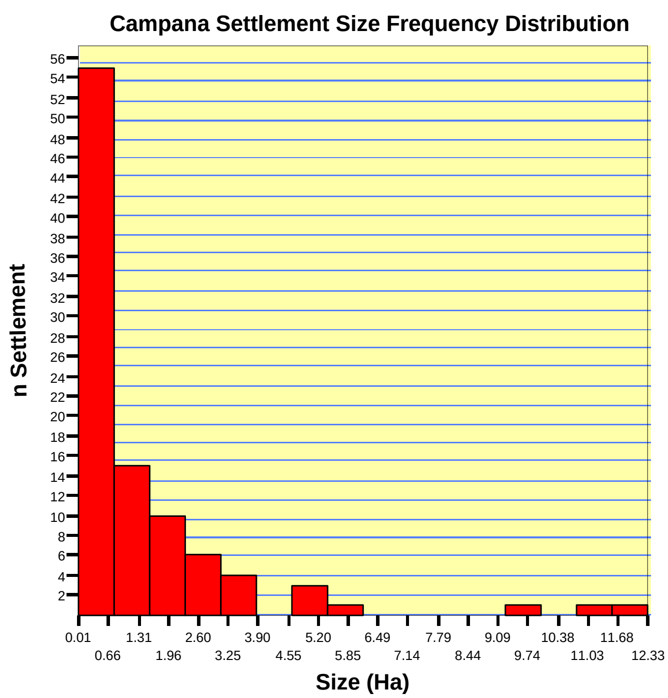

Figure 56: Campana Period Frequency Histogram

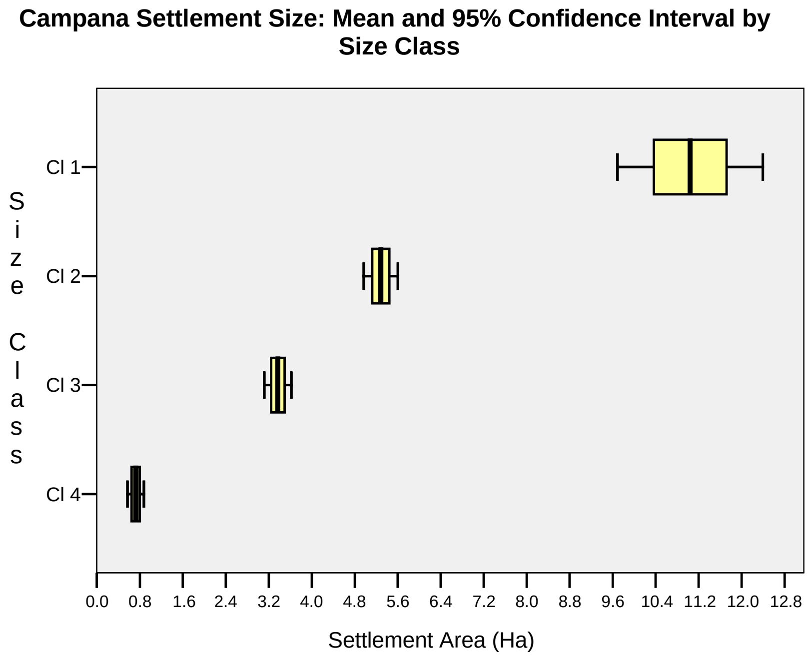

Figure 57: Campana Period Mean Settlement Size by Size Class

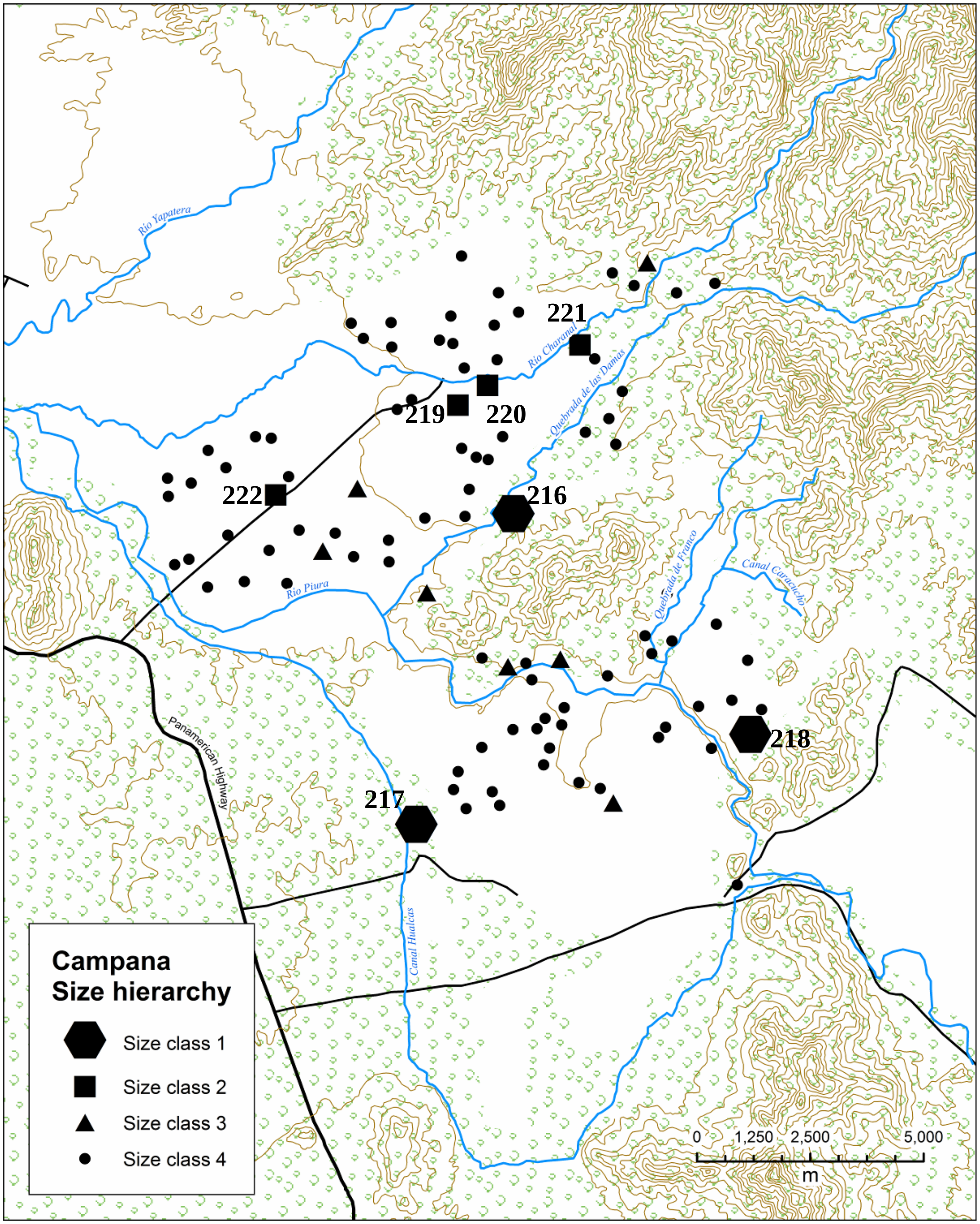

Figure 58: Campana Period Four-Tier Settlement Hierarchy and Major Settlements

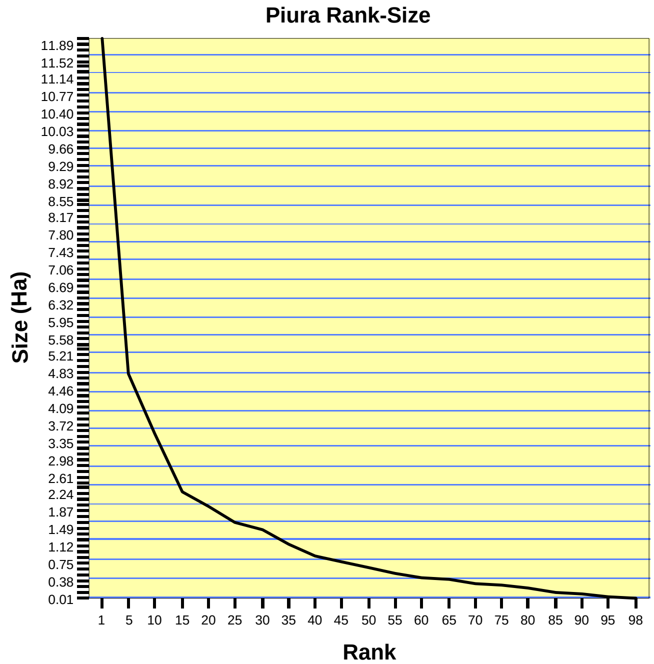

Figure 59: Piura Period Settlement Size Plot

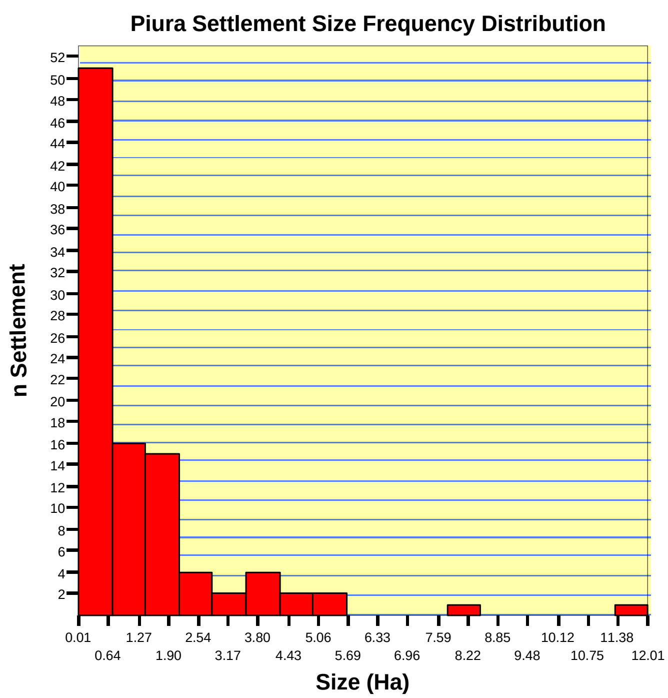

Figure 60: Piura Period Frequency Histogram

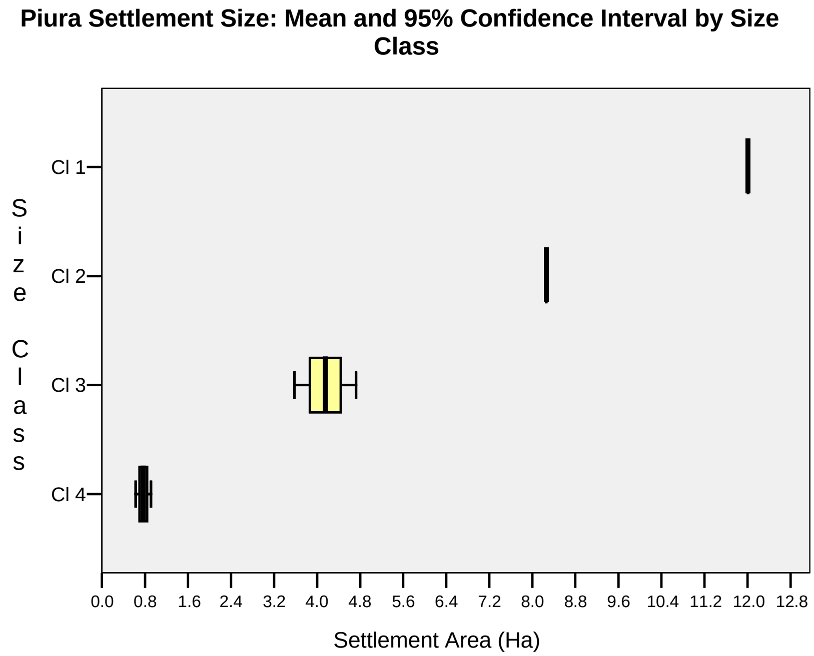

Figure 61: Piura Period Mean Settlement Size by Size Class

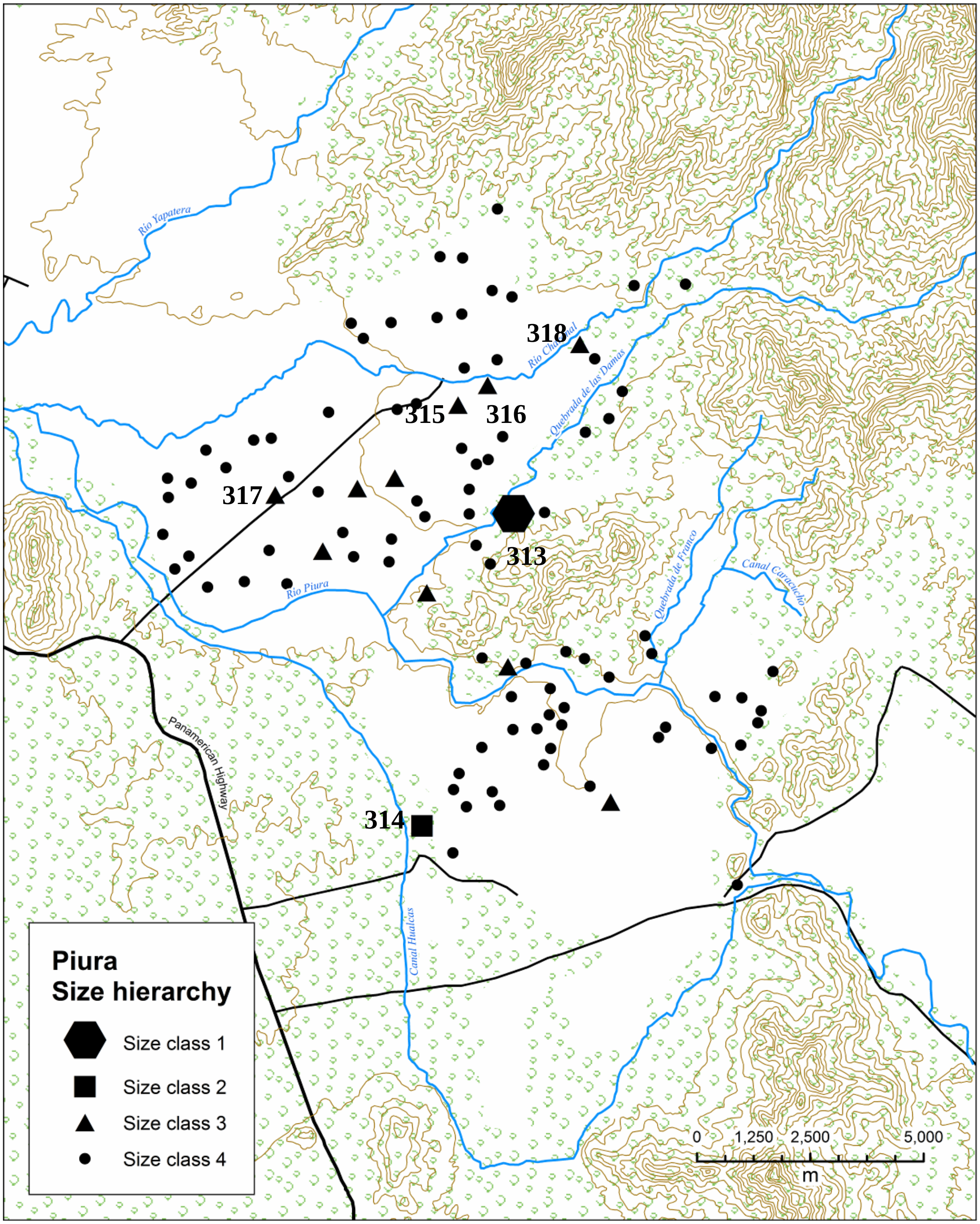

Figure 62: Piura Period Four-Tier Settlement Hierarchy and Major Settlements

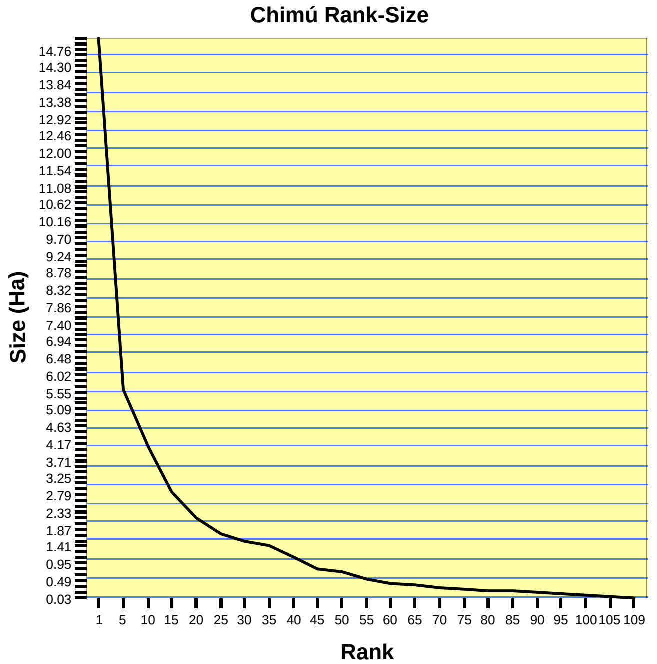

Figure 63: Chimú Period Settlement Size Plot

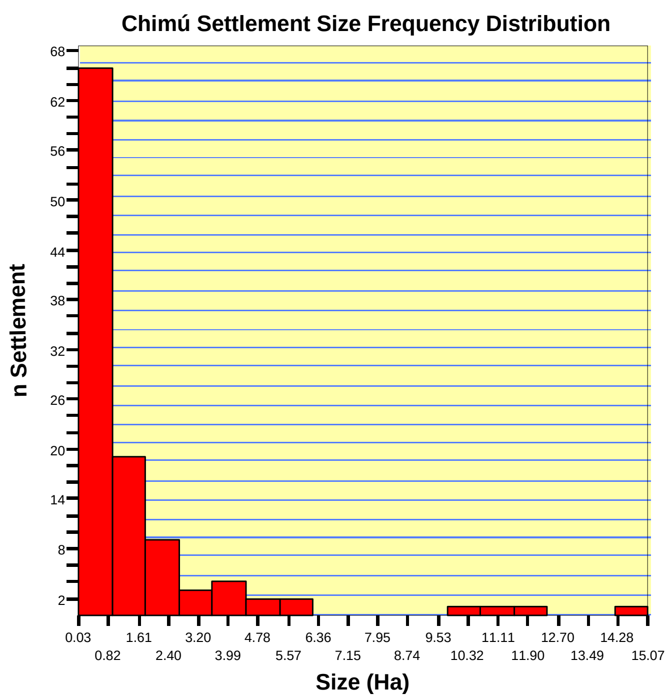

Figure 64: Chimú Period Frequency Histogram

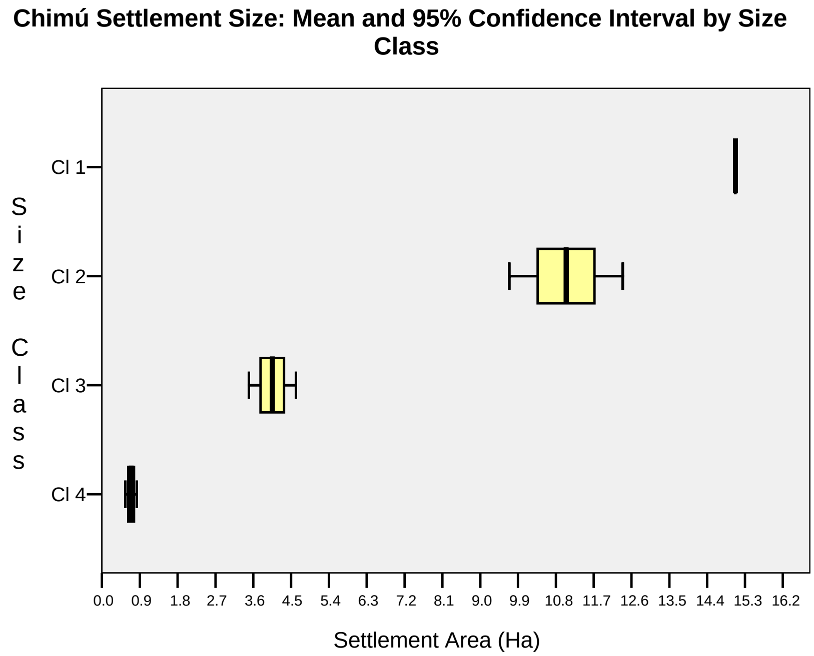

Figure 65: Chimú Period Mean Settlement Size by Size Class

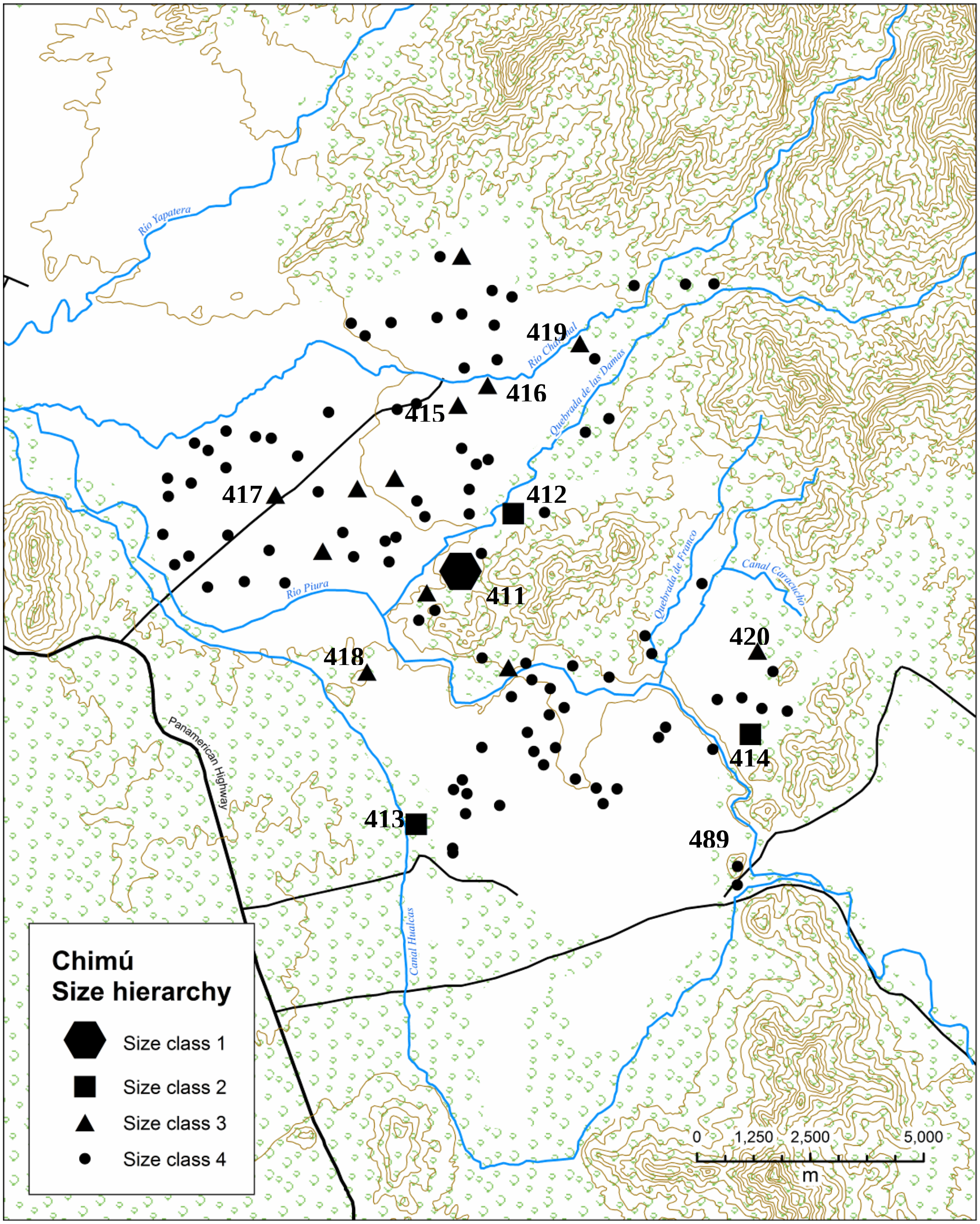

Figure 66: Chimú Period Four-Tier Settlement Hierarchy and Major Settlements

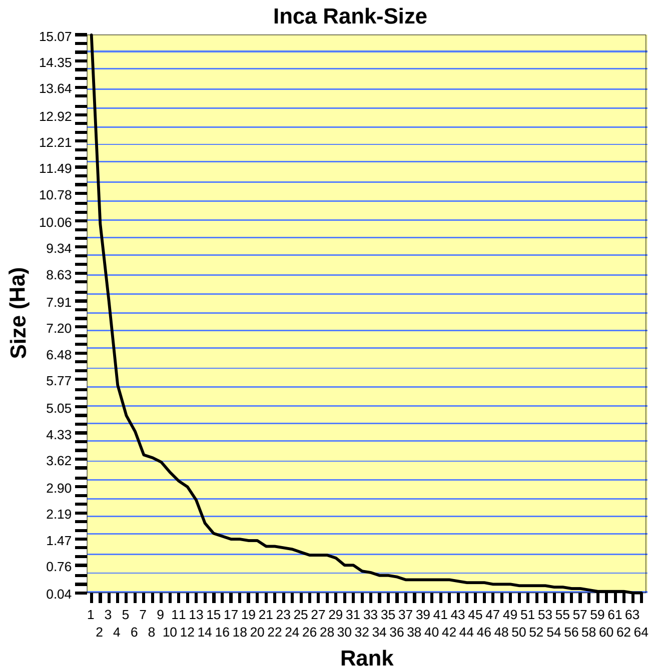

Figure 67: Inca Period Settlement Size Plot

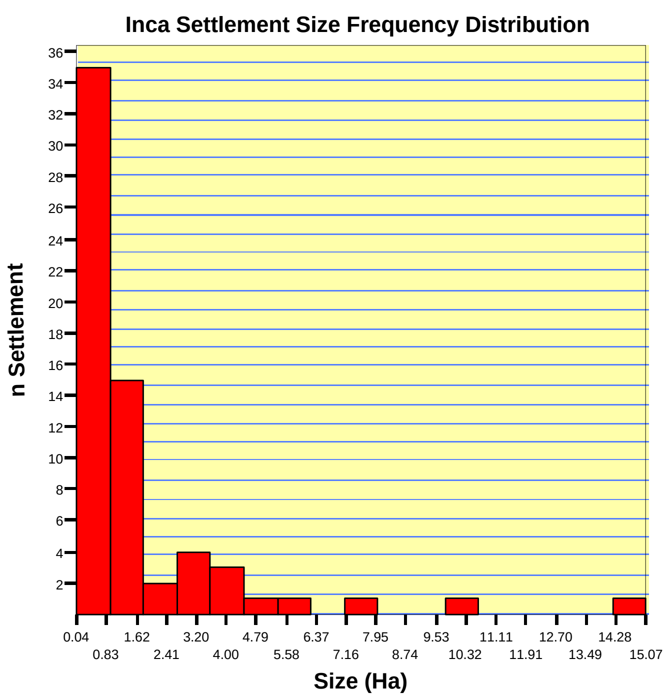

Figure 68: Inca Period Frequency Histogram

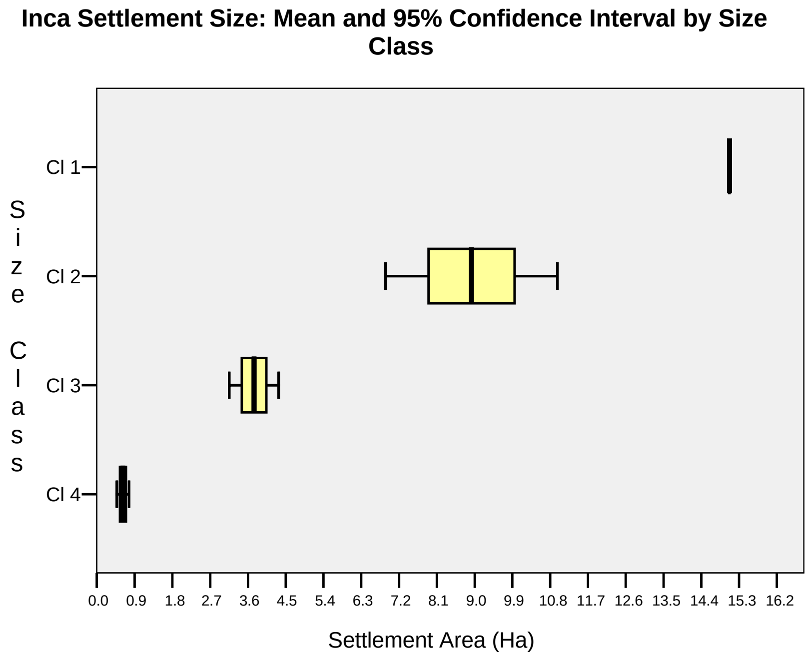

Figure 69: Inca Period Mean Settlement Size by Size Class

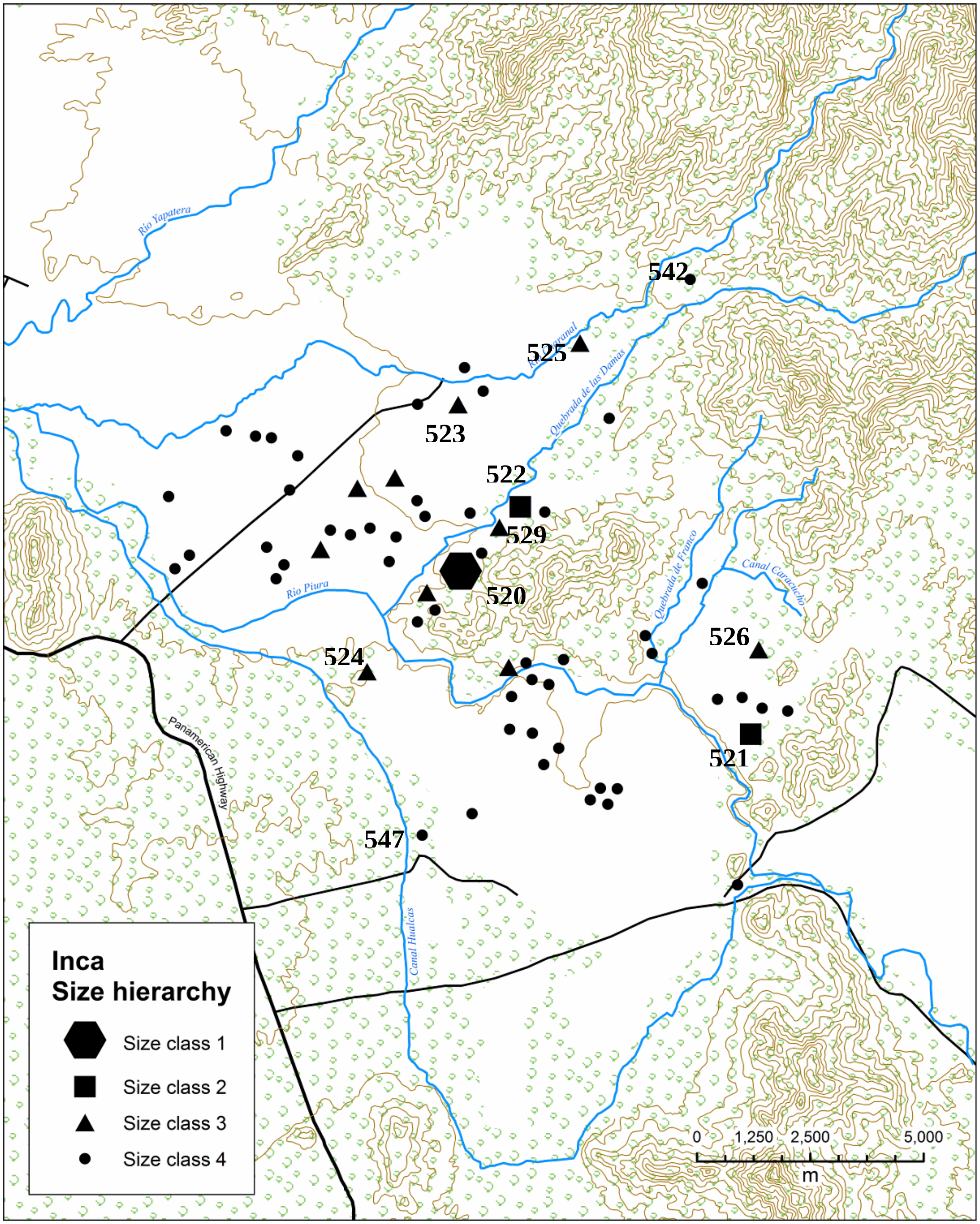

Figure 70: Inca Period Four-Tier Settlement Hierarchy and Major Settlements

Table 4: Ñañañique Period Independent-Samples *t* test Classes 1 and 2

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	Cl 1	2	2.7700	.35355	.25000
	Cl 2	4	2.0750	.17673	.08836

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4.218	.109	3.432	4	.026	.69500	.20250	.13277	1.25723

Table 5: Ñañañique Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	4	2.0750	.17673	.08836
	3	6	1.2733	.18007	.07351

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.036	.854	6.945	8	.000	.80167	.11543	.53548	1.06785

Table 6: Ñañañique Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	6	1.2733	.18007	.07351
	4	5	.2540	.12934	.05784

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.245	.633	10.552	9	.000	1.01933	.09660	.80081	1.23786

Table 7: Panecillo Period Independent-Samples *t* test Classes 1 and 2

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	1	4	3.3750	.41065	.20532
	2	5	2.1660	.25462	.11387

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.256	.299	5.451	7	.001	1.20900	.22179	.68454	1.73346

Table 8: Panecillo Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	5	2.1660	.25462	.11387
	3	6	1.0883	.23693	.09673

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.000	.998	7.266	9	.000	1.07767	.14832	.74213	1.41320

Table 9: Panecillo Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	6	1.0883	.23693	.09673
	4	11	.2382	.13370	.04031

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4.309	.056	9.571	15	.000	.85015	.08882	.66083	1.03947

Table 10: La Encantada Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	4	3.2975	.67786	.33893
	3	10	1.4760	.42267	.13366

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.688	.218	6.172	12	.000	1.82150	.29513	1.17847	2.46453

Table 11: La Encantada Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	10	1.4760	.42267	.13366
	4	19	.2337	.14237	.03266

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	14.692	.001	11.764	27	.000	1.24232	.10560	1.02564	1.45899

Table 12: Chapica Period Independent-Samples *t* test Classes 1 and 2

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	1	2	8.2300	.04243	.03000
	2	3	5.3733	.39273	.22674

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	7.743	.069	9.731	3	.002	2.85667	.29357	1.92239	3.79095

Table 13: Chapica Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	3	5.3733	.39273	.22674
	3	7	3.6586	.65339	.24696

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.047	.336	4.149	8	.003	1.71476	.41332	.76165	2.66787

Table 14: Chapica Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	7	3.6586	.65339	.24696
	4	51	.9182	.69996	.09801

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.319	.575	9.781	56	.000	2.74034	.28018	2.17907	3.30160

Table 15: Vicús Period Independent-Samples *t* test Classes 1 and 2

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	1	3	8.7500	.89236	.51520
	2	7	4.8186	.75552	.28556

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.008	.933	7.194	8	.000	3.93143	.54650	2.67120	5.19165

Table 16: Vicús Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	7	4.8186	.75552	.28556
	3	8	3.0788	.51880	.18342

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4.261	.060	5.260	13	.000	1.73982	.33074	1.02530	2.45434

Table 17: Vicús Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	8	3.0788	.51880	.18342
	4	57	.7816	.65049	.08616

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	2.269	.137	9.549	63	.000	2.29717	.24057	1.81642	2.77792

Table 18: Campana Period Independent-Samples *t* test Classes 1 and 2

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	1	3	11.0433	1.19438	.68957
	2	4	5.2850	.32316	.16158

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4.546	.086	9.474	5	.000	5.75833	.60779	4.19596	7.32071

Table 19: Campana Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	4	5.2850	.32316	.16158
	3	7	3.3686	.33879	.12805

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.634	.446	9.164	9	.000	1.91643	.20914	1.44333	2.38952

Table 20: Campana Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	7	3.3686	.33879	.12805
	4	83	.7233	.70948	.07788

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	4.371	.039	9.733	88	.000	2.64532	.27179	2.10519	3.18544

Table 21: Piura Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	1	8.2600	.	.
	3	10	4.1510	.92484	.29246

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.	.	4.236	9	.002	4.10900	.96998	1.91476	6.30324
			.	.	.		.	.	.

Table 22: Piura Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	10	4.1510	.92484	.29246
	4	86	.7688	.67454	.07274

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	3.392	.069	14.413	94	.000	3.38216	.23467	2.91622	3.84810

Table 23: Percentages of Long Occupation Sites by Period

	Ñ	P	LE	CH	V	C	PI	CHI	I
Total Sites	18	30	41	105	134	186	181	193	93
L.O.	12	16	20	36	35	35	34	35	16
% L.O.	66.6 %	53.3 %	48.8 %	34.3 %	26. 1%	18.8 %	18.8 %	18.1 %	17.2 %

L.O.= total long occupation sites; % L.O.= percentage of long occupation sites; Ñ= Ñañañique; P= Panecillo; LE= La Encantada; CH= Chapica; V= Vicús; C= Campana; PI= Piura; CHI= Chimú; I= Inca

Table 24: Long Occupation Sites and Settlements Size Class by Period

ID	Cont	Type	# Set	ÑSC	# S/S	PSC	# S/S	LESC	# S/S	CHSC	# S/S	VSC	# S/S	CSC	# S/S	PISC	# S/S	CHISC	# S/S	ISC	# S/S
14	y	EM	6	-	0	-	0	-	0	4	1	3	2	3	2	3	2	3	2	3	2
17	y	EM	8	3	1	3	1	3	1	4	3	4	3	4	1	4	2	4	1	-	0
21	y	EM	6	-	0	-	0	-	0	4	3	4	3	4	4	4	3	4	4	4	3
22	y	DM	6	-	0	-	0	-	0	4	1	4	1	4	1	4	1	4	1	4	1
26	y	PM	6	-	0	-	0	-	0	3	3	3	3	4	3	4	3	4	3	4	1
34	y	EM	7	-	0	1	2	2	2	3	4	2	6	2	5	3	5	3	6	-	0
38	y	EM	7	-	0	4	1	4	1	3	4	2	6	2	5	3	5	3	6	-	0
40	y	EM	6	-	0	-	0	-	0	2	1	2	2	2	2	3	2	3	2	3	2
60	y	SM	8	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1	-	0
61	y	PM	6	-	0	-	0	4	1	4	3	4	4	4	4	4	3	4	4	-	0
62	y	PM	6	-	0	-	0	-	0	4	3	4	4	4	4	4	3	4	4	4	1
79	y	SM	7	-	0	-	0	3	2	4	1	4	2	4	3	4	6	4	6	4	1
80	y	EM	6	-	0	-	0	3	2	4	1	4	2	4	3	4	6	4	6	-	0
82	y	EM	6	-	0	-	0	3	1	3	2	3	2	3	2	3	2	3	2	-	0
83	n	EM	7	-	0	2	1	-	0	3	2	3	2	3	2	3	2	3	2	3	1
86	n	PM	7	2	1	2	1	-	0	4	1	3	2	4	2	4	1	3	2	-	0
94	n	SM	6	-	0	4	1	-	0	4	7	4	4	4	8	4	2	4	2	-	0
95	y	SM	6	-	0	-	0	4	1	4	7	4	4	4	8	4	2	4	2	-	0
99	y	EM	8	4	1	4	1	4	1	4	7	4	3	4	8	4	1	4	1	-	0
105	y	EM	7	-	0	3	1	3	1	4	1	4	4	4	4	4	1	4	1	-	0
111	n	EM	7	2	2	2	2	-	0	4	1	4	1	4	1	4	1	4	1	-	0
118	y	SM	6	-	0	-	0	4	1	4	5	4	4	4	4	4	2	4	2	-	0
124	y	RCR	8	2	1	2	1	3	1	4	2	3	2	4	1	4	1	4	1	-	0
125	y	RCR	6	1	1	1	1	2	1	3	1	3	1	3	1	-	0	-	0	-	0
129	y	PM	7	-	0	-	0	2	1	2	4	2	4	2	3	3	2	3	2	3	2
133	n	RR	7	3	1	-	0	3	2	4	1	4	2	-	0	4	2	4	2	4	1
135	n	RR	6	4	1	4	1	4	2	4	2	-	0	4	2	-	0	4	1	-	0
143	n	WFR	7	3	1	-	0	-	0	4	1	4	1	4	1	4	1	4	1	4	1
144	y	RR	8	2	1	2	1	3	1	4	1	4	1	4	1	4	1	4	1	-	0
147	y	WFR	6	-	0	-	0	-	0	1	2	1	4	1	6	1	5	2	6	2	1
167	y	PM	6	-	0	-	0	-	0	4	1	4	1	4	1	4	1	4	1	4	1
196	y	PM	6	-	0	-	0	-	0	4	1	1	2	1	5	4	2	2	5	2	5
203	y	WFS	7	-	0	-	0	3	1	4	1	4	1	4	1	4	1	4	1	4	1
207	y	PM	8	1	1	1	2	2	1	1	4	1	4	1	5	2	4	2	5	-	0
208	n	EM	6	-	0	1	2	-	0	1	4	1	4	1	5	2	4	2	5	-	0
210	y	EM	6	-	0	-	0	-	0	1	4	1	4	1	5	2	4	2	5	4	1

ID= site ID; Cont = continuous occupation (yes or no); EM= extended mound; DM= double mound; PM= platform mound; SM= simple mound; RCR= room(s) complex on ridgetop; RR= room(s) on ridgetop; WFR= wall/wall foundation on ridgetop; WFS= wall/wall foundation on slope; # Set= number of occupation periods; ÑSC= size class in Ñañañique period; P= Panecillo; LE= La Encantada; CH= Chapica; V= Vicús; C= Campana; PI= Piura; CHI= Chimú; I= Inca; # S/S= number of constituting sites by settlement

Table 25: Long Occupation Sites and Settlements Area Percentage Change by Period

ID	Cont	Type	#Set	Area% Ñ-P	Area% P-LE	Area% LE-CH	Area% CH-V	Area% V-C	Area% C-PI	Area% PI-CHI	Area% CHI-I
14	y	EM	6	-	-	-	+59.8	0	0	0	0
17	y	EM	8	0	0	+67.7	0	-40.4	+54.0	-35.1	-
21	y	EM	6	-	-	-	-9.7	+43.1	-30.1	+43.1	-2.7
22	Y	DM	6	-	-	-	0	0	0	0	0
26	y	PM	6	-	-	-	0	-6.1	0	0	-22.0
34	y	EM	7	-	+2.9	+20.8	+5.6	+6.6	-0.6	+2.7	-
38	y	EM	7	-	0	+877.3	+5.6	+6.6	-0.6	+2.7	-
40	y	EM	6	-	-	-	+14.0	0	0	0	0
60	y	SM	8	0	0	0	0	0	0	0	-
61	y	PM	6	-	-	+131.6	+21.6	0	-17.8	+21.6	-
62	y	PM	6	-	-	-	+21.6	0	-17.8	+21.6	-62.6
79	y	SM	7	-	-	-77.4	+343.3	+12.0	+40.9	0	-85.7
80	y	EM	6	-	-	-22.6	+29.1	+12.0	+40.9	0	-
82	y	EM	6	-	-	+210.8	0	0	0	0	-
83	n	EM	7	-	-	+47.4	0	0	0	0	-32.2
86	n	PM	7	0	-	0	+21.0	0	-17.4	+21.0	-
94	n	SM	6	-	-	+2080	-58.7	+180	-92.9	0	-
95	y	SM	6	-	-	+2625	-58.7	+180	-92.9	0	-
99	y	EM	8	0	0	+303.7	-38.5	+88.1	-78.6	0	-
105	y	EM	7	-	0	0	+97.8	0	-49.5	0	-
111	n	EM	7	0	-	-10.6	0	0	0	0	-
118	y	SM	6	-	-	+615.8	+26.0	0	-57.6	0	-
124	y	RCR	8	0	0	+5.2	0	-5.0	0	0	-
125	y	RCR	6	0	0	0	0	0	-	-	-
129	y	PM	7	-	-	+37.2	0	-5.3	-10.5	-7.6	0
133	n	RR	7	-	+49.6	-33.2	+49.6	-	0	0	-33.2
135	n	RR	6	0	+42.9	0	-	0	-	-30.0	-
143	n	WFR	7	-	-	0	0	0	0	0	0
144	y	RR	8	0	0	0	0	0	0	0	-
147	y	WFR	6	-	-	-	+19.3	+26.1	-2.6	+2.7	-36.1
167	y	PM	6	-	-	-	0	0	0	0	0
196	y	PM	6	-	-	-	+3631.8	+21.4	-97.0	+3223.3	0
203	y	WFS	7	-	-	0	0	0	0	0	0
207	y	PM	8	-23.0	-18.7	+227.7	0	+31.1	-23.7	+31.1	-
208	n	EM	6	-	-	+166.5	0	+31.1	-23.7	+31.1	-
210	y	EM	6	-	-	-	0	+31.1	-23.7	+31.1	-90.3

ID= site ID; Cont = continuous occupation (yes or no); EM= extended mound; DM= double mound; PM= platform mound; SM= simple mound; RCR= room(s) complex on ridgetop; RR= room(s) on ridgetop; WFR= wall/wall foundation on ridgetop; WFS= wall/wall foundation on slope; # Set= number of occupation periods; Ñ= Ñañañique; P= Panecillo; LE= La Encantada; CH= Chapica; V= Vicús; C= Campana; PI= Piura; CHI= Chimú; I= Inca; Area% Ñ-P= area growth (+), reduction (-) or no change (0) of the settlement of the long occupation site, between the Ñañañique and Panecillo periods

Table 26: Chimú Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	3	11.0433	1.19438	.68957
	3	12	4.0542	.99011	.28582

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.015	.905	10.572	13	.000	6.98917	.66111	5.56092	8.41741

Table 27: Chimú Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	12	4.0542	.99011	.28582
	4	93	.6934	.65915	.06835

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	5.382	.022	15.608	103	.000	3.36073	.21532	2.93369	3.78776

Table 28: Inca Period Independent-Samples *t* test Classes 2 and 3

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	2	2	8.9250	1.47785	1.04500
	3	10	3.7450	.94795	.29977

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.609	.453	6.598	10	.000	5.18000	.78504	3.43082	6.92918

Table 29: Inca Period Independent-Samples *t* test Classes 3 and 4

Group Statistics

	Size Class	N	Mean	Std. Deviation	Std. Error Mean
Size (Ha)	3	10	3.7450	.94795	.29977
	4	51	.6227	.52449	.07344

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	5.515	.022	14.838	59	.000	3.12225	.21043	2.70119	3.54332

Notes-Chapter 7

[1] Cerro Pilán clearly has had and continues to have meanings embedded in it. It is (and probably has always been) part of the system of beliefs of the local people. Its name appears in local traditional stories (e.g., Centro de Investigación y Promoción del Campesino (CIPCA) 1990), it is known also as a hideout for legendary bandits, and in general it is perceived as an enchanted mountain (*cerro encantado*) where herds of animals and people disappear. More recently it is known as a place of "UFO sightings" and as a place coveted by mining companies. Also local oral narratives relate that Cerro Pilán sometimes "argues" with Cerro Vicús (the other prominent landmark) and that there is a golden underground road that connects the two of them.

[2] It is evident that Cerro Vicús has played (and still plays) a significant role in the customs and belief systems of local people both in the past and present. In fact, possible ritual offerings such as quartz rock crystals, necklaces of chrysocolla beads, and broken pottery (Makowski, et al. 1994:110, endnote 36) and *Spondylus sp.* shells have been found in the slopes and summit of Cerro Vicús. It is also a key element of the local traditional lore (e.g., Centro de Investigación y Promoción del Campesino (CIPCA) 1990) and in general is considered as a highly esteemed landmark by the local population of the Chulucanas district area and the Piura region in general. Actually, when I was doing fieldwork there was a controversy that revolved around the opposition of the local people to the intentions of a telephone company corporation to place a tower antenna for cellular phones on the summit of Cerro Vicús. While writing these lines I don't know the outcome of that dispute; I just hope they finally did not pursue that plan.

[3] These Domain-Viewing Mountain type landmarks indeed have this political/domination connotation even in modern times. This is seen in the quote I present at the onset of the introduction in this dissertation, as well as in the fact that two of the most prominent modern landscape features in the study area are the residences of former *hacendados* now abandoned after the late 1960s agrarian reform. These former residences of the Reusche and Seminario families are found amid the flatlands of their estates and were built on top of a mountain projection and on the summit of a tall prehispanic earthen mound respectively.

[4] Due to time and money constraints, it was impossible to carry out a full-coverage survey of the massif of Cerro Pilán. Considering its topography and dense vegetation coverage such task would have easily required several weeks and thus hindered the survey of other, larger sections of the study area more related to the specific research questions of this dissertation. Yet, on the basis of the portions that were indeed surveyed it is safe to say that in terms of human population throughout time the western slopes of the massif were the most significant location for human settlements. Obviously it should not be ruled out that, in the future, smaller, perhaps non-habitation sites could be found in other portions of the massif especially on their central and southwestern summits and upper slopes.

[5] There are two reasons why it is not possible to assert if Cerro Ñañañique during the Ñañañique period or beyond conformed to some sort of central place model. First, research done on that site contended (e.g., Guffroy 1989) that Cerro Ñañañique was the

sole site in the region occupied during the Ñañañique period; and second, the only other systematic survey carried out on the adjacent Yapatera River Valley (Bats 1990, 1991) did not include settlement size analysis.

[6] There is no archaeological or ethnohistoric evidence of prehispanic abandoned irrigation systems within the fourth fertile "pocket" on the north bank of the Upper Piura River. If it once existed, it was clearly obliterated by the network of secondary canals that were built and used (and still used) during the Colonial and especially the Republican era (both during the *hacienda* and *cooperativa* times). Currently, all this area is irrigated from water obtained from the Charanal River and distributed by two main irrigation canals: The Talandracas Canal which waters areas on the west bank of the Charanal River next to *caseríos* such as Charanal, Hualtacal, La Unión, Calores, Pueblo Nuevo, and Talandracas, and the San Pedro Canal that irrigates land on the east bank of the river next to *caseríos* such as San Pedro, Charanal Alto, Solumbre, and Piura La Vieja. It is not a surprise that the least favored and most impoverished modern *parceleros* are those who live and have cultivation plots on areas next to the north bank of the Upper Piura River (around the modern *caserío* of Batanes); during times of drought or even during years of normal precipitation, the water hardly reaches their plots creating some conflict among the irrigation committees that represent farmers of these areas. In any case, the existence of early irrigation systems during the Formative period could be determined through future research focusing on paleoenvironmental and paleoethnobotanical studies.

[7] The area adjacent to the south bank of the Upper Piura River across the centripetal force next to the north bank was not included in my survey for this dissertation research. Yet, in part of this same area the Upper Piura Project carried out systematic excavations and surface survey and found that Chapica (or Vicús-Tamarindo A) was the earliest occupation on the south bank of the river. As mentioned in Chapter 2 (see also Kaulicke 1991:386) however, the results of this survey are still incomplete and unpublished. Thus, besides general statements on the number of mounds at both margins of the river, or the general location of sites on maps or aerial photographs (e.g., Kaulicke 1991:388, Figure 1; Makowski, et al. 1994: Anexo 1 289-291), there are no data, for the majority of surveyed sites, on their geographic location (e.g., UTM coordinates), physical characteristics, dimensions, area, distance between them, etc. that could be used to compare to (or to integrate with) the settlement pattern data of this dissertation. Yet, the investigations by the Upper Piura Project at the Tamarindo Complex (on the south bank of the Upper Piura River right across the centripetal force on the north bank of the river) indicate that the west sector of this complex has an area of 1.4 ha (Kaulicke 1991:387). If we look at the topographic map made by this project in part of this complex (Kaulicke 1991:389, Figure 2) it is possible to see that the west sector could even reach an area of 3.0 ha. That is, this settlement (mounds are less than 200 m apart) in the west sector of the Tamarindo Complex during the Chapica and Vicùs periods could have an area between 1.4 ha and 3.0 ha which, if compared with the parameters used in this dissertation, would make this settlement a Class 4 or Class 3 settlement. The size of this settlement on the south bank of the river is thus consistent with the size of the settlements in the centripetal force next to the north bank of the river where there are only Class 3

(the largest is 4.32 ha) and Class 4 settlements. It also confirms that the majority of the human occupation during this period was found on areas on the north margin of the Upper Piura River and that the occupation of the south margin spawned from the latter and especially from the centripetal force next to the north bank of the river.

[8] Obviously this axis does not imply that was the only one around which the settlement organization of the entire Upper Piura Valley functioned. Most likely, a similar interacting axis comprised by other Class 1 settlements existed beyond the study area at both the remaining of the fourth "pocket" to the northwest, and in the second fertile "pocket" to the east.

[9] Hayashida and her colleagues (Figueroa and Hayashida 2004; Hayashida 2006) have also mapped, reported, and described such centers (especially the site known as Cerro Arena) at Pampa de Chaparrí though detailed intrasite, spatial, and ceramic analyses are still pending. Her investigations have rather focused on the agricultural and irrigation systems (and its concomitant social and political dynamics) of the farmlands and associated settlements adjacent to this center and beyond on the *pampa*, developed during the Middle Sicán, Late Sicán, Chimú, and Inca periods.

[10] Since the presence of the Chimú empire was not the direct focus of this dissertation, these sites, in terms of recording, received the same treatment as the other sites in my surface survey. That is, they were recorded using the same forms, gathering the same kind of information, and drawing just simple sketch maps in a matter of few hours before

proceeding in the same day to the next survey unit or sites to be recorded. Under these constraints my survey crew and I tried to be as thorough as possible, though. The complete outline of these centers was recorded, sketched, and measured. There are some preservation and logistical factors that should be considered and could result in areas larger than those measured in the field. For instance, the settlement on top of Cerro Loma Negra was recorded as two separate sites. The site located upslope is the large ring wall structure that is connected to the downslope site (wall foundations of a few structures) by a gentle slope or "saddle" on the topography of the hill. The presence of architecture on this "saddle" was not clear besides some scattered stone alignments. Yet since this "saddle" is the lowest point on the hill it is used by modern inhabitants and cattle and other livestock herders as a shortcut to cross the hill and thus is in poor condition. In addition, people from the adjacent village seem to have been picking up stones from this area and from the downslope site to be reused at their homes. If the "saddle" area were considered as part of the settlement, and in a rough estimate to correct this error, the total settlement area would be ca. 9.0 ha instead of the 4.8 ha recorded originally which would make it jump from a Class 3 to a Class 2 settlement. In the case of the site on top of Cerro Santo Tomé, a lush vegetation cover (more than at Cerro Loma Negra) combined with its very steep slopes precluded recording all architecture including a possible third ring wall on its western slopes. Also in a rough estimate to correct this error, I calculate that the area of the site could change from 0.3 ha (basically the area enclosed by the last and upper ring wall on the summit) to no more than 5.0 ha which would make it jump from a Class 4 to a Class 3 in the Chimú settlement size hierarchy.

[11] Cerro Tongo is not a hilltop, ring-walled center. Yet not all Chimú administrative centers are found on such positions. For instance Hayashida (2006:254) has located a Chimú administrative center (site 257X01) on the *pampa* floor and on the course of an ancient route that comprises stone-walled compounds, corridors, and a platform mound with ramps. Such architectural features are not present at Cerro Tongo either. Yet it has an exclusive Chimú period occupation and its existence is unquestionably associated to the presence of the Hualcas Canal (monitored in turn by the Chimú state from the valley-margin centers); it is also found along a possible roadway that penetrates into the *despoblado* adjacent to the Andean cordillera foothill. It is therefore plausible to suggest that residents at the Cerro Tongo settlement were part of the Chimú administration.

CHAPTER 8

DISCUSSION AND CONCLUSIONS

This chapter discusses the impact (or lack thereof) that the hypothesized intrusive Mochica and Sicán polities from the North Coast might (or might not) have had on the organization of the settlement systems during the Chapica, Vicús, Campana, and Piura periods. This chapter also elaborates on some general conclusions of this dissertation.

The chapter starts with a brief diachronic overview of the characteristics of the local settlement systems as detected during the rank-size analyses to observe their general tendencies. On the basis of this characterization, a recapitulation of the interpretation of the sociopolitical organizations during the Chapica, Vicús, Campana, and Piura periods follows. These interpretations will then be compared to settlement organization in two other areas on the North Coast that were affected by the intrusion of the Mochica and Sicán polities. To assess if similar kinds of intrusion (or interaction) occurred in the study area, the archaeological correlates will be assessed vis-à-vis the results and interpretations of the settlement systems and sociopolitical organizations during the periods mentioned above. Finally, a last section elaborates on the general conclusions of this dissertation.

8.1 Diachronic Characterization of the Settlement Systems in the Study Area

The results of rank-size analyses usually have been interpreted differently yet in general they revolve around the degree of integration of the settlement system and its relation with its political and economic organization. These interpretations have focused on exceptions to the rank-size rule (the ideal situation) also known as deviations from the linear log-normal distribution. Three different types of deviations (or distributions) have been defined: convex, concave (or primate), and primo-convex (for the definition and further explanation of these distributions see Johnson 1981:148-151; McAndrews, et al. 1997:70-71).

All the distributions from the Ñañañique period to the Inca period are concave (see Figures 35, 39, 43, 47, 51, 55, 59, 63, and 67). Yet during the first two periods (Ñañañique and Panecillo) it does not conform to the typical curve of the concave distribution but rather is closer to the log-normal distribution. This phenomenon is due to the fact that the difference in size between the top and bottom ranked settlements is not very large and thus the larger settlements are not as large as expected in the normal distribution of the rank-size rule, and the smaller settlements are also not as small as expected in the normal distribution of the rule.

From the La Encantada period on however, the curve of the concave distribution gradually starts to assume its typical concave form, and escalates from the Piura period on, where sharp drops in the curve between the top ranked settlement(s) and those below them are quite evident. The curve of the concave distribution therefore indicates that the largest settlements in the distribution are larger than would be predicted by the rank-size rule, and the smallest settlements are smaller than would be predicted.

The settlement systems in the study area, at one point in time or another, fall into the different interpretations given to the primate distributions. For instance, it has been suggested (Johnson 1981; McAndrews, et al. 1997) that the integration of the settlement system is not balanced; in other words, that a vertical integration usually prevails over a more horizontal integration. This pattern has been observed throughout the entire history in the study area. Since the Ñañañique period a four-tier settlement size hierarchy has been at the core of the settlement system organization.

Primate distributions also may imply that central place functions are overly concentrated at a single site. This seems to have been the case for only some of the occupational periods in the study area. During the first six periods (from the Ñañañique to Campana periods, with the exception of La Encantada) there was more than one (sometimes two or even three) central place. On the other hand, this situation radically changed for the remaining three occupational periods (from the Piura to the Inca periods), in which just one settlement (and always at the same location) constituted the central place.

It has also been suggested (Johnson 1981; McAndrews, et al. 1997) that primate distributions entail both a differential interaction of the settlement system with a larger supra regional system, or a partitioned context situating the areas under investigation as part of a larger settlement system. The study area has fallen into both cases. As for the partitioned scenario, I argued in Chapter 7 that since the Ñañañique and Panecillo periods, the study area was interlinked to the settlement system distributed and organized in the adjacent Yapatera Valley beyond the fourth “pocket” to the northwest, having the site of Cerro Ñañañique as its central place. In addition, a similar main center has also been argued for the Chapica and Vicús periods also beyond the fourth “pocket” at the site of La Huaca next to the modern village of Sol Sol, northwest from the modern town of Chulucanas (James Richardson personal communication, 1998). Also, during the later Piura period the study area was linked to the east in the second and first “pockets” and beyond, to broader regional (at the Upper Piura River Valley level) settlement system with rival or neighboring polities whose main centers were sites such as El Ala, Las Huacas, and perhaps Hualcas too.

As for the situation of a differential interaction of the settlement system with a larger, supra regional system, it has been clearly observed for the settlement systems of the Chimú, and Inca periods. As argued in Chapter 7, during these periods the study area became incorporated into the overarching policy of territorial control enforced by the intrusive Chimú, first, and then Inca, empires.

Finally, it has also been argued (Johnson 1981; McAndrews, et al. 1997) that administrative control of an economic system results in primate settlement systems, and also that this distribution is a distinctive feature of settlement systems in which economic competition (e.g., agricultural production) is politically minimized. This also seems to have been true for the study area yet with variations at different periods. It is obvious that control of the economic system was gradually developed since the earliest human occupation in the study area. Yet this control and the social and political decision makers constituted a decentralized force between the Ñañañique and the Campana periods. In this case, economic competition would not have been politically minimized but rather promoted with the top ranked settlements as the prime movers of the economic system.

On the other hand, as contended in Chapter 7, during the second epoch of the "new system", this situation drastically changed. The administrative control of the economic system became highly centralized and monopolized by the top ranked settlement. With a majority of small, lower size class settlements politically dependent on the top ranked settlement, the economic competition was therefore politically minimized. This situation was exacerbated during the Chimú and Inca periods in which the economic organization was dictated from the top-ranked settlement, first as a co-government between the head of the local polity and the Chimú state administrators, and then vertically imposed (and beheaded) by the Inca empire rulers.

8.2 Settlement Systems and Sociopolitical Organization during the Chapica, Vicús, Campana, and Piura Periods (ca. 300 B.C.-A.D. 1375)

The four periods mentioned above have been chosen because they bracket the moment within which the hypothesized intrusion of the southern Mochica and Middle Sicán polities occurred. The presence of the Mochica polity in the Upper Piura Valley has been dated at least since A.D. 100-200 extending up to A.D. 700 (Kaulicke 1991:417; Makowski, et al. 1994:214, 294-295, Figures 186C and 186D), while the climax of the Middle Sicán state in its core area in the Lambayeque region has been dated between A.D. 900-1100 (Shimada 1990b; 1995).

The Chapica period followed a trend of settlement dispersion already observed during the former La Encantada period. It also continued a process of vertical integration with a four-tier settlement hierarchy with two or even three competing central places. It is a period that witnessed an increase in size of the central places and in general a demographic explosion as reflected on the highest percentage growth of sites by period of the entire prehispanic sequence. It led to a further expansion of the two main centripetal forces that were already present since the former periods. Continuing potential social tensions between the centripetal forces revolved around the control of land, water resources, human labor, and interaction roadways. The process of sociopolitical integration in the fourth "pocket" was thus still in process, and that between the latter and the third "pocket" was just in its initial steps.

The settlement system during the Vicús period ended a long, local, and gradual process of spatial organization transformations that reached its peak during the former Chapica period and thus marked the end of the "old system" and the beginning of the "new system". The settlement system continued its process of vertical integration with a four-tier settlement hierarchy with three well-defined competing centripetal forces that formed a triangular-shaped vortex or new axis of sociopolitical organization. Also, the sociopolitical integration of the entire fourth "pocket" is evident and for the first time there is evidence of a certain degree of integration between the latter and the third "pocket". In addition, the continued presence of long occupation settlements at key locations along the interaction roadways along the pediment and the banks of the Upper Piura River confirmed the consolidation of the regional interaction network.

The settlement system during the Campana period confirmed the transformation to the “new system” and thus its foundation on a very old and local process of sociopolitical dynamics with no indication of disruptions caused by exogenous forces. The settlement system continued its process of vertical integration with a four-tier settlement hierarchy. The vertical integration is strengthened as the vortex formed by the same three well-defined competing centripetal forces from the former Vicús period further grew in size in detriment of the settlements at the bottom of the echelon. The reinforcement of this sociopolitical axis brought a proliferation of small Class 4 settlements in the alluvial plain and thus an increase in agriculture accompanied by control of the economic system (agricultural production) by the three centripetal forces. There is now an already evident sociopolitical integration of both “pockets” yet with certain predominance of the more stable and homogenized (in terms of settlement hierarchy) fourth “pocket” over the third one.

The Vicús and Campana periods therefore constituted the first epoch of the “new system” characterized by an integrated but decentralized sociopolitical system with three competing centripetal forces. On the other and, the settlement system of the Piura period inaugurated the second epoch of the “new system” characterized by an integrated but centralized settlement system with a sole predominant centripetal force. A hint of this transformation -as another example of the changes rooted in local sociopolitical processes- was observed during the former Campana period when the top class settlements started differentiating significantly in size from the bottom class settlements. Yet during the Piura period this differentiation turned even more selective with the presence of just one Class 1 and one Class 2 settlements. That is to say, for the first time the top-ranked settlement outlived its competitors within the settlement system becoming even more vertically integrated with a four-tier settlement hierarchy and just one centripetal force. Finally, as argued in Chapter 7, the characteristics of the settlement system during this period points towards the inception of the late prehispanic *curacazgo* of Pabur.

The characteristics of the settlement systems and sociopolitical organization presented in Chapter 7 and summarized above will now be contrasted in the following section with interpretations on the effects on the spatial and settlement organization in other areas upon the intrusion of the Mochica and Middle Sicán polities.

8.3 Intrusive Mochica and Middle Sicán Polities in other Areas

It has been argued that the Santa Valley is one of the southern Nothern North Coast valleys conquered by the Mochica polity. In this area, Wilson (1987; 1988) suggested that during pre-Mochica times (Early Horizon and early Early Intermediate period) local population was largely located in the upper and middle sectors of the Lower Santa Valley. Although these sectors comprised less than 50 percent of the arable land, populations did not occupy the larger and more fertile lower valley to defend themselves from raids of hostile populations from the Nepeña Valley to the south, perhaps from the competing polities of Recuay and Gallinazo. According to Wilson, settlement location changed with the arrival of the Mochica (Guadalupito period) polity. The Mochica may have imposed a *pax Mochica* defeating and conquering populations in the Nepeña Valley and thus allowing a settlement shift concentrating population in the more fertile, lower valley sector. Wilson therefore argued that for the Santa Valley (i.e., in the southern Northern North Coast) warfare may have been a determinant for settlement location and the development of societal complexity in the North Coast.

Systematic surveys and settlement patterns analyses for the Middle Sicán polity have only been carried out in the Middle Lambayeque Valley immediately south of the Sicán Site, the inferred capital of the Middle Sicán polity in the Middle La Leche Valley. These investigations (Tschauner 2001:305-313) have argued that the Middle Sicán settlement pattern is characterized by a total of 114 settlements occupying an area of 576 ha, and a five-tier settlement size hierarchy. The first three are composed of mound centers (probably of ceremonial and administrative functions). Class 1 is represented by a single site –Vista Florida-, which is surrounded by a triangle of second-rank mound centers on the periphery (Classes 2 and 3). Classes 4 and 5 are smaller sites (1 ha or less) comprised of habitation mounds and habitation sites. Tschauner (2001:305-313) concludes that the Middle Sicán settlement focused generally on occupation of the valley floor and is characterized by a solar settlement system with a centripetal force on the regional center of Vista Florida and integrating the valley entirely. Not all lower rank settlements, however, are agglutinated around major mound centers; smaller habitation mounds and sites seem to be less dependent on elite centers in terms of their location.

8.4 Archaeological Correlates and the Nature of Intrusion or Interaction

To determine if similar settlement organizations and transformations as the above mentioned for the Mochica and Middle Sicán polities in other areas are also present in the study area, a series of archaeological correlates are contrasted vis-à-vis the local settlement systems and sociopolitical organization between the Chapica and Inca periods. This assessment also helps to define the nature of the intrusion or interaction structure; that is, if it was egalitarian and coevolving, or hierarchical and coercive.

As elaborated in Chapter 5, opposite archaeological signatures mirror the opposite interaction structures mentioned above. For instance, in a hierarchical, coercive structure a military presence to control production zones and trade networks as reflected in the presence of fortified or defensive sites is expected. On the other hand, the absence of such sites would support an egalitarian and coevolving structure. As argued in Chapter 7, the presence of such sites in the study area is manifest only during the Chimú and Inca periods. No such sites between the Chapica and Piura periods are present in the study area and thus there is no indication of political or territorial control or imposition of a foreign administration and bureaucracy. The interaction between local polities and the Mochica and Sicán polities therefore appears to have been egalitarian and coevolving.

In addition, the fact that major sites (e.g., Class 1 settlements) of possible residential and administrative function do not present access and circulation restrictions to the site (i.e., located at a strategic point in the landscape such as on a hilltop and flanked by *quebradas*) between the Chapica and Piura periods also suggest that the interaction between local polities and the Mochica and Sicán polities was egalitarian and coevolving. Again, sites with such access and circulation restrictions are only present during the Chimú and Inca periods. On the other hand, top-ranked settlements between the Chapica and Piura periods, can be easily reached since they are located on the gentle lower foothills on the western slopes of the massive of Cerro Pilán, or on earthen mounds in open space on the alluvial plain.

A third archaeological correlate indicates that a hierarchical and coercive interaction structure should show evidence of architectonic features with evident signatures of the intrusive polities. Once again, the only cases that fulfill this condition epitomizing the political intrusion of a foreign polity are the hilltop valley-margin centers imposed by the Chimú state during the Chimú period. In fact, this seems not to be the case even for the most Mochica-like or Mochica affiliated sites such as Huaca Nima in the Tamarindo Complex, on the south margin of the Upper Piura River. Kaulicke (1991:416-418) has compared the architecture of Huaca Nima not to the Mochica architectural styles but to those from the Gallinazo polity. Also, there is no presence of marked adobe bricks and the construction is not completely made of massive adobe walls; they are combined with a technique characterized by adobe walls that create void spaces filled with soil and cultural refuse.

As for the Middle Sicán polity, the site (Huaca Mica) that was originally thought as a regional center of the Middle Sicán polity in the Upper Piura Valley was not such. The site is actually a very long and continuous occupation site since the Ñañañique period. The supposedly Middle Sicán construction was built partially on top of a mound characterized by a fossil dune on which earlier occupations (apparently without major architectonic structures) took place. Tests excavations I carried out at the site obtained a radiocarbon sample from a secure context. It is a piece of wooden pole (Feature No.12) sealed by mud; the latter is in turn adjacent to a wall (Wall 3) which in turned contained an architectonic (soil and refuse) fill; this sample was recovered 6.97 m below the Datum

"0" located on top of the mound. The calibrated date obtained (Lab AA66525) for the date 677±71 (calibrated at 2σ with Calib Rev. 5.0.1. [Stuiver and Reimer 1993]) is cal A.D. 1222-1410. That is to say, the adobe construction in the mound dates between the Piura and Chimú periods or, in other words, to the Late Sicán period at the earliest.

Yet it is not only the date which indicates that this is not a Middle Sicán center. Also, the construction technique is not the chamber-and-fill technique (a hallmark of the Middle Sicán polity) as originally thought. It is rather comprised by an alternation of massive adobe walls with perpendicular, much weaker *bahareque* walls containing at either side of them a "hard" (layers of silt or clay and silt lumps) and "soft" (fine sand mixed with domestic and cultural refuse) fill. In other words, very old, local techniques (seen in the Tamarindo Complex since the Chapica and Vicús periods) were combined to erect this mound. It is therefore highly unlikely that Huaca Mica was the regional center of the Middle Sicán polity as speculated before (Shimada 2000:60).

Out of 17,626 pottery fragments recovered both during the systematic surface survey and test excavations, zero fragments bore the imprint of the Sicán deity, the hallmark of Middle Sicán iconography; and less than a handful seem to be very crude imitations (see Appendix C). There is also a lack of other Middle Sicán pottery diagnostics such as the paddled ware with logrographic designs and other utilitarian vessels forms (e.g., necks with double inflecion rims, etc.). It does not mean however, that members of the Northern North Coast Middle Sicán polity did not have some kind of contact with the Upper Piura Valley local polities. Yet the presence of Middle Sicán pottery style and other artwork on the surface of sites or found in archaeological excavations is not that conspicuous. There are of course private and public collections in

Piura that display Middle Sicán art style; unfortunately they lack information about their provenance and the context in which they were found. Also, Middle and especially Late Sicán style pottery vessels have been found in the littoral in the Lower Piura Valley (e.g. Cárdenas Martin, et al. 1991; 1993). Yet it would not be a surprise that, rather than contacts with the Upper Piura Valley, these vessels could be better explained by the old interaction network and perhaps kin relationship that inhabitants from fishing villages along the littoral of both the Far and the Northern North Coast had. Finally, data from the few systematic excavations carried out in the Upper Piura Valley have shown that observed funerary patterns shared similar features (e.g., burial pit shape, body position, location of the funerary goods, etc.) with those of the Late Sicán period from the Batán Grande area rather than with those from the Middle Sicán period (Guffroy, et al. 1989a:239). In sum, although there is the presence of Middle Sicán art style in the Upper Piura Valley and thus possible contact between members of this Northern North Coast polity and local populations, the interaction, as reflected in the settlement and landscape configurations, did not entail the occupation of any regional center by the Middle Sicán polity or any other type of political dominance and territorial control. The most likely interaction was therefore egalitarian or coevolving.

Another archaeological correlate states that a hierarchical and coercive structure of interaction entailed a multi-tier settlement hierarchy and an associated road network. Yet as demonstrated in Chapter 7, the study area is characterized by such settlement hierarchy since its first periods of occupation. Moreover, also since the inception of the human occupation in the study area the settlements were associated and located along the main road of the pediment playing a key role in the development of the settlement systems. In other words, in this case the existence of a multi-tier settlement hierarchy does not imply a coercive interaction. In addition, if a settlement hierarchy should have been imposed by an exogenous force, a different kind of site would be expected; i.e., displaying monumentality and overall architectonic quality, standing out as more impressive than any of the other sites in the study area. Yet, as also shown in Chapter 7, historically the top-ranked settlements in the study area are not monumental at all but rather share architectonic characteristics with all the other settlements in the settlement hierarchy.

Another archaeological correlate that could point towards a hierarchical or coercive structure of interaction states that if control of production zones and trade networks was the main target of intrusive polities, sites must be found in preeminent locations such as at crossroads, valley choke points, controlling major water intakes of irrigation systems and field systems, among others. Yet, as claimed in Chapter 7, these signatures are very obvious only during the Chimú and Inca periods in which such interaction (although differentially hierarchical) took place. Before these two last periods of the "new system", all sites on or near the above mentioned strategic points are the result of a long and local process of settlement growth and transformations. If any interaction therefore took place between the local polity and the foreign Mochica and Sicán polities, it was an egalitarian and coevolving one not involving any political or military imposition whatsoever.

Lastly, if a hierarchical and coercive interaction structure would have taken place, the forced intrusion of the Mochica and Sicán polities must have created clear signatures of spatial reorganization such as that recorded for the Guadalupito (Mochica) phase in the

Santa Valley, and establishing a five-tier settlement hierarchy akin to the Middle Sicán in the Middle Lambayeque Valley. Yet as pointed out in Chapter 7, such intrusion (although an ordered and negotiated one with the local polity) took place only since the Chimú period, and then, in a detrimental way for the local population, during the Inca period.

Finally, another way to assess the nature of the interaction between the local social groups and the Mochica and Sicán polities is to compare interpretations by Hocquenghem (1998) on the development of the agrarian frontier on the south bank of the Upper Piura River with the results of the analyses of the settlement patterns presented in Chapter 7.

Hocquenghem claimed that the first expansion was carried out by the local Vicús lords. She then argued that the arrival of the Mochica polity led to a second and third expansion of cultivated area through control and extension of irrigation and communication systems that were already developed on a smaller scale by the local Vicús lords. The basis for her inference about the second and third expansion is the strategic location (i.e., next to effective irrigation and prime alluvial lands for cultivation) of hypothesized Mochica settlements located on the south bank of the Upper Piura River.

I agree with Hocquenghem in that the first expansion of the agrarian frontier was led by the local populations. Yet as argued in Chapter 7 (see Endnote 7) these local “lords” of the south bank of the river were in fact smaller, dependent satellite populations spawning from the centripetal force of the alluvial plain next to the north bank of the river in the fourth “pocket”. This centripetal force in turn was already blooming since the earliest Ñañañique and Panecillo periods and even perhaps practicing incipient small-scale irrigation agriculture since the La Encantada period.

Furthermore, although there is no doubt that there was some kind of cultural interaction with the Mochica polity (as was the case before and after the Mochica times), I do not believe this interaction entailed the control and extension of irrigation and communication systems. I have argued that the demographic growth during the La Encantada and especially the Chapica periods would be difficult to understand without some kind of small-scale irrigation agriculture developed by the local populations. In this sense it is difficult to grasp the idea of the arrival of a foreign polity that wrested control of water and land resources from already well-established and resourceful local polities. In addition, the main communication systems could not have been controlled by the foreign Mochica polity since on the main route (along the pediment) of the centripetal force of the pediment large and significant settlements were established since the Ñañañique period. Moreover, as for the strategic location of hypothesized Mochica settlements located and controlling land and water on the south bank of the Upper Piura River, it has to be considered that a local important settlement was already established there since the Ñañañique period.

According to Hocquenghem the fourth expansion of cultivated area in the Upper Piura Valley was executed during the Middle Sicán occupation; that the Middle Sicán polity built the Hualcas Canal aided by arsenical bronze implements, achieved large-scale land modifications and a significant expansion of the agricultural frontier. Likewise, the fifth and last expansion of cultivated area in the Upper Piura may have occurred in the Late Sicán period, which was based on the capture of run-off from substantial seasonal rainfall from the pediment. Although Hocquenghem may be right in the critical role played by the arsenical bronze implements, there is no concrete evidence and contextual data on the timing of their appearance in the Upper Piura Valley. That is, it could have been either during the Campana or Piura periods (roughly corresponding to the Middle and Late Sicán periods) or, as I argue, considering the settlement and landscape configurations, during the Chimú period. In fact evidence to back up her claim that these implements appeared before the Chimú period is not offered either in her earlier publication (Hocquenghem 1998) or in a more recent one (Hocquenghem and Vetter Parodi 2005). Finally, Hocquenghem argued no further expansion of cultivated area occurred in the Upper Piura Valley after it was subjected by the Chimú first and then the Inca states.

I think that the agrarian expansion on the south bank of the Upper Piura River developed gradually since the Chapica to the Piura periods as the local population grew. As mentioned above, there is no major center that points towards the unmistakable presence of a foreign Mochica and Sicán polities controlling the sociopolitical and economic organization. This gradual development could have entailed development of very small segmented irrigation projects on the south bank of the river, or just production obtained from cultivation of the *playas* in the meanders or by just rain-fed agriculture, or even a combination of the three of them. A production in such a fashion would have gradually increased and thus supported a significant population in the south bank of the river by the Campana period.

In this sense, I believe the fourth and fifth expansion suggested by Hocquenghem was in fact a quick and mega enterprise (i.e., the construction of the Hualcas Canal and the irrigation of ca. 3000 ha of land reclaimed to the *despoblado*) that did not occur until the Chimú period. As argued in Chapter 7, the largest population density was reached during this period, the first evidence of a valley-wide control of, and landscapes transformations for, the irrigation and agricultural systems via the Chimú valley-margin centers, and the existence of the Cerro Tongo settlement as a *sine qua non* condition for both the functioning of the Hualcas Canal and the expansion of the agricultural frontier in the *despoblado*; all of this, happened only during the Chimú period.

8.5 A Clarification of Some (Environmental) Sort

The arguments and interpretations I have presented in this dissertation are based on the analyses of certain kind of settlement pattern data (i.e., site size, topography, location, etc.) mentioned in the previous chapters. Yet the reader has to be assured that if other kinds of data (e.g., paleoenvironmental) would have been collected and analyzed, the interpretations presented here could have been (can be) refined or even modified and thus alternative interpretations sketched. The focus of my field research, however, did not entail collecting data such as local variation in soil quality and moisture, evaporation, historical precipitation rates, water flow, modern practice of water management and soil erosion, etc.

The fact that the aforementioned environmental data was not collected does not imply, by any means, that I am against the kind of interdisciplinary research that entails the collaboration of the archaeological discipline with the natural and physical sciences. In fact, I believe that any archaeological program working in a single valley for decades and that considers itself as a serious academic enterprise should have, as part of its goals and outcome, a regional paleoenvironmental reconstruction. In this sense and as I have said before, one of the outcomes of this dissertation (the settlement pattern study) is an initial step that could go in this direction. This dissertation's diachronic settlement pattern reconstruction –certainly done with just one NSF Doctoral Dissertation Improvement Grant and eight months in the field as oppose to millions of dollars worth of funding and decades of fieldwork- is thus an initial effort that, with all its strengths and weaknesses, deserves, I believe, a bit of credit. In other words, the lack of environmental data (again, not a focus of my dissertation), should not be a reason to undermine (yet certainly to discuss) the interpretations I have presented in this dissertation.

Paleoenvironmental studies are surely research efforts worth pursuing. Yet they are both, not a simple and easy task to carry out as part of long-term research endeavors, and, applied into archaeological interpretations, their results can be used differently. First, it is difficult for archaeologists finding specialists (e.g., geomorphologists, paleoethnobotanists, hydrologists, etc) that share their long-term, regional interest and commitment. Usually, these specialists (or their students) and depending on the availability of funds by the archaeologists running the projects, spend just a few days or weeks in the field, take samples, perform their analyses, elaborate their reports, coauthor less than a handful (if any) of articles with the archaeologist, and then finish their participation in the project not coming back to the same region ever again. There are other instances in which these different kind of specialists scholarly work on their own projects without any association with archaeological projects. In these cases archaeologists detect and learn about these kinds of investigations and use the results of these studies (with or without coauthoring articles with these specialists) as a significant basis for their archaeological interpretations. We may certainly call this type of interaction an interdisciplinary collegiality, but, a sustained, long-term effort? Yet no matter how incomplete or complete and comprehensive these interdisciplinary collaborations are, there is no reason to undermine (certainly to discuss) the interpretations the archaeologist elaborates on the basis of these studies.

And second, the results of paleoenvironmental studies have be used differently in archaeological interpretations. In general, the divergences revolve around the interpretative power bestowed in these kind of data and thus in their degree of causality to explain cultural changes. Two clear opposing positions are found in this scenario. On the one hand, the archaeologists that give great weight to the impact of environmental phenomena (e.g., floods, droughts, etc) to explain ancient sociopolitical, economic, and demographic (among others) transformations. On the other hand, critics of the aforementioned position (e.g., Erickson 1999) have denounced it as neo-environmental determinism. That is, instead of considering the agency and resilience (and ancient knowledge and tradition) of ancient societies (especially non-state, local communities), the neo-environmental determinists seem to regard ancient societies, upon being bludgeoned by environmental phenomena, as subjugated, motionless entities haplessly and hopelessly witnessing the "collapse" of their entire sociopolitical systems. Personally, and attempting to understand human culture and its complexity as one is trained to do within a four-field discipline such as anthropology, it is hard to concur with positions such as neo-environmental determinisms.

Also, it may be possible that the difference between the two divergent positions mentioned above reside not (or not only) in the different interpretative power the archaeologists give to environmental factors (e.g., floods, droughts, tectonics, etc), but in the differing geographical scope and methodological and field approaches. That is to say, site-oriented archaeologists (i.e., those who prioritize excavations at few archaeological sites in a region and mainly at major centers) may tend to interpret the environmental data more in terms of collapses or dramatic, abrupt transformations in past societies. On the other hand, regional-oriented archaeologists (i.e., those that prioritize first and foremost a regional, diachronic settlement pattern study on the basis of a systematic pedestrian survey of a large region or valley and only then initiating a program of excavations) may tend to interpret the environmental data as part of normal and natural processes from which ancient societies traditionally learned to manage and live with. The archaeology of the Central Andes (compare, for instance, Craig and Shimada 1986; Dillehay and Kolata 2004; Dillehay, et al. 2009; Hastorf and Earle 1985; Moseley 1983a; Moseley and Deeds 1982; Ortloff and Kolata 1993; Seltzer and Hastorf 1990; Shimada, et al. 1991) is not the only venue where dissimilar geographical scope and methodological and field approaches lead to opposite interpretations of the sociopolitical complexities of ancient societies. In fact, Matthews has shown (2003:93-126) that, historically, in the archaeology of Mesopotamia the degree of political dominance of subjugated territories by Mesopotamian states varies depending on where the archaeologists are working: those doing research at the core areas of the states argue for a complete dominance whereas those investigating the peripheries suggest a loose (if present at all) political control.

Finally, when interpreting paleoenvironmental data, especially with terms such as "collapse" "catastrophe" "disaster" etc., we have to keep in mind that such terminology could reflect the attitudes, responses, and rationalizations of modern men and women (as individuals) in industrialized societies and thus these interpretations cannot be necessarily projected to past societies. In fact, this "discourse of catastrophe" could represent the perception that we, modern, mostly urban, individuals, have of environmental factors. We have been and continue to perpetuate this discourse through different media by recording and transmitting (first in written form and now also digitally) both at an increasing frequency over time and with a larger level of visual detail, first in written documents, chronicles, newspapers, magazines, and now even in personal digital diaries, personal or academic blogs, and Facebook and Twitter accounts with updates literally done at the second. Yet, as Thomas (2004a:119-148) argues, individualism and "the individual" and its manifestations (such as the over awareness of natural "catastrophes"), are constructions of modern philosophical humanism and has two aspects: on the one hand, the idea that each individual is unique and discrete, and, on the other hand, that there are certain universal characteristics of individuals shared by humankind across time and space. And precisely one of these ideas wrongfully assumed as universal, characteristic in modern humans, is that nature is an entity out there that must be conquered and civilized by humans. In this scenario, it is not a surprise thus to find a rather confrontational, and dramatic tone in the discourse with words such as "collapse", "disaster", "catastrophe", etc. In addition, there is a concomitant set of semantic counterparts in words such as "abandonment", "forced migrations", "displacement", etc referring to the presumed effects natural forces have in humans and in their relation with and organization and use of, space. This disharmonious relationship reflects the disengagement (some call it disenchantment) between nature and humans perpetuated since modernity and, as argued above, cannot be projected directly to the past. Moreover, especially when investigating, analyzing, and interpreting issues of human settlement and architecture (directly related with environmental events), we have to consider what some scholars argue (e.g., Ingold 2000:172-188; Thomas 2006); that pre-modern humans seem not to have made a hierarchical distinction between the dwelling and the building perspective as modern humans do, putting the latter (as a pre-designed mental template of the world) before the former. This difference in conceptualization (and in relation with land and space) may well explain the very different kind of attitudes and responses (e.g., staying and rebuilding versus migrating) that pre-modern and modern humans have before environmental events.

In sum, paleoenvironmental data certainly constitute valid and worthy lines of evidence. Yet we have to always keep in mind that there can be a considerable difference in the commitment, consistency, and comprehensiveness of these studies when applied to archaeology, and that their results can be used differently in the archaeological interpretative discourse.

As stated in the preamble of this section, the collection and analysis of paleoenvironmental data was not the focus of this dissertation and thus it is not possible to offer alternative interpretations (grounded in empirical data) to those already offered in Chapter 7 and in this chapter. It is certainly possible, however, to assess some of these interpretations in light of other publications that discuss environmental issues in the Central Andes and in particular in the Far and Northern North Coast.

There have been several attempts to interpret prehistoric cultural change in the Andes on the basis of paleoenvironmental data. For instance, seismic activity and tectonic uplift (e.g., Moseley 1983a; Moseley and Deeds 1982) were proposed as a main cause for the entrenchment of rivers, the failure of irrigation systems, and thus the agrarian and sociopolitical collapse in the late prehispanic Peruvian North Coast. Yet later studies by specialists (e.g., Wells 1987:14,464; Wells and Noller 1999:765, 781) have demonstrated that there is no evidence for such tectonic activity in the Peruvian coastline that remained stable at least since the Pliocene epoch and throughout the Quaternary period. River incision is instead explained by nontectonic fluvial processes such as the elongation (westward) of the delta fan and a concomitant decrease in the slope of the river channel (Wells and Noller 1999:781).

With the tectonic activity ruled out as an environmental factor causing or influencing cultural change, there remain two main, broad environmental factors that seem to have evidently occurred during prehispanic times impinging on perhaps the life and culture of ancient societies: short-term environmental events such as the cycles of the ENSO phenomenon, and long-term and large-scale climatic change, as recorded in ice or sediment cores obtained from glaciers and lakes associated with former glaciers or located at high altitudes, beach-ridges, etc. (e.g., Chepstow-Lusty, et al. 2009a, b; Craig and Shimada 1986; DeVries, et al. 1997; Dillehay and Kolata 2004; Macharé and Ortlieb 1993; Nials, et al. 1979a, b; Ortlieb, et al. 1993; Sandweiss, et al. 1996; Seltzer 1993; Seltzer and Hastorf 1990; Shimada, et al. 1991; Steinitz-Kannan, et al. 1993; Thompson 1993; Thompson, et al. 1988; Thompson and Mosley-Thompson 1989; Thompson, et al.

1984; Thompson, et al. 1985; Thompson, et al. 1986; Wells 1987, 1990; Wells and Noller 1999).

Before going any further into this discussion (and especially, before any comparisons with the Upper Piura Valley), there are a couple of points that we always have to bear in mind: 1) as in any other discipline, there are always methodological and interpretative debates and discrepancies among scholars involved in paleoenvironmental reconstructions. In this sense, a recent publication on the paleoclimate of the Cuzco area (Chepstow-Lusty, et al. 2009a) is emblematic and masks, under an assertive title, a very interesting debate. In fact, even more interesting than reading the article itself, is reading the discussion paper (Chepstow-Lusty, et al. 2009b) previous to the published final version in which anonymous reviewers (an archaeologist and a geochemist) challenge some of the assumptions, analysis and results of the authors. The authors in turn reject, in some issues, the observations made by the reviewers while in others accept and agree with the points raised by them. And 2), debates and discrepancies in paleoenvironmental reconstructions remind us that one of the many points of contention is the applicability of paleoenvironmental data obtained in one area to other distant areas. This is especially critical when climate studies are applied to archaeological studies. In this sense, I concur with some scholars (e.g., Seltzer and Hastorf 1990:411) that claim reliable, detailed, and independent (i.e., obtained in the same areas where archaeological materials are being collected) climatic data to only then compare and observe the similarities and variability of paleoclimates and sociopolitical organizations detected in other areas. Debates and discrepancies in paleoenvironmental studies are certainly not an excuse to renounce and to undermine and invalidate such approaches. Quite the contrary, I believe that dissension and not acquiescence is the mother of progress in any scientific discipline.

The cycles of the ENSO phenomenon and the long-term and large-scale climatic change (e.g., drier versus wetter periods) are therefore the main factors that seem to have influenced and affected prehispanic societies of the Far and Northern North Coast. How could these factors have affected the prehispanic societies of the Upper Piura Valley and therefore altered (or support) the interpretations offered in this dissertation? As for the ENSO phenomenon, this could have caused transformations in many different ways although two are perhaps the major ones: effects on the domestic economies of agrarian groups, and consequences on the distribution and location (settlement patterns) of human groups in the landscape.

A long history of ENSO phenomena has been recorded on the Peruvian coast where at least 20 major events occurred during the last 12,000 years with an average of one major ENSO every 600 years (Wells and Noller 1999:782-783). Other minor ENSOs certainly occurred within this period as well as other even larger events, known as "mega-ENSOs" (e.g. "Naymlap Flood", Craig and Shimada 1986), that developed at an even rarer frequency of approximately one every 1000 years (Wells 1990). In this sense, as Wells and Noller (1999:783) point out, not all ENSO are equal and there is a considerable variation in their extent, frequency, and duration. In other words, and although there is a latitudinal gradient in which usually northern areas receive greater precipitation than southern areas (Wells 1990:1134, Figure 2), the ENSO could devastate (e.g., heavy precipitation and massive floods) certain areas of northwest coastal Perú while other areas within the same region could benefit from a wetter rainy season with precipitation rates above normal and without destructive floods. It is therefore evident once again that paleoenvironmental reconstructions should be first done at a local and regional level before extrapolating interpretations into other areas.

As argued above, the ENSO phenomenon is usually treated in the academic literature with a somewhat somber, fatalistic, and catastrophic tone focusing on the destruction its extensive floods may cause. Yet paradoxically (paradoxically at least for modern humans) the ENSO and its consequences is as much a life-giver as a life-taker. In fact, the ENSO and its intermittent floods are the best thing that could have happened to prehispanic agrarian groups in coastal Perú. As Wells and Noller (1999:779-781) contend, life and agricultural activities in the Peruvian coast would not have been possible if stability of the sea level and backfilling of rivers (in which ENSO-induced intermittent floods played a critical role) had not created floodplains of fine-grained sediments in which agriculture started ca. 5,000 years ago.

Moreover, another indication that ENSO cycles were an advantage and not a handicap for agricultural coastal prehispanic societies was the fact that ENSO cycles seem to have played a crucial role in the development of irrigation networks expanding the agricultural frontier beyond modern limits above the floodplain and into the desert pediment in the Northern North Coast. In fact, this irrigation infrastructure started developing by ca. A.D. 500 and continued growing until ca. A.D. 1300 (Moseley 1983a) beginning to contract then after. Several ENSO events occurred during this period of time (Wells and Noller 1999:781) and it has been even argued that ENSO events happened as frequent as once every 20 years between 600 to 700 years B. P. when the irrigation networks were still expanding (Schaaf 1988). Irrigation agriculture and its expansion is thus understood as a cultural and technological response to deal with the excess of water brought about by the different (major or less intense) ENSO cycles (Wells and Noller 1999:782). In sum, coastal social groups and their environment and landscapes were embedded together for hundreds and even thousands of years and as a product of this experience developed a "software" and a "hardware" allowing them to develop one of the main early world civilizations and complex societies. Yet the Central Andean civilization was not a prerogative of the ruling classes. In fact, as some scholars have argued (e.g., Dillehay 2001) when this long-acquired knowledge and infrastructure were certainly challenged by environmental stress (e.g., a mega ENSO event, long periods of drought, etc.), sociopolitical regimes and its rulers and their urban or urban-like centers seem to have been destabilized while the social base, bearer of this ancient and traditional knowledge, proved to be more adaptable and resilient allowing them to continue with their social and biological reproduction. As Erickson (1999:641) claims "the timing of these phenomena [the fall of states and its rulers and urban centers] may relate to actual climatic fluctuations, although that would not be a satisfying or adequate anthropological explanation of prehispanic cultural change in the Andes".

Studies of ENSO events and determination of their chronology are difficult tasks. Different lines of evidence are followed and chronologies are based on different kinds of data (historical, paleoenvironmental, etc.) and thus correlations are incomplete and inconsistent (Macharé and Ortlieb 1993). There is certain agreement that among the various attempts to date the ENSO events the most reliable are the geomorphological observations of, and radiocarbon dates obtained from, stratigraphic columns containing sediments deposited after ENSO induced floods (Wells 1987, 1990; Wells and Noller

1999). Wells (1990:1137, Appendix 1) has thus identified a 3500 year chronology and 18 flood events with radiocarbon dates for nine of them; two of them have known modern time dates, and there is no radiocarbon dates for seven of them. Eleven of these 18 events occurred during prehispanic times with radiocarbon dates for four of them. From the oldest to the most recent, these dates are: 1240 ±55 B.C., A.D. 16 ± 163, A.D. 1330 ± 35, and A.D. 1459 ± 16. Wells concluded that major ENSO events occurred once every 1000 years during the last 7000 years. Yet we have to remember, as Wells (1990:1136) has shown, that it is likely that smaller, more frequent events occurred between the larger ones though records from the former are missing since the higher flood peaks of the latter have obliterated them. In sum, ENSO induced floods were common events that for centuries were incorporated into the historical consciousness and culture of prehispanic societies from the Peruvian Far and Northern North Coast.

What role then might these dated major ENSO events have played in the economy, and sociopolitical organization and transformations interpreted in this dissertation? The oldest dated ENSO event (1240 ± 55 B.C.) occurred before the first human occupation (Ñañañique period, 1100-700 B.C.) in the study area or right before it. The effects (e.g., floods) this event may have caused therefore did not affect any social group. Quite the opposite, sediments carried and deposited by this major event and by other less intense after it (and probably during the inception of human occupation) may have contributed to consolidating a rich and fertile floodplain from which social groups benefited over time.

The second oldest major ENSO event (A.D. 16 ± 163) occurred during (in fact, right in the middle of) the Chapica period (300 B.C.-A.D 300). It is usually argued, as part of the catastrophic discourse, that a major ENSO event may cause the destruction and burial of agricultural land with serious concomitant social consequences. Yet as argued before, we do not know if during prehispanic times it was perceived as such. What was the real magnitude of such loss of farmland, and, more importantly, how long did it take to recover and reclaim that land (a few years? decades? centuries?). Most likely, social responses to environmental factors were particular and varied across time and space. In the case of the study area in the Upper Piura Valley there is no evidence yet to interpret the concrete effects this major ENSO had. As shown in Chapter 7, however, there is evidence to say that this event occurred in the period that witnessed the highest growth of sites of the entire prehispanic sequence, as well as both a considerable increase in the size of Class 1 settlements, and a significant increase in the occupied area with respect to the former Ñañañique, Panecillo, and La Encantada periods. In other words, this major ENSO event (and probably preceding and subsequent minor events) very likely happened during one of the periods of highest population growths in the area. Again, how devastating was this major specific ENSO event? We just do not know. We do know however that no major disruption in the spatial organization seems to have occurred considering that it followed a pattern already visible since the former La Encantada period as explained in Chapter 7. Moreover, this apparent wet period with perhaps an excess of runoff water may have launched the implementation of an inferred incipient and small irrigation system and concomitant sociopolitical dynamics since the La Encantada or Chapica periods as also argued in Chapter 7. In this context we have to consider, as argued by some scholars above, the gravitating factor that the ENSO events seem to have played in the implementation and expansion of irrigation systems.

The second most recent ENSO event (A.D. 1330 ± 35) occurred close to the end of the Piura period (ca. A.D. 1000-A.D. 1375). If climate regimes interpreted for the southern highlands can be extrapolated to the northern highlands, this ENSO event was preceded first, by a wetter period than normal that lasted 280 years between A.D. 760-A.D. 1040, and, then, by an extreme drier period (precipitation 20 percent below the mean) lasting 60 years between A.D. 1250-A.D. 1310 (Thompson, et al. 1985:973, Table 1). Moreover, it has also been argued (e.g., Thompson 1995) that during this wetter time span occurred the South American equivalent to the "Medieval Warm Period" between ca. A.D. 850-A.D. 1100; i.e., an anomalous warming period within an otherwise cooling trend (Thompson 1995; Thompson, et al. 1995). In other words, environmental conditions could have been another factor that together with the social, political, and ideological factors may explain the settlement patterns and sociopolitical organization during the Campana and Piura periods as argued in Chapter 7. That is to say, during the Campana and part of the Piura periods, the sociopolitical transformations observed in the "new system" may in part reflect social and cultural responses to beneficial agricultural conditions (wetter and warmer periods) as noticed in the population growth and in the apparent organization of the agricultural production with the political decision making possibly concentrated, first (Campana period) in larger and then (Piura period), in larger and fewer Class 1 settlements.

By the same token, the 60-year period of drier conditions and thus probably less water discharge during the second half of the Piura period may have required social and political adjustments. These adjustments may have entailed the centralization of the sociopolitical organization and not the integration but the control of the third "pocket" by the forth "pocket" as observed during the second epoch of the "new system". The drier period ended ca. 65 years before the end of the Piura period; also the second most recent ENSO event (A.D. 1330 ± 35) occurred 45 or perhaps even 10 years before the Piura period ended. In other words, by the end of the Piura period and during the Chimú period (ca. A.D. 1375-A.D. 1460), and considering both that between major ENSO events (the most recent one dated A.D. 1459 ± 16) there are other less intense or moderate ones, and that there is not another extreme drier period until A.D. 1720-A.D. 1860 (Thompson, et al. 1985:973, Table 1) and thus at least normal precipitation patterns, considering these factors, it could be argued that by the end of the Piura period and during the Chimú period, environmental conditions were again suitable enough to harness the excess of runoff water via the continuing use of old, small-scale irrigation systems, and the implementation of new, large-scale irrigation networks.

This is probably the scenario the Chimú state found upon its arrival in the Upper Piura Valley, and, as interpreted in Chapter 7, these are very likely the actions the Chimú rulers and administrators took to fulfill their expansive economic and political policies. It is pertinent to recall that some scholars (e.g., Wells 1990; Wells and Noller 1999) have argued that canal contraction and lower flood frequencies in the Northern North Coast (especially between the Chicama and Casma Valleys) started ca. A.D. 1000 and that by the ca. A.D. 1300 major ENSO flood, irrigation canals were abandoned altogether. This has led some scholars (e.g., Pozorski 1987) to suggest that the canal contraction of the Northern North Coast (coeval in part with the South American Medieval Warm Period, and with the 60-year drier conditions) was accompanied by eolian activity that deposited sand and dust in the irrigation canals and therefore their abandonment. The Chimú state would have considered that politically and economically it was more advantageous not to clean, repair, and rebuild its large irrigation network in its hinterland, but to control and build other agricultural and irrigation systems beyond its border and thus its expansion after ca. A.D. 1300. As argued in Chapter 7, the evidence of a Chimú state policy of landscape control in the Upper Piura Valley and in other parts of the Northern North Coast points in this direction.

The most recent dated prehispanic ENSO event (A.D. 1459 ± 16) occurred immediately before or right at the beginning of the Inca period (ca. A.D. 1460-A.D. 1532). This major ENSO event was probably an important environmental phenomenon but not a determinant factor in the economic and sociopolitical transformations observed during the Inca period as pointed out in Chapter 7. That is, archaeological evidence and ethnohistorical records attest to the continuing occupation of the study area through the 72 years of this period and even during the first decades of the Colonial period. In other words, a major ENSO-induced flood and destruction of the agricultural system and abandonment of the study area can be ruled out. In addition, there is no record of a drier period that could have affected the agricultural production and the coolest period of the Holocene cooling trend known as the Little Ice Age (ca. A.D. 1500-A.D. 1880) was only starting (Thompson 1995; Thompson, et al. 1986; Thompson, et al. 1995). It is most likely therefore that the conspicuous demographic and agricultural production decline observed during this period can be explained by the social and political consequences that represented the subjugation of the Upper Piura local polity by the Inca state as well as by the internal feuds the Inca state was having right before the arrival of the Spaniards.

In sum, the ENSO events were surely an important element in the lives, domestic economies, and cosmovisions of agrarian groups in the Upper Piura Valley. Yet they seem to have been more beneficial than pernicious to them and perhaps not a determinant factor in their sociopolitical organization. It is very tempting for archaeologists or other scholars to see as more than a coincidence the synchronization of major environmental factors (e.g., ENSO events, droughts, etc.) with periods of social and cultural change (e.g., Ortloff and Kolata 1993; Shimada 1994; Shimada, et al. 1991; Wells 1990:1137; Wells and Noller 1999:782-784). Yet we have to bear in mind once again that ancient Andean societies, and thus the civilization they developed, were probably engaged and in tune with their environment and therefore had different subsistence strategies that allowed them to continue with their social and biological reproduction despite any major environmental phenomena. In fact, as suggested by other scholars (e.g., Lawton and Wilke 1979) ancient societies living in dry regions, such as the Northern North Coast and Far North Coast, very likely and according to their needs, changed through time or combined, their agricultural systems such as dry farming, runoff farming, water harvesting, floodwater farming, and irrigation farming. In addition, it has also been demonstrated (e.g., Sandor 1987; 1992) that continuing traditional agricultural management practices for long periods of time (1500 years) can help the conservation of soils, a vital component of agricultural systems. In this sense, in regions such as the Upper Piura Valley (or in the Lake Titicaca Basin e.g., Erickson 1992, 1993, 1999; Erickson and Candler 1989), that show a long and continuous prehispanic occupation and an anthropogenic cultural landscape, it is very unlikely that major environmental events would have easily led to forced migrations or abandonment of these regions or to any other type of "collapse".

The other possible major way in which ENSO events could have caused transformations is precisely related to the location and distribution of human groups in the landscape; i.e., settlement patterns. It has often been argued that environmental perturbations (e.g., tectonic uplift, ENSO flash floods, river entrenchment, sand dunes migration, etc.) that some researchers label as Radical Environmental Alteration Cycles or REACs (e.g., Moseley 1983b) have altered the landscape and concomitantly the settlement patterns and therefore could affect interpretations drawn from the latter. In fact, natural (as well as human) factors have been accounted for in the preservation of archaeological sites in the Upper Piura Valley as explained in Chapter 6 (Section 6.5) and thus taken into consideration in the interpretations offer in this dissertation. As argued in the aforementioned section in Chapter 5, the main source of damage in the sites is the erosion caused by the precipitation under normal or abnormal patterns. This kind of damage is obvious since ancient dwellers in these sites are no longer available to maintain or remodel them. The Upper Piura River and, even less, its tributaries, seem not to have significantly altered their direction over time. On the other hand, the Upper Piura River certainly has caused and causes erosion on its banks especially during ENSO induced floods. As explained in Chapter 6, this erosion has led to the destruction or heavy damage to some of the sites (especially the smallest) located adjacent to the river banks.

Fortunately, unlike modern humans, prehispanic dwellers, including those in the Upper Piura Valley, seem to have better known their environment, landscape, and surroundings and thus avoided the destruction of most sites in certain areas. For instance, as Wells and Noller (1999:775) argue, most archaeological sites are found "… on stable geomorphic surfaces: alluvial fans, older dunes, coastal deposits, or the older (> 500 yr B.P.) floodplain" and thus it is evident that prehispanic inhabitants chose to settle "…space outside of the prime agricultural land and beyond the reaches of El Niño flooding". In the Upper Piura Valley, these geomorphic surfaces correspond to the geomorphological units described in Chapter 7 (Section 7.1) such as the non-floodable lower terraces, middle terraces, and alluvial cones of the alluvial plain, as well as the mountainous structure and the aeolian deposits. In the Upper Piura Valley, sites on the alluvial plain are probably closer to agricultural land than in other valleys; yet, as explained before, human settlement in this area takes places on top of natural or artificial earthen mounds to precisely cope with potential occasional floods. In sum, ENSO-induced floods certainly affected prehispanic settlements yet not to a degree entailing abandonment or migration from the affected areas.

The catastrophic discourse with respect to ENSO events and its consequences seems to be shared not just by some archaeologists but by some ethnohistorians as well. Early (sixteenth century) Colonial documents (e.g., Huertas Vallejos 1987) show the consequences of ENSO-related floods (actually, they also show the beneficial effects of the ENSO precipitation for agriculture) for some indigenous inhabitants of the Northern North Coast. Yet the accounts often found in these documents (and in myths and legends) are usually compared to consequences witnessed during modern times, interpreted as a direct reflection of reality and, even worse, uncritically and without any substantial evidence, extrapolated to prehispanic times.

The documents presented by Huertas (e.g., 1987) certainly compile, in the words of indigenous inhabitants or their translators, the destruction and desolation brought about by ENSO flooding. Yet three issues have to be kept in mind while reading these accounts. First, the testimonies were retrieved in A.D. 1580, that is, 48 years after the arrival of the Spaniards and thus after diseases brought by them had taken a heavy toll on the indigenous population. The social bases that maintained and were the core of the prehispanic Northern North Coast polities had been significantly decimated which diminished their capabilities to respond to environmental challenges. Second, the testimonies were gathered in a context of unbalanced social and political power struggle. By this time it was already evident the abuses perpetrated against the indigenous populations at hands of the Spanish *encomenderos*. The indigenous witnesses, via these interviews, were pleading their case before the Spanish Crown asking, for the last tribute given to the *encomenderos*, to be returned to them arguing the losses they suffered after the A.D. 1578 ENSO floods. Finally, even though the interviewees reported the migration of populations as consequences of the floods, it is difficult to tell how significant it was and, more importantly, if (and how many) people came back to their villages. Yet, the interviews, made two years after the ENSO event, took place in the same villages affected by the floods indicating perhaps that a substantial number of their original inhabitants were already living there again.

Extrapolating the possible consequences of ENSO floods that occurred during Colonial times to the prehispanic scenario is thus perhaps not an adequate solution akin to extrapolating to pre-Inca times the sociopolitical organization and cosmovision of the Inca state interpreted solely on the basis of ethnohistoric documents. In this sense, we have to be careful when interpreting the ENSO events as a major determinant factor to explain constant migrations and the formation of ethnic identities and boundaries during prehispanic times (e.g., Huertas Vallejos 1991, 1993). Migrations have certainly occurred since very early in prehistory. Yet overemphasizing constant migrations due to ENSO events among other factors, sometimes could give the impression that ethnic and polities' identities were in a constant state of flux and thus possibly making inviable such social and cultural institutions. For instance, Huertas (1991:490-492) initially claims that in the Piura region these constant migratory alterations during prehispanic times hamper the definition of ethnic and polities' borders. Yet, by the end of the same article, the author (Huertas Vallejos 1991:499) concludes that "the Incas and the Spaniards disassembled the old ethnic canvas…" (*translation is mine*) thus implying that there were indeed discrete ethnic and polity entities during prehispanic times.

As some scholars argue (e.g., Kaulicke 1993a:284) adaptive responses to environmental phenomena such as the ENSO events could lead to two types of consequences observed in the archaeological record. One of them entails the permanence of populations at the same sites and areas since they had the knowledge and capabilities of coping with these events and their outcome. The other type of consequence is the displacement and abandonment of the sites and areas followed by a later reoccupation by the same or different populations. Considering the long and continuous occupation of the study area in the Upper Piura Valley encompassing the entire prehispanic sequence, the first of the aforementioned scenarios seem to be the most plausible explanation. The second scenario is also plausible though the displacement or abandonment of sites to non floodable areas was most likely only for temporal, short (weeks, months, or few years) periods of time until the retraction of the flood waters. This is perhaps a better explanation than the abandonment for longer periods of time and reoccupation by other populations.

Such cultural responses are not that uncommon. In fact, after the 1985-86 massive flood that affected 20,000 people in the Lake Titicaca basin, Erickson (1999:641) witnessed how traditional Quechua and Aymara farm families had reoccupied and rebuilt their homes sites and corrals right after the waters have receded. Within a few years most families had reestablished themselves on the exact location of their previous homes repeating a long and historic practice also recorded in the stratigraphy of the prehispanic settlement mounds located on the Lake Titicaca plain.

The little archaeological evidence available in the Upper Piura Valley seems to support that this kind of practice, the constant occupation, reoccupation, and rebuilding of sites, existed even after environmental phenomena such as periods of heavy precipitation or massive floods. Excavations by the Upper Piura Archaeological Project in the Tamarindo area within the study area has registered (e.g., Kaulicke 1993a) geomorphologic and archaeological evidence that reflect alterations caused by pluvial and alluvial activities observed in three major stratigraphic and chronological subdivisions: before the human occupation was initiated in the area, during the major occupation of the area between the A.D. first and sixth centuries, and post the A.D. sixth century. Features such as organic surfaces, silt laminations, compacted silt layers, etc., have been interpreted as evidence of alterations caused by precipitation (Kaulicke 1993a:291-295).

The second of these chronological subdivisions is the most relevant for this discussion since evidence is copious unlike that available for the two other subdivisions. Two major events are observed in this subdivision both marked by an alternation of pluvial and eolian deposits; one dated ca. A.D. 250 or A.D. 300 and the other by ca. A.D. 550. The most significant issue is the fact that other similar though perhaps more moderate events are observed before the first major event and between the two of them. In addition, the other most significant aspect is the fact that this subdivision (i.e., a period encompassing ca. five centuries) is characterized by a constant building activity, in response to pluvial and alluvial activities, primarily entailing the remodeling of floors and substantial portions of the architecture (Kaulicke 1993a:304-307).

It is difficult to know if these two major events corresponded to major ENSO events or were just the consequence of heavy precipitation episodes. In fact, none of the aforementioned major prehispanic ENSO events dated by Wells (1990) coincide with the two major events detected in the stratigraphy in the Tamarindo area. Yet Kaulicke (1993a:305) believes that this geomorphologic and archaeological evidence suggests that during this period climatic conditions were definitely wetter than during modern times. Wetter conditions during this period could indeed be possible if we consider that this time span corresponds to the end of the Chapica period and the first part of the Vicús period when, as shown in Chapter 7, population was thriving in the study area. In sum, it is thus very likely that displacement and abandonment of their land was not the most favored cultural response of prehispanic inhabitants in the study area when they had to face environmental challenges such as heavy precipitation and flood episodes.

Overall, short-term environmental phenomena such as the oscillatory ENSO events certainly played an important role in the lives of ancient societies. These events are part of dynamic natural processes that affected their landscape causing both detrimental as well as beneficial effects. Yet prehispanic societies (including those in the Upper Piura Valley) probably incorporated such events into their social and cultural practices responding with different strategies rather than hopelessly envisioning such phenomena as “catastrophes” or causes of “collapse”.

The other main, broad environmental factors faced by prehispanic societies were long-term climatic changes (e.g., cooler versus warmer periods, drier versus wetter cycles) of which drier periods above normal patterns (droughts) have been the focus of contention in archaeological interpretations. Also, as mentioned before, discrepancies over the application of paleoenvironmental reconstructions (and concomitant archaeological interpretations) to areas beyond those in which paleoenvironmental data were obtained, are not uncommon.

Data from ice core records obtained from the Quelccaya ice cap and the Huascarán col (e.g., Thompson 1995; Thompson, et al. 1985; Thompson, et al. 1986; Thompson, et al. 1995) have determined that climatic conditions during the Holocene epoch are characterized by warmest conditions between ca. 6400-3200 B.C. followed by a long and persistent cooling trend between ca. 3200 B.C. and A.D. 1800 that intensified and culminated with the period known as the Little Ice Age from ca. A.D. 1500 to A.D. 1800. Finally, an abrupt warming trend has dominated the climatic conditions of the planet during the last two centuries. In addition, there is a short period of slight warming between ca. A.D. 850 and A.D. 1100 known as the Medieval Warm Period. Moreover, the Quelccaya ice core records (Thompson, et al. 1985:973, Table 1) have shown that, precipitation wise, the Holocene has presented some wetter periods (A.D 610-A.D. 650, A.D. 760-A.D. 1040, A.D. 1500-A.D. 1720, and A.D. 1870-A.D. 1984) as well as drier periods (A.D. 540-A.D. 560, A.D. 570-A.D. 610, A.D. 650-A.D. 730, A.D. 1250-A.D. 1310, and A.D. 1720-A.D. 1860).

Yet a recent paleoenvironmental reconstruction (Chepstow-Lusty, et al. 2009a) analyzing different datasets (pollen analysis, sediments, oribatid mite remains, plant macrofossils, charcoal remains, carbon/nitrogen ratios and $\delta^{13}C$ from organic matter), obtained from sediments in the Lake Marcacocha (at 3355 m asl and ca. 200 km northwest from the Quelccaya ice cap) in the Cuzco region (southern Andean highlands), seems not to be in complete agreement with the aforementioned Holocene climatic trend. In fact, this recent paleoenvironmental reconstruction (Chepstow-Lusty, et al. 2009a:381-386) interprets the results of its analyses as the existence of sustained dry conditions since A.D. 800 with limited agriculture first and then, since A.D. 1100, increased warming conditions that allowed an economy based on major agricultural production (including irrigated terracing technology using melt-water), agroforestry, and pastoralism at higher altitudes. These optimal conditions would have permitted a strong economy and surplus used by the Inca of Cuzco to consolidate as the stronger ethnic group and then, by A.D. 1400, to start its imperial expansion outside the Cuzco heartland. Between A.D. 1400 and A.D. 1540 conditions were relatively stable from a climatic point of view, with temperatures remaining warm and continuing low precipitation rates. Agricultural activity, however, decreased since the land, a major caravan route, was mainly used to feed, herd and tend llamas necessary for the trading activities.

As is evident above, increasing warming conditions since A.D. 1100 clearly contradicts the long persistent cooling trend between ca. 3200 B.C. and A.D. 1800 suggested by the Quelccaya ice cap and Huascarán col records. Cooling conditions would not have allowed an above normal availability of melt-water. In addition, sustained dry conditions since A.D. 800 also contradict the above mentioned records that argue for a wetter period between A.D. 760 and A.D. 1040 and then not dry but extreme drier conditions (precipitation 20 percent below the mean) between A.D. 1250 and A.D. 1310. Cooler conditions and extreme low precipitation during this time span thus rebut the scenario of climatic and economic bonanza that, according to Chepstow-Lusty et al., was a major basis for the consolidation and expansion of the Inca empire.

Three different scenarios could possibly explain these dissimilar interpretations and apparent divarications. First, the sampling and methodological discrepancies existing among the specialists (e.g., palinologists, geochemists, glaciologists, etc.) involved in paleoenvironmental reconstructions have resulted in different interpretations. Second, macroregional or even global climatic trends as detected in the Quelccaya ice cap and Huascarán col records may not be completely applicable at the regional and local levels. Finally, environmental phenomena are important yet not determinant factors to explain sociopolitical events (e.g., the Cuzco imperial expansion) of ancient societies.

Other paleoenvironmental reconstructions seem to support the aforementioned third scenario as well as the long persistent cooling trend during part of the Holocene epoch suggested by the Quelccaya ice cap and Huascarán col records though supported by local environmental data. For instance, research by Seltzer and Hastorf (1990) in the northern Mantaro River Valley in the central Andean highlands is based not only on data from the Quelccaya ice core records but, more importantly, on the glacial history of the local Huaytapallana snowcapped mountain, as well as on data obtained, as part of an agricultural study, from settlement pattern analysis, excavations at different sites (including domestic structures), and paleoethnobotanical analyses (e.g., Earle, et al. 1980; Hastorf 1990; Hastorf and Earle 1985; Hastorf, et al. 1989). The researchers determined that the last Huaytapallana Holocene glaciation ended by 12,000 B.P. and the valleys were definitely glacier-free by 8200 B.P. Yet during the late Holocene there were two brief (ca. 200-300 years) glaciation periods; one, before A.D. 680 (poorly dated though), and the other, for which there is a good time control, starting right after A.D. 1290 (Seltzer and Hastorf 1990:402). The data from the Huaytapallana glaciation (glaciers, to be formed in dry environments, need cooler temperatures for excess snow to be accumulated) thus confirmed the drier and cooler conditions after A.D. 1290 as suggested by the Quelccaya ice cap and Huascarán col records.

Glaciation and cooler temperatures after A.D. 1290 thus depressed the climatic conditions by 150 m meaning that less land, considering the limits of crop production, was available for agricultural production; i.e., potatoes and especially maize. Yet as the authors argue (Seltzer and Hastorf 1990:405-411), during the Wanka II period (ca. A.D. 1300-A.D. 1460) populations from the local Sausa polity had a counterintuitive social response to these cooling conditions. This response was reflected in a dramatic shift in settlement patterns. People became organized in fewer and denser sites and, unlike previous periods, completely resettled out of the valley floor and onto higher defended knolls rather than at lower elevations where agricultural production, especially in these harsh cooling conditions, would have been more successful. Notwithstanding the coincidence of the start of the Wanka II period with the beginning of the second late Holocene glaciation, and considering the settlement patterns and social and political turmoil already observed in previous periods, the authors (Seltzer and Hastorf 1990:411) conclude that "… the climatic changes of the 14th century exacerbated an already charged local sociopolitical situation,…". Environmental factors are therefore not a determinant but another variable, among several others, that needs to be considered in cultural change.

As mentioned before, the role played by drier periods above normal patterns (droughts) has been the focus of contention in archaeological interpretations. The most emblematic case in Andean archaeology is found among scholars (e.g., Kolata 1993; Ortloff and Kolata 1993) that argue for the decline of the Tiwanaku state (centered in the Lake Titicaca basin) after the collapse of its agricultural systems, and those scholars (e.g., Erickson 1999) claiming that such systems never collapsed. In fact, Kolata and his colleagues have interpreted, on the basis of different kinds of evidence (e.g., Quelccaya ice cores, sediment cores from Lake Titicaca, archaeological excavations, etc.) that a prolonged and severe drought between A.D. 1000 and A.D. 1400 (partly coinciding with extreme drier conditions detected in the Quelccaya ice cores), caused the decline of the Tiwanaku state because it led to the deterioration and abandonment of its regional-scale agricultural systems. On the other hand, Erickson reads differently the same evidence used by Kolata and his colleagues and, adding historic, ethnographic and applied archaeology data (experimental cultivation in raised fields), argues that such agricultural systems in the Lake Titicaca basin, in spite of environmental stresses such as droughts or massive floods, never collapsed either in the past or in the present. Furthermore, Erickson (1999:641) claims that the archaeological data suggest that farming communities (rural settlements) and intensive agriculture continued expanding during the post-Tiwanaku state periods.

A prolonged and severe drought has also been argued as a major factor of cultural change in the Northern North Coast (e.g., Shimada 1994; Shimada, et al. 1991) as well as in other coastal valleys. Shimada (1994:122) argues that, since all the Central Andes share the same climatic regime (cf. Macharé and Ortlieb 1993:42; Seltzer and Hastorf 1990:399) as the Quelccaya ice cap, phenomena observed in its ice records (e.g., droughts) are also expected in other areas of this region. On the basis of the Quelccaya ice core records (Thompson, et al. 1985) and the location of some archaeological sites (though not on the basis of a detailed settlement pattern analysis), Shimada thus states that a severe 32-year long drought (A.D. 562-A.D. 594), anteceded by two shorter ones (A.D. 524-A.D. 540 and A.D. 506-A.D. 512), coincided with the transition and cultural transformations observed between the Moche IV and Moche V periods in the Middle Lambayeque Valley. After a bibliographic review and considering that the same environmental stress was affecting other areas in the Andes, he also sees similar cultural transformations (i.e., settlement shifts) in other coastal valleys such as the Rimac and Nazca River Valleys.

The major cultural Moche IV and Moche V transformation in the Northern North Coast is characterized by the abandonment of the Huaca del Sol and Huaca de la Luna adobe platform mound complex in the Moche Valley, the resettlement of its enfeebled elite to the Moche V site of Galindo (Moche Valley), and thus the replacement of the Moche V capital from the Moche Valley to the Middle Lambayeque Valley at the site of Pampa Grande, seat of the local Moche V Lambayeque elite and surrounded by its commoners (Shimada 1994:127). This monumental architecture site and its elite, located at the valley neck where the major canal intakes are found, and considering the drought conditions, would have then controlled the distribution of the scarce water available and thus the agricultural production.

There is some evidence however, indicating that the Huaca de la Luna in the Moche Valley continued to be occupied (presumably by the elite) during the Moche V period. In fact, Uceda and Canziani (1993:340-342) have found evidence of heavy precipitation events that led to several large-scale rebuilding episodes in its monumental architecture. According to these scholars, rebuilding episode 3a occurred during Moche IV, and episode 3b and episode 4 (the last one) at the beginning of, and well into, the Moche V period, respectively. Two main conclusions can be drawn from this evidence. First, as these authors posit (Uceda and Canziani 1993:341), the Mochica polity of the Moche Valley during the Moche V period was able to recruit a significant labor force required for corporate projects such as the large-scale remodeling of Huaca de la Luna. This means that its major subsistence base (agricultural production and its infrastructure) was not severely affected by heavy precipitation events being resilient enough to rapidly recover and thus sustain the large-scale remodeling and rebuilding episodes. And second, this evidence suggests that there were several heavy precipitation events (perhaps ENSOs) that occurred during the sixth century drought highlighted by Shimada. In this sense, it is pertinent to remember the remark by Erickson (1999:635) claiming that periods of drought are always followed by periods of heavy precipitation including floods and that due to "…their focus on long-term trends, Kolata and colleagues overlook the evidence for short-term episodes of ‘excess’ precipitation during the presumed ‘chronic drought’ that are clearly recorded in the Quelccaya ice records…”.

In the Upper Piura Valley this sixth century drought occurred during the Vicús period (ca. A.D. 300-A.D. 700). Yet it seems not to have been severe enough as to leave a clear and significant imprint in the landscape reflected in dramatic settlement patterns shifts as those argued by Shimada for the Northern North Coast. In fact, as shown in Chapter 7, the Vicús period, following a local trend, witnessed the consolidation of the first epoch of the “new system” with a blossoming population, the integration of the fourth and third “pockets”, and a decentralized sociopolitical organization. The sixth century droughts, as in other parts in the Central Andes, very likely affected the Upper Piura Valley too. Yet its local populations were probably resourceful enough to cope with these environmental stresses guaranteeing their social and biological reproduction as evident also during later periods.

While reflecting on “droughts” we probably should ask the following question, as Wells and Noller (1999:783-784) do: what is a drought in an already hyperarid environment such as the Peruvian coast, anyway? And we have to always keep in mind, as these scholars do, that a “drought” in the coast is not a drought per se. Commonly, precipitation in the coast is almost non-existent. A “drought” on the coast means lower precipitation rates in the highlands and thus lower river discharges. It is therefore worth asking if all river valleys, during the droughts, had the same lower discharge levels or if social and technological responses to such challenges varied according to the different social groups inhabiting those valleys.

In this sense, it is worth pointing out that Shimada (1994:127-128) acknowledges that it is difficult to discern if the Moche IV-V transformations occurred immediately after, during, or before the 32-year drought but that it should be regarded as a long-term process and thus consider the antecedent two other droughts (17-year long and six-year long respectively). In other words, for Shimada, the 32-year long drought might just have been the nail in the coffin. But, could it be possible to reverse this argument? That is, could it be possible to argue that the 32-year long drought was not as detrimental as one might think precisely because the traditional Far and Northern North Coast societies, knowledgeable enough and in tune with their environment, learned from these and other previous experiences coping with these situations of environmental stress? In this case, social, political, and ideological factors might have been as important as the environmental factors to explain cultural change. If that was the case, it could explain, for instance, the continuing occupation of the Huaca de la Luna during Moche V in the Moche Valley or the absence of dramatic settlement shifts in the Upper Piura Valley.

Finally, the possibility that coastal prehispanic societies might have had different social and technological responses before environmental challenges is suggested by research done on the basis of paleoenvironmental reconstructions and settlement pattern analysis in the Northern North Coast Jequetepeque River Valley (e.g., Dillehay and Kolata 2004; Dillehay, et al. 2009; Eling 1986; 1987). In fact, it has been demonstrated that during the Late Moche, Post-Moche, and Chimú periods (ca. A.D. 700-A.D. 1470), response to transient (e.g., ENSO events) and protracted (e.g., desertification, droughts) environmental challenges varied through time and space. The social and technological answers to these environmental uncertainties included, among others, flexible opportunistic agricultural regimes with numerous small-scale irrigation systems or sequential cultivation terraces, check dams, and reservoirs placed in narrow gullies; development of anticipatory agricultural infrastructure entailing medium-scale (30-40 km long) irrigation canals carrying water to different parts of the valley; the construction of defensive overflow weirs; and crescent-shaped sand breaks made of fieldstone to prevent the formation of salt in residences, agricultural fields, and irrigation canals.

In sum, paleoenvironmental reconstructions are scientific efforts worth pursuing. They can be incorporated and contrasted with other lines of evidence but not as independent determinant factors of cultural change. Yet we always have to keep in mind that they can show some inconsistencies, discrepancies, and their results can be used differently in the archaeological interpretation. Two major environmental factors, short-terms ENSO events, and long-term climatic changes, certainly had an effect on prehispanic societies. Yet the response of these societies to these environmental challenges probably varied across time and space. To better understand how ancient societies and cultures reacted before these phenomena, paleoenvironmental reconstructions should be done first at the valley (local and regional level) together with archaeological data recovered in the same area and incorporated into a detailed diachronic settlement patterns analysis.

8.6 Summary

The settlements systems of the study area all along its history conformed to a primate distribution with a vertical integration, with one or sometimes more than one central place, at times forming part of a larger settlement system, and sometimes even subjected to a differential interaction with a supra regional settlement system. These general characteristics are observed during both the “old system” and the “new system”. Yet there are clear differences between the “old system” and the first epoch of the “new system” on the one hand, and the second epoch of the “new system” on the other. On the former there is an integrated but decentralized settlement system, and on the latter an integrated but centralized settlement system.

Settlement patterns in other areas with presence of the Mochica and Middle Sicán polities show clear imprints of their effects such as drastic relocation of populations and the establishment of a complex five-tier settlement size hierarchy revolving around a sole exceedingly large central place. Although populations of the Upper Piura Valley undoubtedly interacted with foreign populations from the North Coast during the time of the Mochica and Middle Sicán polities, this interaction was more at the level of local elites or even other lower levels of the echelon and characterized by a mutual influence and thus conforming to a egalitarian or coevolving interaction. On the other hand, a hierarchical and coercive interaction structure only occurred during the Chimú and Inca periods when the local polity was co-opted first by the Chimú empire, and then subjugated by the Inca rulers.

Finally, environmental phenomena undoubtedly influenced the lives of the Upper Piura Valley prehispanic societies. These short and long-term events however, were probably one among many other social, political, and ideological components that explained cultural and sociopolitical transformations. Paleoenvironmental reconstructions are certainly important contributions yet they should be performed first at the local and regional level and integrated within detailed settlement pattern analysis before extrapolating their results and conclusions into other, more distant areas.

8.7 Conclusions

As argued in the introduction, this dissertation has been an attempt to focus on an archaeological problem from an interpretive archaeology perspective. Through the writing process I have tried remaining loyal to the defining aspects of this approach integrating in a mutual and permanent interaction its three main components: 1) Processual archaeology via a classic settlement pattern analysis; 2) hermeneutics, interpreting, by means of the dwelling perspective and thus a back and forth reflection between the past and the present, aspects from the past in terms of their possible past meanings, their historical processes, and social actions that ultimately created the reconstructed landscape(s); and 3) critique, by being aware of the dangers that certain academic discourses and national and official policies cause when they objectify "the other" as "peripheries" and "marginal" areas. In this sense, the result offered in this dissertation is not just an interpretation about the past. It is also, hopefully, and within the limits allowed by the evidence, an open field, awaiting to be appropriated, debated, contested, and improved, by academics and none academics alike, local or non local. Finally, the results offered in this dissertation or those obtained from future research could also be the path to the (re)creation of new landscapes by modern local dwellers of the Upper Piura Valley.

At the onset of this dissertation I argued that although there are geographical factors that differentiate the Far North Coast from the Northern North Coast, the former is not an environmentally “marginal” area but perhaps much more resilient than the Northern North Coast. The Piura River Valley in particular has a large and fertile alluvial plain on its upper course that housed a long and continuous human occupation for over 26 centuries.

In spite of this exemplary accomplishment of human survival and persistence, no significant archaeological long-term research endeavors have been ever undertaken. Rather, research in this area has been precluded by external, academic, and even ethical factors: the exploitation of resources by corporations, urban and rural development projects, looting, and, the pervasive illegal commerce of pre-Columbian art. Also, an overemphasis on the study of Mochica style cultural materials has biased the orientation of research in this region. In addition, this emphasis and the phenomenon I referred to as the Mochica Factor has contributed to maintain the idea of the “marginal” or “peripheral” which, as I have argued, is in fact a modern biased construction that has little to do, if anything, with the archaeological past.

It is precisely the emphasis and over reliance on analyses of “high quality” Mochica ceramics (most of the time looted and from unknown provenance) that have created a view of local sociopolitical developments from the perspective of the “dominant” societies in an unbalanced situation disregarding the perspective of the supposedly “weaker, less developed” local societies. It is therefore not uncommon at archaeological conferences on Andean archaeology to hear trigger-happy archaeologists (and their happily triggered students) using the words “conquered” “dominated”, etc.

referring to societies of the Far North Coast and especially the Upper Piura Valley when in fact, as I hope I have demonstrated here, they were pretty autonomous developments (until the arrival of the Chimú and especially the Inca empires) for most of their history.

In this sense, interpretations drawn from iconographic and stylistic analyses of objects on the one hand, and from landscape analyses as I have attempted to do here, on the other, seem like two different versions of the same story. Since the latter is so uncommon and unexplored in Andean archaeology, I chose to apply to this research and to this dissertation two different but complementary paths of interpretation. The first path is an interpretation of the landscape from a dwelling perspective. As the act of fieldwork is in itself an act of dwelling, the goal was to create an analogy of the experience of past individuals through an embodiment process via the movement of my body and mind through the landscape features.

A second path of interpretation was merged with the first one. This second path comprised a classic settlement pattern analysis oriented to clarify the nature of the sociopolitical interaction between local polities of the Upper Piura Valley and the intrusive polities of the Northern North Coast. The second path of interpretation also entailed overlapping the settlement patterns observed onto the spatial structures and topograms defined and interpreted by the dwelling perspective.

As a result, I found that the study area is characterized by a 2600-year long process of dwelling in the landscape. This process was rooted deep in time and responded to hundreds of years of people moving through its surroundings, embedding in them, and creating the sense of places that are critical for the definition of tradition, belonging, territory, and in general, the polity. Through this process and along the years, yet following a long, local process, revolving around the topograms, the landscapes conceptualizations and configurations changed. In this sense, two moments of the settlements and landscapes configurations were defined: the “old system” and the “new system”. For most of its history (through all the “old system” and the first epoch of the “new system”), and acknowledging the mutual cultural influence with other areas, the local landscape and settlement configurations were not disrupted and engaged in an egalitarian or coevolving interaction. Yet during the second epoch of the “new system”, this situation changes drastically when a hierarchical and coercive interaction structure developed during the Chimú and Inca periods.

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APPENDIXES

APPENDIX A

RECORDING FORMS

No. Ficha **No. Página**

Proyecto Arqueológico Chulucanas-Morropón

Registro de Sitios

Registrador(a)____________________ Fecha______________________

No. de Sitio_____________________

No. de Unidad____________________

Foto aérea_______________________ UTM_____________________________

____

Altitud_____________________ No. Rollo__________________________

Dimensiones (l x a)________________ No. Foto__________________________

Area_________________________ No. Dibujo_________________________

Categoría: cuarto/recinto conjuntos montículo simple muro

Montículo con plataformas cementerio otro (especificar)

Restos superficiales:

Cerámica (densidad, #/m^2) 0-1 1-5 5-10 10-20 20-30 >30 (estimar)

Otros artefactos (moluscos,etc), tipo y densidad _________________________________

____

Topografía, superficie y pendiente:

Suelo:

Vegetación (tipo y %):

Condición del sitio (erosión, huaqueo):

Ubicación respecto a otros sitios o elementos:

Arquitectura (tipo de muros, dimensiones, técnicas, formas, materials):

No. Ficha **No. Página**

Croquis indicando (1) arquitectura, hallazgos, y otros elementos, (2) área de dispersión de artefactos alrededor de la arquitectura, (3) posibles basurales y (4) puntos GPS.

No. Ficha **No. Página**

Descripción, otras observaciones e interpretaciones:

No. De bolsas:

No. Ficha **No. Página**

Proyecto Arqueológico Chulucanas-Morropón

Registro de Excavaciones de Prueba

Registrador(a)______________________ Fecha______________________

No. de Sitio_____________________

Unidad_________________________ UTM (esquina NE)__________________

No. Rollo__________________ _____________________

No. Foto___________________ Datum______________________

No.Dibujo___________________

Elementos(No.)____

____

Contextos(No.)____

____

Hallazgos(No.)____

____

Bolsas(No.)____

____

Carbón? (procedencia)_________________ Flotación? (procedencia)________________
profundidad_____________ volumen______________
No. bolsa_______________ No. bolsa_____________

Polen? (procedencia)_____________ #/peso tiestos nd_____________________
volumen____________________
No. bolsa___________________

Observaciones del material:

Observaciones de la arquitectura:

No. Ficha **No. Página**

Capas excavadas:

Capa	Nivel	Profundidad	Color (Munsell)	Descripción (textura, inclusiones, etc)
		NO		
		NE		
		SO		
		SE		
		C		
		NO		
		NE		
		SO		
		SE		
		C		
		NO		
		NE		
		SO		
		SE		
		C		
		NO		
		NE		
		SO		
		SE		
		C		
		NO		
		NE		
		SO		
		SE		
		C		
		NO		
		NE		
		SO		
		SE		
		C		

No. Ficha **No. Página**

Proyecto Arqueológico Chulucanas-Morropón
Registro de Elementos

Registrador(a)______________________ Fecha_________________

Sitio______________________

Unidad____________________

Elemento (No.)______________ No. Rollo______________

Capa________ Nivel________ No. Foto______________

Profundidad________________ No. Dibujo_____________

Tipo de Elemento: muro piso fogón hoyo de poste

Impronta banqueta otro (especificar)

Descripción (matriz, dimensiones, textura, color, contenido, etc):

Otras observaciones generales e interpretación:

No. Ficha **No. Página**

Croquis:

No. Ficha **No. Página**

Proyecto Arqueológico Chulucanas-Morropón
Registro de Hallazgos

Registrador(a)______________________ Fecha________________

Sitio______________________

Unidad____________________

Hallazgo (No.)________________ No. Rollo_____________

Capa________ Nivel__________ No. Foto_____________

Profundidad__________________ No. Dibujo____________

Bolsa No.____________________

Tipo de Hallazgo (especificar):

Descripción (matriz, dimensiones, forma, material, etc):

Otras observaciones generales e interpretación:

No. Ficha **No. Página**

Croquis:

No. Ficha **No. Página**

Proyecto Arqueológico Chulucanas-Morropón
Registro de Contextos

Registrador(a)______________________ Fecha_________________

Sitio______________________

Unidad____________________

Contexto (No.)______________ No. Rollo_____________

Capa_______ Nivel__________ No. Foto______________

Profundidad_________________ No. Dibujo____________

Tipo de Contexto (especificar):

Descripción (matriz, dimensiones, No. elementos componentes, contenido, etc.):

Otras observaciones generales e interpretación:

No. Ficha **No. Página**

Croquis:

No. Página

Proyecto Arqueológico Chulucanas-Morropón

Registro Fotográfico

Rollo#	Foto#	Sitio#	Quién?	Fecha	Descripción

Photo Recording Form

Attribute Analysis Form

SHERD ID				SURFACE TREATMENT							
1	2	3	4	5	6	7	8	9a	9b	10	11a
SITE_NO	BAG_NO	SHERD_NO	SHERD-TYPE	SURFTREAT_INT_BODY	SURFTREAT_EXT_BODY	SURFTREAT_INT_NECK	SURFTREAT_EXT_NECK	COLOR_INT_ABBR	COLOR_INT_MUNS	SLIP_INT	COLOR_EXT_ABBR
U15S6	00554	2	R	S3	S3	\	\	O	\	U	O
U15S6	00554	8	O	S2	S3	\	\	O	\	U	DB
U15S6	00554	9	O	T1	S3	\	\	LB	\	U	LB
U15S6	00554	6	R	S3	F2	\	\	B	\	U	R
U15S6	00554	4	O	S1	F2	\	\	O	\	U	O
U15S6	00554	1	R	S2,S3	S3	\	\	O	\	U	B
U15S6	00558	3	O	F2	F2	\	\	R	\	S	R
U15S6	00558	2	R	S3	S3	\	\	O	\	UF	R
U15S6	00558	4	R	S3	S3	\	\	O	\	S	B
U15S6	00558	7	R	S3	S3	\	\	DO	\	UF	O
U15S6	00558	1	R	S3	S3,S3a	\	\	O	\	UF	B
U15S6	00558	10	X	S2	F2	\	\	\	5YR5/4	U	\
U15S6	00558	8	O	S2	F2	\	\	LB	\	U	R
U15S6	00558	6	O	F1	F1	\	\	R	\	S	LB
U15S6	00558	11	R	F2	F2	\	\	B	\	U	B
U15S6	00558	9	O	S2	S3	\	\	LB	\	U	R
U15S6	00558	5	O	F3	F3	\	\	BK	\	U	LB
U15S6	00470	2	R,V	\	\	\	\	\	\	\	\
U15S6	00470	3	R	F2a	F2a	\	\	DB	\	S	DB

		GENERAL VESSEL MORPHOLOGY										
11b	12	13	14	15	16	17	18	19	20	21	22	23
COLOR_EXT_MUNS	SLIP_EXT	BODY_SHAPE	NECK_SHAPE	BODY_DIA	RIM_BAS_HT	RIM_PROF	RIM_DIA	RIM_DIA_PC	RIM_ANGLE	RIM_THICK_MAX	RIM_THICK_MIN	RIM_THICK
\	U	ROJ	\	\	\	SGE	10	5	40	5.3	4.4	N
\	U	\	\	\	\	\	\	\	\	\	\	\
\	U	\	\	\	\	\	\	\	\	\	\	\
\	UF	UP	\	\	\	SGU	16	3	69	5.3	4.8	ESTW
\	UF	\	\	\	\	\	\	\	\	\	\	\
\	U	UO	\	\	\	SXU	32	3	64	12.9	9.5	N
\	S	\	\	\	\	\	\	\	\	\	\	\
\	UF	ROJ	\	\	\	SGU	13	3	81	4.1	2.8	N
\	UF	\	\	\	\	\	\	\	\	4.9	4	N
\	UF	\	\	\	\	\	\	\	\	9.1	7.1	\
\	UF	ROJ	\	\	\	SGU	24	5	106	10.06	7	BSO
2.5YR4/4	S	\	\	\	\	\	\	\	\	\	\	\
\	S	\	\	\	\	\	\	\	\	\	\	\
\	U	\	\	\	\	\	\	\	\	\	\	\
\	U	UP	\	\	\	\	\	\	\	4.9	3.7	N
\	U	\	\	\	\	\	\	\	\	\	\	\
\	U	\	\	\	\	\	\	\	\	\	\	\
\	\	\	\	\	\	\	\	\	\	\	\	\
\	S	UP	\	\	\	SGU	17	4	82	7.4	7	N

		BASIS						SPOUT(S)				LUG(S)		
24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
LIP_FORM	NECK_HT	BASE_FORM	BASE_WJFORM	BASE_ANGLE	BASE_DIA	BASE_DIA_PC	BASE_THICK	SPOUT_SHAPE	SPOUT_LEN	SPOUT_DIA_MAX	SPOUT_DIA_MIN	LUG_FORM	LUG_DIA	LUG_WID
RM3	\	\	\	\	\	\	\	\	\	\	\	\	\	\
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RM2	\	\	\	\	\	\	\	\	\	\	\	\	\	\
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RM1L	\	\	\	\	\	\	\	\	\	\	\	\	\	\
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QUI2	\	\	\	\	\	\	\	\	\	\	\	\	\	\
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RE2	\	\	\	\	\	\	\	\	\	\	\	\	\	\
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QUE2	\	\	\	\	\	\	\	\	\	\	\	\	\	\

		HANDLE(S)							GENERAL DECORATION			
39	40	41	42	43	44	45	46	47	48	49	50	51
LUG_THICK	LUG_LOCUS	HAND_ORI	HAND_LOCUS	HAND_FORM	HAND_LEN	HAND_HT	HAND_WID	HAND_THICK	DEC_TEC_INT	DES_EL_INT	DEC_TEC_EXT	DES_EL_EXT
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			GROOVES/INCISIONS					PUNCTATION				ZONING
52	53	54	55	56	57	58	59	60	61	62	63	64
DEC_LOCUS	PAINT_TEC	PAINT_COL_MUNS	GR_DEP_WID	GR_SLP_PNT	INC_DEP_WID	CHAN_FORM	INC_SLP_PNT	PUN_FORM_ORI	PUN_TOOL	PUN_DEP	PUN_SLP_PNT	ZON_OUTL
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OE	\	\	\	\	\	\	\	R	N	M,IN	N,R	\
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OE	O	10YR8/2	\	\	\	\	\	\	\	\	\	P
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RE	\	\	\	\	R,VN	U	P,IR	\	\	\	\	\

	PASTE			
65	66	67	68	69
ZON_CONTENT	PASTE_TYPE	VAR_FIR_CORE	CORE_THICK	CORE_THICK_PC
\	B	3	3.8	VT
\	B	3	2.3	VT
\	B	1	\	\
\	B	1	\	\
C	B	1	\	\
\	F	3	3.4	T
\	M	3	2.8	VT
\	L	3	3	VT
\	A	3	3.2	VT
\	A	3	5.7	VT
\	A	3	3	T
\	B	3	2	VT
\	B	3	1.8	VT
\	B	1	\	\
\	B	11	2	VT
\	B	1	\	\
\	V	12(9)	2.5	VT
\	\	\	\	\
\	M	1	\	\

Paste Analysis Form

Paste Type:

Color:	core:	ext. margin	ext. surface
		int. margin	int. surface

Hardness:	**Feel:**	**Fracture:**

Inclusions:					
Frequency:					
Sorting:					
Size:					
Roundness:					
Sphericity:					

APPENDIX B

SUMMARY OF RECORDED SITES

site_id	site_name	site_location(UTM_E)	site_location(UTM_N)	site_length(m)	site_width(m)	site_height(m)	site_orientation	site_area(m^2)	site_area(Ha)	site_category
1	U84S4	600151	9431165	65	36	3	E-W	1545	0.15	SM
2	U84S3	600317	9431282	66	55	2.9	E-W	2202	0.22	SM
3	U84S2	600464	9431315	52	43	1.7	E-W	1607	0.16	SM
4	U84S1	600682	9431378	70	54	1.5	NE-SW	2332	0.23	SM
5	U83S3	601016	9431103	62	30	1.5	NE-SW	1659	0.17	SM
6	U83S4	601130	9431140	50	35	1.5	NE-SW	1039	0.10	SM
7	U83S5	601228	9431157	42	21	2.3	NE-SW	474	0.05	SM
8	U83S6	601247	9431186	31	27	1.3	NE-SW	473	0.05	SM
9	U83S7	601375	9431218	45	40	0.6	NE-SW	758	0.08	SM
10	U83S1	601902	9431610	71	71	3	NE-SW	3224	0.32	PM
11	U83S8	601894	9431790	38	30	1.9	NW-SE	795	0.08	SM
12	U83S2	601727	9431985	44	34	0.8	NE-SW	629	0.06	SM
13	U67S1	601183	9432479	415	100	9	E-W	35435	3.54	DM
14	U68S1	600591	9432293	260	130	1.7	E-W	22947	2.29	EM
15	U68S2	600117	9432247	210	100	2.4	NE-SW	13687	1.37	EM
16	U71S1	597507	9432746	110	0.8	6.4	E-W	11700	1.17	EM
17	U56S1	597070	9433100	150	130	0.5	N-S	12420	1.24	EM
18	U57S1	596964	9433116	100	90	0.5	E-W	6633	0.66	EM
19	U56S2	597481	9433535	90	50	2	E-W	3229	0.32	SM
20	U55S1	598054	9433567	80	70	0.7	E-W	3458	0.35	SM
21	U55S2	598120	9433360	140	70	3	N-S	7475	0.75	EM
22	U55S3	598484	9433373	90	50	4.5	NW-SE	2108	0.21	DM
23	U55S4	598215	9433277	35	20	0.4	NW-SE	399	0.04	SM
24	U55S5	598034	9433149	70	50	1.6	NW-SE	2325	0.23	SM
25	U87S1	597540	9431225	80	50	3.7	NW-SE	2946	0.29	SM
26	U103S1	598380	9430940	170	150	6.2	NE-SW	19092	1.91	PM
27	U103S2	598792	9430571	60	50	1.6	NW-SE	1789	0.18	SM
28	U103S3	598580	9430727	100	50	2.7	NW-SE	3663	0.37	EM
29	U86S1	598643	9431051	80	50	1.4	NE-SW	3376	0.34	SM
30	U69S1	599073	9432988	70	70	3.7	N-S	3415	0.34	SM
31	U70S1	598879	9432521	100	100	1.4	E-W	5362	0.54	EM
32	U70S2	598885	9432238	120	110	2.6	E-W	6073	0.61	EM
33	U70S3	598813	9432106	50	40	1.5	E-W	1360	0.14	SM
34	U70S4	598558	9432182	240	210	22	E-W	33590	3.36	EM
35	U70S5	598249	9432074	60	60	3	NE-SW	2041	0.20	SM
36	U86S2	598307	9431969	40	30	2.7	NE-SW	1041	0.10	SM
37	U86S3	598378	9431969	80	50	3.4	NW-SE	2962	0.30	SM
38	U86S4	598524	9431720	110	40	5.8	NW-SE	4384	0.44	EM
39	U36S1	603307	9434549	260	230	7.5	NW-SE	43161	4.32	EM
40	U37S1	602678	9434140	440	160	5.8	NW-SE	49246	4.92	WFEM
41	U36S2	603157	9434402	150	90	4.9	NE-SW	10590	1.06	EM
42	U38S1	601622	9434200	70	60	1.2	NW-SE	2944	0.29	SM
43	U38S2	601719	9434076	150	110	4	NW-SE	12838	1.28	EM
44	U37S3	602405	9434260	120	70	1.5	E-W	6861	0.69	EM

45	U52S1	601289	9434011	250	100	2.3	E-W	11489	1.15	EM
46	U55S6	598252	9433584	110	60	1.6	NE-SW	4365	0.44	EM
47	U57S2	596816	9433267	60	40	0.3	NW-SE	1700	0.17	SM
48	U57S3	596367	9433173	50	40	1.7	NW-SE	893	0.09	SM
49	U54S1	599769	9433949	60	40	2.8	E-W	1449	0.14	SM
50	U51S1	602726	9433129	80	70	3.3	E-W	3210	0.32	PM
51	U50S1	603609	9433407	40	20	1.6	E-W	550	0.06	SM
52	U65S1	603289	9432902	50	40	1.9	E-W	1165	0.12	SM
53	U65S2	603036	9432948	60	40	1.5	NE-SW	1570	0.16	SM
54	U65S3	603043	9432702	70	50	6.5	NE-SW	2539	0.25	PM
55	U66S1	602867	9432242	90	70	7	E-W	3020	0.30	PM
56	U82S1	602765	9431639	50	40	2.4	NW-SE	903	0.09	SM
57	U82S2	602883	9431723	140	60	5.3	NE-SW	5764	0.58	PM
58	U69S2	599532	9432191	50	40	2.5	E-W	997	0.10	SM
59	U72S1	596231	9432501	80	60	2.4	E-W	2899	0.29	PM
60	U72S2	596749	9432376	140	30	2.4	E-W	1881	0.19	SM
61	U72S4	596184	9432043	80	60	2.2	E-W	3792	0.38	PM
62	U72S3	596229	9432091	90	60	6.3	NW-SE	3977	0.40	PM
63	U72S5	596220	9432193	50	50	0.9	NW-SE	1867	0.19	SM
64	U72S6	596361	9432115	300	300	0.2	E-W	1048	0.10	EM
65	U88S1	596118	9431263	210	120	3.5	E-W	13511	1.35	PM
66	U105S1	596665	9430900	110	70	3	NW-SE	5425	0.54	PM
67	U105S2	596689	9430797	80	60	3.1	N-S	2786	0.28	PM
68	U105S3	596368	9430706	90	50	3.8	NE-SW	3260	0.33	PM
69	U105S4	596369	9430488	100	50	3.4	N-S	3785	0.38	PM
70	U105S5	596693	9430685	100	90	4.1	NE-SW	6891	0.69	PM
71	U105S6	596947	9430494	90	60	5.2	NO-SW	3843	0.38	PM
72	U104S1	597111	9430093	120	70	2.8	E-W	5030	0.50	EM
73	U104S2	597911	9430210	60	40	3.3	NO-SW	1993	0.20	PM
74	U103S4	598598	9430257	70	40	4.7	NW-SE	1612	0.16	PM
75	U103S5	598787	9430170	120	50	4.2	NW-SE	4779	0.48	EM
76	U103S6	598948	9430124	60	50	3.6	NW-SE	2236	0.22	PM
77	U102S1	599144	9430097	60	40	7.7	E-W	1249	0.12	PM
78	U100S1	601099	9430648	40	40	2.9	N-S	1021	0.10	SM
79	U85S1	599803	9431342	80	60	5.1	NE-SW	3038	0.30	SM
80	U85S2	599894	9431284	170	70	3	NE-SW	10273	1.03	EM
81	U101S1	600320	9430755	100	60	2.7	NE-SW	2808	0.28	EM
82	U102S2	599722	943085	200	90	5.4	NW-SE	12047	1.20	EM
83	U102S3	599577	9430939	830	190	4.6	NW-SE	25277	2.53	EM
84	U85S3	599077	9431317	210	110	2.1	NE-SW	13809	1.38	EM
85	U8S1	602221	9437380	140	80	3.3	NE-SW	7333	0.73	EM
86	U8S2	602725	9437391	240	120	7.9	N-S	21373	2.14	WFPM
87	U8S3	602605	9437556	150	60	7.6	NW-SE	4554	0.46	WFPM
88	U9S1	601264	9437623	190	110	0	N-S	14034	1.40	RR
89	U7S1	603310	9437929	70	30	1.3	E-W	1722	0.17	SM
90	U2S1	603483	9438443	130	70	3.1	E-W	6088	0.61	WFSM
91	U14S1	604664	9436161	80	70	4.1	NE-SW	3496	0.35	PM
92	U25S1	603899	9435926	50	40	1.5	NE-SW	924	0.09	SM
93	U15S1	603964	9436162	30	30	0.7	N-S	452	0.05	SM
94	U15S2	603839	9436444	40	20	0.9	NE-SW	517	0.05	SM
95	U15S3	603787	9436556	40	20	1.2	NE-SW	425	0.04	SM

96	U15S4	603728	9436720	60	40	0.6	NE-SW	1371	0.14	SM
97	U15S5	603822	9436824	60	60	3.9	NW-SE	2153	0.22	SM
98	U7S2	603668	9437092	90	60	3	NE-SW	4042	0.40	PM
99	U15S6	603380	9436638	110	30	2.9	NW-SE	2729	0.27	EM
100	U15S7	603353	9436474	70	60	3.9	NE-SW	2268	0.23	PM
101	U15S8	603589	9436589	80	40	0.9	E-W	1460	0.15	SM
102	U15S9	603681	9436606	50	40	4.3	NW-SE	1800	0.18	PM
103	U15S10	603163	9436297	60	50	4	NE-SW	1702	0.17	PM
104	U25S2	603429	9435872	50	40	1.5	NE-SW	1145	0.11	SM
105	U16S1	602706	9436127	160	80	4	NE-SW	9273	0.93	EM
106	U16S2	602105	9436055	100	90	9	E-W	5920	0.59	PM
107	U28S1	600289	9435935	130	100	5.8	E-W	7439	0.74	PM
108	U28S2	600545	9435736	70	50	2.7	NE-SW	2330	0.23	SM
109	U28S3	600586	9435622	140	50	8.6	NE-SW	5664	0.57	EM
110	U28S4	600498	9435539	150	90	5.3	NE-SW	8261	0.83	PM
111	U27S1	601111	9435925	260	80	4.9	E-W	16871	1.69	EM
112	U27S2	601061	9435821	70	50	2.7	NE-SW	2074	0.21	SM
113	U27S3	601155	9435385	60	60	2.7	N-S	1875	0.19	SM
114	U26S1	602255	9435700	90	70	0.5	E-W	3480	0.35	SM
115	U26S2	602519	9435470	60	50	2.6	E-W	1536	0.15	SM
116	U26S3	602216	9435540	50	40	2.1	NW-SE	1050	0.11	SM
117	U26S4	602200	9435607	50	40	0.5	E-W	1332	0.13	SM
118	U26S5	602340	9435923	90	40	0.6	E-W	1867	0.19	SM
119	U26S6	602589	9435918	50	40	2.4	NE-SW	1343	0.13	SM
120	U13S1	605882	9436798	230	170	0	N-S	25204	2.52	WFR
121	U4S1	606023	9437024	170	120	8.8	NE-SW	14032	1.40	WFR
122	U4S2	606143	9437260	200	170	7.7	N-S	16702	1.67	WFR
123	U12S1	606290	9436627	0	0	0	N-S	1250	0.13	WFR
124	U12S2	606458	9436761	270	240	0	NE-SW	22875	2.29	RCR
125	U4S3	606816	9437870	260	220	0	E-W	30189	3.02	RCR
126	U23S1	605047	9435289	80	60	2.9	NW-SE	2949	0.29	SM
127	U23S2	605244	9435269	130	70	6.2	NE-SW	6553	0.66	PM
128	U23S3	605318	9435322	120	70	8.4	NE-SW	5631	0.56	PM
129	U23S4	605258	9435467	270	220	17	E-W	40939	4.09	WFPM
130	U25S3	603457	9435072	280	90	9.9	NE-SW	23941	2.39	WFR
131	U37S2	602798	9434951	300	70	7.9	NE-SW	16328	1.63	WFEM
132	U11S1	607548	9436579	110	80	11	NE-SW	6117	0.61	WFPM
133	U11S2	607732	9436842	290	60	0	NE-SW	12293	1.23	RR
134	U10S1	608353	9436827	30	20	0	NE-SW	303	0.03	RR
135	U10S2	608288	9436788	30	20	0	NE-SW	676	0.07	RR
136	U11S3	607894	9436000	150	120	0	E-W	12259	1.23	WFS
137	U10S3	608604	9436266	30	20	0	N-S	287	0.03	RR
138	U23S5	605644	9435127	30	20	3	E-W	277	0.03	SM
139	U33S1	606447	9434578	180	80	0	NW-SE	10108	1.01	RR
140	U33S2	606260	9434410	70	60	0	NW-SE	2506	0.25	RS
141	U33S3	606239	9434171	170	30	0	NE-SW	4019	0.40	RR
142	U47S1	606120	9433236	20	10	0	N-S	129	0.01	WFR
143	U48S1	605933	9433796	310	40	0	NE-SW	15469	1.55	WFR
144	U48S2	605472	9433514	210	160	0	E-W	19821	1.98	RR
145	U93S1	608007	9430164	40	20	0	N-S	537	0.05	WFR
146	U80S1	604537	9431734	70	60	0	E-W	2695	0.27	RR

147	U81S1	603958	9431869	430	360	0	NE-SW	78827	7.88	WFR
148	U81S2	603715	9431740	100	60	0	E-W	5536	0.55	WFR
149	U81S3	603661	9431697	90	70	2.4	N-S	3172	0.32	SM
150	U81S4	603684	9431243	110	40	0	NW-SE	3118	0.31	RS
151	U81S5	603573	9431569	150	110	0	NW-SE	10228	1.02	WFR
152	U81S6	603506	9431324	240	150	0	NW-SE	22408	2.24	WFR
153	U98S1	603373	9430901	12	5.7	0	N-S	246	0.02	RS
154	U98S2	603247	9430657	140	70	0	NW-SE	6598	0.66	RR
155	U98S3	603185	9430793	50	25	0	NW-SE	1115	0.11	RR
156	U98S4	603340	9430595	20	18	0	NW-SE	364	0.04	RR
157	U81S7	603017	9431022	120	90	0	NW-SE	6161	0.62	RR
158	U99S1	602720	9430460	490	470	0	E-W	150734	15.07	RCS
159	U117S1	601960	9429975	360	130	0	NW-SE	30267	3.03	WFR
160	U117S2	601670	9429233	70	50	0	NE-SW	2491	0.25	RR
161	U117S3	601766	9429349	110	80	0	N-S	5157	0.52	RR
162	U116S1	602106	9429572	40	20	0	E-W	595	0.06	RR
163	U132S1	602014	9428891	60	30	0	N-S	870	0.09	RR
164	U131S1	603156	9428516	100	90	4.6	E-W	5024	0.50	EM
165	U131S2	603539	9428578	60	40	0	NE-SW	2001	0.20	WFS
166	U131S3	603745	9428325	340	110	13	N-S	28670	2.87	WFPM
167	U130S1	604118	9428380	150	90	11	NW-SE	9729	0.97	WFPM
168	U130S2	604872	9428521	240	150	11	NE-SW	24613	2.46	WFEM
169	U130S3	604939	9428641	30	20	3	N-S	547	0.05	SM
170	U129S1	605007	9428662	20	10	0.6	NE-SW	120	0.01	SM
171	U130S4	604952	9428478	250	60	3.4	NE-SW	12209	1.22	WFEM
172	U129S2	605159	9428343	70	40	4.1	NE-SW	2166	0.22	PM
173	U129S3	605419	9428491	110	70	0	N-S	6467	0.65	RS
174	U129S4	605778	9428248	80	60	2.5	E-W	3474	0.35	SM
175	U129S5	605936	9428083	200	90	11	NE-SW	14386	1.44	EM
176	U128S1	606900	9428615	90	70	0	E-W	4018	0.40	WFR
177	U112S1	606751	9429009	30	20	0	NW-SE	437	0.04	WFR
178	U111S1	607251	9429943	20	20	0	NE-SW	504	0.05	RS
179	U127S1	607356	9428886	60	50	4	NW-SE	1519	0.15	SM
180	U143S1	607930	9427453	60	50	3.7	NW-SE	1745	0.17	SM
181	U142S1	608219	9427615	70	70	3.1	NW-SE	3451	0.35	SM
182	U142S2	608332	9427522	50	50	2.7	NW-SE	1661	0.17	SM
183	U110S1	608336	9429271	30	20	0	NE-SW	658	0.07	RS
184	U93S2	608078	9430279	30	30	0	NE-SW	876	0.09	RR
185	U142S3	608881	9427641	140	90	5.7	E-W	7876	0.79	DM
186	U142S4	608826	9427580	60	60	4.2	NW-SE	2246	0.22	SM
187	U142S5	608673	9427587	140	40	4.1	NE-SW	5338	0.53	DM
188	U142S6	608328	9427844	60	50	3.5	E-W	2731	0.27	SM
189	U142S7	608405	9427463	50	40	2.3	NW-SE	1553	0.16	SM
190	U142S8	608593	9427401	60	50	4.6	NW-SE	1868	0.19	SM
191	U141S1	609152	9427108	120	60	3.2	NW-SE	5516	0.55	EM
192	U141S2	609285	9427092	180	70	3.5	NW-SE	11301	1.13	EM
193	U141S3	609894	9427348	90	40	0	N-S	2151	0.22	WFR
194	U141S4	609340	9427400	40	30	1.9	NW-SE	444	0.04	SM
195	U141S5	609327	9427353	30	20	0.1	E-W	344	0.03	SM
196	U158S1	608928	9426577	80	60	6.9	NE-SW	2182	0.22	PM
197	U158S2	608713	9426643	50	30	2	NW-SE	795	0.08	SM

198	U157S1	609051	9426795	380	260	5.2	NE-SW	79948	7.99	EM
199	U125S1	609039	9428474	80	70	3.1	NE-SW	3511	0.35	SM
200	U125S2	609275	9428709	260	170	3.5	NE-SW	37400	3.74	WFEM
201	U125S3	609584	9428218	20	20	0	NW-SE	513	0.05	RS
202	U199S1	608799	9423902	160	20	0	NE-SW	2560	0.26	RH
203	U199S2	608796	9423525	180	90	0	NE-SW	14645	1.46	WFS
204	U158S3	608249	9426514	220	140	5.6	NW-SE	17340	1.73	PM
205	U158S4	608027	9426651	80	50	5.3	NW-SE	2690	0.27	PM
206	U159S1	607071	9426746	90	60	3.4	NW-SE	3409	0.34	SM
207	U194S1	601948	9424798	210	140	11	NW-SE	25175	2.52	PM
208	U194S2	601950	9424924	100	80	6.4	NE-SW	5799	0.58	EM
209	U194S3	601715	9424867	380	140	11	NE-SW	41139	4.11	EM
210	U194S4	601829	9424605	160	80	7.4	NE-SW	10486	1.05	EM
211	U194S5	601311	9424975	250	130	7.8	NE-SW	25719	2.57	EM
212	U159S2	607210	9426995	70	60	2.4	NW-SE	2614	0.26	SM
213	U161S1	605020	9426758	40	30	0.4	NW-SE	636	0.06	SM
214	U161S2	605070	9426603	30	30	0.4	NW-SE	682	0.07	SM
215	U162S1	604997	9426541	40	30	2.4	NW-SE	875	0.09	SM
216	U161S3	605057	9426470	50	40	3.1	NW-SE	1496	0.15	SM
217	U162S2	604947	9426306	60	50	5.7	NW-SE	2309	0.23	SM
218	U162S3	604891	9426399	30	30	2.6	NW-SE	665	0.07	SM
219	U162S4	604784	9426324	30	30	2.2	NE-SW	652	0.07	SM
220	U162S5	604637	9426420	60	50	2.4	NE-SW	2763	0.28	SM
221	U162S6	604916	9426597	60	40	0.1	NW-SE	1501	0.15	SM
222	U162S7	604752	9426626	50	40	3.4	NW-SE	1242	0.12	SM
223	U162S8	604675	9426635	70	60	4.5	NW-SE	3376	0.34	SM
224	U162S9	604366	9426955	80	80	5.3	NW-SE	4896	0.49	SM
225	U162S10	604180	9426803	130	100	10	NW-SE	7902	0.79	PM
226	U130S5	604257	9428040	60	50	6.4	NW-SE	2138	0.21	SM
227	U146S1	604630	9427936	90	90	5.8	N-S	5082	0.51	SM
228	U146S2	604731	9427678	70	60	3.8	NW-SE	2810	0.28	SM
229	U146S3	604972	9427422	90	70	0.9	NW-SE	4303	0.43	SM
230	U146S4	604908	9427038	120	80	6.8	NW-SE	6909	0.69	EM
231	U146S5	604550	9427183	60	50	3.6	NW-SE	1645	0.16	SM
232	U146S6	604678	9427297	90	50	3.2	NE-SW	3576	0.36	SM
233	U147S1	603807	9427660	80	70	7.3	NE-SW	3999	0.40	PM
234	U162S11	604495	9426696	100	50	4.9	NE-SW	2953	0.30	DM
235	U162S12	604425	9426536	40	40	2.9	NW-SE	1316	0.13	SM
236	U163S1	603771	9426939	110	40	5.3	NW-SE	3055	0.31	EM
237	U162S13	604034	9426929	50	40	2.9	NE-SW	1201	0.12	SM
238	U162S14	604303	9426455	70	60	5	NW-SE	2911	0.29	SM
239	U162S15	604506	9426169	70	50	5.1	NW-SE	2656	0.27	SM
240	U163S2	603156	9426549	80	80	2.2	NW-SE	3862	0.39	SM
241	U178S1	603542	9425262	50	40	2.5	NW-SE	1349	0.13	SM
242	U178S2	603381	9425568	30	30	2.3	NE-SW	757	0.08	SM
243	U164S1	602599	9426039	100	80	3.6	NE-SW	5382	0.54	EM
244	U179S1	602716	9425898	50	40	2.6	NW-SE	1617	0.16	SM
245	U179S2	602719	9425823	70	40	3.4	NW-SE	2025	0.20	DM
246	U179S3	602526	9425611	40	40	3.4	NE-SW	1224	0.12	SM
247	U179S4	602773	9425495	40	30	3.2	NW-SE	827	0.08	SM
248	U179S5	602856	9425539	50	40	2.1	NE-SW	1397	0.14	SM

249	U179S6	602922	9425425	50	40	2.7	NE-SW	1083	0.11	SM
250	U179S7	602783	9425384	50	40	3.7	NW-SE	1355	0.14	SM
251	U179S8	602766	9425212	60	50	4.9	NE-SW	2209	0.22	PM
252	U179S9	602932	9425076	50	40	4.9	NW-SE	1730	0.17	PM
253	U179S10	602789	9425004	70	40	2.2	NE-SW	2016	0.20	SM
254	U193S1	602595	9424958	50	30	3.2	NE-SW	950	0.09	SM
255	U193S2	602516	9424224	100	60	3.5	NE-SW	3676	0.37	EM
256	U193S3	602501	9424310	80	30	2.6	NW-SE	2189	0.22	SM
257	U134S1	600473	9428073	260	180	0	NE-SW	31098	3.11	RH
258	U134S2	600910	9428495	230	70	0	NE-SW	17132	1.71	RH
259	U176S1	605215	9425835	70	30	4.6	NE-SW	1973	0.20	SM
260	U176S2	605376	9425702	60	40	2.8	NE-SW	2032	0.20	SM
261	U176S3	605481	9425655	70	40	4.9	NE-SW	2167	0.22	SM
262	U176S4	605679	9425683	60	50	4.3	NW-SE	1773	0.18	SM
263	U176S5	605550	9425395	120	50	4.4	NW-SE	4833	0.48	EM
264	U176S6	605940	9425277	160	120	9	E-W	14916	1.49	PM
265	U176S7	605770	9425219	60	50	3	NE-SW	2053	0.21	SM
266	U175S1	606185	9425307	160	90	5.3	NW-SE	9870	0.99	EM
267	U175S2	606135	9425627	60	40	2.8	NW-SE	1296	0.13	SM
268	U175S3	606388	9425368	60	40	1.8	E-W	1481	0.15	SM
269	U175S4	606230	9425401	130	50	3.2	NW-SE	4855	0.49	EM
270	U176S8	605818	9425610	80	50	2.5	N-S	3167	0.32	SM

Key to Abbreviations of Category of Sites

SM= simple mound
EM= extended mound
PM= platform mound
DM= double mound
WFSM= wall/wall foundation on simple mound
WFEM= wall/wall foundation on extended mound
WFPM= wall/wall foundation on platform mound
WFR= wall/wall foundation on ridgetop
WFS= wall/wall foundation on slope
RR= room(s) on ridgetop
RS= room(s) on slope
RH= room(s) on hilltop
RCR= rooms complex on ridgetop
RCS= rooms complex on slope

APPENDIX C

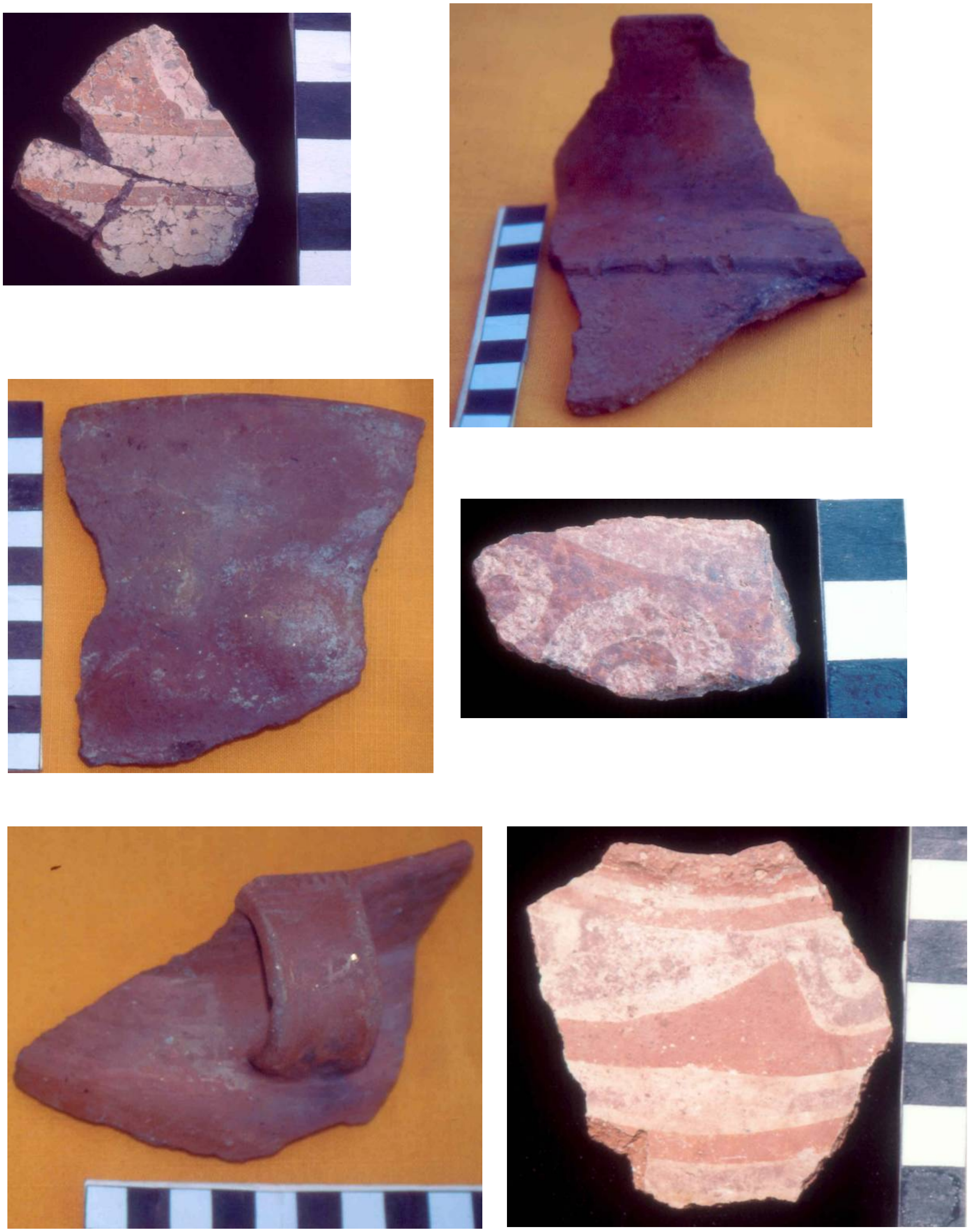
SAMPLE OF CERAMIC DIAGNOSTICS BY TIME PERIOD

Ñañañique

Panecillo

La Encantada

Chapica



Vicús

Campana

Piura

Chimú

Inca

Rare Sicán or “Sicanoid” Style Pottery Fragments

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