REGIONAL SETTLEMENT PATTERNS AND POLITICAL COMPLEXITY IN THE CINTI VALLEY, BOLIVIA

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REGIONAL SETTLEMENT PATTERNS AND POLITICAL COMPLEXITY IN THE CINTI VALLEY, BOLIVIA

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Traditionally, scholars investigating prehispanic Andean polities and sociopolitical organization have worked from cross-cultural models of complex societies underlain by concepts of political hierarchy and centralized control. Recently, however, some archaeologists, drawing from ethnohistorical and ethnographic sources, have argued that late prehispanic polities in various parts of the Andes were organized around principles different from those that underlie traditional constructs of complex societies. This ethnohistoric evidence raises the possibility that models of political organization often used by archaeologists are not adequate to account for the development and dynamics of all prehispanic Andean polities.

Ethnohistoric sources portray structure and dynamics of the "ethnic kingdoms" as rooted in still poorly understood indigenous principles of organization featuring nested, dual socio-territorial units (*ayllus*), decentralized political leadership, and confederation as the basis of hierarchy. To date, there has been little study of what these polities would look like archeologically, or how the supposedly different principles of

organization would manifest themselves in regional settlement structure, wealth and status differentiation, or production and exchange patterns.

Ethnohistoric documentation for the existence of *ayllu* polities in the Cinti region, southern Bolivia, made this area a prime setting for exploration of the archaeological ramifications of traditional and *ayllu*-based models. Full-scale regional survey and excavation generated data on the long-term evolution of sociopolitical structure and economic processes in the Cinti Valley. The investigation was organized around identifying strategies (economic and social) associated with political leadership, and their role in politico-economic centralization and social differentiation.

The research revealed the emergence, by AD 800, of a strongly integrated, regional polity, characterized by a traditional settlement hierarchy, and elite residence at a dominant center. Catchment zone analysis indicated that increasing agricultural production was most closely linked to strategies of political leadership and status differentiation.

The Cinti Valley investigation served to refine our understanding of the *ayllu* polity both as an archaeological model, and as a form of prehispanic political organization. Highlighting the convergence and divergence between emic constructs and empirical regional patterns should contribute to a better understanding of the nature and variability of southern Bolivian prehispanic societies, and how they should be archaeologically approached.

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PREFACE

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CHAPTER 1

POLITICAL AND ECONOMIC POWER STRATEGIES IN THE NATIVE ANDES

Recent years have seen great strides made in investigation of prehispanic Andean polities and sociopolitical organization. With considerable success, archaeologists have based investigation on cross-cultural models of political organization that are underlain by concepts of political hierarchy, centralized control, a political economy, and domination of contiguous territory (Kolata 1993; Wilson 1988). Lately, however, some investigators have proposed constructs of prehispanic organization whose arrangement and operation were very different from the dynamics of centralized political statecraft that underlie many models used by archaeologists. These investigators (Albarracin-Jordan 1996a, 1996b, 1998; Isbell 1997; Silverman 1993) have joined with ethnohistorians and anthropologists (Netherly 1990, 1993; Ramirez 1998; Rostorowski 1983; Platt 1988; Abercrombie 1998) to argue that the late prehispanic polities in various parts of the Andes - - variously known as “señorios”, “ayllu polities”, or “ethnic kingdoms” - - did not have the centralization and elite economic domination that archaeologists often assume are characteristic features of ancient complex societies. As Netherly (1993:14) argues, a model of prehispanic polities featuring a “centralized core” of managerial rulers, “does not work well for the Andes...where the functions of the central core were largely delegated.” Various ethnohistoric sources portray the structure and dynamics of the “ethnic kingdoms” as rooted in still poorly understood indigenous principles of heterarchical organization (Bouysse-Cassagne 1986; del Rio 1995a, b; Izko 1992; Platt 1982, 1988; Rasnake 1988). Common to these reconstructions is a dual system of leadership and nested, socioterritorial levels whose minimal unit of organization was the ayllu. Through confederation, rather than permanent centralization, these populations could form loose supraregional polities such as the ethnohistorically known Qaraqara, Chicha, Killaka, and Charkas kingdoms of the Bolivian altiplano.

It is argued that these polities were integrated in very different ways from centralized polities (Albarracin-Jordan 1996a; Platt 1988), but we do not really know what these polities would look like archaeologically, or how the supposedly different principles of organization would manifest themselves in regional settlement structure, wealth and status differentiation, or production and exchange patterns. Although the ayllu model has been presented as essentially pan-Andean, there is no reason that archaeologists should accept the ethnohistoric reconstructions uncritically. On the other hand, the ethnohistoric evidence raises the possibility that the models of political organization often used by archaeologists are not entirely adequate to account for the development and dynamics of all prehispanic Andean polities.

In the south central Andes, a great deal of attention has been devoted to the study of societies that reached a state level, such as the Tiwanaku and the Inka. Contemporaneous societies organized at a different scale have received less archaeological attention, with the societies of southern and eastern Bolivia treated as the passive recipient of “high culture” influences from the Lake Titicaca Basin (Ponce 1980; Browman 1997). The archaeology of this region has been preoccupied with identifying ceramic styles and their distribution as a way to delimit vague cultural areas, highland colonies, or “interaction spheres” (Arellano 1992; Bennett 1936; Helsley 1993; Ibarra Grasso 1957, 1973; Ibarra Grasso and Querejazu Lewis 1986; Vignale and Ibarra Grasso 1943). By their nature, these studies have not addressed the most basic questions about the societies that produced these ceramic styles: issues of social and political organization, economic patterns, or supra-local organization. Yet the ethnohistoric accounts of these ethnic kingdoms - - as fragmentary, biased, and idealized as they may be - - highlight compelling anthropological reasons why archaeologists should pay attention to the sociopolitical organization of the native populations in this region (Lecoq and Cespedes 1997; Platt 1988; Rasnake 1988; Rivera Casanovas 1998). In this context, I view the Cinti as forum to explore how we can develop archaeological approaches that seem more sensitive to Bolivian “contingent history” and ethnohistoric accounts. The Cinti archaeological record presents an opportunity to use, as Isbell (1997:313) calls for, “rigorous archaeological criteria” to study - - in relational context - - key processes and institutions of prehispanic Andean society.

In place of the conjectural and synthetic picture of the ayllu polity garnered from ethnohistorical fragments, my research aimed at generating an empirically grounded understanding of sociopolitical structure and economic processes as manifested in a single, late prehispanic population. Given the very strong ethnohistoric documentation for the existence of ayllu polities in the central altiplano and southeastern valleys of Bolivia, the Cinti Valley was a logical setting for such investigation.

POWER STRATEGIES IN COMPLEX SOCIETIES

From the large literature dealing with political leadership and social differentiation in complex societies, we can, for analytical purposes, divide the basis for political leadership and social inequality into broad categories: economic strategies and prestige based strategies. Economically based strategies entail control over basic resources and staple production and /or control of the production or traffic of highly valued wealth items (D'Altroy and Earle 1985; Earle 1997). In these systems, political economy and status differences are closely tied to controlling agrarian resources or valuable goods (Earle 1994), or, less directly, controlling the productive labor they require (Price 1984; Webster 1990). Along these lines, strategies linking political power to economic processes can be further broken down into the now familiar two broad strategies of staple finance and wealth finance (D'Altroy and Earle 1985).

Staple Strategies

Staple stratgies involve control over production and/or distribution of subsistence goods. The economic basis of political leadership is closely related to domination of agriculture, and involves mobilization of surplus production. High social status is associated with differential access to staple resources, with elite domination of agricultural and pastoral production. Elite households may differ from non-elite households in diet, may have more household storage capacity, and may be spatially located to control prime agricultural lands. In societies in which staple finance is a dominant strategy, the residential sites of political leadership are likely to be differentially associated with the best agricultural lands. Staple finance is used to support projects such as ritual events, feasting, craft activities, and collective activities (such as warfare or corporate construction projects). Mobilizing surplus for these ends often involves intensification of production through technological improvements such as the building of agricultural facilities (terraces for cultivation, irrigation systems), large-scale storage facilities, or elite control of land use rights (Earle 1997).

Wealth Strategies

Wealth strategies involve dominating the production, flow, and use of specific valuables such as prestige goods (D'Altroy and Earle 1985). Wealth objects are often important bearers of social messages or esoteric iconography, involve a high degree of expense or skill in production, and/or are from exotic distant locales (Earle 1990, 1997; Helms 1994). Control over long-distance trade and the establishment of interregional ties is used by elites to sustain and enhance their position in the social order. Dominance over production of valuable items can also be achieved through limiting access to raw materials or controlling some steps in production. This strategy typically results in significant household differentials in wealth accumulation, and differential participation in exchange and local-craft production (Brumfiel and Earle 1987). Clearcut Andean examples include the Inka and local elite domination of metal and shell items in prehispanic settlements in the Calchaqui Valley, Argentina (Earle 1994), or the household wealth differences and elite domination of long-distance trade documented for the Wanka II period in the Mantaro valley (D'Altroy 1992).

Prestige Based Strategies

Political power and social hierarchy are not necessarily directly linked to the economic processes delineated above. Elites may be prestigious, but not wealthy. Instead, sociopolitical hierarchy may be rooted in elite manipulation of forms of legitimization and social ideologies, rather than control of production, wealth, or trade (McGuire 1983; Gailey and Patterson 1988; Paynter 1989).

Partial prestige systems are visible in “Great Man” or middle-range societies that lack strong economic differentiation (Fried 1967; Sahlins 1963; Service 1968; Webster 1990). Unlike Big Man societies, in prestige systems status enhancement is not dependent on household labor mobilization, generosity, or gift-giving in valued items (Clark and Blake 1994; Helms 1994; Price 1984). Instead, high status and political influence accrue from managerial skills in mobilizing followers, oratorical ability, possession of esoteric knowledge, or having special relationships with the divine. Chiefly societies dominated by prestige based strategies include those Renfrew (1974) has described as group-oriented chiefdoms, and Feinman (1995:268) identifies as “collective” in mode. In these polities - - which would include chiefdoms in Neolithic Malta, Polynesia, and the Alto Magdalena, Colombia - - there is little emphasis on differential access to wealth (staple items or valued objects). In these examples, political leadership and high social status were not accompanied by significant material privilege (Drennan and Quattrin 1995; Feinman 1991, 1995). Prestige based strategies, as Renfrew (1974) observes, are likely to be manifested in egalitarian access patterns, collective ritual, stressing of kinship affiliation, and communal and ritual activities to integrate equivalent social segments (Feinman 1995).

The *Ayllu* Polity

Pre-Inka political organization has been extensively investigated in parts of the central Andean highlands, and the role of wealth and staple finance well-documented in such regions as the Mantaro Valley and the northern Titicaca Basin. There is much less concrete knowledge about political structure in the southern Andean highlands and sierra. Ethnographically based reconstructions of the late prehispanic political formations in this region often depict these polities as having a dualistic political and social structure (Abercrombie 1998; Albarracin-Jordan 1996a, 1998; Platt 1988). The nesting of *ayllus* into larger units was integrated through symbolic oppositions, myth, kinship ties among dual hereditary leaders ("lords"), and ceremonial/ritual activities (Abercrombie 1998; Izko 1992; Platt 1982, 1988). "The political system," Albarracin-Jordan (1996b:205) writes, "was articulated by shared ideological beliefs that provided a 'common language' among the different levels of authority. Reciprocal exchanges, similar to those of *ayni*, *waqui*, *satake*, and *mink'a* granted the 'perceived balance' that maintained social cohesion." Although the nested polities could consist, when viewed maximally, of tens of thousands of subjects, the confederations lacked the centralization (in settlement or economic processes) or settlement hierarchy characteristic of the centralized complex polity.

Ceremonies essential to social and political integration were carried out at the *marka*: the capital site at which different *ayllus* and larger segments interacted (Albarracin-Jordan 1996a, 1996b, 1998; Parssinen 1992). Albarracin-Jordan (1996b: 204), in arguing that the Tiwanaku state (AD 400 - 1000) consisted of "integrated nested hierarchies" rather than a "centralized bureaucracy," describes the *marka* characteristics of the capital site: large-scale labor invested in communal, ceremony-oriented public architecture, rather than in elaborate residential architecture; evidence of residence and activities by a multiplicity of distinct social groups; and the lack of residential patterning indicative of social classes or marked wealth distinctions.

The limited ethnohistorical and ethnographic sources dealing with political leadership in the *ayllu* polities suggest the importance of communal and ceremonial prestige-generating mechanisms that were not linked to economic control (Platt 1988). Some accounts portray leaders as wealthy (Arze and Medinacelli 1991; Espinoza Soriano 1969), and having control over large llama flocks, and parcels of distant lands producing such desirable products such as *coca* and *ají* (Murra 1968; Platt 1988). But it may be that these accounts mistakenly ascribe individual "ownership" to resources held by the group and only managed by the *kuraka* or lord.

While *kurakas* were supported by *ayllu* labor, and while the various levels of leaders could mobilize labor for tribute and communal projects, there are no ethnographic accounts revealing that this support underwrote a lavish elite lifestyle, nor was the mobilization of labor necessarily dependent on the downward flow of valuables as in a prestige good system. One the one hand, Albarracin-Jordan (1996b: 205) notes that, "some of the strategies in the gain of personal prestige may have involved associations with the supernatural and the accumulation of wealth," and were linked to the, "display of wealth in a hierarchy of ceremonies." But other scholars stress that to a more significant degree, high social status and political authority were based on ritual observance, reciprocity, conspicuous generosity, and ceremonial exchange, rather than on surplus extraction or wealth accumulation. Feasting and drinking parties were important for reinforcing social ties (Abercrombie 1993, 1998; Cobo 1890:166-67; Salazar-Soler 1993). Ceremonial redistribution and gift-giving permitted leaders to accumulate prestige that could be converted into all kinds of support.

In the prestige strategy characterizing the *ayllu* model, high value goods such as metal objects were likely to have been used for ceremonial costumes or ritual adornment; it was the ceremonies (not the wealth items) that made it possible to mobilize labor for group projects and for support of the political leadership. In a study of the possessions of early historic native political leaders (in the central Andes), Ramirez (1998:217) comments, “metals (silver and gold) were esteemed...primarily for their malleability and (were) used...for collective purposes.” Items particularly important to political leadership and social differentiation were special drinking vessels, serving vessels, textiles/costumes, and other objects that symbolize authority (Abercrombie 1998; Murra 1975; Rasnake 1988). Ceremonial drinking cups were used by leaders in rituals in honor of gods and ancestors to dispense maize beer, essential for mobilizing labor and reinforcing reciprocal ties with commoners. By making publicly manifest the elites’ commitment to the principles of collective reciprocity and redistribution, the actions served to institutionalize social difference on a moral rather than material plane (Ramirez 1998). “Power and wealth,” Ramirez (1998:217) comments, “were not measured as much by a person’s collection of material objects as by the number of persons who obeyed and respected him.”

In sum, the *ayllu* model of native political order downplays the regional politico-economic centralization inherent to traditional models, and downplays as well the economic basis (wealth or staple finance) for status orders that figures strongly in the political economy of the traditional models.

However, the fragmentary ethnohistoric evidence is insufficient to gauge the actual underpinnings of social or economic differentiation of the “lords” of the southern Bolivian polities, or to assess the degree of centralization in these polities. We know from vague references that the lords commanded labor, but for what activities? Were political and economic activities as “decentralized” in the settlement system as some of the proponents of the *ayllu* model argue? Are *marka*s amenable to interpretation as “central places”? Was political leadership as divorced from economic processes as some of the ethnohistoric sources imply?

To address these questions, I explored the nature of settlements, their interaction with one another, and man/land relationships in the Cinti population for the Formative period (BC 2000- AD 400), the Early Regional Development period (AD 400-800), the Late Regional Development period (AD 800-1430) and the Late Horizon or Inka period (AD 1430-1532).

GOALS OF THE RESEARCH

As a way to learn more about the nature of the *ayllu* polity, organizing my investigation around the power strategies outlined above offered a number of advantages. First, the Andes archaeological literature already offers some excellent comparative studies of native political economy of such polities as the Wari and Inka states, and the political formations of the Lake Titicaca Basin including the Tiwanaku. Undeniably, staple and wealth strategies were important in these polities. Second, the strategies in this analytical framework are sufficiently general to be useful in exploring the foundations of political leadership and inequality in societies that range widely in complexity. The scale of the “ethnic kingdoms” of the southern Andes is not completely understood. Among the largest were the circum-Titicaca Lupaca and Colla, but even these did not approach the Inka, Tiwanaku, or Wari polities in complexity, and the populations further south, including in the Cinti Valley, were still smaller and less complex.

Third, because this framework focuses on identifying specific underlying processes rather than describing patterns, investigation should lead to “unpacking” specific integrative principles and institutions, rather than to descriptive classification into self-reifying “types” (such as individualizing chiefdom, confederation, *ayllu* polity). The three strategies may coexist in one society; they may not always be parallel, and their relative importance within a society might change significantly through time (Blanton et al 1996; D’Altroy 1992; Earle 1997; Hastorf 1993:227).

Finally, this analytical framework emphasizes political and economic processes that are amenable to archaeological investigation. Distinguishing staple and wealth finance has already proven possible and informative in studies elsewhere in the Andes (D’Altroy 1992; D’Altroy and Earle 1985; Earle 1997), and the Cinti results can be fruitfully compared to studies done in the Lake Titicaca Basin, Cochabamba Valley, Mantaro Valley, Peru, and the Valle Calchaqui, Argentina. In contrast, we do not know what the archaeological “footprint” of an *ayllu* polity (as described ethnohistorically) is like. Because, according to ethnohistory, the southern Bolivian valleys, of which the Cinti Valley is part, were home to *ayllu* polities, investigation in the Cinti provides an opportunity to look at the archaeological record associated (according to ethnohistory) with an *ayllu* polity, and to use this archaeological record to refine our models of both the traditional, centralized, and the native *ayllu* polity.

Research Questions and Archaeological Correlates

In focusing on the three strategies, my aim is to address some larger issues that will help to elucidate prehispanic sociopolitical dynamics in the Cinti Valley: the extent of elite wealth accumulation and display; the source of this wealth (staple production or valued craft goods); the extent to which the political economy is "inward looking" or "outward looking;" whether surplus is invested in public works, or kept by elites for personal consumption; and the nature of economic interaction between leaders and followers/subjects.

Among the specific research questions guiding my investigation were:

Is there evidence for regional settlement hierarchy in the Cinti Valley? In other words, can we be confidant that there was a regional-level prehispanic polity in the Valley to begin with?

To answer this question, a long, narrow region delimited by Cinti Valley topography was chosen, and a survey was designed to record the sizes of sites (for rank size analysis) and to note functional differences among sites indicative of particular settlements acting as central places. These functional differences include size, internal segmentation, public features, architectural differences, and elite residential areas, among others.

Was greater agricultural production associated with prehispanic centers (such as El Porvenir, El Patronato, and Huankarani), or with elite households at these and other locations?

Staple strategies involve control over the production and/or distribution of subsistence goods. Thus, the economic basis of political leadership is closely related to domination of agriculture and involves mobilization (and storage) of surplus production. If staple strategies were important in the Cinti valley, I expected to find some of the following indicators: (1) centers, or elite residential areas, spatially associated with the most productive agricultural lands; (2) central domination of surplus agricultural production - - as seen in storage facilities and political centers greater than would be predicted by the carrying capacity of their catchment zone (Steponaitis 1981); and (3) agricultural intensification (agricultural terraces, irrigation channels) differentially associated with the centers. If staple strategies were an important part of leadership and differentiation, we might also expect to see at the intrasite level: (4) marked differences in household storage capacity; similar to the greater storage shown by the Wanka II period Sausa elite households (Hastorf 1993).

Were craft activities and imported goods concentrated at the centers or at elite household residential locations?

Wealth strategies entail dominating the production, flow, and manipulation of valuables ranging from textiles to marine shell. These strategies typically are manifested in differences in wealth accumulation, and in elite domination of trade and local-craft production. If wealth strategies were important in Cinti, I expected to find: (1) greater association of centers with llama corrals (to house caravan and wool-producing camelids); (2) evidence of craft specialization or workshops spatially associated with elite residential areas or public architecture at the centers. In addition to the evidence for copper object and projectile point production, relevant artifacts include tool blanks, manufacturing debris, and items used in spinning and weaving - - bone needles and awls; (3) high status households or elite residential areas marked by higher relative proportions of wealth items (these would include non-local stone tool material, such as sodalite, obsidian, alabaster); and (4) evidence at the site level for restricted access to valuable or imported goods, with centers displaying proportionally more such goods than lower levels in the settlement hierarchy.

Were there significant differences within or among sites in public activities or ritual practice, without parallel wealth differences?

Assessing prestige systems is challenging because status is not dependent on economic processes. In the pure prestige strategy, the only material differences between elites and commoners would be in feasting and ritual items, as political leaders (elites) would not lead a materially better lifestyle than non-elites. Therefore we have to identify a prestige strategy, at least in part, through the absence of particular archaeological patterns. This problem in dealing with prestige strategies archaeologically is a theme I return to in the concluding chapter.

If prestige systems alone were operating in Cinti, I expected to find: (1) little evidence for strong functional differences among sites, with the *markas* distinguished from other sites only by size and greater proportions of elements relating to communal ritual (ceremonial architecture, regional cemeteries) and not by greater economic specialization or concentration of prestige goods; (2) that the *marka* site would have public areas or public architecture but would not display evidence for marked household wealth differences (in house size, construction material, or architectural elaboration, for example); (3) little economic variability among households, with the elite distinguished materially by limited status “badges” (ornaments or costume materials) rather than traditional wealth markers (house size, elaboration, high value domestic goods); (4) differential participation in feasting activities with “elite” areas, or the *marka* site, displaying higher proportions of serving vessels for food preparation and consumption (bowls) or drink preparation and serving (vessels for chicha) than other loci.

My research consisted of a regional survey of an area of 253 km², accompanied by systematic surface collections, and test excavations. This work had as its goal generating information on settlement hierarchy, man-land relationships, and the inter-site and intra-site distribution of public features, craft goods, ceramic styles and trade items. These data are used here to assess the: (1) degree of politico-economic centralization; and (2) nature and degree of social differentiation in the prehispanic Cinti population. These insights, in turn, allowed me to assess the role of the politico-economic strategies currently viewed as essential to understanding native statecraft, and to evaluate critically Cinti organization against both the indigenous *ayllu* construct and the more common constructions of prehispanic political organization.

CHAPTER 2

ENVIRONMENTAL AND ARCHAEOLOGICAL SETTING

The Cinti Valley is located between the North and South Cinti Provinces of the Department of Chuquisaca, Bolivia, an area of steep mountains and dissected valleys (Figure 2.1). The study area lies approximately between 20°27’00’’ and 20°58’33’’ latitude south, and 65°05’28’’ and 65°14’29’’ longitude west. The Cinti Valley is 80 km long, and historically has constituted an important natural corridor linking the *puna* or *altiplano* populations of the west, to valley and lowland populations to the east.

My survey area encompassed two sections of the Cinti Valley (Figure 2.2.), each section with its own particular geographical characteristics: (1) the upper valley or basin; and (2) the lower valley or Cinti canyon (Figure 2.3). The upper valley (3600-2800 masl) consists of a series of small sub-basins or sub-valleys separated from one another by rocky formations or hills. Although these sub-valleys differ from one another in elevation and climate, they contain the preponderance of agricultural land within the region of study.

In general, two environmental zones are present in the upper valley: the *cabecera de valle* and the “upper valley” zone. The *cabecera de valle* lies between 3600 and 3000 masl, including an elongated area (Carusla-Muyuquiri) located in the northwest part of the study area. The upper valley zone (3000-2800 msl) is composed of small sub-valleys such as Oveja Cancha, Cochaca, Huaca Cancha, Huankarani, and

Tacaquira. These sub-valleys are surrounded by sheltering rocky formations that stop cold winds; because of this protection, the growing conditions in the valleys are better than in the *cabecera de valle* and temperatures remain somewhat higher.

The upper valley is connected to the Cinti canyon by a narrow, steep, *cañadón* located between Sarcarca and Viña Vieja (2800-2500 masl). This area lacks good agricultural soils with the exception of small patches in some sectors such as around Sarcarca. Bare cliffs and steep slopes covered by dense xerophytic vegetation are common in this connecting corridor.

The Cinti canyon (2500-2200 msl), or lower valley, comprises a homogeneous stretch of narrow valley, flanked by a red sandstone, wall-like, formations to the west and synclinal formations to the east. This valley runs from north to south and several small passes or *quebradas* and other narrow sub-valleys lead to it. These *quebradas* and sub-valleys have played a major role as routes of communication among populations in the past.

CLIMATE AND NATURAL RESOURCES

The region receives a mean of 476 mm of rainfall annually, but the rainfall is unevenly distributed. The rainy season runs from October to March and the dry season from April to September, although some variation occurs by zones. For instance, in Villa Abecia, the rainy season starts in December and lasts until March, while the dry season goes from April to November (CORDECH 1994). Data taken from six meteorological stations by the SENAMHI between 1975-1984, (Cortés 1994) distributed in the valley shows this variation (Table 2.1). Areas of higher altitude such as Muyuquiri and La

Torre, receive more rain than the Cinti canyon. This geographical difference is important for agricultural practices.

Temperature also varies with altitude (Table 2.2), and there is significant variability in the study area, with an annual mean of 12ºC for the upper valley, and 17ºC for the canyon (Cortés 1994). Maximum temperatures can reach 35 to 41ºC during the summer, and as low as -10ºC during the winter, when cold air moves in from the south (*surazo*) (Cortés 1994).

Several factors of climate adversely affect agricultural activities in the Cinti Valley; the more common are frosts, hail, drought and excessive rain (ZONISIG 2000). Frosts have a direct impact on cultigens, and their inter-annual frequency and severity is shaped by a field's location in the valley and altitude. In higher and open areas, frost is more frequent than in protected areas. Frost is most common during the dry and early wet season. Hail is another significant risk factor for crops during the wet season, although its frequency is relatively low, around eight days annually (ZONISIG 2000). However, one episode of intensive hail can severely damage the crops for the entire year. Droughts and excessive rain are also frequent in the region and can cause significant damage to crops. Flat areas near the rivers are exposed to floods and erosion during the rainy season.

Flora and Fauna of the Cinti Valley

Based on hydrology, temperature, topography, and vegetation (Cortés 1994), the upper valley is classified as a sub-humid-dry zone characterized by one or two months of water surplus and six to seven months of water deficit, with a moderately dry winter.

Vegetation in this zone is mainly xerophytic. The lower valley or canyon is a semiarid zone characterized by six to twelve months of water deficit, marked dry conditions, and low humidity. Winters are dry and summer rains are limited. Xerophytic species dominate here as well.

Vegetation in the Cinti Valley generally consists of xerophytic grasses and shrubs, with plant communities varying according to altitude. In the upper valley are species that also can be found in most of high valleys, while in the canyon vegetation is more adapted to arid conditions. The interandean valleys have seen much human disturbance since prehispanic times, so that the natural vegetation patterns have been strongly affected through time. Deforestation, and as a consequence, desertification and a reduction in biodiversity and soils, is a significant problem in the region (Vetté and Rojas 1998).

According to CORDECH (1994), Vetté and Rojas (1998), Torrico et al. (1994), ZONISIG (2000) and personal observations in the field, the most common species in the study area are: tola (*Baccharis sp.),* quehuiña *(Polilepis sp.),* higuerilla *(Carica quercifolia),* chillca *(Eupatorium sp.),* añahui and kanlli *(Tetraglonchin sp.),* tolilla *(Satureja sp.),* maicha *(Senecio sp.),* anacachi *(Berberis sp.),* churqui *(Acacia sp.),* algarrobo (*Prosopis sp.),* molle *(Schinus sp.),* palqui *(Acacia feddeana),* chañar (*Geoffrea decorticans*), karallanta *(Nicotiana sp.),* bromeliaceous *(Puya, Pitcairnia),* chacatea *(Dolonae sp.), cardonales* with cactii *(Trichocereus sp., Eriocereus tephracanthus, Cereus sp.),* and diverse gramineae *(Festuca, Calamagrostis, Aristida, Stipa).*

Native fauna has also been dramatically affected by human intervention; many species that inhabited these valleys are now rare or vanished, such as the Taruka deer *(Hippocamelus antisensis)*, felines such as puma *(Felis concolor),* Andean mountain cat *(Felis jacobita or Felis geoffroyi)* and Andean parrots. It is likely that populations of guanaco (*Lama Guanicoe)* once inhabited this valley and/or its surrounding mountains. According to the oldest residents I interviewed, guanaco hunting was common until the first part of the twentieth century until these animals virtually vanished from the region. Some people maintain that small groups of guanaco remain in the high mountainous chains of Lique. Other animals in the valley include: viscacha *(Lagidium Viscaccia),* cuy (*Cavia aperea*), chozchoz (*Octodontomys gliroides*), and fox (*Dusycion Andinus*).

GEOLOGY, HYDROLOGY, AND SOILS

Information about Cinti geology can be found in *Mapas Temáticos de Recursos Minerales de Bolivia, Hoja Camargo* (Troëng et al.1996). Within the study area, several geological formations and geological units are present, mainly made up of sedimentary rocks such as sandstones, shales, siltstones, conglomerates, marls, limestones and mudstones. Also, quartz and diverse quartzites are common in the valley (Troëng et al. 1996). The oldest geological formations belong to the Ordovician Period and form the Ordovician Sedimentary Rocks geological unit (Os). This unit consists of a series of alternating beds of sandstones, shales, and siltstones with gray colors. These deposits are present in the upper valley as well as in some sectors of the Cinti canyon. The upper part of the canyon’s wall consists of Eocene to Oligocene sedimentary rocks (EOs) of the Camargo Formation. The canyon also includes conglomerates and calcareous sandstones as well as quartz-rich, calcareous and oolitic sandstones, and calcareous clay stones. These types of rocks are spread over the west part of the canyon because of erosional processes. The Valley contains mineral resources that might have been important for prehispanic populations. In upland areas overlooking the Cinti canyon such as Camblaya and Tumusla are alluvial sources of gold. In the upper valley are deposits of silver, lead, and copper (Troëng et al. 1996).

The upper valley and bottoms of the Cinti canyon display relatively shallow soil deposition in areas of *quebradas* and larger rivers. Deeper soils are present on alluvial terraces. On the slopes located in the eastern part of the study area, are irregular surfaces composed of limestones, sandstones, and marls, commonly subject to erosion and landslides.

Hydrology

The Cinti Valley rivers currently display a high flow of water, especially during the rainy season (Cortés 1994). The Lique Mayu, Tacu Mayu, Churqui Pampa, Ñequeta, Chiñi Mayu, and lesser rivers flow into the Río Chico in the canyon. The Río Chico joins with the Tumusla River near the village of Palca Grande, to form the Río Grande that empties into the Camblaya River, a principal tributary of the Pilcomayo River. The flow of the principal rivers has been calculated (Cortés 1994); for example the Chiñi Mayu River has a caudal of 0.265 m^3/sc and 265 lts/sc, while the Río Chico and Río Grande have a caudal of 0.106 m^3/sc and 105.80 lts/sc and 3.850 m^3/sc and 3,850.00 lts/sc respectively. The presence of these rivers in the Cinti canyon, together with other sources of water, make possible intensive agriculture in this otherwise semiarid environment.

Landscapes and Soils in the Cinti Valley

According to Agreda and collaborators (1994), the Cinti Valley contains at least five different types of landscapes based on criteria such as soil composition, soil depth, pH, retention of humidity, and slope among others. Here, I present a brief description of Agreda's classification of landscapes and soils because they served as a reference for my own classification of agricultural potential.

Slopes (Cuestas), C.6.1

This landscape consists of moderately dissected slopes of sandstones, limestones and cretaceous marls. It is located in the eastern part of the valley in an area of synclinal formations. There are two different soils in this unit: (1) piedmont soils that are moderately deep, clayish, and strongly calcareous with poor drainage. These soils are heavy in calcium carbonates, alkaline, and have low or moderate fertility. Piedmont soils require a lot of investments for any agricultural activity; and (2) Soils on the slopes that are very shallow, located in abrupt, steep slopes with rocky outcrops. These soils are of limited depth, and do not have much agricultural utility.

Alluvial terraces and beaches C.1.14

This landscape is formed by alluvial terraces and beaches located mainly in the canyon's bottom, as well as near the rivers in the upper valley. Soils contain sediments of sandstones, conglomerates, limestones, shales and limonites. Soils are deep, composed of silty clay (*franco arcillo limosos*), sandy clay (*franco arcillo arenosos*) and sand. They are strongly to slightly calcareous, moderate to well drained, and with moderate to low retention of humidity. Their pH is strongly alkaline and slightly saline in the first horizon. These soils are stable, have moderate to low fertility, and are good for agriculture.

Mountains (Serranías) C.1.9

This landscape consists of high mountains located in the western part of the valley, and is composed of conglomerated sandstones and marls. It includes three types of soils: (1) stony alluvial fan deposits, with little soil at all and without any agricultural value; (2) piedmont soils, deep, silty, clayish, well drained with regular capacity for retaining humidity; moderately alkaline pH, moderate to low fertility, and relatively stable. These soils can be used in agriculture but are susceptible to erosion; and (3) mountainous soils in rocky outcrop areas that are very shallow, without any agricultural use.

Mountains (Serranías) C.1.27

This landscape, composed of sandstones, conglomerates, limestones, and marls, is characterized by strong processes of alluvial and aeolian erosion. There are two types of soils: (1) Clays of alluvial terraces and piedmonts that are shallow to moderately deep. These range from sandy to strong clays, are highly to slightly calcareous, moderately well drained, and have alkaline pH, and low to moderate fertility. These soils are good for agriculture given the right plants and regime; and (2) run-offs from mountains and slopes with shallow, alkaline, sandy soils located in rocky outcrops. These areas lack agricultural value.

Mountains (Serranías) C.1.62

Low mountains consisting of quartz-sandstones. This landscape is dominated by two types of soils: (1) piedmont soils of deep, sandy clay (*arcillo arenosos*) and sandy (*franco arenosos*), strongly calcareous with a moderate drainage and capacity of humidity retention. Alkaline pH, low fertility and variable stables. With some protective measures taken as erosion control techniques, these soils can be used for agricultural purposes; and (2) mountain soils that are very shallow. Acute slopes make erosion high in these areas, and soils are not stable, sharply limiting their value for agriculture.

Mountains (Serranías) C.1.45

This landscape consists of mountains with moderate slopes and irregular hilltops. It is composed of shales and limonites, intercalated with sandstones, quartz and siltites.

There are two types of soils here: (1) soils of recent or middle alluvial terraces, moderately deep, silty, calcareous, well drained, with good capacity of humidity retention, strongly alkaline, low fertility, and very stable. These are good for agriculture under protection; and (2) superficial soils of mountains with a neutral pH. These soils are not good for agriculture because of the presence of rocky outcrops, steep slopes, and alluvial erosion.

Land Classification and Agricultural Potential

Establishing a soil classification related to agricultural potential for the Cinti Valley was difficult because currently there are no available agronomy studies for the valley. The macro regional study of soils made by Agreda and his collaborators for the Departamento of Chuquisaca (1994) presented above, is in a scale (1:250,000) that cannot be related in detail to the scale of maps used for my archaeological research (1:50,000) in the Cinti Valley. Because of these problems, I had to establish my own categories of agricultural land (Category 1 - *good*, Category 2 - *moderate*, Category 3 - *bad*) by combining the information contained in Agreda (1994) with my own observations in the field, and with detailed study of the aerial photography to delineate the areas corresponding to each category of land in the valley (Table 2.3).

The Cinti Valley study area covered 253,556,760 m² or 253.5 km² (Figure 2.4). Category 1 land - - rated as the best for agriculture - - are those soils located on alluvial terraces and the floodplain on the bottom of the valley. The thickness, capacity for humidity retention, and stability of these soils make them the most fertile in the valley. A total of 31, 810, 000 m² or 3,181 ha of Category 1 land are found in the study area. The preponderance of this land is located in the lower valley or Cinti canyon, following the Chico and Grande river courses. Category 1 land is also located in the upper valley, near rivers such as Carusla and Muyuquiri among others.

Category 2 land - - rated as moderately good for agriculture - - includes those soils commonly found on the piedmont and medium slopes. In general these soils are moderately deep, less stable because of the slope, with less capacity of humidity retention than the soils of Category 1 land. Category 2 land needs more care and erosion control measures in order to be cultivated than Category 1 land. For this reason, agriculture practiced on Category 2 land is based mainly on agricultural terraces and depends on channel irrigation. In prehispanic times, soils of this category were intensively used for agriculture and different types of terraces were built for this purpose. A total of 25,481,560 m^2 or 2548.1 ha, Category 2 land is found in the study area.

I classified soils without agricultural value as Category 3 land. These are most common on upper slopes, and steep formations. Generally, these soils are shallow, and in steep or rocky areas not useful for agriculture. A total of 196,265,140 m^2, or 19626.5 ha, Category 3 land occur in the study area.

Prehispanic and modern land use

In prehispanic times land was used mainly for agricultural purposes, hunting, and collection of wild resources. Fertile soils in the bottom of the valley, near the rivers, were probably the first areas cultivated in the Formative period. As agricultural settlement increased with time and population growth, areas located in the piedmont and slopes, with soils moderately fertile, were brought under cultivation. Agricultural terraces were built, as well as irrigation channels. In this manner, the valley was deforested through time, the natural landscape of xerophytic forests reduced to xerophytic shrub land.

Modern land use is restricted to agricultural and pastoral activities. Piedmont areas with soils and also with moderate rocky outcrops are well situated for agriculture. In these areas, irrigated modern and prehispanic terraces are found. Upper slopes, because of the presence of grasses and shrubs, are now used as pasturage for goats and sheep, as well as a source of wild resources such as wood for fuel, honey, and the seeds from leguminous trees such as algarrobo (*Prosopis sp.*), palqui (*Acacia feddeana*), chañar (*Geoffroea decorticans)* that have a high caloric and protein content and are used for preparing different meals, beverages and medicines.

Agriculture mainly is practiced today on the bottom of the valleys and in some areas with terraces in the piedmont, where crops can be grown with irrigation systems. Although maize and potatoes remain as important staples, introduced plants such as legumes, fruit trees (peach, plum, apple, lucuma, orange, etc), and grapes have great economic importance for local populations (Arancibia Cardozo 1997). The Cinti canyon is one of the valleys of southern Bolivia that has been dedicated since colonial times to the production of wine and related liquors such as *singani* (Bakewell 1995; Langer 1989). The areas given over to vineyards have undergone significant soil modification, because since colonial times, loamy soils have been transported to them from riverine deposits (Arturo Leytón, personal communication 2000).

Some of the native crops commonly cultivated in the valley are varieties of maize (*Zea Mays)*. Southern Bolivia and especially its valleys are considered an area where prehispanic populations experimented and produced a wide variety of maize (Centro de investigaciones geneticas de Pairumani 1998). For instance, in these valleys exist varieties that differ in hardness of the grains, chemical composition, shape and size, type of starch, color, etc. Ethnohistoric and colonial accounts document the economic and ritual importance of maize cultivation in these valleys (Del Río 1995b; Julien et al. 1997; Sebill 1989; Langer 1989). Bolivian maize belongs to seven racial complexes, 45 races, and hundreds of varieties. Within these complexes, and with samples collected during fieldwork, it has been possible to identify at least four local varieties that correspond to different racial complexes (Centro de investigaciones fitogenéticas de Pairumani 1998):

(1) Chalky (*harinoso*) racial complex from the valley grows between 1500 and 3000 masl and is composed by a broad diversity in terms of shape, size and color of the grains. In Cinti, the Kajbia and Checchi races are the most common; the first is consumed boiled as *mote* while the last is roasted for consumption. Also, both types are used for chicha preparation.

(2) Morocho racial complex, important because of its place in the development of Bolivian maize strains, is widespread in Bolivia between 1000 and 3000 masl. This complex is adapted to arid environmental conditions and grows in areas without irrigation and with low levels of precipitation, such the Cinti Valley. In the research area occur the Morocho and Kellu races, used for *mote* or *pelado*, chicha, and flour.

Other native crops include a variety of potatoes (S*olanum tuberosum* and others), quinoa (*Chenopodium quinoa)*, oca *(Oxalis tuberosa)*, beans *(Phaseolus vulgaris)*, peppers *(Capsicum sp.),* squash *(Cucurbita Maxima)* and mate *(Lagenaria)*.

HISTORY OF RESEARCH IN CINTI VALLEY

The Cinti Valley was neglected by Bolivian archaeology until recently, when some colleagues and I began with a program of systematic investigation in the area (Rivera Casanovas et al. 1993; Rivera and Michel 1995a, b). Prior to this work, archaeological investigation had consisted of small-scale and sporadic study aimed mostly at documenting the chronology and distribution of ceramic styles.

Some of the earliest observations about the prehispanic cultures in the valley were made by Juan Ramirez (1935) a local historian and collector. In a historical synthesis of the valley, he describes the archaeological sites as villages located in hills or rocky formations near the main rivers. He concludes that the settlements were defensive in nature, because the prehispanic population, known as *Chichas* or *Tablas,* was constantly attacked by the *Chiriguanos*. In the remains of these villages he noticed burials that contained ceramic and stone objects.

Alfred Metraux (1933) excavated a cist tomb in the prehispanic settlement of Culpina, 70 km east of Cinti. He recovered vessels and described their decoration and styles. Some of them were in an Inka style known as La Paya-Inka, while others, of a gray color, belonged to a local style with decorative motifs related to styles known from Tarija, northwest Argentina and Chile. He mentioned that these ceramic materials were similar to those found in Cinti sites by a local collaborator. Based on stylistic similarities in pottery, he posited widespread diffusion and exchange among groups in southern Bolivia, northwest Argentina and Chile. This work was for a long time the only reference to the archaeology of southern Chuquisaca, and was used by Bennett (1936) in his attempt to establish a main culture sequence for Bolivia.

Ibarra Grasso seems to have done some research in the Cinti Valley during the 1940’s, although he never published any detailed information. We can deduce that he knew the region from his synthesis of the cultural areas of southern Bolivia, and his description of the dispersion of the Huruquilla ceramic style. In addition, several of his maps include the location of archaeological sites in the Cinti canyon (i.e. Ibarra Grasso 1973; Ibarra Grasso and Querejazu Lewis 1986; Vignale and Ibarra Grasso 1943).

Subsequent work includes that of Posnansky (1945), who published and described ceramic vessels from the Cinti Valley that belong to the Cinti and Huruquilla styles (see Appendix C), the publication of Huruquilla and Inka vessels from Camargo (Ibarra Grasso and Querejazu Lewis 1986), and the recording and description of some rock art sites (Strecker 1987; Trimborn 1967).

One area that was investigated in some detail is San Lucas, 20 km north of the Cinti Valley. Here, Ibarra Grasso (1973:385-389) described an Inka settlement, a number of sites with Huruquilla ceramics, and a Formative site. Later Kuljis and Bustos (1977) carried out an archaeological reconnaissance in the area, and identified settlements with possible ritual circular structures associated with the Huruquilla pottery and incised ceramics with lowland influences. They dated these sites to between AD 1200-1400. More recently, Lecoq and Céspedes (1997a) carried out another reconnaissance in San Lucas, looking for a multiethnic site mentioned in ethnohistorical accounts. They did not find this settlement, but recorded some sites with a variation of the Huruquilla ceramic style that they called Yura Geometric.

In 1993 Sonia Alconini, Marcos Michel and I carried out a systematic survey in an area of 30 km² in the Cinti canyon (Rivera Casanovas et al. 1993). The main purpose of this research was to evaluate the potential of the lower valley for exploring long-term trajectories of settlement development and interregional interaction, as well as to establish a basic chronological sequence for the area. The data gathered during this work allowed us to establish a preliminary sequence of four periods: Archaic, Transition-Formative, Formative-Late Horizon, and Colonial-Republican, and to compare the adaptations of these populations. The long-term continuity in many ceramic preferences prevented us from at this time setting up a more detailed cultural sequence.

In 1994 Marcos Michel and I (Rivera Casanovas and Michel López 1995a, b) continued the research in Cinti with a second field season focused on test pits excavations in two sites: El Porvenir and Palca Chica. The goal was to obtain ceramic materials in context, and date them through 14C samples for refining our initial chronological sequence. The results permitted to recognize clearly the Inka component in the valley and its local manifestations, as well as to date with more confidence the Huruquilla and Thick Rims Incised and Stamped styles. The Chicha style was also identified in the ceramic assemblages collected. Charcoal samples from excavation were dated and the first 14C dates for Cinti were obtained, placing the Huruquilla style materials between AD 900-1300.

During 1998 (Rivera Casanovas 1999) I conducted a third season in the valley, this time mapping El Porvenir, conducting systematic surface collections by sector in order to explore intrasite differences in activities, and excavating new test pits for chronological control. Also, a salvage excavation was conducted in Barrio Obrero, a site where an early urn cemetery was disturbed. During the season, a broad reconnaissance of the valley and nearby areas was carried out in order to identify archaeological sites in a regional scale and set the limits of the study area for this doctoral research.

REGIONAL ARCHAEOLOGICAL SEQUENCE OF SOUTHERN INTERANDEAN VALLEYS

Southern Bolivia prehistory remains poorly understood because little research has been conducted in the region. Archaeologists have preferred to investigate large-scale societies that reached a state level, such as Tiwanaku. In contrast, societies organized at different smaller scales have received less archaeological attention, and in the case of southern and eastern Bolivia areas, these societies have sometimes been dismissively treated as the passive recipient of “high culture” influences from the Lake Titicaca Basin (Ponce 1980; Browman 1997). Until recently, the archaeology of southern Bolivia valleys was limited to identifying ceramic styles and their distribution, as a way to delimit cultural areas, or interaction spheres and highland colonies (Arellano 1992; Bennett 1936; Branissa 1957; Helsley 1993; Ibarra Grasso 1944, 1957, 1960, 1973; Ibarra Grasso and Querejazu Lewis 1986; Metraux 1933; Vignale and Ibarra Grasso 1943). These efforts, framed within a cultural history perspective, were important in creating the foundations for later studies. Specifically, the pioneering works of Ibarra Grasso nowadays constitute the base on which new studies are being developed in southern Bolivia.

Archaeological investigations carried out during the 1990’s began to shed light on southern Bolivian prehispanic societies in terms of cultural chronological sequence, social organization, and economic patterns (Alconini 2002; Angelo 1999; Janusek et al.

1998; Lecoq and Cespedes 1997a, b; Lecoq 1999, 2001; Lima 2000; Michel López et al. 2000; Nielsen 1998, 2001; Rivera Casanovas et al. 1993; Rivera Casanovas 1998, 2002). Drawing on these studies, we can delineate the following cultural sequence for the southern valleys region of Bolivia (mainly Tarija, Potosí and Chuquisaca) that includes the Cinti Valley (Figure 2.5; see also Figures 2.1 and 2.6 for location).

Preceramic Period (ca. 6000 - 2000 BC)

During this period, the southern valleys of Bolivia were occupied by hunter-gatherer groups exploiting a variety of resources located in different ecological zones (Arellano 1992; Michel et al. 2000; Rivera et al. 1993). Studies of these groups have been basic, and mainly are limited to describing lithic artifacts and to establishing typologies of projectile points although some efforts have been made for interpreting the economic patterns of such groups. The diagnostic artifacts for this period are lanceolate and triangular shape projectile points found in camp sites and shelters. For example, a number of camp sites located near the shores of the lakes in Taxara, Tarija (Michel et al. 2000) have yielded lithic materials including cores, preforms, and spear points 12-16 cm long. The authors (Michel et al. 2000) concluded these groups were likely organized in bands, and had an economy of hunting and gathering with seasonal circuits of transhumance.

Another example is the high and middle valleys of the Yura River basin and its surroundings areas in Potosí. In Betanzos, Lecoq and Céspedes (1997 a, b) recorded preceramic sites in caves or shelters with rock art near the rivers. These caves contained leaf-shaped spear points, cores, scrapers and other lithic materials. In Icla, Chuquisaca Janusek and his team (Janusek et al. 1999) recorded the presence of two preceramic sites near the San Jacinto River and excavated one of them. These sites seem to have been base camps and killing sites, given the high proportions of projectile points and animal remains present on surface and subsurface. The lithic materials included a variety of lanceolate, triangular, and other points, as well as tools such as burins, scrapers, knives, cores and microliths. In the Cinti canyon (Rivera Casanovas et al. 1993), some preceramic sites, characterized by the presence of projectile points, scrapers, and lithic debitage were identified in the Tonka Bajo Mountains. As part of the fieldwork described here, additional base camps and hunting camps were recorded in Cinti upper valley.

From the information provided by these sites, together with comparison with contemporaneous groups in Chile and Argentina, it is likely that during the Preceramic, the population consisted of highly mobile hunter-gatherers, exploiting big game such as camelids and cervids, and small mammals. It is also likely that other important resources for collection were various leguminous trees with fruits rich in proteins. These preceramic bands established temporary camps in strategic places and shelters, generally located in rocky formations near water sources.

Formative Period (ca. 2000 BC- AD 400)

This period was first described by Ibarra Grasso as representing the first agricultural cultures in the southern Bolivia region (1973). He identified, in collections from Tarija and Lípez, incised sherds with linear and dot geometrical patterns, and dated them by comparison with similar ceramics from Chile and Argentina. Two sites were reported by Ibarra Grasso as belonging to the “Culture of the Tells”: Mojo, near Villazón in Potosí, and San Lucas, Chuquisaca. More recently, studies focused on settlement patterns and excavation have shown that this period witnessed the emergence of agricultural societies made up of hamlets and villages located along the bottom of valleys, and alongside rivers and lakes (Janusek et al. 1999; Lecoq 2001; Michel et al. 2000; Nielsen 2001). For instance, in the highlands of Tarija (Sama in the Taxara basin), Formative sites with ceramic similar to the Tarija Incised of Ibarra Grasso are located near or over preceramic sites, showing continuity in occupation (Michel et al. 2000). In the high valleys of Puna, Potosí, these communities were cultivating fertile lands and probably starting to build agricultural terraces in some areas. Settlements generally seem to have consisted of clusters of dwellings of circular plan, as seen in those excavated by Lecoq and Céspedes (1997 a; Lecoq 2001).

Although, these societies practiced agriculture, they would likely also have depended on wild resources, so that gathering and hunting were important elements in their economy (Michel et al. 2000; Ottonello and Lorandi 1987; Rivera Casanovas et al. 1993; see Chapter 3). In Lípez, because of characteristics of the environmental setting, the population was probably seasonally mobile (Nielsen 2001). Yet more research in this period is necessary for understanding the social organization and economic patterns of these early societies.

Early Regional Development Period (AD 400- 800)

This period corresponds to the Middle Horizon in the central Andes. It is a poorly understood period in southern Bolivia prehistory because of the lack of research, and because it is not easy to identify ERD occupations in settlements with multiple occupations. During this time, societies in different areas began to develop locally distinct ceramic styles, and population nucleation led to larger settlements generally located in areas near the bottom of the valleys and along rivers (Janusek et al. 1998; Lecoq and Cespedes 1997a, b). According to Lecoq and Cespedes (1997a), this period saw a shift from circular to rectangular dwellings in the valleys of Yura, Potosí. Settlement pattern studies in the Icla region, Chuquisaca (Janusek and Blom n/d) revealed a week site-size hierarchy of three tiers, with a relative convex rank-size. This settlement pattern also seems to be the case for other valleys as well (Sonia Alconini, personal communication 2003; see Chapter 3 for Cinti).

The economy of these populations in the valleys was based on agriculture, with maize likely being the major staple in most areas. In higher valley elevations, potatoes, quinoa and oca were also important, and probably llama flocks too. Agricultural terraces and irrigation systems were built in most of the valleys, and were essential to local economies (Janusek et al. 1998; Lecoq and Céspedes 1997 a; Michel et al. 2000).

During this time period, most of the societies of the southern Bolivian interandean valley area maintained exchange ties with populations located in the piedmont or lowlands, interaction that may have been important in local political dynamics (Rivera Casanovas 2003b). One manifestation of this interaction was the adoption into local ceramic styles of the Thick Rims Incised and Stamped tradition that had first originated in the lower piedmont areas (Alconini and Rivera Casanovas 2003). Regional interactions with societies located in the highlands and valleys were also crucial during this period.

The interaction with Tiwanaku is evident in the presence of Tiwanaku related materials in some areas of the southern valleys/highlands (Alconini 2002; Janusek and Blom n/d; Lecoq 1999; Lima 2000) or ceramic styles from these regions present in the Tiwanaku core area (i.e. Bermann 1994; Janusek 1994; Rivera Casanovas 1994, 2003a). The nature of such contacts is not well understood yet because of the lack of problem-oriented research. However, some scholars have suggested (Lecoq 2001; Lecoq and Céspedes 1997a) llama caravans were basic in these interactions. Other authors point out that interactions could have included a broad array of situations such as clientage (Kolata 1993), ties between different social segments of Tiwanaku people and distinct populations in the interandean valleys, and trade. In any case, the regions located in the northern part of Potosí and Chuquisaca were more involved in the Tiwanaku sphere of interaction, while societies located in the southern part of Potosí, Chuquisaca, and Tarija seems to have had a limited contact, or no contact, with Tiwanaku, as deduced from the absence or great rarity of Tiwanaku materials in these areas. In conclusion the ERD period in southern Bolivia was a time of population growth, population nucleation, development of agricultural production, and new forms of sociopolitical integration.

Late Regional Development Period (AD 800-1430)

This period witnessed the appearance of regional-level societies. Ethnohistoric accounts portray these societies as essentially segmentary, and organized in confederations, such as Chichas, Qaraqaras, Charkas and other polities. Sociopolitical hierarchies are manifested in the archaeological record by the presence of regional centers with sites grouped in their vicinity as in Oroncota, Icla, Tarija and Cinti valleys (Alconini 2002; Arellano 1992; Janusek et al. 1998; Michel et al. 2000; Rivera Casanovas 1998, 2002). Three tier site-size hierarchy is common for these valleys. Central sites of the LRD period tend to be larger than those of the previous period, contain dense architecture, and in some cases public architecture or features, and tend to be located in elevated areas near to agricultural lands and rivers (Alconini 2002; Angelo 1999; Lecoq and Cespedes 1997a, b; Rivera Casanovas et al. 1993). Residential areas were often constructed on domestic terraces, with rectangular houses and compounds separated by paths and open areas. LRD societies relied strongly on agriculture and intensified production by building terraces and systems of canals, as has been reported for different areas such as Icla (Janusek et al. 1998), Yura (Lecoq and Céspedes 1997a), Tarija (Arellano 1992) and Sama (Michel et al. 2000).

Caravan trade and pastoralism were also important in these southern populations (Angelo 1999; Lecoq and Cespedes 1997a, b; Michel et al. 2000; Nielsen 1997). The importance of caravan trade is manifested in the existence of interregional networks of roads associated with shelters and in the rock art depicting caravan of camelids (Methfessel and Methfessel 1997; Rivera Casanovas 1999) Some petroglyph motifs may be emblemic of particular polities or groups. The placement of some regional centers suggests that they functioned as gateway communities to the valleys, as in some valleys near Tupiza (Angelo 1999), or within the valleys in points that intersect *quebradas* or other natural features that were used as routes of communication linking highland with lowland populations (Michel et al. 2000).

Late Period or Late Horizon (AD 1430-1535)

This period corresponds to the Late Horizon in the Andean sequence and in the southern valleys is associated with the intrusion of the Inka empire. Inka installations, road systems, and ceramics have been documented in the highlands and valleys of Chuquisaca, Tarija and Potosí (see Alconini 2002; Angelo 1999; Lecoq and Céspedes 1997a; Lima 2000; Michel at al. 2000; Raffino 1993). There is little specific information on the type of Inka domination of the southern valleys, however.

The nature of Inka domination and policies in this part of Bolivia would have varied regionally, with direct and indirect control strategies determined by factors such as the level of complexity of local societies, resources, demography, hostility to the Inka empire, and Inka aims (D’Altroy 1987). Ethnohistorical documents indicate that the Charka confederation was made up of four major, segmentary polities: the Qaraqara, Charkas, Chichas and Chuyes. All of these polities were allies of the Inka, and because of this they enjoyed special privileges. All these groups were exempt from tribute and provided warriors for the Inka army (Platt 1988; Saignes 1985).

It is well known that Tupiza, and nearby valleys such as Talina, Tapaxa, San Miguel and Suipacha-Chuquiago, were controlled by an Inka empire interested in the presence of minerals and agricultural lands (Raffino et al.1987; Angelo 1999). Tupiza, some 50 km west of Cinti, was an Inka settlement and an important point on the *Qapaqñan* or royal road in the south (Raffino et al. 1987; Raffino 1993). In Potosí, Lecoq and Céspedes (1997a) reported Inka installations and roads for highlands and valleys in the Porco, Betanzos, Puna, Yura and Caiza regions. These authors concluded that there was a stronger Inka presence in the highlands than in the valleys, based on the location and distribution of Inka settlements. In the northern Chuquisaca valleys, the control appears to have been rather indirect (Alconini 2002; Janusek and Blom n/d; Lima 2000).

Archaeological information shows that, in general in the southern valleys, sites from the LRD period continued to be occupied through the Late Horizon. In some cases, Inka style structures were built within these sites. In other cases, new settlements grew under the Inka state policies (Alconini 2002; Angelo 1999; Lecoq and Cespedes 1997a, b; Lima 2000; Michel et al. 2000; Nielsen 2000).

Chuquisaca and Tarija were the areas where the Inka settled part of the southern frontier against the Chiriguanos. This imperial border was marked by a string of fortresses, which in some cases, had initially been built by local groups before the Inka expansion. *Mitmas* were moved to the frontier area to maintain and protect it (for a detailed discussion on this topic see Alconini 2002). A portion of this frontier runs near the Cinti Valley, approximately 80 km to the east. Here, fortresses (Incahuasi, Santa Elena) and other installations were built but these remain uninvestigated. North of Cinti, near San Lucas, the Inka built imperial facilities with at least one temple (Ibarra Grasso 1973), and there is evidence of other, smaller, settlements such as *tambos*. Probably in this San Lucas area was a regional administrative center. The settlement of San Lucas (San Lucas de Pahacollo) is mentioned in several ethnohistorical accounts as a multiethnic place where the Inkas settled different populations, mainly those of highland origin (Saignes 1986).

ETHNOHISTORY OF THE REGION

Ethnohistorical accounts of indigenous life in the Cinti area are scanty. This paucity reflects a combination of factors, including the valley's position as a distant frontier (Presta 1995), a possible early Colonial period depopulation of the valley due to constant raids by *Chiriguano* peoples, as has been suggested by some scholars (Julien et al. 1997:405; Langer 1989; Saignes 1985), and the resettling of the local population by the Spaniards in the new town of Tarija in the second half of the 16th century (Julien et al. 1997:405-423), as is described in the *Relación de servicios de Luís de Fuentes* ([1604] quoted in Julien et al. 1997: 418):

> "… e porque [e]ste testigo sacó para la dicha poblacion de Tarixa muchos yndios, que fueron cantidad de más de setenta, de quebradas y huaycos, y los rreduxo y llebó a la dicha poblacon de Tarija donde [h]oy estan poblados, a rrespeto de [h]aber despoblado muchos lugares, como fue Camataqui, Cinti, arriba del rrio de San Juan, donde este testigo vio fortalezas muy grandiosas y pueblos poblados y fundados, como fue el propio de la villa de Tarija, donde a lo que parece, según los pueblos y casas, devieron de consumir y matar antes que la dicha villa se poblara los dichos yndios chiriguanaes más de treinta mil ánimas porque los lugares que destruyeron fueron muchos; y por no saber los nombres este testigo no los dice".

Among the few references available for the Cinti region are those quoted in Saignes (1986), who proposed a distribution of ethnic territories during the 16th century for the Bolivian highlands and valleys. In that work, he vaguely locates the Cinti region as the border between the Qaraqara and Chicha groups, and mentions the presence of Churumatas and Tomatas in Cinti. In an earlier publication, he (Saignes 1985:13) implied that the Cinti region was under the control of the Qaraqara confederation by quoting from an early colonial account (La Plata 11.IX. 1637; Probanza de don Fernando Ayra de Ariute, cacique de Copoata *AGI* Charcas 56) in which it is stated that

Ayra Canchi, *cacique* principal of this confederation before the Inkas, built fortresses in the Pilaya and Paspaya lands (the colonial name of the Cinti region):

> "Ayra Canchi, cacique y señor absoluto que fue del pueblo de Macha y Chaqui, de veinte mil indios que le fueron sujetos, que fue tan valeroso capitán en aquellos tiempos que no sabía quien se le opusiese y sujeto hasta los Chuies y corrió las tierras de Pilaya y Paspaya donde puso unas fortalezas cuias memorias duran hasta hoy en día".

Del Río (1995a) mentions a series of places close to the Cinti Valley where members of some ethnic groups belonging to the Qaraqara confederation had settlements during the late 16th century. For instance, the Visisa had settlements in Pututaca, Tontola and Caile while the Tacobamba and Chaqui were settled in the Pututaca area, a valley close to Cinti to the north. Langer (1989) makes reference to the presence of parts of three *ayllus* from Oruro in the northernmost part of the Cinti Valley. Based on tribute records, he concludes that the Quillaca, Asanaques and Yucasa people that served as warriors for defending the area against the *Chiriguano* incursions during the Inka domination of the region were resettled there after the *visita* of viceroy Toledo, late in the 16th century.

From this fragmentary information, we can conclude that the region's population was part of Qaraqara confederation, with the Cinti Valley forming a frontier with the Chichas to the south and southwest. At least during the 16th century, the valley was subject to turmoil and conflicts because of the frequent *Chiriguano* incursions, the fall of the Inka Empire, the consequent disintegration of the imperial frontier that protected the region, and a new colonial regime that altered the local forms of sociopolitical organization. It is possible, as Langer and other scholars have suggested, that most of the native population fled the area, died, or were resettled in other regions.

THE QARAQARA CONFEDERATION IN ETNOHISTORIC AND ARCHAEOLOGICAL PERSPECTIVE

Ethnohistoric and colonial documents reveal that during the Late Horizon, southern Bolivian polities were organized into a larger entity called the Charkas Confederation (Bouysse Cassagne 1986; Espinoza Soriano 1969; Platt 1988). This confederation was itself composed of four regional confederations: Qaraqara, Charkas, Chuis and Chichas, that in turn, incorporated different political or ethnic groups (Figure 2.7). Although some scholars have pointed out that the Charkas confederation probably was a product of Inka policies of territorial reorganization and population control (Harris 1997), it is likely it was formed from a pre-Inka organization (Rasnake 1988; Saignes 1986). Ethnohistorical accounts mention the existence of such a confederation before Inka conquest, and how it resisted the conquest of its territory (Bouysse Cassagne 1986; Del Río 1995a).

Most sources concur that the Qaraqara was formed of at least seven ethnic groups (Del Río 1995a; Rasnake 1988), and covered a territory of highlands and valleys running southeast from the Central Cordillera of Asanaques and the Frailes, to the mountainous chains of the Chichas (Del Río 1995a:50). The Qaraqara structure consisted of nested, dual hierarchies based on the *ayllu*/moiety unit, so that Macha and Chaqui, for example, were the two “capitals” of this confederation, representing a dominant and subordinate *ayllu* respectively.

Archaeologically, little has been done to identify or study the material manifestations of the Qaraqara as a polity, or to understand its regional composition and origins. Pioneering studies in the region were focused in identifying “cultural areas” following the spread of pottery styles and other traits (Ibarra Grasso 1944, 1960, 1973; Vignale and Ibarra Grasso 1943). Ibarra Grasso tried to establish cultural territories based on ethnohistoric information and ceramic styles. Within this framework he defined the Yura, Chaqui and Huruquilla styles as belonging to distinct, ethnohistorically identifiable groups settled in the region. He named as “Huruquilla” a gray ceramic ware based on the name of a group mentioned in the Matienzo itinerary for that territory and because in Caiza D, Potosí, there is still an *ayllu* with that name (Ibarra Grasso 1960:19).

If we assume that ceramic styles are the material manifestation of particular ethnic groups and/or polities, as may loosely be the case for the largest of the Late Intermediate period polities in southern Perú and *altiplano* Bolivia (Ibarra Grasso 1973; Albarracín-Jordan 1996a; Angelo 1999; Stanish 2003), then we might expect to see a congruence between the Yura and Huruquilla ceramic styles, and the territories of the groups that formed part of the Qaraqara confederation. Both styles occur approximately in the territory occupied by the Qaraqara confederation and belong in part to the Late Intermediate period (or Late Regional Development period) and Late Horizon (Bustos and Kuljis 1977; Lecoq 1999; Lecoq and Cépedes 1997a, Rivera Casanovas 1998). These ceramics are found in a broad area that comprises roughly the central east part of Potosí (Quijarro, Linares, part of Frias, and north of Omiste Provinces), and the central west part of Chuquisaca, mainly the Provinces of North and South Cinti. The Yura style mainly corresponds to the territory of the Visisa (Lecoq i.p; Rasnake 1988), in the highlands and valleys of the Yura region, while the Huruquilla style is broadly spread over the rest of the confederation’s territory. Lecoq and Céspedes (1997a, b) have suggested that Yura ceramics correspond to the Visisa group that formed part of the Qaraqara confederation because there is a correspondence between the Visisa territory and the dispersion of the Yura style. Therefore, it is logical to conclude that these styles represent the emblemic preferences of particular socio-territorial units in this confederation.

It is interesting to note that during the Early Regional Development period, there is a broader range of pottery styles than is known for the Late Regional Development period. For instance, in the valleys of Potosí (Lecoq and Céspedes 1997a, b) a diversity of local styles is present, while in Cinti the local style differs markedly in the use of red color and some design patterns from the later Huruquilla (see appendix C). The later replacement of this stylistic diversity might be an indicator of people adopting cultural patterns manifested in more homogenized ceramic styles due to: (1) new regional forms of sociopolitical organization, and (2) stylistic marking of a larger, regional-level, shared identity.

CHAPTER 3

SETTLEMENT PATTERNS, REGIONAL ORGANIZATION AND AGRICULTURAL PRODUCTION

This chapter presents a diachronic perspective on settlement patterns, regional organization and agricultural potential in the Cinti Valley. The regional survey documented a prehispanic sequence of five periods: Preceramic period (? - 2000 BC), Formative period (2000 BC – AD 400), Early Regional Development period (ERD, AD 400 - 800), Late Regional Development period (LRD, AD 800 - 1430) and the Late period or Late Horizon (LH, AD 1430 - 1535). Here only the four last periods will be discussed in detail; the Preceramic period is not considered in this study. However, a description of the Preceramic period sites and their characteristics can be found in Appendix D.

REGIONAL SURVEY

Regional settlement survey is an ideal methodology for generating data to understand how prehistoric populations settled in a region and exploited resources (Flannery 1976; Johnson 1977, 1981; Kowalewski 1990; Parsons 1972; Wilson 1988). Moreover, of the most important aspects of regional survey is that it recovers information relevant to investigating and reconstructing forms of political and economic organization. The goals of the survey in Cinti were threefold: (1) recording the spatial distribution of settlements in the different environments of the valley through the entire prehispanic sequence; (2) establishing a site typology for distinguishing potential settlement hierarchy in the size, components, functions, and artifact assemblages of the sites; and (3) collecting information on the relative proportions of particular architectural forms (public architecture, storage structures, houses) and associated artifact assemblages (imported ceramics, tools, specific vessels forms).

For these purposes a full (100%) coverage of the terrain was conducted in a roughly rectangular area of 253 km^2 that corresponded to the natural topographical boundaries of the steep sided Cinti Valley (Figure 2.2). Transects were adapted to the topographical conditions of the terrain. The survey covered all the ground in the survey area, excepting the slopes too steep to walk and some farms whose owners did not allow us to walk. Two survey teams of 3 - 4 persons each walked at intervals of 15 - 20 m, recording all cultural features on air photos, filling field forms, and collecting materials.

Site size was calculated from the spatial extent of architecture and surface materials. Sites were assigned to a specific period in the regional sequence depending on the ceramic styles present or other diagnostic materials, such as projectile points in the case of Preceramic sites. When multi-component sites were identified, site size at different periods was established by recording the presence or absence of diagnostic materials in the different sectors (cultural or arbitrary) in which a settlement was sub-divided. For instance, if diagnostic materials appeared in two sectors of a site, the areas of these sectors were taken as the extension of the site for that particular period.

Systematic surface collections were made in most of the sites that presented archaeological materials on the surface, except in those where there was not enough material for this purpose such as rock art sites or agricultural terraces. Sites were divided in sectors according to cultural or topographical features and size; in each sector, one or several 2 m diameter collection circles were placed and materials collected. Also non-systematic diagnostic collections were made at the sites in order to collect diagnostic materials, especially ceramics, for chronological purposes or other artifacts such as lithics or beads that could bring some information about activities at the sites.

Site Typology

My site typology was designed for all the periods in the sequence, and is based on site size and site components such as architectural features and internal segmentation. Site sizes were examined using stem and leaf plots for each period, and then related to site components revealing four levels of settlement labeled as: regional center, local center/large village, small village, and homestead. Other types of sites included cemeteries, sites with rock art associated with roads and shelters, agricultural fields or areas of terraces and irrigation channels, camp sites, hunting areas, roads, and quarry areas.

In total, 113 sites were recorded in the research area (Figures 31, 3.2 and 3.3): 10 from the Preceramic period, 32 from the Formative period, 17 from the Early Regional Development period, 25 from the Late Regional Development period and 36 from the Late Horizon. Colonial and Republican sites are not included among this total.

Regional Centers

Regional centers are settlements larger than 10 ha. These sites were densely occupied, judging by the density of buildings, residential terraces, patios, cist burials and circulation paths. In some regional centers, functional sectors of the site could be defined on the basis of architecture and construction techniques. In the case of one regional center - - Huankarani (C-48) - - huge walls divided the settlement into at least three separate sectors. In general, regional centers displayed one or more central areas with more open space, and some contained sectors of carefully built houses that probably corresponded to relatively high status residential areas. In the Cinti Valley it was not possible to distinguish obvious “public architecture” in the form of platforms, temples or huge plazas, although public spaces may have been embedded architecturally in residential areas, as was found in the Tarama-Chinchaycocha region, Peru (Parsons et al. 2000).

Local Centers or Large Villages

Local centers or large villages measure 2.1 – 10 ha, and consist of nucleated domestic structures, residential terraces and circulation areas. Some of these sites display central areas with structures that resemble small open plazas or patios, and carefully laid stone architecture. It is unclear if these structures had a public character or if they were part of elite compounds. Some of the settlements exhibit perimeter walls, probably built in later times, suggesting defensive concerns.

Small Villages

Small villages are characterized by a concentration of structures built over residential terraces; they range in size from 0.51 to 2.0 ha. These settlements contain well-worn paths, open internal spaces, and stairs linking different terraces.

Homesteads

Homesteads range from 0.01 to 0.5 ha. These sites displayed few structures, or in some cases, only concentrations of ceramics and other artifacts on the surface. These sites would represent the residential area of one or just a couple households.

Rock Art Sites

These sites contain petroglyphs or rock painting and are generally associated with paths and roads connecting the valley to other *quebradas* or regions. In some cases these sites are shelters and seem to have constituted resting places for people linked to llama caravans.

Camp Sites and Hunting Areas

Most of these sites belong to the Preceramic period and are characterized by a scatter of lithic materials on the surface, occasionally associated with small, circular, shelter foundations. Some times ceramic fragments, in low densities, dating from the Formative period or even later periods are present. Although such sites were registered as discrete areas or concentrations, projectile points and other lithic remains are widely spread in the Cinti Valley, and a specific methodology would be needed to deal with the settlement remains left by the Preceramic period population.

Roads

A system of prehispanic roads, paved with stones in many places, connects most of the sites with agricultural areas to the main Inka road in this region. The system certainly was used in the LH period; however, it is probable that it dates to an earlier system, as most of the large sites were occupied in the LRD period as well.

Agricultural Terraces

Ancient agricultural terraces have remained untouched in some areas of the valley. There are two types of terraces: (1) low (<20 cm high), rectangular terraces delimited by one row of stones and associated with irrigation channels that run through them, generally this type of terraces are placed in areas with slopes of less than 30º; and (2) terraces faced by two or more rows of stones (20-50 or more cm high), in areas with slopes of over 30º. The size of the terrace face relates to ground slope.

Quarry Areas

These are sources of lithic materials, mainly rocky outcrops of different varieties of quartzite that were used for obtaining the raw materials and crafting different tools. They were used through all the sequence, and remains of cores, blades, flakes and some preforms were identified at these locations.

Population Estimates

To estimate site populations in the Cinti Valley, the Late Horizon period site of Higuerahuayco (C-87) was singled out for study because of the excellent preservation that made possible room counts on the surface. At this site, we recorded 58 - 66 structures per hectare. Drawing on similar calculations for other parts of the Andes (Hastorf 1993), we assumed that three contiguous structures housed a family of a minimum size of 6 persons. This density worked out to a figure of 116 - 132 persons per hectare. This figure probably overestimates residential populations for the Formative period and the Early Regional Development period, where residential settlement appears to have been less agglutinated, but is reasonable for later periods (Table 3.1). Comparing these calculations with other areas in the Andes such as the Mantaro Valley, Peru, we can see that our estimates are lower than those from the Mantaro, where an average of 35 to 50 structures per hectare is proposed - - taking in consideration all periods - - and a population ranging from 210 to 300 individuals per hectare (Hastorf 1993:Table 3).

Not all of a site area is contemporaneously occupied. In addition to open areas and outdoor areas, at any one time a significant portion of the site’s houses might be unoccupied (Steponaitis 1981). To reflect this, I subtracted 25% from the area of each site in calculating residential population.

Catchment Zone Analysis

Catchment zone analysis was performed in order to assess man/land relationships. Analysis involved calculating the potential production of the catchment zone of each site, and comparing these figures to site size and storage capacity. One goal of the analysis was to determine if site size differences related to differences in local productivity. A second goal was to determine if any sites were disproportionately large, or had a disproportionate amount of storage, relative to local agricultural potential. If so, this would suggest that staple finance, involving tribute flow or the mobilization of surplus, was a leadership strategy. Another approach to this issue was to compare the calculated residential population of sites to estimated local catchment productivity. Settlements with populations exceeding local productivity would presumably have depended on surplus mobilized from other settlements (a staple strategy).

As described in Chapter 2, land was divided into three categories (1 – 3) to reflect differences in agricultural potential. Productivity was calculated by measuring the hectares of productive land (Categories 1 and 2) within a 1 km diameter zone of each site (Table 3.2). Catchment area was calculated using the edge of larger sites as the starting point, rather than the center. The relatively small 1 km diameter catchment zone was chosen because the density of Cinti settlements meant that larger zones would involve a great deal of overlap in the catchment zones of different sites. Sites in the Cinti were generally spaced to give themselves a minimum distance of 1 km from neighboring settlements, so that we can suppose this zone represented the basic amount of land needed by all but the largest settlements. Due to the restricted, linear distribution of farmland in the Cinti canyon (lower canyon), catchment areas would probably have been narrow and linear in many ways, rather than circular.

Only sites classified as settlements or habitational sites were used in the catchment analysis. Settlements where poor preservation prevented determination of site size were also not used. In addition, I excluded some homesteads very close to villages or larger centers because of the great overlap this created in catchment zones.

Estimates of Production

Estimates of maize, potato and legume/fruit production were done largely using data derived from Departament of Chuquisaca agronomy records. Maize and potatoes were chosen for calculations because ethnohistoric documents and archaeological data point to these products as the main staples in the interandean valleys of southern Bolivia. Maize and potato yield data for Chuquisaca were taken from Pozo Uribe (1991), Vetté and Rojas (1998) and Zonisig (2000). These sources provide averages of production for both traditional methods and modern systems in the valleys (Table 3.3).

Maize was the main staple for populations settled in the interandean valleys of Chuquisaca, with different systems of cultivation adopted to compensate for differing topographic and environmental conditions. In some areas, where rainfall permits, maize can be cultivated without irrigation, but in the majority of the Chuquisaca Department, irrigation and terraces were employed for cultivation. Several races of maize were cultivated in these valleys (described in Chapter 2).

Actual estimates of traditional maize production in these valleys (Pozo Uribe 1991; Zonisig 2000) indicate production of 625 - 1380 k/ha, with an average of 1002 k/ha. Similarly, farmers in Cinti pointed out to me that they produce an average of 1000 k/ha and 700 k/ha on the bottom of the valley and on terraces respectively. Considering the area, the production with traditional methods, and information recovered during the field season from people in the communities of Carusla and Huankarani, I adopt the following figures: Category 1 land, the most productive, yield an average of 1000 k/ha of maize, while Category 2 land, located in piedmont areas, can reach 700 k/ha.

Potatoes should also be considered a staple crop in the interandean valleys. It is difficult to specify potato yields because of the different soil types, differing figures for local and introduced species, and fluctuation in average yields. For instance, the average potato production using mainly traditional methods for the interandean valleys in Chuquisaca is calculated at 4364 k/ha (Pozo Uribe 1991) and 4140 k/ha (Zonisig 2000). People I interviewed gave figures that varied from 2500 to 8000 k/ha! Taking in consideration these differences, and the information from other similar valleys, I chose to use an average of 2500 k/ha as a measure of potato production for prehispanic times on both Category 1 and 2 land.

These figures of maize and potato production are comparable to those obtained for other parts of the Andes, such as the Mantaro Valley, Peru (Hastorf 1993). Here, estimates of maize and potatoes production vary considerably according to microenvironments, however if an average of production is considered for comparative purposes, the Cinti figures generally fall within the range of variation of the Mantaro estimates (Table 3.3).

Finally, I considered legumes in the form of algarrobo (*prosopis sp.*), chañar (*Geoffroea decorticans*) and palqui (*Acacia feddeana*) wild pod, important foodstuffs reported for various parts of the Andes (Correa and Bernal 1995; Felker 1981; Felker et al. 1984; Laguens 1999 and local informants in Cinti 2000), I performed some calculations for estimating pod harvest in kilograms/hectare. Taking into account plant density, age, yield, and annual variability, harvests can range from 400 to 8000 k/ha.

For each site catchment zone, I calculated yield figures for the two staple crops, maize and potatoes, converted these figures into kilocalories in order to determine how many people the catchment zone could support (Table 3.4). Once production was estimated, the amount of calories contained in 100 gr of dry matter was also calculated, using the figures provided by Hastorf (1993) for maize (340 calories) and potatoes (320 calories), and Correa and Bernal (1995) and Wu Leung (1964) for legumes. In the case of palqui and chañar, values similar to algarrobo (337 calories) and other legumes were adopted because there is not information about these particular species (Tables 3.5 and 3.6).

These figures could then be compared to estimated site population, to ascertain whether local production was sufficient for feeding a site's population and whether the catchment zone had potential for generating surplus. Figures resulting from these estimates and their conversion into kilocalories (1 kcal= 1000 calories) are detailed in Tables 3.7, 3.8 and 3.9). Kilocalories were related to the intake a person needed yearly in the Andes during prehispanic times (Hastorf 1993). Hastorf, proposed based on Thomas (1973), 1530 cal as necessary daily for a person, and yearly 558,450 cal as the basic requirement for and individual.

THE FORMATIVE PERIOD (2000 BC – AD 400)

The Formative period in the southern interandean valleys of Bolivia saw the appearance of small communities, frequently located on slopes or alluvial terraces near the rivers (Lecoq 2001). The identification of such settlements from surface is difficult because of the processes of fluvial deposition and erosion (Lecoq and Céspedes

1997a, b; Lecoq 2001). Another problem in the identification of Formative occupations is that they are often overlain by subsequent occupations within multicomponent sites, a situation common in the valleys.

General Settlement Pattern

This period saw the establishment of many small farming communities along the valley (Figure 3.4). Of the 37 sites of this period, 18 are residential sites: 2 are large villages (2.1>ha), 16 are small villages or hamlets (0.51 - 2.0 ha). The remainder consist of 11 small shelters/camps (0-0.5 ha), 6 areas of agricultural terraces, one cemetery and one non-site. Of the 18 settlements 12 (61%) are concentrated in the upper valley and 7 (39%) are located in the narrow canyon of the lower valley.

As seen in Figure 3.4, the distribution of Formative settlements is broadly related to the distribution of agricultural lands; settlements are found associated with the bottom lands (areas of Category 1 land), or in areas of piedmont or Category 2 land that also had agricultural potential. The larger settlements (villages and hamlets) associated with Categories 1 and 2 lands probably were sites with year-round occupation. Campsites and shelters, more common on Category 3 land, were temporary occupations reflecting hunting/gathering activities. The upper valley contains the bulk of the Cinti Valley's agricultural land, so the broad distribution of valley settlement as a whole reflects the location of prime agricultural land, and the larger sites tended to be located near the largest concentrations of good agricultural land.

Besides agriculture, gathering of wild fruits also may have been important during the Formative period. The fruits of trees such as algarrobo, chañar*,* and palqui were important sources of proteins and sugars for local populations. Also, the collection, processing, and storage of such products might provide a food supply during critical times in the year, or during long-term shortage events (Rivera Casanovas 2002). Gathering and storage of these fruits during the Archaic and Formative periods has been reported from several areas in the southern Andes (Nuñez 1974, 1989; Ottonelo and Lorandi 1987).

Some campsites and shelters appear to have Preceramic period components. Large projectile points with morphological attributes related to this period were found at some of these sites. In the Reserva Nacional de Sama, 70 km south of the research area, Preceramic sites often have Formative occupations as well (Michel et al. 2000).

The distance among settlements during this period suggests a regular distance was maintained between villages. In the upper valley, most of the bigger settlements are 2 to 3 km from one another, while in the canyon, distances tend to be greater, ranging from 9 to 18 km. I believe the differences in intersite distances relates to the distribution of agricultural land, which is much more linear in distribution in the canyon (creating more elongated catchment zones).

Regional Organization

A site size histogram for the valley (Figure 3.5) shows that the biggest sites in the valley (Cochaca C-16 and El Rancho C-94) measure around 3 ha. There are several sites around 2 ha in size (Jatun Talasa Huankarani C-48, Santa Rosa C-53 and Escuela Carusla C-8) and the rest of the sites follow in decreasing size.

If we divide the valley into upper valley and the lower valley (canyon), and look at each area separately, the patterns are somewhat different. A histogram of the upper valley shows no marked size differences among sites (Figure 3.5), although, most of the sites of two and three hectares are located in this part of the valley. Sites in the canyon (lower valley) are in general smaller, with the exception of El Rancho (C-94), which measures close to three hectares. It is possible that our lower valley site sample is underrepresented because sites are buried under alluvial sediments or have eroded away, as is usual in these kinds of topographic settings (Brockington et al. 1995).

A rank size analysis for the survey area as a whole (figure 3.6) shows a convex pattern, suggesting a lack of regional political integration, with settlements rather being autonomous. a separate rank size analysis for the upper valley and the canyon reveal different patterns. for the upper valley, a convex pattern indicates no political integration, while in the canyon the distribution is rather close to log normal line. this latter distribution could indicate some type of integrated settlement system in the canyon, but is more likely a fortuitous expression of a small number of sites and the “lower-limb” effect.

Man-Land Relationships

It is possible that during the Formative period, small scale building of agricultural terraces took place. At least five areas of agricultural terraces located near small rivers or streams had Formative sherds scattered on their surfaces (Figure 3.4). These terraces also contained sherds from later periods, suggesting that they continued in use.

Using the figures discussed above, I calculate a total valley population of 1612 – 1837 during the Formative period, although these figures might vary because of deeply buried sites or poor preservation. Most of the population (1098 – 1252, or 68%) was concentrated in the upper part of the valley (Table 3.1). This concentration can be related to the presence of rivers that provide a flow of water even during the dry season, and to agricultural land that can be worked without large investment in terracing. In the canyon (lower valley) the population was both smaller and more dispersed. Agricultural soils here are close to the rivers, but need more work to make them available and productive. If embankments or some kind of protection for fields are not constructed, during the rainy season, fields (and settlements) can be completely inundated and swept away by the strong currents of water.

The site catchment analysis with zones of 1 km diameter shows that all villages and hamlets included in their catchment good and moderately good agricultural lands (Figure 3.7, Table 3.5). From a total catchment area of 1505.46 ha, 569.73 ha of Category 1 land were available for cultivation and 416.21 ha of Category 2 land may have been potentially used for cultivation. Also, 519.52 ha of Category 3 land were available for the exploitation of other resources such as game, wild fruits, fuel, and other materials.

All Formative settlements had sufficient potential agricultural productivity (maize and potato) in their small catchment zones to maintain themselves, and to generate some surplus as well (Tables 3.7, 3.8 and 3.9). The same would be true for legumes/fruits (Table 3.6); in fact, these alone could have sustained the whole population.

A scatter plot of site size vs. catchment productivity (determined by hectares of Categories 1 and 2 land in the catchment zone) shows that - - in general - - larger sites had more agricultural land within their catchment zone (Figure 3.8) than did smaller sites. Although a regression analysis shows only a “weak” correlation between these two variables (n=16, r= 0.296 p=0.029), the catchment zone analysis reveals a solid relationship between site size and local productivity. This relationship is particularly striking if we consider the vagaries and difficulties in calculating Formative occupation size as well as catchment zone productivity.

Dividing the valley into upper and lower sections, this pattern changes. In the upper valley (Figure 3.8), there is an even stronger (“moderately strong”) correlation between site size and agricultural lands (n= 9, r= 0.601 p= 0.014). In contrast, in the canyon (Figure 3.8) there is no correlation between these variables (n= 7, r= 0.001 p= 0.953). Again, I believe this is due to the narrow linear distribution of agricultural land in the lower valley; site residents in the canyon were likely cultivating fields beyond one kilometer from their settlements. Calculations of production of maize and potatoes in kg/ha provide the same patterns with similar values in the regression analysis.

If we look at the valley wide relationship between site size and Category 1 land (Figure 3.9), only weak correlations result (n=16, r=0.279 p=0.035). Similar values apply for figures of maize and potato production. For Category 2 land there is no correlation at all between these variables (n=16, r=0.001 p=0.913).

Summary

The Formative period settlement pattern does not provide any evidence for settlement hierarchy, regional polities, or supra-local integration in the valley. The distribution of settlement as a whole in the valley broadly corresponds to the distribution of agricultural land, and the observed site size differences likely reflect differences in local agricultural productivity. Settlement is concentrated in the upper valley, with lighter and more dispersed settlement in the canyon. All Formative period settlements were well below the carrying capacity of their catchment zones; the population of even the largest settlements could have been comfortably supported by agriculture within a 0.5 km radius of the settlement.

EARLY REGIONAL DEVELOPMENT PERIOD (AD 400 – 800)

The Early Regional Development period (ERD) roughly corresponds to the Middle Horizon in the Central Andes. In southern Bolivia, a lack of research means this time period is poorly known, although it is believed that important processes of social change were taking place at a broad regional level, reflected in new types of settlements, ceramic styles, and patterns of interaction among groups settled in highlands, lowlands and valleys (Lecoq and Céspedes 1997a, b; Janusek et al. 1998).

General Settlement Patterns: Population Growth

This period witnessed important shifts in settlement patterns in the Cinti Valley (Figure 3.10). One of the most striking changes was population growth, reflected in the increase of size and number of sites. Of the 18 sites of this period, 17 are settlements, and one is a camp site. At least five settlements are associated with areas of agricultural terraces and canals. New settlements were founded in previously unoccupied areas of the valley, a situation particularly evident in the canyon, where new sites were established on Category 3 land near alluvial fans that provided some agricultural potential, mainly on the eastern side of the valley. The bulk of the settlement expansion took place in the canyon. In contrast to the previous period, ERD settlements are almost equally divided between the upper valley and in the canyon, of 17 sites, 9 (53%) are in the upper valley while 8 (47%) are in the canyon.

Regional Organization

It is difficult to evaluate regional organization for this period, because most of the ERD occupations occur in multi-component sites, making it problematical to calculate site size and composition. A histogram of site size shows two tiers, with one large settlement (C-18 Palcamayu) that might have constituted a regional center, two large villages and a group of small villages and hamlets (Figure 3.11). The largest settlement (C-18 Palcamayu) is located in the upper valley, and covers 7.2 ha. It is composed of residential terraces with rectangular structures and patios, and circular and rectangular cist tombs within the settlement. To the east and west of the site lie agricultural terraces with irrigation canals.

There is no evidence for settlement hierarchy in the canyon, but villages and hamlets are distributed in loose clusters according to the distribution of farmland. Settlements maintained a linear distance of 1 - 4 km in the upper valley, while in the canyon, distances among sites and clusters of sites ranged from 5 - 7 km.

Rank size analysis (Figure 3.12) reveals a slightly convex distribution, but one close to the log normal distribution, particularly among the five largest sites, suggesting a significant level of political integration in the valley, with C-18 (Palcamayu) as the head of this system followed by C-58 (Talasa Chaco) and C-48 (Jatun Huankarani), all located in the upper valley. The rank size distributions for the upper valley and canyon display a near log normal distribution in the former, but pronounced convexity in the latter. The differences between these rank size plots indicates that centralization or regional political integration was developing strongly in the upper valley, but not at all among the canyon settlements. It is therefore reasonable to talk about a regional polity emerging in the upper Cinti Valley during the ERD period.

Man-Land Relationships

The range of estimated population for the entire valley during the ERD is 2710 - 3086 persons (Table 3.1). As in the previous period, most of the population was concentrated in the upper valley, 1804 - 2054 persons (66.6%), while in the canyon the estimate is 906 - 1032 persons (33.4%). Of a total of 1548.99 ha of the pooled catchment areas, 501.3 ha correspond to Category 1 land, 349.6 ha to Category 2 land and 697.0 ha to Category 3 land.

Catchment zone analysis using zones of 1 km diameter (Figure 3.13) indicates that local population had enough agricultural production (maize and potato) at the regional level for subsistence (Tables 3.7, 3.8 and 3.9). Calculation of agricultural production for each site reveals some important distinctions. Palcamayu (C-18), the biggest site in the valley, is above my estimated productive capacity of its catchment area, and the next largest sites, Huankarani (C-48) and Chaco (C-58), are also close to or above the estimated potential production of their catchment areas.

Scatter plots of site size versus agricultural potential show that the largest site C-18 (Palcamayu) did indeed had more productive land in its catchment zone than did other sites (Figure 3.14). Regression analysis shows that there is only a weak correlation between site size and agricultural potential (n=17, r= 0.357 p= 0.011), but the correlation would be much stronger if one removed the two largest sites from the equation. In general, the scatter plot displays three tiers of settlement, very similar to that observed in Late Formative settlement hierarchy in the Valley of Mexico (Steponaitis 1981: Figure 2b and Figure 8). The first tier consists of the two largest sites in the valley, each substantially above their predicted catchment productivity. The second tier consists of sites below three ha in size, whose size is strongly correlated with catchment productivity. The third tier consists of several small sites (under 1 ha) that are well below the size that their catchment productivity would predict. These are probably newly founded “daughter” communities not yet grown to their catchment production limits.

This tier pattern may indicate that: (a) the catchment zones of these sites were larger than 1 km diameter, as seems likely; (b) that intensive agriculture (terracing and irrigation) were of special importance in the catchment zones of these sites, increasing their productive potential above the figures I used in my calculations; or (c) that the residents of these sites, especially Palcamayu, were receiving agricultural products as tribute. The latter two possibilities are consistent with staple strategies underlying emerging political leadership.

We found indications that agricultural terraces were being built in the upper valley in areas near the larger settlements. However, terraces were also built in locations far from settlements, where streams could more easily provide water for irrigation. Overall, it is difficult to measure the extent of agricultural terraces for any given period because of the lack of diagnostic sherds associated with these features. Only 9 ha of terraces can positively be associated with this period. In addition, wild legumes and fruits were also likely to have been important staples for the inhabitants. As was previously mentioned, gathering of these wild resources alone could have sustained the entire population in the valley (Table 3.6), and I have not factored these resources into my catchment zone analysis.

If we break down the plot into the upper valley and canyon (Figure 3.14), each shows a weak correlation (n=9, r= 0.330 p= 0.106 for the upper valley; n=8, r= 0.135 p= 0.372 in the canyon). The three tier pattern, however, is still apparent in the upper valley, but is not seen in the canyon. The same values are repeated plotting production of maize/potatoes against site size. If we separate different categories of land, it is evident that the relationships are even weaker (Figure 3.15). A regression analysis of Category 1 land and site size for the whole valley resulted in a weak correlation (n=17, r=0.127 p=0.160), the same pattern repeats with maize and potato production for Category 1 land. In the case of Category 2 land, the situation is similar (n=17, r=0.146 p=0.130), including maize and potato production.

Summary

From these analyses, several observations emerge. An integrated settlement system, likely corresponding to a regional polity, emerges in the ERD in the upper valley. The capital of this system, Palcamayu (C-18), had greater potential local productivity than other sites; this would probably account, at least in part, for that settlement's size. However, Palcamayu's size is even larger (by almost 50%) than would be predicted even from its highly productive catchment zone. Explanations for how this larger population was supported include agricultural intensification (the site is spatially associated with agricultural terraces and irrigation channels), and extraction of agricultural surplus from other sites within the system.

At this point would be useful to have information about storage areas in the largest settlements, but poor preservation precludes this for the ERD. In C-18 (Palcamayu) and C-58 (Chaco), the best preserved ERD sites, no signs of extra-domestic storage were seen on the surface. Information from neighboring areas (Lecoq and Céspedes 1997a, b) and the northwest of Argentina (Raffino 1988) suggests that significant surplus storage may have been domestic, associated with households either as internal bins or as below-floor pits. For instance, in the area of Yura, west to the Cinti Valley, Lecoq and Céspedes (1997a) found ERD dwellings with storage structures inside them arranged in groups of three, used to store maize.

LATE REGIONAL DEVELOPMENT PERIOD (AD 800-1430)

The LRD period corresponds approximately to the Late Intermediate period in the Central Andes. In the southern Andes, this period was characterized by the development of polities commonly called *señoríos* or ethnic kingdoms that, according to ethnohistorical data, were organized through a system of inclusive, nested, dual hierarchies. In some cases, such as the Chicha and Qaraqara, these polities formed regional confederations over a broad territory (Bouysse Cassagne 1986; Del Río 1995a; Platt 1988; Rasnake 1988). According to ethnohistorical accounts and the regional distribution of Huruquilla and Yura ceramic styles (Ibarra Grasso 1944; Lecoq and Céspedes 1997a; Vignale and Ibarra Grasso 1943), the Cinti region probably formed part of the Qaraqara Confederation during this period, although exactly which of the groups that constituted the federation were settled here is not completely known. There is a possibility that the *Wisijsa*, an ethnic group located west of Cinti could have occupied the region in pre-Inka times, as some early documents suggest (Del Río 1995a, b; Rasnake 1988).

General Settlement Patterns: Population Growth and Settlement Hierarchy

The trends of the previous period continued during the LRD, with population increase manifested in the growth of previously occupied sites, and in the establishment of new settlements, generally hamlets or homesteads (Figure 3.16). The total area of estimated LRD population for the valley is 68 ha (Table 3.1), more than double the figure for the ERD (18 ha). As in the previous periods, population was concentrated in the upper valley, with 3414 - 3888 persons (58.1%), while in the canyon the figure range is 2465 - 2805 persons (41.9%). Clusters of sites grew in the upper valley and in the canyon in areas of agricultural lands; sites are generally placed in rocky piedmont areas overlooking agricultural land. Agricultural terraces were built in most of the piedmont areas closest to the settlements, but in some cases were built as a distance from settlements. For this period, 69 sites were recorded in the valley, 27 are settlements, 10 are rock art/shelters, 6 are campsites, there is one non-site and 25 areas of agricultural terraces.

The 27 settlement sites recorded included one regional center (C-48 Jatun Talasa Huankarani, 17 ha), nine local centers, and 17 villages or hamlets. In the upper valley are 12 (44.4%) settlements, while in the canyon are 15 (55.5%) settlements. Distances among sites varied, with 2 - 5 km in the upper valley, while in the canyon distances were greater 5 - 10 km, reflecting the higher population density in the upper valley.

Regional Organization

A site size histogram reveals a three-tier hierarchy in settlement size (Figure 3.17). Hierarchy is more pronounced in the upper valley; where three modal levels of site size are clear, while in the canyon a two tier hierarchy can be distinguished, composed of local centers and villages and hamlets.

A rank size analysis performed for the whole valley (Figure 3.18) presents a nearly perfect log normal pattern, with C-48 (Jatun Talasa Huankarani) at the head of the system. Palcamayu (C-18), only some five km distant, was thus superceded as the largest site in the settlement system. In fact, Palcamayu seems to have been largely abandoned at the end of the ERD.

The log normal pattern indicates a political regional integration or administrative hierarchy in the valley at this time, with C-48 as the capital, and the several larger sites as secondary centers. The rank distribution actually presents a slightly plano-convex pattern, with the convexity developing after the fifth-ranked site. C-48 is followed in rank by C-53 (Santa Rosa), C-17 (Jayasamana), C-76 (El Porvenir), and C-16 (Cochaca), after which the convexity develops. However, given the difficulties and subjectiveness in measuring the sizes of small archaeological sites, it is unlikely that one can come much closer to a log normal distribution with archaeological data.

The rank size plot for the upper valley LRD sites by themselves (Figure 3.18) presents a perfect log normal pattern, marking a well-integrated settlement system. In contrast, in rank size distribution of settlements in the canyon area of the valley presents the same convex pattern as seen in the ERD (Fig 3.18). This pattern could be interpreted as revealing that there was little horizontal integration among the lower sites, and that their articulation into an overarching system, if they were articulated at all, was through interaction with upper valley settlements. Overall, the LRD pattern is quite similar to that of the ERD, indicating a regional polity in the upper valley, now centered at C-48, Jatun Talasa Huankarani, rather than Palcamayu (C-18). The rise of a new dominant settlement during the course of population growth and increased system integration, and the abandonment of the old center, suggest powerful, inter-site, political dynamics, perhaps even elite competition, at work in the upper valley during the LRD.

Man-land Relationships

Catchment areas (Figure 3.19) embrace 2235.9 ha, of which 646.1 corresponds to Category 1 land, 593.2 to Category 2 land, and 996.5 to Category 3 land (Table 3.2). Analysis shows there was enough agricultural land regionally for sustaining the population with maize and potato production (Tables 3.7, 3.8 and 3.9). The same would be true for legume/fruit production (Table 3.6) At the site level, the catchment analysis suggest that some sites were close or slightly over the estimated carrying capacity of their 1 km diameter catchment areas, and C-48's (Jatun Huankarani) C-70's (El Patronato) and C-76's (El Porvenir) estimated population exceeded the predicted yield of their respective catchment zones.

That some sites had populations at or above what local (1 km diameter) productivity would predict can be interpreted in several ways. One possibility is that the populations of these sites were supported by staple products obtained as tribute from satellite sites located around them (Steponaitis 1981). A second interpretation, one that seems more likely to me, is that the sites simply had catchment zones larger than 1 km diameter. The larger sites are surrounded by small sites, with populations well below even the production expected from a 1 km diameter catchment, so it seems reasonable to assume that inhabitants from local centers were cultivating in part of these lands.

The catchment zone analysis points to greater or intensified agricultural production on the part of the Cinti population as a whole during the LRD. There were few sites over 2 ha in size during the ERD, but during the LRD, sites with commensurate catchment productivities now range between 3 - 4 ha in size. In the upper valley, there is evidence for agricultural intensification during the LRD. Areas of piedmont were brought under cultivation with the construction of terraces and irrigation channels. Although it is difficult to date terraces, it is evident that the construction of these facilities centered around C-48 (Jatun Talasa Huankarani), and C-39 (Talasa Chajra Khasa). In the canyon, a similar process might have taken place but it is difficult to evaluate this possibility because modern agricultural practices have destroyed terraces and other prehispanic features.

Regression analysis for the whole valley shows (Figure 3.20) a weak correlation between site size and agricultural land (n=25, r=0.223 p=0.017). Although there is a weak correlation between site size and agricultural land it can be because small sites tend to pull down the regression line. The graphic (Figure 3.20) depicts C-48 (Jatun Talasa Huankarani) far above the rest of the sites suggesting tribute was probably going to this site from the other sites down in the hierarchy as was argued in other cases for the Basin of Mexico (Steponaitis 1981). Breaking down the plot into the upper valley and canyon shows a weak correlation, (r=0.289 p=0.071) and (r=0.209 p=0.116) respectively Regression analyses produce similar plots with maize and potato production. Interestingly, the three tier pattern seen in the ERD is not visible in the scatter plots for the LRD.

The same analysis performed for the upper valley alone, without the largest settlement and sites smaller than 0.5 ha (homesteads) shows (Figure 3.21) a moderate correlation between these two variables (r=0.578 p=0.079). In the case of the canyon (Figure 3.21) there is no correlation between these two variables (r=0.065 p=0.507). In the canyon, this pattern may be due to the topography; because the canyon is elongated, the agricultural land is concentrated along the river and broad areas without agricultural use are inside the catchment circles, but there are lots of agricultural lands along the Chico River very close to the sites.

Considering just categories of land alone (Figure 3.22), the correlations are weak, the regression of Category 1 land and site size shows no correlation between these two variables (n=25, r=0.023 p=0.471), nor with maize and potato production. In the case of Category 2, land the correlation is weak (n=25, r=0.214 p=0.020), the same values hold for alternative calculations of maize and potato production.

Summary

The most striking developments in settlement patterns in the LRD are the regional population growth and nucleation, the continuation of settlement hierarchy in the upper valley, the emergence of C-48 as the new, dominant center, the virtual abandonment of the old center (C-18), and an expansion in the number of large villages (C-17, C-53, C-62, C-70, C-76, C-94, C-96, C-106) that likely acted as subsidiary centers in the upper valley system. The lack of correlation between site size and catchment productivity (when compared to the ERD) suggests the development of more complex agro-economic patterns in which site size was increasingly governed by investment in agricultural intensification in the form of terraces and irrigation, and/or by sociopolitical factors (possibly including political competition and tribute flow).

LATE HORIZON (AD 1430-1535)

The LH period witnessed Inka expansion into the southern Andes. The Inka domination of the southern Andes entailed different strategies of control, both direct or indirect (D'Altroy 1992). Direct Inka control in the Andes was generally associated with changes in settlement patterns and intensified exploitation of resources. In contrast, indirect strategies involved delegating the administration of territories to client elite, and using the local political structure to implement imperial policies (D'Altroy 1992; Stanish

1997, 2001). Indirect strategies often involved minimal imperial intrusion into subject areas.

The Inka presence in the valleys and highlands of southern Bolivia remains the subject of investigation (Alconini 2002; Janusek et al 1998; Lecoq and Céspedes 1997a; Lima 2000). Although our understanding of the Inka presence in southern Bolivia remains sketchy, it is apparent that Inka strategies widely varied according to political, economic, and security interests. For instance, in areas where mineral resources such as silver and gold were present, the Inka state employed direct control, reorganizing local settlement and political order, and construction a standard set of facilities as infrastructure. This pattern can be seen in the highlands of Potosí and the area of San Lucas in Chuquisaca. In contrast, in valleys to the south of Cochabamba that lacked valuable resource, control was much less direct and intrusive. The very fertile *pampas* of Culpina and Incahuasi, both high valleys (2900 masl) located 70 km east of Cinti Valley and in the zone next to the Inka frontier, provided broad areas for cultivating products such as maize and potatoes, and would have been more attractive to the Inka empire in terms of staple finance than the Cinti Valley. The lack of Inka buildings in Cinti could also be related to the relative proximity of a probable Inka regional center located 15 - 20 km north of Muyuquiri, at the extreme northern part of the study area. Here, in the vicinity of San Lucas, ethnohistorical documents refer to an Inka-created multiethnic settlement where groups, mainly from the Quillacas-Asanaque Confederation, were settled (Abercrombie 1998; Rasnake 1988; Saignes 1986). Ibarra Grasso examined this area in the 1940’s, and found in Yapusiri, near the present town of San Lucas, an Inka settlement with two main temples composed of rectangular and circular buildings.

Cusco style pottery was found in the Inka structures. The area around San Lucas and Padcoyo contain deposits of silver, zinc and lead, minerals also present in Carusla in the extreme northern portion of my study area (Troëng et al. 1996). It is possible that the Inka installations in San Lucas, and the presence of *mitmaqkunas*, might have been related to the exploitation of these metals.

The Inka domination of the Cinti Valley was indirect; we found none of the typical Inka provincial administrative centers or facilities (*tambos*). Nor have storage structures typical of Inka sites, such as *qollqas*, been found, suggesting that the Inka were not involved in surplus mobilization in the valley. However, the Late Horizon in the Cinti did include some changes in settlement that may relate to the region's incorporation into the Inka system.

General Settlement Patterns: Continued Population Growth and Settlement Hierarchy

The Late Horizon period saw the continuation of previous settlement trends: (1) the continued growth of regional and local centers; (2) population growth to 113 total ha of settlement (as opposed to 68 ha in the LRD); (3) population expansion with the spread of small settlements throughout the valley, and (4) agricultural intensification, with the construction of agricultural terraces and canals in both the upper valley and the canyon. C-48 (Jatun Talasa Huankarani) remained the dominant center in the regional system, expanding to 23 ha.

The LH period also witnessed the use and possible expansion of what had probably been a pre-existing road system that connected most of the larger settlements and terraced agricultural areas in the upper valley and the canyon. Finally, it is likely that Chicha *mitmaqkunas* were introduced into the valley during the LH. This introduction of foreign settlers is recorded in ethnohistorical documents that note that groups of *Tomatas* and *Churumatas*, members of the *Chicha* confederation, were settled in Cinti (Saignes 1986). Archaeologically, we found that surface collections in the canyon's settlements yielded significant proportions of Chicha ceramics, both decorated and undecorated, suggesting that the colonists probably were moved into the canyon section of the valley rather than the more densely settled upper valley. Chicha ceramics were rare in the upper valley.

For the LH period, 61 sites were recorded (Figure 3.23): 36 settlements, 25 areas of agricultural terraces, and system of roads. Probably some of the rock art sites dating from the previous period continued in use during this period. Of the 36 settlements, one can be classed a regional center (C-48, Jatun Talasa Huankarani), 9 can be classified as local centers, and the remainders are villages or homesteads. In the upper valley there are 11 (30.6%) settlements, while in the canyon there are 25 (69.4%) settlements, showing the continued expansion of settlement in this part of the valley during this period. Distances among settlements in the upper valley remained 2 – 5 km among the bigger sites, while in the canyon, distances among bigger sites averaged about 5 km, somewhat less than during the LRD period.

Regional Organization

A site size histogram of the valley (Figure 3.24) shows a tri-modal pattern consistent with the other lines of evidence indicating site hierarchy. Unlike the previous

LRD period, however, the model site size differences now appear in the canyon as well, indicating the development there of secondary or local centers, including C-96 (El Caserón), C-70 (El Patronato), C-62 (Volcán), and C-76 (El Porvenir).

The rank size distribution for the entire valley takes a log normal pattern, virtually identical to that of the LRD period, indicating the continuation of settlement hierarchy with C-48 (Jatun Talasa Huankarani) at the apex (Figure 3.25). C-48 is followed in size by canyon sites such as C-96 (El Caserón), C-70 (El Patronato), C-53 (Santa Rosa), C-76 (El Porvenir), and C-17 (Jayasamana) showing that C-48 is now the dominant site in a system that integrates not just the upper valley settlements, but the canyon settlements as well. The rank size distribution for the upper valley shows a slightly primo-convex distribution, while the canyon sites present a markedly convex distribution (Figure 3.25). If we examine the distribution of sites in the canyon, it becomes clear that the canyon rank-size convexity reflects the pooling of local subsystems, each consisting of a local center and cluster of spatially associated villages. These subsystems probably had little interaction among themselves, but were integrated into the C-48 dominated Cinti polity through their interaction with the larger centers in the upper valley.

Man-land Relationships

The LH population estimate for the entire valley is 9948 - 11328 persons (Table 3.1). For the first time in the Cinti Valley's history, the canyon had a larger population than the upper valley, with estimates of 5599 – 6375 (56.3%) and 4349 – 4953 (43.7%) respectively. The high population figure in the canyon represents a continuation of the trend of general population increase in the valley as a whole, and suggests that the upper valley may essentially have “filled” to capacity. The disproportionate growth in the canyon also may reflect an Inka emphasis on settlement and agricultural production in what had previously been a relatively under-populated and under-producing zone; the probable movement of Chicha *mitmaqkuna* into this area being the Inka reaction.

Catchment areas (Figure 3.26) include 2885.3 total ha of land, of which 865.7 ha is Category 1 land, 624.1 ha is Category 2 land, and 1395.5 ha is Category 3 land (Table 3.2). By this time, most of the Category 1 and 2 land in the Cinti Valley were under cultivation (i.e. within the catchment zones of settlements). New settlements, *per force*, are established on less desirable land. Catchment analysis for this period again shows enough land, maize and potato production (Tables 3.7, 3.8 and 3.9) to sustain the estimated regional population. The same could be said for legume/fruit production (Table 3.6) At the individual site level, as in the previous period, the populations estimated for the regional center C-48, and local centers as C-62, C-70, C-76, C-96, and C-106, as well as some smaller sites, are above their estimated catchment capacity suggesting, that food for these populations was being cultivated in other areas, marked agricultural intensification through terracing, overlapping catchment zones, or, as in the case of the canyon sites, that the catchment areas were elongated rather than circular zones because of the topography.

Regression analysis for the valley (Figure 3.27) shows a statistically weak but archaeologically revealing correlation between site size and agricultural land (n=32, r=0.313 p=0.001). Subdividing the plot for the upper valley and the canyon shows in the first case a moderate correlation (r=0.570 p=0.012) and a weak correlation for the last (r=0.082 p=0.197). As in the ERD, the largest sites are above their expected size given their catchment productivity. In fact, one can perhaps distinguish four levels of settlement, comparable to the complex settlement hierarchy observed in the Terminal Formative Valley of Mexico (Steponaitis 1981: Figure 2c and Figure 11). With the regional center (C-48) and the local centers either near or above their estimated local catchment productivity, it seems likely that these settlements were relying on lands in the catchment areas of small, nearby subsidiary sites, on lands that were not included inside their own circular catchment zones, or had the production of other sites as part of their catchment zone (tribute). In addition, the agricultural intensification seen in the building of terraces in almost all the areas possible for that purpose, reflect the marked LRD/LH effort to increase agricultural yields.

The relation of village size to catchment productivity is clarified if we remove from the analysis the largest sites and the sites smaller than 0.5 ha (pioneering settlements). As shown for the upper valley in Figure 3.28, there is a moderately strong correlation for villages between site size and agricultural land (r= 0.661 p= 0.014). This pattern underscores that the sizes of centers and villages are being governed by a different set of factors. The forces determining the sizes of the largest settlements (C-48 and the others) go beyond local agricultural productivity. In contrast, in the canyon there is no correlation at all between village site size and local productivity (r=0.009 p=0.704). The lack of correlation in the canyon, again, is likely due to the narrow topography creating non-circular catchment zones.

Dividing agricultural land and production into categories of land affords a surprising different perspective (Figure 3.29). There is no correlation between Category 1 land and site size (using all the valley sites), and this pattern includes productivities based on maize and potato production in these zones (r=0.007 p=0.654). Looking at Category 2 land and maize and potato catchment production, the correlation is merely weak (r=0.340 p=0.000). In essence, whatever was enabling C-48 and other putative centers to get large; it was *not* their proximity to the very best agricultural soils. The catchment zone for C-48 stands out for its proportion of Category 2 land, so it may be that at some level Cinti Valley settlement sizes were shaped more by the availability of “good enough” land, than by availability of optimal farmland.

SUMMARY: SETTLEMENT TRENDS IN THE CINTI VALLEY

A comparison of settlement patterns from the four periods reveals some clear valley-wide, regional trends. The regional distribution of initial agricultural village (Formative period) settlement broadly reflected the distribution of the best agricultural land, with the focus of settlement in the upper valley. Population growth increased steadily through time, from the 18.5 ha of total settlement area in the Formative period, to 31.1 ha during the ERD period, 68 ha in the subsequent LRD period, and finally 113.5 ha in the LH period. This population growth was accompanied by population nucleation into increasingly large centers, and in the spread of settlement throughout the canyon section of the valley. Eventually, by the LH, the estimated population in the canyon exceeded that of the upper valley.

Settlement Hierarchy

The Formative period settlement provides no indication of settlement hierarchy or political integration. The site size differences in the Formative were likely a function of local productivity. The ERD rank size distribution indicates that regional settlement integration developed in the upper valley, with C-18 at the apex of a settlement hierarchy. The settlement hierarchy revealed by the nearly log-normal rank size distribution of the LRD shows that the valley population was integrated into a regional polity, with C-48 (Jatun Talasa Huankarani) as the capital replacing C-18 as the dominant site. This regional settlement integration spreads into the canyon during the LH period, suggesting the existence of a valley-wide polity during this time. Inka domination in the LH period did not alter the major settlement trends of population growth and nucleation, and increasing settlement hierarchy.

The log-normal distributions seen in the LRD and LH rank size analyses are consistent with a settlement system characteristic of complex societies in which the populations are integrated a hierarchy of centers. This pattern does not fit what might be expected from the "decentralized" *ayllu* polity model, in which otherwise autonomous communities or settlement clusters were connected only by a regional center or *marka* where limited special activities (primarily ceremonial) took place in certain times. We would expect that the rank size distribution of such a polity would show a strongly primo-convex pattern, or even a markedly convex pattern. In contrast, the politico-economic forces integrating the Cinti population were sufficiently strong to create a valley wide hierarchy of site sizes, with little indication, expect perhaps in the canyon, for relatively autonomous settlement subsystems.

The evolution of Cinti settlement can be compared, at least in outline, to settlement evolution in neighboring valleys and regions. Settlement in Quila Quila, to the north of the Cinti Valley, and in Tupiza, to the south, did not gain the complexity seen in

Cinti. No settlement hierarchy can be distinguished in the former area during the LRD or Late Intermediate period, and at most a rudimentary two-tier hierarchy in the latter (Angelo 1999; Lima 2000). A more parallel evolution took place in Oroncota and in Icla, where the Late Intermediate period saw the development of a three-tier site size hierarchy, including regional centers (Alconini 2002; Janusek and Bloom n/d). However, I believe that much of this apparent variability in settlement patterns may relate to the scale at which different "regional" surveys were carried out. Boundary effects along mean that there can be marked differences between surveys that cover only 80 km² and those that cover 250 km². More large scale survey, at least valley wide surveys, will be needed to generate truly comparable data sets and provide a better sense of how typical the Cinti evolution might be of demographic and settlement processes in southeastern Bolivia.

Staple Strategies

Did staple strategies underlie political leadership or elite status in the polity that emerged in the ERD/LRD period? If this were the case, I predicted that centers would be disproportionately large relative to their catchment productivity, with the "excess" resident population supported by tribute extraction or intensified agriculture. Centers were disproportionately large in the LRD and LH periods, and there is evidence of terrace construction around these centers (as well as many smaller sites). However, we cannot conclude that tribute mobilization, as opposed to other political arrangements that gave these sites catchment zones larger than 1 km across, enabled these disproportionately large centers.

Accompanying the population growth was a constant increase in agricultural production, with the extension of settlement into less productive lands, and the construction of terrace systems. Agricultural intensification in the form of terracing and irrigation was most dramatic during the LRD and LH periods. The construction of terraces not only allowed a control of erosion but also created conditions for maintaining deep arable soils behind the terrace walls in favorable microhabitat conditions. As Denevan (2001) notes, terraces create microclimates with desirable regimes of moisture, wind, and temperature.

I estimate that LRD terrace construction totaled at least 132 ha, while LH construction may have raised this figure to 231 ha. Most of these terrace systems were located in the upper valley around or close to the regional center (C-48). This is not the area of optimal soils, but the place in the valley where there may have been the most water available for irrigation.

Comparing the correlation of Category 1 land in site catchment zones to site size throughout the sequence in Cinti reveals that this correlation was becoming weaker through time. For instance, the correlation changed from $r=0.279$ $p= 0.035$ during the Formative period to $r=0.127$ $p=0.160$ in ERD, to $r=0.023$ $p=0.471$ in LRD, to finally $r=0.007$ $p=0.654$ in LH. This means that Category 1 land was not as important as governing site size in later times as in early periods. This pattern no doubt reflects a population “filling up” the best agricultural lands early on, and the subsequent push for residents to turn to the moderately productive Category 2 land.

Examining the correlation of Category 2 land/production in the sequence, a different pattern is manifested, suggesting that production on this land become more important for bigger sites with time. The correlation changed from r=0.001 p=0.913 during the Formative period to r=0.146 p=0.130 in ERD, later it got strong r=0.214 p=0.020 in LRD and finally in LH values and significance are higher r=0.340 p=0.000. Although results do not show strong correlations, they point towards the increased importance of Category 2 land in both supporting the larger population as well as the political economy of the LRD and LH periods.

Considering that Category 2 land needed the construction of terraces and irrigation channels for maximal agricultural production, that the bigger sites relied more on intensified production in these lands than they did on Category 1 land, supports the hypothesis that the ability to generate agricultural surplus was associated with the rise of political centralization in the Cinti (staple strategy).

The next step in evaluating the importance of a staple strategy is to turn to considering individual sites in order to determine if there was relatively greater storage capacity (at the community or household level) at the larger centers. This possibility will be addressed in the next two chapters, along with the intersite and intrasite lines-of-evidence relating to wealth and prestige strategies.

CHAPTER 4

INTERSITE DIFFERENCES AND LEADERSHIP STRATEGIES

In this chapter I compare Cinti sites for intersite differences that would relate to the operation of staple, wealth, and prestige strategies. Archaeological correlates for staple strategies would include evidence for marked differences in storage or agricultural production, as seen in:

(1) architectural features (specialized storage facilities or storage spaces in domestic units).

(2) storage vessels. Higher proportions of storage vessels at particular sites might indicate that these sites were more heavily involved in agricultural production or control of surplus. Storage of agricultural products in jars has been a common practice in the southern Andean valleys. For instance, Raffino (1988, 1993) describes cases in northwest Argentina where products such as maize, quinoa, and algarrobo were stored in jars. Similarly, Lecoq and Céspedes (1997a, b) report storage in jars at Middle Horizon sites in the valleys of Potosí. Large jars were also used in fermenting maize and preparing chicha.

Wealth strategies are based on controlling the production, flow and use of valuable items or prestige goods. Such objects are likely to be exotic, long-distance imports, bear distinctive iconography, or be the result of labor-intensive craft production. Wealth strategies may have involved control of the raw materials from which valued goods are created, such as the Tiwanaku polity's control of obsidian (Giesso 2003) or the Inka's control of raw resources (Earle 1994). Concurrently, wealth strategies may involve control of the craft specialists that produce prestige goods (D'Altroy 2002), or involve domination of the exchange of that good. These variants of wealth strategies provide the basis for intersite comparisons. In a system in which wealth strategies were important, we would expect that regional and local centers might:

(1) be disproportionately associated with camelid corrals, because camelids were themselves "wealth goods" that produced wool for textiles, one of the most common prestige goods in the prehispanic Andes. As beasts of burden, camelids also made up the caravans that moved prestige goods.

(2) display evidence for craft specialization (ceramic workshops, stone tool workshops, bead workshops, disproportionate proportions of weaving tools) spatially associated with elite residential areas or public architecture.

(3) reveal higher relative proportions of wealth items made up of non-local raw materials or artifacts such as shell, lapis lazuli, obsidian, or alabaster.

4) exhibit proportionally more valuable or imported goods (particularly pottery from distant regions) than sites at lower levels in the settlement hierarchy.

Prestige strategies are difficult to evaluate, because they are not dependent on economic processes that manifest themselves in simple ways in the archaeological record. Material possessions associated with prestige strategies would likely consist of feasting and ritual items, and ceremonial facilities. As explained in Chapter 1, we would also recognize the operation of prestige strategies by noting the *absence* of staple or wealth strategy indicators in a central place system. In other words, the central place functions in this system would consist solely of public and ritual attributes. If prestige strategies were the basis for elite status in Cinti, archaeological indicators would be:

(1) the bigger sites (regional and local centers) largely distinguished from other sites *only* by size and by a greater proportion of features relating to communal ritual such as ceremonial architecture and regional cemeteries.

(2) *marka* sites or regional centers possessing public areas or public

architecture, but would displaying evidence for marked household wealth differences in house size, construction materials, or elaboration;

(3) differential participation in feasting activities with “elite” areas or the *marka* site displaying the presence of higher proportions of serving vessels for food preparation and consumption (bowls) or drink preparation and serving (jars for chicha, cups). Unfortunately, it is known from ethnohistorical and ethnographic sources that serving vessels, especially cups for drinking chicha were frequently crafted in wood (Abercrombie 1998; Rasnake 1988) or from gourds (Harman 1987). Today in the Cinti Valley and nearby areas, chicha is consumed in wooden or gourd bowls. Excavations at El Porvenir (Rivera Casanovas and Michel López 1995a) yielded a burial accompanied by small, keru-like cups, together with the remains a carved wooden bowl. Thus, there is the possibility that drinking vessels will be significantly underrepresented in the archaeological record.

THE NATURE OF THE SURFACE COLLECTIONS AND DEALING WITH MULTICOMPONENT SITES

This chapter explores potential staple, wealth, and prestige strategies in the Cinti populations in a diachronic perspective. Exploring architectural differences in site layout allowed understanding of how people organized their space and social relationships through time. We also looked for potential differences in the composition of settlements, according to their place in the regional hierarchy, and assessed architectural differences potentially indicative of public versus residential space.

At the same time, analysis from surface collections drawn from different sectors of each site provided information about the range of activities carried out in the settlement. Surface collections were made in all sites that presented materials on the surface. In general, sites were divided into sectors according to cultural or topographic features, and in each sector, one or more collection circles (2 m diameter) were placed.

Only sites that yielded at least 384 sherds in their collections were considered for analysis, because I desired a confidence level of 95% for error ranges of ± 5% in comparing the proportions of different materials. This means that most of the homesteads were left out of my analysis, because most of them yielded 30 - 100 artifacts. In the case of Formative sites, proportions were estimated with a minimal confidence level of 66% for error ranges of ± 44% (or 20 sherds) as an optimal minimum because the quantity of Formative materials was limited in most of the surface collections.

One of the major problems in collecting multicomponent sites was the difficulty of distinguishing domestic ceramics from different periods. Because of this difficulty, I decided to use different strategies for analyzing materials of different periods. For instance, Formative period materials were analyzed without problem, because Formative ceramics are distinctive enough to be isolated from materials from other periods. In the case of the ERD period, I chose to use just the unicomponent sites for the analysis presented in this chapter, with the exception of two sites containing an important occupation from this period (C-67 and C-74). This strategy allowed me to explore ceramic variability that would not have been possible using multicomponent sites.

In the case of the last two periods - - LRD and LH - - I was not able to distinguish domestic ceramics of these periods from one another. Although some diagnostic forms were apparent, the bulk of sherds, especially from bodies of jars and cooking pots, were not chronologically distinguishable. In this case, analysis was twofold: first, I only analyzed unicomponent sites by period as in the case of the LH period; and second, in dealing with LRD sites, I mixed unicomponent and multicomponent (LRD/LH) sites when there was a predominance of LRD materials at the site. Both types of comparisons were carried out and are presented here.

In the case of sites that were occupied during the last three periods of the sequence, I considered that, although some mixing of materials occurred on the surface, this would not be a problem because most of the ERD materials are buried in the lower stratums of the sites (as was evidenced in excavation), therefore the existing mix should not affect in great degree the proportions in the analysis.

Two ceramic analyses were performed. The first was a functional classification in which diagnostic sherds were sorted into three main functional categories based on vessel shape: (1) serving vessels, including *kerus*, bowls, plates, basins, and small jars such as the *jarrita con pitón*, used for drinking chicha (Ibarra Grasso 1973); (2) storage vessels or *cantaros* used for storing solids and liquids; and (3) cooking vessels or ollas used for food preparation. A fourth category consisted of non-diagnostic sherds; that is, sherds that could not identified as to vessel form. Functional categories, excluding the non-diagnostic, were compared in terms of proportions using bars and bullet graphs. Most of the analysis is based mainly in bullet graphs (see Drennan 1997) because the proportions and error ranges are depicted in a way that provides easy graphic comparisons.

The second analysis consisted of looking at the proportions of imported ceramics in all settlements in order to determine if they were disproportionately located at the centers, and therefore related to prestige and/or wealth strategies. Non-pottery materials recorded in surface collections such as lithics, beads, and metals, were used for ubiquity analysis, and for testing whether craft specialization was spatially associated with elite residences or public areas.

FORMATIVE PERIOD: NO WEALTH OR PRESTIGE STRATEGY DIFFERENCES

During the Formative period, small farming communities were established along the valley. These communities appear as discrete concentrations of sherds, in most cases forming part of multicomponent sites. The lack of surface architecture made it difficult to obtain any information about settlement composition or layout. Judging from information in the Puna area of Potosí (Lecoq and Céspedes 1997b) houses probably were circular in plan, and a household might have used at least a couple of these structures for sleeping, for a kitchen, and for storage. The size of the Formative scatters suggests that most communities probably were made up of at least several household compounds.

Survey did not reveal evidence for a Formative period settlement hierarchy. A Formative period cemetery, Barrio Obrero (C-80), was found in the canyon near San Pedro (Figure 3.2). This site contains secondary burials (bones or ashes) contained in funerary urns. We found no primary burials at the site, but they may exist there as well. A 14C AMS obtained from the walls of one of these urns yielded a calibrated date of AD 1-218[1]. Unfortunately this cemetery has been badly damaged by modern construction. Local people recalled how during the construction work, a lot of urns and bones, as well as skeletons were removed from the earth.

There is no evidence for wealth strategies during the Formative period. Surface collections at Formative sites produce a relatively small amount of sherds and lithic artifacts (Tables 4.1 and 4.2). Formative period pottery generally consisted of undecorated wares of local manufacture, ranging from utilitarian domestic vessels to funerary urns (see Appendix C). Proportionally, there was a predominance of storage and cooking vessels over open forms at each multicomponent site, mainly *cuencos*. However, in unicomponent sites, it is apparent that all these categories are represented (Figure 4.1). There are no significant differences among the sites in proportions of serving, cooking, or storage wares. We found no decorated pottery dating to this period, except for at C-66 and C-80, where some decorated fragments were recovered.

Lithic materials from this period included projectile points of different shape and size, knives, scrapers, nodes, flakes and debitage (Table 4.2, Figure 4.2). Tool manufacture and use was carried out in the settlements and in camp sites. Most of these artifacts were made of local stones such as quartz, varieties of quartzite, and basalt. The wide variety of high quality stones present along the valley provided these populations with the necessary raw materials for tools. For instance, C-30 (Figure 3.1) is a hill with around 20 has of quartzite outcrops, intensively exploited through time as a quarry area. Surface lithics here include cores, flakes, and projectile points. The absence of lithic cores at most of the sites and the presence of flakes, mainly secondary and tertiary[2], and pre-forms indicate the first steps in the manufacture were carried out at the quarries where cores were obtained and converted into performs. The surface collection did not reveal any intersite differences in lithic assemblages during this period, or any evidence for lithic production concentrated at particular sites.

EARLY REGIONAL DEVELOPMENT PERIOD

During this period, settlements grew in size and component complexity. I could not map many of the sites of this period because the early occupations are buried under subsequent occupations, or because of insufficient architectural preservation. Nonetheless, some basic characteristics of ERD site plan and architecture can be outlined. Sites were made up of residential terraces, filled with earth moved from the base of the valley (in the case or most sites), or cultural refuse from the same site. Three examples of sites at different levels in the ERD site size hierarchy are briefly described below.

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[1] Calibrated at two sigma 95% (AA45701, 14C age 1919±45 BP).

Palcamayu (C-18)

This was the largest site in the valley during this period, covering 7.26 hectares, and is located on a bench of sandstone outcrops. The site straddles two elevations and with intervening flat areas (Figure 4.3). The settlement visually dominates the surrounding landscape, and from it there is an excellent view of the Huankarani valley and the Cochaca basin.

Remains of terraces and rectangular structures with patios are visible at the site, although they are collapsed and covered by cacti and xerophytic vegetation. These structures average 3 x 4 meters or 12 m^2 in size. In general, house foundations consisted of one row of stones ranging from 30- 50 cm in size, although double course foundations were also observed. It was not possible to differentiate distinct functional areas at the site, or any non-residential architecture. Graves were found associated with residential structures. Graves consisted of circular and rectangular cist tombs, built from cut red sandstone. These tombs were sealed by flat stones.

A prehispanic road crosses the settlement in an area that separates the two peaks. Although this road forms part of a system that can be dated in the LDR and LH periods, it is possible this segment already was in use in the ERD, and was later reused.

Talasa Chaco (C-58)

Talasa Chaco, covering 4.4 hectares, is located on a rocky formation overlooking the beginning of the *cañadón* that connects the upper valley and the canyon. The

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[2] Primary flakes present more than 50% of the cortex, secondary flakes less than 50% and tertiary flakes no cortex at all.

settlement presents several levels of residential terraces holding dwellings, patios and other structures. In the central part of the settlement, terraces are wider than in the rest of the settlement. Structures are rectangular, with foundations of one or two courses of stones. This site displayed larger structures than those seen at C-18, with dimensions of 7.5 x 5 (35.5 m^2) down to 5 x 4 meters (20 m^2). Circular and oblong cist tombs are distributed throughout the settlement.

Papagayo Bajo (C-73)

Papagayo Bajo is a typical village of this period in terms of size and location (Figure 4.5). It is located on a small elevation near the river, and consists of the architectural remains of residential terraces, rectangular dwellings, and collapsed stairs that connected levels of terraces in the north part of the settlement. Foundations consisted two courses of stones. Below the elevation are corrals and additional architecture.

Early Regional Development Period Intersite Artifact Assemblage Variability

Surface collections obtained from sites from this period were analyzed in order to determine if artifact variability suggested wealth and/or prestige strategies, with Palcamayu (C-18) and Talasa Chaco (C-58) standing out as putative centers, based on their size. For this purpose, only unicomponent sites and those sites where materials from this period strongly predominated were used.

Ceramic Variability

Serving vessels are present in more or less similar proportions in all sites, (between 4 and 13%), however some differences also exist. The biggest site in the valley Palcamayu (C-18) and the second one, Talasa Chaco (C-58), have lower proportions of serving vessels than three smaller sites (Figure 4.5). All the sites share proportions to the 95% and 99% confidence level, meaning differences are not strong but they are statistically significant. This pattern is striking because these two sites are the largest sites in the valley and might be expected to have higher proportions of serving vessels if leaders or elite groups were residing and feasting there. However, the low proportions might relate to the amount of people living in these settlements. If feasting was organized by a particular segment of the population at a large site, the evidence for it could be swamped by the ceramics deposited by the commoners at the site. On the other hand, higher proportions of serving vessels in small sites might reflect the opposite situation, a segment of the population or important families could be organizing feasting and it is evident in the proportions of serving vessels because the overall population at the site is smaller.

In the case of storage vessels, there is a different pattern (Figure 4.5); here there are strong, significant differences among two groups of sites. The bigger sites in the sample have proportionally more storage vessels (50-60%) than do smaller ones (20-40%), for instance, Talasa Chaco (C-58), Palcamayu (C-18) and C-67 have more storage vessels than the other sites. C-1 and C-8 have significantly less storage vessels than the other sites.

There are strong and significant differences in the proportion of cooking vessels in the sample between two groups of sites, with Talasa Chaco (C-58) and Palcamayu (C-18), the bigger sites in the valley during this period having relatively higher proportions of cooking vessels (22-29% respectively) than C-1 and C-8, and significant differences with C-67 and C-74 (Figure 4.5). While the proportionately greater storage and cooking vessels at Talasa Chaco (C-58) and Palcamayu (C-18) may relate to greater involvement by residents in food preparation for feasting activities, we would expect feasting activities to be manifested in proportionally more *serving* vessels.

From these mixed results, we can conclude that there is no unambiguous evidence in our sample suggesting that prestige strategies - - at least as reflected in vessels likely to be used in feasting activities - - were the basis for elite status or underwrote Cinti political leadership during this period. If prestige strategies had been important, I would have expected to find significantly greater proportions of serving vessels in the assemblages at the largest sites, rather than at the smaller settlements.

Turning to wealth strategies, I predicted that high value goods such as elaborately decorated pottery or imported pottery should be disproportionately represented in samples from the largest sites in the system. The ERD sample did *not* indicate that decorated pottery was represented in higher proportions at the biggest sites. In fact, almost no non-local ceramics were found either in non-systematic or in systematic surface collections on settlements from this period. Only at Palcamayu (C-18), did we recover a single Tiwanaku keru fragment.

During this period, pottery of the Thick Rim Stamped and Incised tradition began to be used in the Cinti Valley. Although this pottery style originated in the eastern lowlands, the Cinti samples were produced locally using local pastes and tempers (Alconini McElhinny and Rivera Casanovas 2003; Rivera Casanovas 2003b). The spread of this stylistic preference into the Cinti might be related to the establishment of economic, political, and even kinship ties with lowland populations, which allowed cultural exchange and sharing of preferences among distinct populations (Rivera Casanovas 2003b). Ties with lowland groups would have been important for getting products from the forest; exchange of ritual/medicinal plants as well as shells for ornaments, among other products, seem to have been common during this time (Janusek et al. 1998; Téllez 1997). Therefore, if this ceramic tradition is related to these processes, these ceramics could be taken as an indicator of regional interaction and possible exchange. This ceramic tradition may be in some ways, therefore, a proxy for interaction with populations to the east. That said, the distribution of this pottery in the ERD surface samples did not indicate disproportionate amounts at any particular sites. All sites displayed (using this ceramic measure) the same access to external ties.

Evidence of Ceramic Production

Surface collections yield evidence of ceramic production in Ojo (C-67), a village with rectangular structures associated with agricultural terraces. Although the site also bears Formative and LH occupations, the majority of the site dates to the ERD. Evidence for production (Table 4.3) includes ceramic wasters, and fragments of vessels in process of modeling. Also, this surface yielded many burned or over-fired sherds, and pale yellow buff jar fragments. Some ceramic objects whose function was not identified were also present. These indicators are similar to those found at Ch'iji Jawira, a ceramic production area in the Tiwanaku capital (Rivera Casanovas 1994, 2003a). A crucible piece, in the shape of a keru was also identified. As the bulk of the occupation belongs to the ERD, I believe the pottery manufacture dates to this period. However, many of the Formative period sherds also showed heavy burning. This situation could be because the earlier deposits were disturbed and materials exposed to fire associated with pottery manufacture in later periods.

Intersite Variability in Other Artifact Categories

The distribution of lithic forms reveals that expedient tool production was probably taking place at the household level at each site (Table 4.4). Surface collections from each site generally included projectile points, scrapers, knives, and flakes (Figure 4.6). Most of the flakes are secondary or tertiary, suggesting the first steps of manufacture were carried out at the sources of lithic materials, then preforms were brought to the settlements for manufacture into specific tools. The low densities of artifacts and flakes in all the systematic and diagnostic collections suggest lithic production took place at the household level to cover domestic needs. The surface collections revealed no specific areas of production characterized by high concentration of lithic materials, or high proportions of manufacturing debris that might relate to craft-specialization. There was nothing in the surface collections to contradict the picture of each site being equally involved in the procurement, reduction, and use of lithic materials.

Special "prestige good" artifacts such a shell beads, copper, and other metal objects were so rare in surface collections in unicomponent sites from this period that quantitative analysis is meaningless (Table 4.5). For instance, the only ERD period copper fragment was recovered at C-18 (Palcamayu), the largest site in the valley. Multicomponent sites yielded shell beads.

ERD Summary

Neither the comparison of architectural features at ERD sites, nor the intersite variability seen in the surface collections, revealed evidence for wealth or prestige leadership strategies. I found no marked evidence for functional variability among sites, or indications that the largest sites (C-18, C-58) were indeed “central places” in the functional sense, or the residential site of an elite stratum or political leadership. Admittedly, surface architectural preservation was poor for the ERD, but we did not find evidence for public architecture or larger llama corrals at the larger sites. I can be more confident in concluding that the bigger ERD sites do not have relatively high proportions of high value, wealth and prestige items.

The high proportion of storage vessels at bigger sites might suggest the presence of a staple strategy, if we assume that these vessels were primarily used for food storage. However, there is also the possibility that storage vessels were being used to hold food or beverages used in ceremonies. Both possibilities are plausible, and future research has to address these points; contextual data from excavations in residential areas as well as public sectors will be crucial to solve these points. For instance, if the ERD population included an elite stratum involved in staple strategies, and food was stored in jars, I would expect to find higher proportions of storage vessels in elite domestic contexts.

In sum, the intersite architectural and artifact assemblages shed little light on whatever leadership strategies may have been operating in the ERD settlement hierarchy. C-18 did not stand out from other sites in any way consistent with our expectations for the different strategies.

LATE REGIONAL PERIOD AND LATE HORIZON PERIOD

As discussed earlier, occupations from these periods are analyzed together because of the difficulty in chronologically distinguishing architecture and artifacts.

Excavations carried out in Cinti (Rivera Casanovas and Michel López 1995a) and the present research have shown that most of the Cinti sites present a sequence of occupation with at least two different construction phases: a first one that belongs to the LRD period and a second one related to the LH period. I will return to this topic in the next chapter. Some of the visible architecture at the sites probably belongs to the latest occupation or LH period, but there also occurs mixtures of LRD structures with the new LH features, or sectors within a largely LRD site with a new LH occupation.

During the LRD and LH periods, the patterns of growth of sites and population nucleation continued, giving rise to a settlement hierarchy consisting of regional centers, local centers, large villages, and small villages/homesteads. These settlements present community plans and architectural elements that suggest some level of social differentiation within large villages, local centers, and the regional center. The following sites were chosen for description based on their place in the settlement hierarchy, and the degree of success we had in the field in mapping them, or in producing detailed descriptions of them: the regional center (C-48), two local centers or large villages (C-

76, C-70), small villages (C-72, C-87, C-79, C-34), small villages with corrals (C-38, C-68), and a homestead (C-41).

Jatun Talasa Huankarani (C-48): A Regional Center

This settlement was a regional center in the valley during the LRD and LH periods; during the LRD period it reached 17 ha in size, and subsequently in the LH period grew to 23 ha. It is located on a steep rocky hill whose base is delimited almost completely by the Liquemayu River to the north, and the Tacumayu River to the south and west (Figure 4.7). The locale includes two peaks, one to the east and the other to the west, between them is a saddle that contains a large part of the settlement. To the east there is a flat plain over which the site expanded during the LH period. The site visually dominates the upper valley, the canyon, the nearby *quebradas* and small surrounding basins; many points of access and routes leading to the region could have been observed from C-48.

Jatun Huankarani differs from other sites not only in terms of size, but also in internal spatial differentiation, and scale of architectural construction. The site layout presents a regular plan, with the streets and staircases running at right angles to connect distinct residential sectors and residential terraces. Within the site, there are also architectural differences among sectors that suggest residential social status or wealth zonation.

The site is divided into eight distinct sectors separated by walls or landscape features (Figure 4.7). In the Late Horizon, Huankarani (C-45), located on the flat top of a near hill, was incorporated into the settlement, or at least can be considered a C-48 outlier (Figure 4.7). Here the orthogonal pattern of construction continues, as well as the careful treatment of the walls. As this area is flat, residents here did not build domestic platforms and terraces. Due to the presence of dense xerophytic vegetation, it was not possible to make a close inspection of the occupation in this area.

A large canal draws water from the Liquemayu River, and taking advantage of the gradient, crosses the settlement through northeast section. This canal feeds secondary canals used for irrigating all the terraced fields located in the lower part of the mountain. I believe it is likely that this canal was built in ancient times and should be considered part of the site. From it, water for the inhabitants and terraced fields would have been obtained. This type of irrigation feature - - in size and complexity - - is unique among the sites of the LRD/LH period in the valley.

One of the most impressive elements of this site is the set of large walls that separate residential sectors within the settlement, and a wall that encloses the southern edge of the site (Figure 4.8). The latter runs from east to west for more than 2 km. Although it has collapsed in some parts, it was at least 2 m high, and has a gate where a prehispanic road enters the settlement. The other two walls separate Sector 1 from 2, and Sectors 2, 3, 4, 5 from Sector 6. The function of these walls might have been defensive in nature, but could also relate to status or social segment zonation. A similar situation has been observed in the Mantaro valley (DeMarrais 2001) in Wanka III settlements, where walls separate sectors of sites such as in Jatun Marka.

The large wall that circles part of the settlement may be related to Inka influence, and could have constituted an element of status as has been noted for other regions in the Andes (Alconini 2002; Niles 1997). Such walls were built in administrative sites or regional centers to visually highlight the political importance of the settlement.

Sector 1

Sector 1 is located in the westernmost part of the hill (Figure 4.7). This sector is separated from Sector 2 by a long wall that crosses the east part of this peak from the northern heights, descending gradually to the flat, central area of Sector 2. This sector includes residential terraces covering both the slopes of the peak, as well as the small flat area on the hilltop. Due to the steep slopes, building houses here required considerable labor investment in the construction of domestic terraces. Some of these habitations present a patio arrangement. It was difficult to observe architectural features in the western part of the peak because of the steep grades and the xerophythic vegetation. However, grinding stones or *batanes* were observed on surface, indicating food processing activities in this area. On the eastern slope of the peak, structures are visible as well as circulation paths that connect terraces to a main street. The structures here were larger 3 x 4 (12 m^2) - 4 x 4 meters (16 m^2) than in other sectors of the site and exhibit more elaborate construction techniques compared with other sectors such as the east slope of Sector 2, Sectors 4-5, and Sectors 6 and 7.

Sector 2

Sector 2 constitutes the core of the settlement. It covers a flat area that separates the elevation in Sector 1 from a hill peak in Sector 2; this last feature is covered by residential terraces. This hill area has house remains visible on the western slope of the peak. These houses were smaller and of less elaborate construction than those in the rest of the sector, which suggest the western hill slope residents were of lower status or less wealthy than residents of the central part of the sector. Residential terraces in the center of the sector hold dwellings arranged in patios groups. Structures here include small rectangular structures (1 x 1 m), possibly used for storage, either adjoining, or slightly separated from, habitation structures. These small structures are found only in this sector of the settlement.

Terraces are connected to a central street that runs from the upper part of the site towards the center of the flat, central area, crossing the slope. This path is 1.50 m wide, and is demarcated by terraces. Entrances from the street to patio groups or to structures in the terraces are clearly marked by the arrangement of stones. Looted cist burials are found both in house floors and in patios. Grinding implements are also ubiquitous through the hill and terraced section of the sector.

In the flat, central part of this sector, and in the southern section, towards Sector 3, are larger open spaces, larger structures, and greater architectural complexity in terms of the distribution and segmentation of space. The level of planning and the investment in stone architecture suggest higher status residents than elsewhere in Sector 2. This sector seems to have been remodeled during the LH period.

Sector 3

Sector 3 is located south of Sector 2 (Figure 4.7); it is divided from the latter by a rock outcroppings and a hillslope. Most of the Sector 3 residential terraces are built at a lower elevation than in the two previous sectors. This sector presents the most elaborately constructed residential terraces in the site, with walls that reach between 1 and 2 m high (Figure 4.9). Also, in this sector we found the most elaborate construction in the site: fine stone joinings, and stone wall masonry (*paramentos*) of houses built to form trapezoidal shapes for better structure stability. There is a path or street that runs among the terraces, measuring 1.5 m wide. Structures grouped around patios measure in average 5.30 x 2.80 m - 5 x 3 m (15 m^2), although bigger structures 6 x 4m (24 m^2) or more were also identified. Entrances to structures and patios are marked by two longer lintel stones. The distribution of patios and circulation areas is quite regular. Cist burials are present either inside structures or in patios, with walls of small flat stones and caps of big rectangular, flat stones.

One of the striking features in this sector is the density of grinding implements on the surface. Although all the sectors presented these grinding stones, Sector 3 exhibited a higher density of different stones and greater variety of grinding artifacts: grinding stones (*batanes*), flat grinding stones for producing flour, mortars, and pestles. Also, there are oblong stone fragments that may have been used as hoes. Finally, we also found the remains of worked green slate, possibly used to make hoes.

Sectors 4-5

Sectors 4 and 5 form the northernmost part of the settlement (Figure 4.7). These sectors are discussed together because their division is somewhat arbitrary. Here, the terrain slopes down toward the river. This slope is completely covered by residential terraces that now are eroded or have even collapsed. Terraces or platforms measure 5

- 15 m with walls of 1 - 2 m high. Structures are rectangular in shape, and are connected to patios by small pathways. There are cist burials here as well. The easternmost part of this sector is separated from Sector 6 by a massive wall.

Sector 6

Sector 6 is located in the easternmost part of the hill, presents a lower density in buildings than other areas of the site, and it is separated from Sectors 2, 3 and 5 by a huge delimiting wall (Figure 4.7). This sector displayed a lower density in both terraces and buildings than other sectors, although some terraces reached 1.70 m high. Most terraces, especially in the lower part of the sector, near the ancient road, were smaller. Terraces contain structures, patios, and cist burials. There are some small areas of terraces and structures in the *quebrada* that separates most of the site from sector 7.

Sector 7

Sector 7 is located on a small hill separated from the rest of the sectors by a *quebrada* (Figure 4.7). This sector is linked to the rest of the settlement by a road that still has traces of paving in some areas, particularly on the slopes. This sector consists of platforms or wide terraces with structures and patios. Unfortunately this sector has been greatly disturbed, first by the hacienda activities and modern settlements, and most recently by the construction of a road.

Sector 8 (C-45)

Sector 8 was built during the LH period, judging from the ceramic materials and the shallow stratigraphic deposits; it therefore represents the youngest occupation in the settlement (Figure 4.7). It is located on a flat hilltop in a lower elevation than the rest of the site. The big wall that runs in the southern part crosses a saddle and continues towards the hilltop, separating this sector from the agricultural terraces and circulation paths located in the south and west slopes of the hill. Because of the vegetation, it was difficult to reconstruct the planning in this sector, however, a series of low platforms built for leveling some gradients in the terrain were observed. These platforms present one row of big stones and contain patios or *canchas* associated with structures displaying double course stone foundations. As we originally registered this sector as a separate site, it is divided in three different sub-sectors: Sector 1 or north, Sector 2 or east and Sector 3 or south. Possible functional among these sectors will be discussed in the next chapter.

Architectural Details at C-48

C-48 was occupied throughout the prehispanic sequence, and therefore contains remains from the Formative period through the Late Horizon. The earlier occupations are buried under the later ones, and it was not possible to analyze them. The visible remains correspond mainly to the LRD and LH periods.

The natural rock in the area consists of quartzite sandstones and lutites, and these materials were generally used in the construction of buildings, terraces staircases, and to pave paths.

Structures were built by piling up stone blocks in a way that the semi-regular shapes of the blocks formed joints and unions. Blocks used in houses typically measure 40 – 50 cm on a side, although some blocks used in the big walls that divide the site into sectors measure 80 x 60 cm. Also used were small blocks of 10 cm or less on a side, used in the junctures of dwelling walls. The stones used in the walls of dwellings were worked on both sides, providing regular faces both internally or externally. The core of double course walls was filled with rubble of small pieces of stone (Figure 4.10). In general, larger stones were placed in the lower walls and toward the corners with the purpose of giving more stability to the structure (Figure 4.10). The presence of stone blocks with dressed, regular faces, with dimensions of about 100 x 40 x 10 – 15 cm suggests that entryways to the structures used stone lintels. In the terrace walls, stone blocks of greater dimensions were employed, always taking care to create smooth, regular faces. The same technique was used in the construction of paths and staircases.

The rectilinear disposition of the walls is consistent, although in some areas this characteristic is broken either due to the topography or blocks of such size that straight lines cannot be maintained. An interesting architectural detail is a gap often left between the terrace retaining walls and the foundations of the dwellings. In several places there is a space of 30 to 50 cm between the walls of the terraces and the walls of the dwellings that are supported by the terraces. This generates a pyramidal structure that provides better support to the buildings (Figure 4.10).

The big walls that cross the site have a thickness of 1.50 - 2 m and are built with stones with dimensions of 80 x 60 x 60 cm, although some larger stones measure 1 m on a side. These walls reach 2 m high in some areas. These walls run over the terrain in almost straight lines, crossing all the natural obstacles without changing their direction. These features are evidence for some level of public labor management and planning that relate to the organization of the site as a whole.

Although not totally uniform, the stone work of Sector 3 and the central area of Sector 2 exhibited the greatest amount of care and labor investment. In these areas, the wall masonry is highly regular, and the joining of the stone blocks very precise, almost without using small, fitting pieces (Figure 4.10). Double course masonry was widely used in the flat area of Sector 2. Domestic architecture is least substantial in the eastern zone of Sector 2 and in Sector 6. Here, the architecture is also less regular and rectilinear.

Site El Patronato (C-70): A LRD/LH Local Center

This is a large local center (9 ha) with most of its occupation dating from the LH period, and a large LRD occupation in the center of the site. The site is located near the hacienda El Patronato over a series of moderate slopes, crossed by two *quebradas* that hold the Patronato River (Figure 4.11). This site has 5 principal sectors divided by the two *quebradas* that divide the site from east to west. The central sector (Sector 2) was the most densely occupied followed by Sector 3. This core area of the site exhibited larger open spaces, and a better quality of architectural construction. The farther one moves from the center of the site, the lower the residential density and the lower the level of investment in the architecture. Such a situation is clearest in Sectors 1 and 5, where there is lower structure density, generally smaller houses, and more open terraces. The construction techniques in these areas represent less labor investment than structures in the center of the site.

Red and gray sandstone was employed as construction materials. The stone blocks have dimensions of 30 x 60 x 10 cm, the lintels measure100 - 120 x 40 x 10 cm. The walls present a careful finish similar to Jatun Talasa Huankarani (C-48 described above). Structures have dimensions of 4 x 6 (24 m^2), 5 x 5 (25 m^2), and 6 x 5 (30 m^2) and are built with walls dressed on both sides. Mortar was commonly used in walls and consisted of a mix of mud and cultural refuse. Stone-covered, semi-subterranean chambers were found in the northwest corner of the structures, and may represent storage features.

Site El Porvenir (C-76): A LRD/LH Local Center

El Porvenir covers 6.4 ha on a broad slope below a ridgeline (Figure 4.11). Rocky outcroppings and *quebradas* limit access to the settlement.

The principal materials for construction here were red and gray sandstone, and construction quality is related to structure function. In general, there are two types of walls: those used for dwellings or residential structures, with stones of 30 - 40 cm long, and those with stones of 40 to 80 cm long, located in terraces on the slopes. Large stones set vertically into the soil mark entrances and window openings. In the corner of structures, bigger stones were placed for purposes of wall stability.

Dwellings present rectilinear layouts, and commonly measure 4 x 5 m (20 m^2). Walls were built employing a system of simple junctions, with regular blocks placed to both sides and pebbles for chinking. It is possible that in some places a mortar of mud, small sherds and pebbles was employed as chinking as at C-48.

Residential terraces reach up to 1.80 m high in the areas with pronounced slope, and specific techniques were used for the construction of their retaining walls. For instance, the walls present pyramidal bases that reduce their section in layout according to the gain in elevation. The construction technique employed in the buildings is similar to those applied in Huankarani (C-48) and El Patronato (C-70). Walls present a more careful treatment than at smaller sites in the valley, especially in the internal and external facing of wall stones for dwellings and in dressed stone faces in the case of retaining walls and staircases.

The site presents groups of structures located over residential terraces connected by paths and staircases. In each case, as in the vast majority of the settlements in the valley, the walls follow a north-south orientation.

Although it is not possible to recognize a clear, central area in the settlement, it is evident that the highest building density is present in Sector 2. Here, structures alternate with patios, and there are some larger enclosures that may be plazas or some special purpose buildings. Found under their wall foundations are circular cist burials built with stones and capped with flat stones. These burials have been looted, but the looters in some cases overlooked small items of adornment, such as sodalite and shell necklaces. Although it is not possible to quantify this difference, my experience was that only in this part of the site were such items found in looters' backdirt. A large wall separates the big patios from the eastern part of the settlement.

Sector 3, to the north, presents terraces connected by perpendicular paths or staircases running east-west. In this sector, building density is lowest. A large wall, averaging 80 cm thick, runs from east to west. Sector 1, to the west, is difficult to evaluate because most of the terraces and structures have collapsed, but some paths and staircases together with segments of foundations and terraces are visible.

Site Bella Vista (C-72): A LRD Large Village

This site is located near the hacienda Bella Vista, on the east shore of the Chico River and measures 2.08 ha (Figure 4.12). The main occupation of the site occurred during the LRD period, although an earlier ERD component is present in the lower strata of the site. The site lies on flat ground that slopes gently from north to south. The center zone of the site is formed by large basins, while the remainder of the residential occupation is on domestic terraces. Architectural preservation at the site is not good, but it is possible to recognize the remains of dwellings. In general domestic structures are rectilinear, measuring 4 - 5 m on a side. Walls are 40 cm thick, and faced on both sides, employing for each wall face regularly shaped, 20 x 40 cm or 30 x 30 cm stones.

The high concentration of pebbles and sherds next to the collapsed walls suggest the use of mortar prepared of mud, pebbles, and crushed ceramics. When these spaces were big enough (more than 5 cm), they were filled with stone chinking, in the same way as the core of the walls. Red sandstone was the most common construction material employed. Small retaining walls were constructed of rows of rough stone without to create low terraces averaging 5 m in width. In the southwestern part of the site, there is a small architectural group that includes two paths or “streets,” each one meter wide and leading to a stairway with stone steps.

The concavities or basins towards the center of the site seem to form two open areas that may have functioned as public spaces or large domestic patios. Surrounding these features is a series of residential terraces.

The layout of the site is well organized, and rectilinear, with walls aligned with the cardinal points throughout much of the settlement.

Site Higuerahuayco (C-87): A LRD/LH Village

This site of 1.9 ha is located near the hacienda Higuerahuayco, on an east-west hillslope slanting down from three peaks (Figure 4.13). Part of the occupation, situated on domestic terraces, can be dated to the LH period. A large wall running from north to south may have had a defensive function. The wall remains are about 1 m wide and 2 m high.

The group of structures located in the western part of the site (Sector 2) has entrances facing south. They were roughly built of fieldstones arranged without mortar, and little attempt was made to get smooth joints or corners. Overall, these structures suggest either a short-term occupation or a non-domestic use. The rest of the settlement contains more carefully built structures, averaging 4 x 4 m (16 m^2) in size. Walls consist of quartzite, sandstone blocks alternating with large slabs set vertically into the ground. Mortar was not employed in their construction. Associated with many of the structures is an adjoining, small structure or two that could have served as kitchens or storage units.

The site layout shows that there were circulation areas or paths linking open spaces and different levels of terraces. Such spaces might have been used for public activities.

Site Chajra Khasa (C-38): a LH Large Village with Corrals

This 3.2 ha site is located on a flat hill, near a prehispanic road that crosses the Chajra Khasa area and continues to the sites of Cochaca and Huankarani (Figure 4.15). House density is lower at this site than most other sites.

Structures were built of quartzite sandstone, including some large enclosures (15-20 x 20-25 m) that may have served as corrals or patios. Close to one of these structures are piled stone platforms of a trapezoid shape, roughly 2 m high. These are conventionally interpreted as “loading platforms” for llama caravans, but their function is not actually known. It is possible to observe at least three distinct residential groups or structure compounds, each including component corrals, dwellings, storage areas, and in one case, some agricultural terraces. The best preserved of these compounds is located in the southeastern part of the site and includes agricultural terraces, corrals, structures for camelid packing, and small dwellings of 3 x 5 m (15 m^2).

The corrals and the limited number of domestic structures point towards a specific function for the settlement, as herding site or a way-station for llama caravans. The latter possibility seems likely given the road network close to the site. This is one of the last areas where caravans could have been housed before entering or leaving the Cinti Valley to the high valleys of Suquistaca and Pututaca.

Site Palca Chica (C-79): a LRD/LH Village

This multicomponent site located on a slope near the *haciendas* Velasco and Oroza covers 0.93 ha, and was occupied from the Formative period to the LH. However, it is probable that visible structures correspond to the last two periods of the sequence (Figure 4.15). The site has a good view of the surrounding area, especially the Palca Grande area where the Tumusla River joins the Chico River.

The site is badly eroded and looted; however it is possible to distinguish successive residential terraces that generate platforms of 5 m width and variable longitude. Structures are small, between 15-20 m^2, and present a more careful treatment of the stone in the internal walls. The presence of circular pits near the corners of these structures indicates cist burials, or in some cases, maybe storage features. The settlement does not present distinct spatial zonation or segmentation, and the homogeneous architecture points to no functional differences within the site.

Site Frente Patronato (C-68): a LH Village with Corrals

This small site of 0.45 ha is located in a flat hilltop across the river from El Patronato (C-70), and probably once constituted an outlier of this settlement. A prehispanic road crosses the hill near this site. The site consists of a central group of domestic structures, with *canchas* or corrals surrounding them (Figure 4.16). Platforms of loosely piled stones (1.50 x 1.50 m) are part of this central group. Structures have double course stone foundations (6.30 x 2.30 m, 6.40 x 3.80 m), and corrals of different dimensions were built using big stones without mortar. These elements suggest the site housed caravans arriving in the area and probably was the point where goods that circulated in El Patronato were unloaded.

Site C-34: a LH Village

This small village or hamlet of 0.7 ha is located in the Cochaca basin on a natural terrace over the river (Figure 4.17). The site displays two concentrations of rectangular structures and patios, towards the north and the south, while in the middle there seems to have been some type of structures that have been destroyed by erosion. In the southern part of the site are remains of cist burials. Patios walls are delimited by large stones. Habitation foundations consist of a single course of stones. The ceramic material one this site is mainly domestic but non-local, and has tentatively been identified as in the styles found in Tarija and the *altiplano*. This pottery suggests the presence of *mitmaqkuna* or non-local residents in this settlement.

Site Escuela Cochaca (C-41): a LRD Homestead

This homestead of 0.07 ha is located near the modern school of Cochaca in two levels of residential terraces near a seasonal stream (Figure 4.18). The site consists of a domestic structure associated with a corral and one small structure that could have been used for storage. Walls are built of a single course of stones, the ceramic density was low, and some flakes were scattered on the surface. This is a most typical example of an isolated household for the LRD period.

LRD/LH Architectural Variability Among Sites

A great deal of time was devoted to examining the architectural remains at each site during our survey. The purpose of this attention was to distinguish potential: (1) chronological architectural differences, to aid in dating occupations; (2) architectural features corresponding to non-domestic functions (corrals, public architecture, fortifications); and (3) residential architectural differences (in house size, labor investment, layout, or associated storage) relating to status or wealth differences. Despite the erosion and vegetation, it was possible to distinguish examples of all three among the LRD/LH sites.

Although the construction styles that developed in the region during the ERD period were maintained through the LRD and LH periods, there were some shifts in construction techniques and basic layout. Architecture of the latter periods is characterized by a more careful selection and cutting of the stones or blocks for construction, resulting in more uniformly sized wall stones, and smoother walls with neater joints and corners. Terraces walls also tended to be taller in the later periods.

In terms of site components, we identified llama corrals at both centers and villages, but poor preservation made it impossible to compare corrals to site size or position in the settlement hierarchy quantitatively, although it is evident that during the LH there is an association among some centers and sites with corrals. No public architecture was recorded, but C-48 exhibited large enclosed, internal spaces that likely served as plazas. Defensive/perimeter walls were constructed around centers (such as C-48, C-76, C-106) and larger village sites (C-87) during the LRD-LH periods.

The largest site - - Jatun Huankarani (C-48) - - also stood out from other sites in terms of its internal segmentation and variability in domestic architecture. C-48 exhibited strong residential spatial zonation, and the large walls and natural features (such as ravines) would have further restricted circulation at the site. The internal differentiation extended to marked differences in the quality of residential architecture. Sectors 2 and 3 of C-48 contained high labor investment residences. Domestic architecture of this quality was seen in only one other site in the survey, and in lesser amounts, this was in Sector 2 at the local center of El Patronato (C-70). Based on this architecture, we can identify Sectors 2 and 3 at C-48 as higher status or "elite" residential areas. Unfortunately, it proved not possible to use surface architecture to address systematically potential differences in storage capacities within and among sites.

LRD – LH Intersite Artifact Variability

Our expectation was that the ways in which the regional center (C-48) and the other centers differed from other sites in the settlement system would provide the strongest clues as to the leadership strategies operating during the LRD and LH periods. Put another way, we hoped to identify, through artifact assemblages, central place functions indicative of one or more of the three proposed leadership strategies.

Late Regional Development Ceramics

One expectation of the prestige strategy was that elites might have been differentially involved in feasting or serving activities, requiring more serving vessels. Thus we would expect to see higher proportions of serving vessels at the centers, particularly C-48. This was not born out in the surface collections of LRD ceramics (Table 4.1). The sample showed quite variable proportions among settlements in terms of serving vessels proportions. Samples from some sites did have higher proportions of serving vessels than others, but the regional center (C-48, Jatun Talasa Huankarani) as well as other large villages or local centers as C-62 (Volcán), C-70 (El Patronato) and C-76 (El Porvenir) did not yield proportionally more serving vessels than smaller settlements such as C-39, C-57, and C-65. Other local centers (C-94, C-106) actually had lower proportions of serving vessels than most of the villages.

A bullet graph (Figure 4.19) shows this pattern in which there are strong and moderate significant differences among sites, with a bimodal distribution of serving vessels proportions among settlements. Two groups of sites are evident, those with higher proportions of serving vessels (12 - 20%) and those with lower proportions (7 – 10%) This division was not related to site size or rank in the settlement hierarchy. Rather, there seems to exist a certain relationship between site location and higher proportions. Sites located in the upper valley or in the north part of the canyon present relatively higher proportions than sites located further south in the canyon (with the exception of C-72). This geographic division indicates that, in general, residents of the canyon sites engaged less in the activities using serving wares.

If we take into consideration settlement patterns, site hierarchy, and the different clusters of sites identified in the valley (see Chapter 3), it is appears that there was always more complexity (in terms of hierarchy) towards the north part of the valley than in the south. The rank size analysis for the canyon alone, as discussed in Chapter 3, suggests little horizontal settlement integration in the canyon; in the LRD, at least, local centers were surrounded by minor sites that might have constituted autonomous settlement clusters. Also, regression analysis showed no correlation between agricultural land and site size in the canyon. Such patterns are interesting when compared with serving vessels proportions because if feasting or serving activities were important for leadership strategies it might suggest higher social status households may have been concentrated in the northern part of the valley, with most of the canyon essentially populated by rural commoners.

Returning to the similar proportions of serving vessels among centers and some villages, another explanation, as discussed for the ERD period, is that the large population of commoners effectively swamps or hides what may have been feasting or serving activities carried out by the elites.

Storage vessels proportions also show a striking variability among sites, ranging from 35 - 62%. The sample from Jatun Talasa Huankarani (C-48), as depicted in the bullet graph (Figure 4.20), included a higher proportion of storage vessels than the rest of the settlements in the upper valley (see sites C-39, C-57 and C-65), although not in the whole valley. Similarly, large villages or local centers - - in general - - have higher storage vessels proportions than smaller sites (C-72, C-87). The bullet graph shows differences that are significant among the large sites and among the smaller ones. However, some smaller sites have similar proportions of storage vessels than the other bigger sites such as in the case of Bella Vista (C-72) and Higuerahuayco (C-87). Again, the storage vessel proportions do not pattern completely with site size or place in the settlement hierarchy. Part of the problem no doubt lies in the multiple functions of storage vessels. As yet, it is not possible to distinguish between dry and wet storage (or chicha production), so that the large vessels at different sites may reflect differential involvement in different activities. However, we can interpret the results as indicating that, centers, on the average, have higher proportions (50 – 60%) of storage vessels than do villages suggesting differential involvement in storage/surplus accumulation during the LRD period.

Cooking vessels proportions range roughly from 12 - 38%. A bullet graph shows (Figure 4.21) moderately strong differences among sites. It is interesting to note that sites located in the upper valley display lower proportions of cooking vessels than those located in the canyon. For instance, local centers in the southern part of the canyon have more cooking vessels than those in the north.

Late Horizon Ceramics

If sites corresponding to the LH period or with a preponderant LH occupation are taken alone, some interesting patterns emerge as well. There is a great deal of variation in serving vessels proportions at LH occupations, from less than 5% to 35%. As the bullet graph shows (Figure 4.22) there is a group of five sites (C-16, C-45, C-53 and C-68) that have higher proportions of serving vessels than the other sites, with C-86 that occupying an intermediate position; these differences are statistically significant. C-45 is the LH sector (Sector 8), or residential “suburb” of the regional center C-48. In comparison to the LRD, some sites now have much *higher* proportions of serving vessels.

However, high proportions of serving vessels are not limited to centers. C-16 and C-53 are smaller sites spatially associated with expanses of agricultural fields. It is possible that the high proportions of serving vessels at these sites are related to some specific activities carried out in these sites. For instance, agricultural tasks and labor required in the *minka* form might have been sponsored by local elites and some type of feasting, for feeding people engaged in such work could have taken place in these sites.

C-68 may also represent a “special” purpose site, as this site is mainly an area of corrals associated with some structures and likely housed caravans of llamas that moved goods. It is possible that activities involving serving vessels were performed here, or even that serving vessels were moved as goods. A significant percentage of serving vessels at this site are imported pottery, suggesting these products were being received at this place and then moved to El Patronato (C-70), a local center, and distributed from there. A similar pattern of high percentages of non-local, serving vessels have been documented for sites with corrals in the nearby region of Tupiza in the Inka site of Chuquiago (Raffino 1993). Similarly, C-86 is a village located quite close to an expanse of agricultural lands.

In the case of storage vessels, the proportions range from 24% to 66%, again suggesting marked differences in domestic storage, or in the use of pottery to store goods. As shown in the bullet graph (Figure 4.23), differences are significant. The very high proportion of storage vessels at C-71 in comparison to other sites is strong and highly significant. This site yielded surface fragments of Inka provincial ceramic as well as other imported pottery. Not surprisingly, C-71 has relatively low proportions of serving and cooking vessels. This is obviously a function of the functional ceramic classification in which 96.5% of the pottery from the site was classified as serving, storage, or cooking. In order to have a high proportion of a particular type of ceramics, a site will, of course, have lower proportions of other types. In contrast to the LRD, villages in the LH have more storage vessels than bigger sites, perhaps suggesting a change in storing patterns.

Cooking vessels proportions show a bimodal pattern as it is depicted in the bullet graph (Figure 4.24). Sites located in the upper valley show lower proportions of cooking vessels (and more serving vessels) than those located in the canyon, suggesting differences in domestic activities. The exception is C-71, whose proportion falls between these two groups. Differences are statistically strong and significant.

Distribution of Imported Pottery

To examine the differences among sites in imported pottery preferences, it was necessary once again to group LRD and LH periods together because we cannot yet separate imported styles by chronological period. The distribution of imported ceramics shows an interesting pattern, probably structured in part by the Inka presence in the region and by local incorporation into Inka-dominated ceramic exchange systems (Tables 4.6, 4.7, Figure 4.25).

The most common imported pottery is in the Chicha style, coming from regions located to the southwest and south of Cinti Valley. Although some of this material can be dated to the LRD period, it is most common in LH occupations, and may, in fact, reflect the movement of Chicha populations into the valley as Inka *mitmaes*. The Chicha wares found at the Cinti sites, especially in the southern part of the valley, include a significant percentage of utilitarian, domestic vessels such as jars and cooking pots, not the kinds of vessels likely to serve as trade goods. The Chicha wares are limited mainly to middle and lower parts of the canyon, and occur only rarely in the upper valley. It is also possible that proportions of this style were the most common in Cinti because the “borders” of the ethnohistorically known *Qaraqara* and *Chicha* confederations were located around the town of Las Carreras (Lecoq personal communication), a settlement 20 km south of the southern border of my research area. If one moves south from Las Carreras, the Huruquilla style is replaced by the Chicha style; the closeness to the Chicha confederation might have had an influence in the use and distribution of these ceramics in Cinti.

Surface samples yielded a small proportion of sherds coming from the Yampara area; Yampara pottery was found at the regional center, C-48 (Jatun Talasa Huankarani), and at larger sites including C-62 (Volcán), C-76 (El Porvenir), but also in C-79 (Palca Chica), a smaller site or village.

The rest of the imported pottery, such as the Altiplano styles, includes materials from the highlands, whose exact geographic origin or cultural affiliation is not known. Tarija, Pacajes and Inka wares are each associated with the LH period. The last two occurred in small numbers in the surface collections. For instance, we observed that sites such as C-68, composed of few structures and corrals had significant proportion of imported ceramics. As this site was probably an outlier of C-70 (El Patronato) - - a local center during the LRD/LH - - and was a point at which caravans arrived.

The Tarija component seems to be related to the presence of *mitmas* in the valley. For instance, C-34 is a small settlement associated with a prehispanic road; here most of the ceramic materials recovered, including domestic wares (cooking pots and jars), are in the Tarija style (Table 4.6).

An expectation of wealth strategies was that centers would exhibit proportionally more valuable or imported goods (particularly pottery from distant regions) than sites at lower levels in the settlement hierarchy. This expectation was not met in the surface collections. Instead, intersite differences in imported ceramic style preferences appear to be structured by population movements and proximity to exchange routes.

Evidence of Ceramic Production

Systematic surface collections provided some evidence pertaining to ceramic production at some sites. Mainly this activity can be inferred from ceramic smoothers present in collections (Table 4.3). For instance, C-39, C-79, and C-94 yielded smoothers and a ceramic waster. So it is likely that pottery production took place at the household level at a number of sites (not necessarily at centers).

Lithic Materials

Lithic materials were not found in significant quantities in either systematic or diagnostic collections. As our goal was to understand whether or not there was evidence for craft specialization at the centers, I examined both types of collections together (Table 4.8). As in earlier periods, during the LRD and LH periods primary production was mainly done in the quarry areas, and secondary and tertiary production was done at the residential sites (Figure 4.26). The materials used were locally obtained with few exceptions such as basalt and cristobalite. The rest of artifacts were crafted mainly in quartz, varieties of quartzite, and sandstone. Most of the non-flake tools produced were projectile points, scrapers, knives, and grinding stones.

The collections suggest that expedient and secondary stone tool production was carried out in most settlements at the household level. Only at one site, C-17 (Jayasamana) dating to the LRD period, was there a lithic concentration with the hallmarks of craft-specialization. This concentration was located next to the houses and corrals, and the debitage and production failures indicated more than casual or expedient production of projectile points and scrapers.

Stone beads were crafted in sodalite, lapis lazuli, and volcanic stones (Table 4.8). Sodalite sources are locally present, meaning this material was locally obtained while lapis lazuli and other semi-precious stone are from distant locales. Beads of this material were recovered in systematic and diagnostic surface collections from large site as well as small sites. The surface collections did not reveal higher relative proportions of wealth items, including non-local raw materials or artifacts such as shell, lapis lazuli, obsidian, or alabaster, at the centers.

Conclusion: Intersite Variability and Leadership Strategies in the LRD and LH

Comparison of architecture at sites revealed there are differences in layout, internal segmentation, and labor investment in domestic structures in some sectors of the regional center (C-48) and in at least one local center, when compared to villages or other sites lower in the settlement hierarchy. These differences can be interpreted as indicating that C-48 was the residential site of an “elite” or higher status segment of the population.

Comparing surface assemblages among sites did not reveal clear-cut differences consistent with any of the leadership strategies. There was significant variability among sites in some artifact categories, but this variability did not parallel site size differences. The surface assemblage at C-48 did not reveal central place functions limited to C-48 or to other centers. The partial exception, discussed above, is the higher proportions of storage vessels at centers in both the ERD and LRD/LH periods.

If the status of this political elite had been based on wealth strategies, we would expect to see differential association of centers with llama facilities. This was not clearly the case. However, settlements with llama corrals do exist near to large villages or centers such as is the case with C-17 (Jayasamana), Chajra Khasa (C-38), C-68 that forms part of El Patronato (C-70), C-93, C-98, and C-101 that are close to C-94 (El Rancho), C-96 (El Caserón) and C-106 (Camblaya) respectively. This distribution suggests that llama caravans were likely moving though these locales. I believe that most of the extent corrals date to the LH period.

Another correlate of wealth strategies was differential association of centers with craft production. Surface collections did not reveal evidence for this at the centers, with the possible exception of El Porvenir (C-76). In Sector 2 of this local center, an area of high status residential areas, surface collections included some crucible fragments of the kind used in metal smelting.

Evidence relating to production of another form of important wealth good - - textiles - - was not found at all in surface collections. This absence is likely a preservational matter, as most of the tools associated with this activity, such as spindle whorls, needles, awls, in the Cinti would have been crafted from wood rather than the more durable bone. One grave at El Porvenir (C-76), from the LRD period (Rivera Casanovas and Michel López 1995a), contained spindle whorls and wooden sticks probably used in textile manufacture. Such artifacts are common in southern Andean valleys, as Raffino (1993) reports for the Juella, Quebrada de Humahuaca, where the only indicators for such activities were wooden tools recovered from burials. Therefore if wealth strategies included control over weaving they cannot be recognized from surface collections.

Surface collection provided no evidence for differential proportions of wealth items at centers or larger sites, nor striking differences in access to imported goods. Imported ceramics are found in low proportions at most sites, centers included, and at varying proportions in different sizes of sites.

Prestige strategies are difficult to see archaeologically, because they do not involve wealth accumulation. If prestige strategies *alone* were operating in Cinti, we would expect to find little evidence of strong settlement hierarchy and that centers would not display marked differences from other sites in terms of household wealth as manifested in architecture and access to high value objects.

The intersite comparisons do not support the archaeological correlates for prestige systems, however. For instance, there is strong settlement hierarchy manifested in site size, internal complexity, and differences in household wealth manifested in amount of work put in the construction of some structures and residential sectors at Jatun Huankarani (C-48), Volcán (C-62), El Patronato (C-70) and El Porvenir (C-76). I found no evidence at the intersite level for differential involvement in feasting activities, as manifested in significantly higher proportions of serving vessels at centers.

Another expectation in the prestige strategy model was that *marka* site or regional centers would have more public areas or public architecture than other sites. This was difficult to evaluate for the Cinti sites, which lacked recognizable non-domestic structures. C-48 did display proportionally larger plazas or public areas than other sites, but larger public spaces, by themselves, are not incompatible with the other strategies.

In sum, the evidence stemming from the intersite comparisons points to political leadership weakly associated with domestic level, staple strategies, based on the proportions of storage vessels at the centers and the small, household storage structures found in some residential areas of C-48. We did not find architectural features that would constitute clear evidence for strong staple strategies: large-scale storage facilities (of the Inka *colca* pattern) at the centers.

CHAPTER 5

INTRASITE VARIATION AND EXCAVATIONS IN CINTI SITES

This chapter presents the analysis done using surface collections and excavations to examine staple, wealth, and prestige strategies at the intrasite level. It was hoped that intrasite patterns, particularly those involving comparing the residential sectors at the larger sites in the valley, would provide a more specific identification of political leadership strategies. The Formative period is not considered here because of the limited amount of Formative ceramics recovered in surface collections.

EXCAVATION DESCRIPTION

Test pits were made at a number of sites. Excavations were performed primarily to: (1) explore the relationship between surface and subsurface artifact patterns; (2) provide stratigraphic information relating to occupational sequences and formation processes; and (3) obtain samples for C14 dating. I recognized that generating excavation data to address issues of political leadership and social differentiation would require a much more extensive excavation program, but it was also hoped that the artifact assemblages produced by the limited excavations might be of some use in comparing sites and sectors within sites. Excavations were carried out in units of 2 x 2 m, and natural or cultural layers were divided in arbitrary levels of 10 cm. All soil removed was screened and all artifacts kept for analysis.

Three sites were chosen for test excavations, based on their place in the regional hierarchy and the periods of occupation represented: the regional center Jatun Talasa Huankarani (C-48), Bella Vista (C-72) a large village, and Higuerahuayco (C-87) a small village. The most extensive occupations at the first two sites date to the LRD period, while the last has significant late LRD and LH occupations. Additional information is provided by test excavations carried out in two more sites during 1994: El Porvenir (C-76), a LRD local center, and Palca Chica (C-79) a LRD, LH small village (Rivera Casanovas and Michel López 1995a).

INTRASITE COMPARISONS FOR THE EARLY REGIONAL DEVELOPMENT PERIOD

As previously discussed, it is during the ERD that nucleated settlements and regional system integration in the upper valley appeared, and the basic architectural patterns seen in later periods developed. Some ERD sites are sufficiently large to divide them into different sectors in order to look for significant internal variation.

Ceramic Differences

The surface collections at several ERD sites revealed some intrasite variability in ceramic assemblages. For instance at Palcamayu (C-18), the largest site in the valley, there as low to moderate significantly differences in proportions of serving vessels among its several sectors (Figure 5.1). Three model proportions can be distinguished:

the first one, comprising Sectors 1, 3 and 6 has higher proportions of serving vessels (over 10%), but about the mean for all other ERD sites, the second consists of Sectors 2 and 4 with lower proportions and finally Sector 7 with the lowest proportion. This pattern expresses marked internal variation among residential zones of the site, with the residents in some areas differentially engaged in feasting or serving activities. In the case of Talasa Chaco (C-58) differences are minimal and not statistically significant, with Sectors 1 and 3 displaying a slightly higher proportion of serving vessels (Figure 5.2).

In the case of storage vessel proportions, at C-18 some interesting patterns emerge with sector proportions falling into two modes, with strong and significant differences (Figure 5.1). The mode of higher proportions is composed of Sectors 3 and 6, suggesting more intensive storage activities in these zones, while there is significantly less storage in Sector 2.

Storage activities in C-58 present a pattern (Figure 5.2) with Sector 3 having a higher proportion of storage vessels. The differences are strong and significant between Sectors 3 and 1, and moderate when compared with Sector 2. As at C-18, the variability points to some intrasite variability in domestic economic processes.

Intrasite-level analysis of the distribution of other artifacts in the ERD did not generate information that would suggest wealth strategies. For instance, we did not find evidence for differential distributions of imported ceramics, malachite beads, or other imported or craft goods. However, we noted that the only fragment of imported ceramic found in the valley for the ERD period was recovered from C-18, as well as a copper object, and some fragments of rock crystal were observed scattered on the surface.

INTRASITE COMPARISONS FOR THE LATE REGIONAL DEVELOPMENT PERIOD

This period saw the development of strong regional hierarchy in settlement in terms of site size, and functional differences in layout and architecture. In particular, Jatun Huankarani (C-48) displayed significant internal variability in quality of domestic architecture, as well as internal divisions of the site into zones.

The Regional Center: Jatun Huankarani (C-48)

As was described in the previous chapter, this site was a regional center during the LRD and LH periods, distinguished from other sites by its size, layout, and scale of some architectural features, including the height of its residential terraces and internal and defensive walls. Differences among sectors in domestic architecture suggest distinct status or wealth differences. Sectors 1, 3 and the central part of Sector 2 contained elaborate residential architecture. In Sector 2, there are small rectangular structures (1 x 1 m) associated with larger structures and patios. Sector 3 contains careful constructed terraces, and the best examples of domestic architecture and labor investment. Less carefully made residential architecture is found in Sectors 4 – 7. Sector 8 (C-45) was built during the Late Horizon period.

C-48: IntraSite Ceramic Differences

Surface assemblages from the different sectors exhibited significant, moderate - strong variability in the proportions of serving vessels (Figure 5.3). Particularly, Sector 3, with 23%, stands out greatly in comparison to the other sectors of the settlement, and to the mean of all the other sites in the valley, showing a higher proportion of serving vessels (15% and less). Sector 3 is also singular for the quality of domestic architecture, and the density of *batanes*, grinding stones, mortars and pestles. Together, these lines of evidence suggest differential involvement in processing and serving/consumption activities. It is possible that the proportion of serving vessels relates to the processing of chicha that might have been used in ceremonies or feasting carried out in patios, as was the case in the Mantaro valley during the Wanka II period (Costin and Earle 1989; Hastorf 2001). Sector 2, another zone of relatively elaborate residential architecture, shows also a high proportion of serving vessels but differences with Sectors 4 - 7 are only statistically moderate.

With the internal variability at C-48 revealed, we can now explain why the proportions of serving vessels for the site overall was lower than for many smaller sites, as was discussed in the previous chapter on inter-site differences. In fact, the high proportions of serving vessels used by the high status residents of Sector 3 was obscured by the low proportions used by the much larger population of lower status residents at this big site. It was only a segment of the C-48 population that was differentially engaged in serving activities, rather than the residential population as a whole.

Proportions of storage vessels at C-48 (Figure 5.3) present a pattern with moderate to strongly significant differences. Here, there are two modal proportions, with Sectors 6 and 7 with the highest proportion of storage vessels. Storage was obviously important in all residential sectors, but more emphasized in some. Sector 2 has a relatively higher proportion of storage vessels, which coincide with our expectations because within the Sector 2 domestic architecture there are small structures that could have served as storage facilities. When comparing the proportions with the mean for all the other sites in the valley it is clear that C-48 as a regional center has a significantly higher proportion of storage vessels than the rest of the sites.

Another way of looking at activity patterns among the different sectors is to divide the ceramic materials into fineware and domestic categories (Table 5.1). This grouping allows incorporating into the analysis those sherds that are in the non-diagnostic in functional terms, or functionally “undefined.” Fineware consists of decorated pottery, and all the thinware fragments with gray paste and its variations, that seem to have been used for special purposes, in contrast to domestic fragments, mainly with orange pastes that largely represent cooking ollas, storage vessels, and simple bowls. Grouping materials in this way and comparing them by sectors reinforces the results obtained previously, and basically replicates the pattern seen in proportions of serving vessels. As depicted in the bullet graph (Figure 5.4), there are moderate and strongly significant differences among sectors, with Sector 3 again standing out from the other sectors and the mean for all other sites.

C-48: IntraSite Distribution of Wealth Goods

If wealth strategies were prevalent for Huankarani leaders, I would expect to see higher proportions of high value goods (imported pottery, semi-precious stone, shell) in the residential sectors of the leaders (either Sectors 1, 2 and 3, based on the domestic architecture, or perhaps even Sector 3, based on the serving vessels). Surface collections at C-48 did not reveal such difference because the small number of such items found overall at the site precludes statistical analysis. For instance, just seven imported sherds were identified in both systematic and diagnostic collections at C-48 (Table 4.6). Most of these sherds did, in fact, come from Sectors 1, 2 and 3, and belonged to serving vessels, either *cuencos* or small jars, suggesting they probably were used for display during specific activities. From the rarity of fancy imported pottery, I can conclude that elite status or social leadership activities in the Cinti were not strongly associated with pottery style preferences that incorporated foreign pottery. Higher status households were not displaying their status through use of imported serving vessels.

C-48 Excavations

Sector 2 was chosen for excavation because of the presence of the high labor investment domestic architecture, the small structures (1 x 1m) that probably were used for storage, and because the flat area of this sector constitutes the central core for the settlement. Two test pits were placed at different places, one in the western slope of this sector and other in the flat area at the bottom of this slope (Figure 5.5).

Unit 1 was placed in what seems to have been a patio area, and was excavated in arbitrary levels of 10 cm. No clear stratigraphy was visible (Figure 5.6, Table 5.2). A charcoal sample taken from Level 3, in what seemed to be the remains of a hearth, gave dated to 912 ± 49 BP, with a calibrated age range of AD 1024 -1216 (2 sigma) (Table 5.3). The ceramic assemblage from excavation yielded 9% serving vessels, 35% storage vessels, and 37% cooking vessels (Figure 5.7). Special items found in this unit included a piece of copper, a shell bead, and a quartz flake (Tables 5.4 and 5.5).

Unit 2 was placed next to the remains of a wall in an area of high surface artifact density. After a stratum of cultural fill, with a high density of sherds and bones, a floor was found associated with two *batanes*, and Feature 1: a fill of ash and burned earth that seems to have constituted a fill under the floor. Below this fill there was another floor, associated with the remains of a structure foundation (Figure 5.6). This floor rested over sterile soil. A charcoal sample taken from this floor gave an age of 991 ± 46 BP, or the calibrated date of AD 912-1172 (2 sigma) (Table 5.3).

In Level 1, two ceramic wasters and two ceramic smoothers were recovered, suggesting the production of ceramics in the sector (Table 5.4). These elements are the only evidence for craft production, other than expedient production of stone tools, found at this site (Giesso 2003). The ceramic assemblage from excavation was very similar to that of Unit 1: serving vessels constituted 9%, storage vessels 29% and cooking vessels 31% (Table 5.2, Figure 5.7). Other special objects included one bone tool for either weaving or retouching, and two ceramic discs (Table 5.4). Lithic tools in this unit consisted of some flakes, a *batán*, and pestles (Table 5.5).

Proportions of serving, storage and cooking vessels from the Sector 2 excavations differ markedly from the proportions seen in the Sector 2 surface collections. As yet, I cannot explain this difference but suggest that the difference might be due to the activity specific loci in the excavated contexts.

Investigation at Local Centers: Volcán (C-62), El Patronato (C-70), El Porvenir (C-76), and El Caserón (C-96)

Intra-site analysis of serving vessels proportions at the local centers does not reveal a consistent pattern of significant intrasite variability in assemblages. Some centers showed C-48 type variability, other centers did not. For instance, the collections from Sectors 1 and 2 at Volcán (C-62) contained over 20% of serving vessels while Sector 3 contained around 5% (Figure 5.8). Larger and more carefully built domestic structures were found mainly in Sector 2, suggesting differential participation by their residents in ceremonies or feasting. Storage vessels proportions (Figure 5.9) indicate moderately significant differences among sectors in storing activities. Sectors 2 and 3 of El Porvenir (C-76) display relatively higher proportions of serving vessels than Sector 1 (Figure 5.9). This pattern match with our expectations because Sector 2 is composed by elaborated architecture suggesting local elites might have resided there. Storage vessels proportions are similar among the three sectors in this settlement and differences are moderate or not significant (Figure 5.9).

In other local centers, however, such as El Patronato (C-70), and El Caserón (C-96), the intrasite differences of serving vessels was not as marked, showing a range of variability of 5% - 15% in most of the cases (Table 4.1) while the variability in proportions of storage vessels was more significant. For instance, In the case of C-70, differences in serving vessels are significant between Sectors 2 and 3 (Figure 5.10), suggesting differential activities. The low density of ceramic materials on surface in Sector 1 prevented us for making broader comparisons with this sector. Storage vessels proportions also show significant differences between Sectors 2 and 3 (Figure 5.10). El

Rancho (C-94) does not show strong variability in proportion of serving vessels among its sectors (Figure 5.11), while in terms of storage vessels, the differences are moderate (Figure 5.12). In the same way, El Caserón (C-96) present moderate differences in serving vessels between its sectors but no significant differences in storage vessels (Figure 5.12).

Excavations at El Porvenir (C-76)

Excavations at this site were carried out in 1994 (Rivera Casanovas and Michel López 1995a) as well as in 1998 (Rivera Casanovas 1999). In total, eight test pits (Figure 4.11) were dug with the objective of understanding the stratigraphy, the relationship between surface and subsurface deposits, and building the local chronological sequence. For the purposes of this chapter, just the two units with clear, undisturbed stratigraphy, sufficient artifact sample sizes, and radiocarbon dates will be discussed: Units 3E and 4E-F.

Unit 3E was a 2 x 2 m unit placed in Sector 2 near some of the larger domestic structures in this area. The area was chosen because it did not exhibit the looting seen in most of the site. The uppermost occupation in the excavation included the remains of a wall and a floor. A layer separated this floor from two possible, superimposed, lower occupational surfaces, located at 27 and 31 cm below the datum respectively. Below these, were a series of cultural layers that constituted fills for the house platform to a depth of 96 cm bd, where we found the remains of structures associated with a third floor just above sterile soil (Figure 5.13).

The strata in this unit were taken as chronologically representative of the LRD period in this site. Here, serving vessels constituted just 7%, storage vessels were roughly 30%, and cooking vessels reached 35.3% (Figure 5.14). The differences between these proportions and those on the surface may be the result of different contexts. Special artifacts found in this unit included a shell bead, and a projectile point (Table 5.4).

A cist tomb was uncovered in Unit 4E-F. The tomb represented a multiple burial containing two complete adult skeletons and fragments of additional skulls.[3] Associated with the remains were several bowls (see Appendix C, Figure C10, C11, C14) with organic materials as offerings, as well as artifacts made from wood. Among these artifacts were spindle whorls, spindles, small cups similar to kerus, and the remains of a long stick whose use might be related to weaving activities. Also, in the tomb were the remains of decomposed textiles and fragments of copper. A 14C dating from one of the offerings (Table 5.3) gave the age of 878 ± 56 BP or the calibrated range of AD 1023-1249 (2 sigma).

The presence of wood weaving tools suggests that most of the weaving equipment must have been made from wood, as is the case today in the local communities, and would not be visible on the surface archaeological record. In the same way, wood cups for drinking suggest that drinking vessels probably were carved in wood or gourds, and would not preserve in most archaeological contexts. Ethnographic studies tend to support this idea. For instance, Harman (1987) observed that most of the drinking vessels in the Yura Valley, Potosí were carved in either wood or gourds while ceramic bowls were used mainly for food.

Investigation at Villages: Bella Vista (C-72), Higuerahuayco (C-87), and Palca Chica (C-79)

Surface collections and excavation units were placed in some villages corresponding to the LRD and LH periods.

Bella Vista (C-72)

Bella Vista is a large village with occupations from the ERD through the LH. However, the first occupations are buried, and the latest was very ephemeral. For these reasons, this site is considered for analysis as a LRD period site. Two units were dug here but the first one uncovered only disturbed strata. The second unit (Unit 2) yielded a fine sequence that is presented here.

Unit 2 was located in the northern part of the site (Figure 4.12). More than 2 m of occupational strata were uncovered, exposing the remains of structures, floors and several layers of midden. Three episodes of occupation were distinguished: the upper two associated with remains of a wall visible on the surface (Figure 5.15). The second of these floors yielded a 14C date of 861 ± 56 BP or the calibrated range of AD 1038-1267 (2 sigma). Below it there were some layers of cultural fill, and another occupation with the presence of a wall belonging to a structure, a floor, and some features (a hearth, and two cache pits). A charcoal sample taken from the hearth was dated in 958 ± 51 BP or the calibrated range of AD 996-1192 (2 sigma). A cache pit located in the northwest corner of the unit (Feature 5), yielded six complete ceramic vessels (see Appendix C, Figures C12, C13, C15), while a second cache pit located in the northeast

[3] The human remains have not been analyzed yet.

corner of the unit yield the bottom of a jar that had been reused as a cooking bowl. Cleary, this context was one of domestic activities, and that Unit 2 was probably inside a domestic structure.

Under this occupation was a cultural fill covering the earliest occupation at this location: two cist burials, one containing an adult (Feature 7) and the other an infant (Feature 8). The tomb cap of the former consisted of a flat slab over which a grinding stone (*batán*) laid. West of this feature, 1 m, another cist burial was detected but was not excavated. However it was possible to see that this burial included a cooking pot containing the remains of a fetus or newborn child.

A sample of charcoal from the Feature 7 cist burial gave the age of 1227 ± 56 BP or the calibrated range of AD 676-946 (2 sigma), corresponding roughly to the Early Regional Development period.

An analysis of the ceramics from all the strata in this unit, excluding the burials, gave the following proportions: serving vessels 9%, storage vessels 35% and cooking vessels 34% (Figure 5.16). These proportions are comparable to the results from surface collections, except for the higher proportions of storage vessels represented on the surface.

Lithic artifacts were found in small quantities, although the presence of secondary and tertiary flakes, as well as performs and projectile points in different layers, indicates different artifacts were being produced at the site (Table 5.5). Shell beads and a fragment of a snail shell with red pigment inside were also recovered, as well as one fragment of a crucible suggesting that melting activities for metal production might have been taken place here (Table 5.4). These materials suggest that some forms of craft production were carried out in smaller settlements.

Higuerahuayco (C-87)

This small village contains both a late LRD and a LH occupation. Two test units were dug in Sector 2 to understanding the nature of occupation and stratigraphy at the site.

Unit 1 was placed in an area that was used as a domestic patio (Figure 4.13). Two strata of cultural fill were identified, and under them we encountered an occupational surface associated with a hearth (Figure 5.17). A sample of charcoal from the hearth pit gave the 14C age of 624 ±37 BP or the range of AD 1296-1399 (2 sigma). Ceramics from this unit yield the following proportions: 6% serving vessels, 33% storage vessels and 29% cooking pots (Figure 5.18). In both layers, a number of secondary and tertiary flakes were collected, as well as a projectile point and a mortar hand (Table 5.5). Several fragments of shell were also recovered (Table 5.4).

Unit 2 was located in a small structure that probably served as a storage facility (Figure 4.13). Strata were exposed inside and outside the structure, consisting mainly of cultural fill associated with the terrace that supported the structure (Figure 5.18). However, inside the room there was a living floor associated with a hearth. A charcoal sample taken from this last feature gave the radiocarbon age of 883 ± 70 BP or the calibrated range of AD 1024-1265 (2 sigma).

Ceramics were not abundant (n=155), proportions of functional categories were: serving vessels 13.5%, storage vessels 29% and cooking vessels 53.5% (Figure 5.18).

Comparing the proportions of these two units with those obtained from surface collections reveals broadly similar patterns, with any differences in proportions possibly relating to the particular contexts in Unit 2 and that the small size of the Unit 2 sample produced a range of confidence less than 95±5%.

Palca Chica (C-79)

Occupation at this small village began in the Formative period, although the denser occupation seems to have been during the LRD and LH periods. In 1994, two test pits were excavated in this site for understanding the stratigraphy and establishing a ceramic sequence (Rivera Casanovas and Michel López 1995a). For the purposes of this research, just one excavation unit has been selected (Unit 4A) for comparing ceramic proportions as well as other materials.

Unit 4A was located in a terrace next to structure foundations and a wall terrace (Figure 4.15). The stratigraphy here consisted of several layers dating to the LRD and LH periods. Underlying the uppermost two layers was an occupational surface dating to the LH period. This was separated from an underlying surface belonging to the LRD period by a thin layer of deposit. Under this floor there was a third cultural layer over the sterile soil. Here, just those layers associated to the LRD period are described.

The lower floor (Piso 2) belonging to the LRD period had three associated hearths (Figure 5.19). A charcoal sample taken from one of the hearth pits gave the radiocarbon age of 888 ± 62 BP or the calibrated range of AD 1031-1272 (2 sigma). Under this floor there were other layers of cultural fill, composed mainly of trash and ash, lying over the bedrock. Proportions of vessels in strata from the LRD period are

12.4% for serving vessels, 41% for storage vessels and 20.8% for cooking vessels (Table 5.2). These proportions are close to the figures obtained from surface (Figure 5.20).

Other materials included a few lithic fragments, a copper fragment, a shell bead, and a small alabaster cup (Tables 5.4, 5.5). This last artifact is important, because it constitutes evidence for villagers in the Cinti having access to long distance exchange; alabaster objects were being produced in the Humahuaca area of northwest Argentina during the Late Intermediate period and were common export items (Axel Nielsen, personal communication 2002). It is also known that there was an Inka workshop for producing beads, figurines and other alabaster ornaments in the Pukara de Tilcara (Axel Nielsen, personal communication 2002).

Comparisons Among Excavation Units at LRD Sites

The bullet graphs presented compare vessels proportions from all the excavation units at the different sites during the LRD period. As can be seen, there is no correlation between site hierarchy and the proportions of different types of vessels in the excavation assemblages. For instance, the serving vessel proportions are similar for all the sites, ranging from 5.6% - 14%, considering the error ranges and the levels of confidence, there are no significant differences among them. Storage vessel proportions show a similar: between 29% and 35%. Cooking vessel proportions exhibit the most variability, ranging between 19% and 53%. The presence of shell beads made mainly from a snail (*Sthrophocheilus oblongus Müll*) (Téllez 1997) brought from the Chaco lowlands and an alabaster cup at a village site (C-79) indicates that long distance exchange items were not restricted to the centers or to elite contexts.

INTRASITE COMPARISONS FOR THE LATE HORIZON PERIOD

The Inka domination of the region did not produce sharp discontinuities in the preexisting regional settlement trends, which included regional population growth, population nucleation, and increased agricultural production involving terraces. However, it would not be surprising to see changes at the household or intrasite level, as the local population was incorporated into wider regional exchange networks and overarching political and status orders. As noted, results from intersite analysis of LH unicomponent sites (discussed in the previous chapter) suggest an increase in serving vessels during this time, which might have been associated with feasting/ceremonial activities related to Inka political economy.

The Regional Center: Huankarani (C-45)

During this period the regional center, Jatun Huankarani (C-48), grew in size to 23 ha, in part through the addition of an LH occupation of Huankarani (C-45), located on the flat top of the Huankarani hill. Collection from one sector of Huankarani (C-45) produced one of the highest proportions of serving vessels in the valley. Sector 2 of C-45 has 40%, compared to the other two sectors of C-45 that have 18 and 22% respectively (Figure 5.21). The difference between Sector 2 and the other sectors, as well as with the mean for all the other sites, is strong and highly significant. This pattern suggests intensive feasting/serving activities took place in this sector.

Storage vessels proportions by sector show Sector 3 presenting higher proportions than the other two sectors, that themselves have moderate differences. This difference is for Sector 3 is strong and significant even when compared with the mean of all other sites (Figure 5.21). This strong spatial differentiation between serving activities and storage activities parallels the LRD/LH pattern at C-48, and may suggest, not so much household specialization, but the emergence of different patterns of activities for households of different statuses at the larger sites.

Investigation at Large Villages: Palca Grande II (C-85), Villa Abecia II (C-102), and at a Small Village Palca Chica (C-79)

Collections from villages such as Palca Grande II (C-85) also suggest moderate and strong significant internal variation in the distribution of serving vessels. The sample from Sector 2 of C-85 was 29.7%, serving vessels (Figure 5.22), compared to 12.5% and 14.8% for Sectors 1 and 3 respectively. Storage vessels proportions, in contrast, depicted just moderately significant variation, with Sector 3 having the higher proportions.

In the case of another large village, Villa Abecia II (C-102), proportions of serving vessels are lower than in sites located to the north, and intrasite differences are moderate, ranging from 14.72% in Sector 2 to around 8% in Sectors 1 and 3. Storage vessels show weaker differences among sectors (Figure 5.23).

Excavations at Palca Chica (C-79)

Unit 4A contained strata of both of the LRD and LH periods, but here just the LH strata are discussed. The stratigraphy related to this period consisted of two layers; a superficial one that included an active surface zone, and a second layer of collapsed stones, probably from nearby structures, under which we found evidence for a domestic occupation (Figure 5.19). Floor 1 was found below this fill of earth and collapsed stones, and presented the remains of two hearths associated with some fragments of Inka provincial pottery. In the eastern part of the unit was a mass of burned branches, suggesting part of some sort of roof that covered the area. Proportions of serving vessels from these excavation contexts are 20.8%, storage vessels are 36.5% and cooking vessels 15.8% as shown in Figure 5.20. Unit 4A shows an increase in the proportion of serving vessels in the LH in comparison to the LRD, a trend observed from surface collections as well.

Faunal Remains from Excavations

Although faunal remains were recovered from excavations, preservational factors precluded a quantitative analysis. Nonetheless, some genus and species identification was possible depending on type and quality of the sample (Aliaga Rossel 2001). Comparing the archaeological specimens to the reference assemblages of the Bolivian Faunal Collection were used in the identification.

Grouping the fauna from all excavations, there is a predominance of camelid bones in relation to other taxa. All the fragments belong to the *Lama* genus but the species could not be identified due to the small sizes and deterioration of the bones.

The majority of the specimens belong to adult individuals, more than 36 months (Aliaga Rossel 2001). Some of these bones presented evidence of cut marks.

Hunting activities were also important in local economies, as evidenced in the taking of wild animals such as deer, rodents and birds. The second group most frequently identified was cervids with two genuses: *Mazama* and *Hippocamelus* or *Odocoileus*. The presence of antlers indicates adult individuals.

Rodents identified corresponded to the Sigmodontinae and Phyllotini families, with the genus Phyllotis of small rodents that usually are present near human settlements, and rodents of larger size such as the *Octodontynis gliroides*, similar to the *cuy* and the *viscacha* (*Lagidium viscaccia*) that were also hunted. Bones of birds were also present, but it was not possible to make genus or species identifications.

Tomb Contents: A Subjective Appraisal

The poor preservation and domestic refuse origins of surface assemblages can limit their utility in investigating wealth and prestige strategies. As noted earlier, we know from tomb contents that spinning and weaving implements, or serving vessels, and metal items, were of perishable materials. It is hard to know how common high status goods (imported shell, metal, or semi-precious stone) were in the Cinti population. These materials tend to have been items of adornment, and typically would not go through the same formation processes that generate most of the surface assemblage. Of course, this is why looters target tombs.

Looted grave goods existing in local collections in the valley indicate that lapis lazuli and shell beads, metal *tupus*, metal rings, silver and copper necklaces, and other high value craft goods were all circulating in Cinti. I know from observation that grave goods including finer pottery and metal objects, and that necklaces made from semi-precious stone beads and shell beads were placed under the foundations of big structures or *canchas* as in the case of El Porvenir (C-76). Most of the looting has been at the larger centers, but of course it would require a systematic mortuary program to determine if high status burial treatments are concentrated at, or limited to, these centers.

CONCLUSION: INTRASITE PATTERNS IN CINTI SITES

Intrasite analysis was successful in terms of helping us distinguish social differentiation in the LRD/LH population, in providing clues as to which leadership strategies may have been in operation, and in clarifying some of the ambiguities stemming from intersite-level analysis. At the same time, the intrasite analysis revealed some unexpected results that raise new questions about leadership strategies in Cinti, and how they can be studied archaeologically.

Collections from C-18, the largest site of the ERD period, suggested differential participation in serving activities by some of the residential population. The variability in serving vessel proportions might reflect either household size (larger families using more serving vessels) or some households engaged in more feasting and/or serving activities than others at the site. However, the proportions of serving vessels at C-18 as a whole, or Sectors 1 or 3 at the site, are *not* substantially larger than other settlements. We would not expect that *each* household in an integrated regional system such as existed in the upper valley in the ERD would engage in the same range of activities to the same extent. And, indeed, it is likely that at C-18, as at other settlements, some higher status household were differentially involved in serving activities. We cannot say that some C-18 households were regionally special, doing things not found at other ERD sites, only that some C-18 households were doing different things than other C-18 households. In the ERD, therefore, we cannot point to a particular sector of any settlement as representing a “regional elite,” as we can for the Sector 3 residents of LRD C-48. The lack of architectural evidence prevents effective assessment of household staple or wealth differences in the ERD, but we can tentatively conclude that the serving vessel differences indicate that differential involvement in serving activities distinguished some households from others.

The activities associated with social differentiation during the LRD are much more clearcut, particularly when one looks at the intrasite patterns at C-48 Jatun Huankarani. The intrasite assemblage differences here parallel the other lines of evidence (architectural and spatial) for marked social differentiation at this site. The variability among sectors in serving vessels and fineware corresponds to our ranking of the degree of investment in domestic architecture, with Sector 3 standing out as high status residential zone. If these residents have differed from other households *only* in greater participation in serving/feasting activities, this could be interpreted as manifestation of a prestige strategy. However, Sector 3 residents were wealthier (as seen in architectural indices and use of finer pottery). The intrasite variability in C-48 in proportions of storage vessels and grinding technology, together with the specialized storage structures in some of the higher status zones of the site, suggest some form of staple strategy. LRD elites may not have been accumulating vast amounts of staple surplus, but the C-48 evidence suggests that they were more involved than other households in storing, processing, and serving staple goods.

The low proportions of imported pottery (in both surface collections and excavations), indicates that imported pottery was not part of the ceramic style preferences of the elite. Keeping in mind the preservational caveat, the low quantities and lack of concentration of these materials makes it unlikely that wealth strategies involving “prestige goods” or imported materials were the basis for political leadership or high social status in the LRD/LH.

LH period intrasite patterns show one important change from the previous period. This shift was an increase in overall proportions of serving vessels - not only in the regional center, but in other villages and smaller sites. This shift may relate to Inka policies that affected local sociopolitical organization as in other parts of the Andes (D’Altroy 1992; D’Altroy et al. 2000). For instance, the increase of serving vessels during this time could be linked to reciprocity, hospitality, and feasting practices that formed part of the Inka state ideology and political economy. It is worth noting, in this context, that bowl dimensions changed from 14-16 cm diameter in the ERD and LRD periods to 18-22 cm during the LH period. Although this observation needs further confirmation with a detailed analysis, it suggests changes in the size of serving portions, and is consistent overall with more serving activities.

The intrasite analysis did not clear up some of the puzzling aspects of ceramic assemblage variability noted in the previous chapter, including the marked proportional differences in serving vessels within even relatively small sites, such as C-85 and C-53 some sectors displaying three or four times higher proportions of serving vessels than others), and the very high proportions of serving vessels even at some quite small sites, such as C-68 and C-79.

If serving activities are truly a measure of status or social position, these findings are intriguing. We would not expect small sites to exhibit a great deal of internal social variability, or to house an elite. Secondly, why should quite small sites such as C-68 and C-79 exhibit such high proportions of serving vessels? Why should high status import goods (copper, alabaster, shell) be found at small sites such as C-79? One possibility is that these sites were in some way "specialized," for instance, serving as way stations along the road system. However another possibility is that high status individuals or elites were not all concentrated at C-48, but were instead, "dispersed" through the system even down to the smallest settlement units. Such a pattern is not consistent with traditional centralized models of complex societies, but is consistent with the *ayllu* model. It is possible that political leadership at these lower levels of settlement was not associated with wealth differences or staple finance (hence no high investment domestic architecture at these small sites), but was involved in serving/ceremonial activities alone; i.e. a prestige strategy. There is no reason to assume that principles of social differentiation and political authority need be congruous at all levels of society; clearly more research is need to explore this tantalizing pattern.

CHAPTER 6

CONCLUSIONS

In a cogent criticism of the use of "homogenized" models in Andean prehistory, Isbell (1997:312) has pointed out that Andean archaeologists, "seem to feel remarkably satisfied visualizing the past in terms of models and interpreting the archaeological record as perfect expressions of these models," without directing study to the archaeological correlates essential for examining key components of these models. Isbell (1997:313) cautions against both the "homogenized" analogies based on other cultures, and the abstractions, "inferred by an anthropologist from bits and pieces in various accounts."

The goal of my research was not to characterize the Cinti Valley as fitting the political economy model or the "*ayllu* model," nor to test the utility of considering wealth and finance strategies; these concepts already have proven their value. Yet it is the very success of the cross-cultural models such as staple and wealth finance strategies that should caution us to being blinded to other dimensions of social organization, and direct us to seek variations and patterns that do not fall neatly into the categories or explanatory scope of the models we have found so powerful. Thus, the aim of this research was to generate an empirically grounded understanding of the sociopolitical structure and economic processes as manifested in a single, late prehispanic population in the Cinti Valley. At the same time, by explicitly incorporating the prestige strategy expectations inherent in the *ayllu* model into a comprehensive research design, this project also tested the utility of an *ayllu* archaeological model.

THE EVOLUTION OF SETTLEMENT HIERARCHY

The regional survey provided the data needed to understand the evolution of the Cinti Valley settlement system and the growth of regional political hierarchy. Occupation began in the Cinti Valley during the Preceramic period, with mobile groups of hunter-gatherers that established camps, shelters and hunting areas. The valley at this time was probably part of a transhumance circuit involving the nearby highlands and mountainous chains.

The first clearly sedentary occupation developed during the Formative period (2000 BC – AD 400), with people in the valley forming small communities in areas of arable land. There is no evidence of settlement hierarchy during this period, and rank size distribution was strongly convex. The population concentrated in the upper valley where the bigger sites are located (C-16, C-48, C-53), and was broadly distributed relative to agricultural potential, exhibiting a preference for the best agricultural lands.

The ERD period (AD 400-800) was a time of important regional and site-level changes. Demographic trends included regional population growth, population nucleation to form larger settlements, and population expansion into areas not previously occupied. Site size differences generally reflect differences in local catchment productivity, but several sites grow beyond what would be expected from their catchment productivity. The largest of these was Palcamayu (C-18), spatially associated with expanses of agricultural terraces. Rank size analysis revealed a pattern very close to the log normal distribution, with Palcamayu at the apex of the settlement hierarchy, suggesting the formation of a regional polity, at least in the upper valley where the population was concentrated. Palcamayu (C-18) is abandoned, however, at the end of the ERD.

The LRD period (AD 800 – 1430) witnessed the further development and consolidation of settlement hierarchy, with three levels of settlement evident in site size. The new paramount center, Jatun Talasa Huankarani (C-48), dominated a pyramid of regional centers, villages and hamlets. The settlement system was most integrated in the upper valley, but the canyon population may have been integrated into this regional polity through interaction with upper valley centers. Rank size analysis showed a roughly log normal pattern for the Cinti Valley as a whole as well as for the upper valley settlements. Overall, ERD regional trends of population growth, nucleation, and expansion increased, as did the proportion of land given over to terrace agriculture.

C-48 differed from other settlements primarily in terms of internal segmentation in residential zones, probably related to social differentiation. It is possible to distinguish elite or high status residential areas (such as Sector 3) at C-48 by the quality of the domestic architecture and proportion of fine ware pottery measured from surface collections. C-48 and two other centers were significantly larger than would be predicted from their local catchment productivity, and may also have contained larger residential populations than could be sustained by their catchment territories alone. This “extra” population at the largest centers may have been supported by intensified irrigation/terrace agriculture, or political arrangements in which the populations could draw on staple products from outside their own catchment zone (through an enlarged catchment zone that incorporated satellite villages or through tribute mobilization). Cinti, since the LRD period, formed part of what is known as the Qaraqara confederation. LRD/LH ceramic styles, architecture, and burial types resemble patterns found in other regions within the Qaraqara territory (i.e. Ibarra Grasso 1973; Lecoq 1999; Lecoq and Céspedes 1997a, b; Vignale and Ibarra Grasso 1943).

Inka domination of the Cinti Valley in the LH period (AD1430 – 1535) was indirect, but possibly included the movement of foreign *mitmas* into the valley. Inka hegemony did not lead to any appreciable interruption of regional settlement trends; population growth (primarily in the canyon), nucleation, and expansion (particularly in the canyon) all continued in the LH. Regional settlement integration, expressed in a log normal rank size distribution, lay in the hierarchy of settlements with C-48 at the apex, dominating a set of secondary centers spread across the valley. The entire valley was likely integrated into a single polity during this period, with subsystems of settlement (consisting of clusters of settlement, each with a local center and associated villages) interacting with the larger upper valley centers.

SOCIAL INEQUALITY AND POLITICAL STRATEGIES IN THE CINTI

This research was organized around discerning principles of political leadership or social differentiation drawn from both traditional archaeological models of hierarchy and centralization, as well as from a currently popular model of Andean organization, one mainly based on ethnohistoric and ethnographic accounts. In the former models, political leadership or social differentiation are economically based on staple or wealth strategies, that is, elite domination of staple production or the circulation of high value goods. The latter, *ayllu* model, incorporates what I have called a “prestige” strategy, in which elites dominate communal and ritual activities rather than economic processes. The ethnohistoric documentation for the existence of *ayllu* polities in the Cinti region, described by some archaeologists (Isbell 1997) differing so much from traditional, centralized polities, made this area an ideal opportunity to study what one of these polities looks like archaeologically.

Staple Finance Strategies

Staple strategies involve control over production and/or distribution of subsistence goods. Therefore, the economic basis of political leadership is closely related to control of agriculture, and generally entails mobilization and storage of surplus production. If this type of strategy was important in Cinti, we expected to see: (1) political centers associated with the most productive agricultural lands and disproportionately large relative to local productivity; (2) agricultural intensification (terraces, irrigation) differentially associated with the centers; and (3) mobilization of agricultural surplus as evidenced in storage.

Each of these expectations was met for the Cinti regional polity of the LRD and LH periods, suggesting that differential involvement in agricultural production played a role in Cinti leadership strategies from the ERD through the LH periods.

Political Centralization and Catchment Productivity

Regression analysis for looking at the correlation between site size and agricultural land revealed some trends through time. During the Formative period there was a weak correlation between these two variables in the valley, although dividing it in upper valley and the canyon showed that there was a moderate strong correlation in the upper valley, while in the canyon there is no correlation at all. Regression analysis for the ERD period revealed a weak correlation between site size and agricultural land. The same analysis for the LRD period shows a weak correlation between site size and agricultural land that turns into a moderately strong correlation for the upper valley if sites < 0.5 ha and the largest site are not considered. LH period regression analysis showed a weak correlation between site size and agricultural land that became, again, moderately strong for the upper valley when sites less than 0.5 ha and the largest site are not considered.

The centers of the ERD through LH periods tended, not surprisingly, to have more good agricultural land in their catchment zones then did other sites. However, catchment zone analysis revealed that the sites such as C-18, C-48, C-58, C-70, and C-76 were also disproportionately large for their estimated catchment productivity. During the LRD and LH, Jatun Talasa Huankarani (C-48), El Patronato (C-70) and El Porvenir (C-76) are estimated to have resident populations larger then their respective catchment zones could support. The resident populations of these centers must have been supported by political arrangements that allowed them to dominate (or draw from as surplus) the catchment zones of other settlements, or by intensified agricultural production within their own catchment zones.

The terracing of Category 2, and even Category 3, land substantially raises the agricultural productivity of a site's catchment zone. Agricultural terracing is widespread throughout the Cinti Valley; many terrace systems dating to the LRD and LH periods.

However, the earliest terracing is associated with the upper valley centers such as Palcamayu (C-18). The LRD – LH center Jatun Talasa Huankarani (C-48) is surrounded by agricultural terraces and irrigation channels; distances from this site to most terrace areas ranges from 0 to 4 km. C-48 for example, is not in an optimal location relative to Category 1 land, but it is in one of the valley's best location for irrigation agriculture because of the proximity of streams and water courses. The agricultural intensification represented by these terrace systems may well have been essential to supporting the large residential populations at C-48 and other centers, and suggests leadership strategies were related to ability to increase agricultural production.

Political Centralization and Staple Storage

The two lines of evidence to evaluate differentials in staple storage were architectural features (storage structures) and proportions of storage vessels in residential ceramic assemblages. For the ERD period, the largest site in the valley, Palcamayu (C-18), shows a higher proportion of storage vessels, relative to the mean of the other sites in the valley. Analysis of storage vessels proportions for LRD period sites, especially the regional center Jatun Talasa Huankarani (C-48), likewise showed the importance of storage at those sites. The regional and local centers present in general a higher proportion of storage vessels than the rest of the settlements. At Jatun Talasa Huankarani (C-48), intrasite differences in domestic storage are indicated by variability, with residential Sectors 6 and 7 presenting higher proportions of storage vessels than other zones at the site (including the high status Sectors 2 and 3). However, residential units in Sector 2 contained small (ranging from 1 to 4 m^2)

structures that may have been used for storage. No common or "public" storage facilities, comparable to the Inka *qolqas*, were found in the Cinti Valley.

During the LH period proportions of storage vessels declined at the centers, and increased at smaller sites, which might suggest local elites were not controlling surplus as before. One possibility is that some surplus would have been moved outside of the valley as part of the political economy of the Inka Empire, or that there was a change in strategies at this time. In any case, this point requires more regional research in order to be addressed. In any case, a closer look to storage facilities needs a program of excavation in order to identify in detail storage practices and see if there were marked differences between higher at lower status households at C-48.

Wealth Finance Strategies

Wealth strategies entail controlling the production, flow, and manipulation of valuables. They are manifested in differences in wealth accumulation, and in elite domination of trade and craft production. If these strategies were prevalent in Cinti, I expected to find: (1) differential association of centers with llama corrals, (2) signs of craft specialization associated with elite residential areas or public architecture at the centers; and (3) high status households or elite residential areas displaying higher relative proportions of wealth items. At the intersite level, this last process would be seen as centers displaying proportionally more such goods than lower levels in the settlement hierarchy.

Camelids and Political Centralization

There is no clear association between corrals and centers at Cinti sites prior to the Inka domination. During the LRD period, C-17 (Jayasamana) was the only big site that contained areas of corrals, although and some small satellite sites near the centers had corrals. However, there is no an exclusive or greater association with centers. My subjective assessment is that the number of corrals in the Valley increased during the LH period in sites close to the centers suggesting goods were moved in and out of the centers through llama caravans. It is likely that during the Inka domination of the region, the Inkas would have exercised a more direct control of the caravans or reoriented the trade or movements of goods within their political economy. This pattern has been reported from other regions of the southern Andes (i.e. Costin and Earle 1989; Santoro 1995). More direct evidence for textile production was not available from Cinti surface collections because spindles in the region were made of wood and would not have preserved.

Craft Specialization and Prestige Goods

Analysis of the surface collections did not indicate that domination of the production or circulation of craft or high value goods constituted part of the leadership strategies for Cinti elites. There were no signs of differential concentration of such goods at the centers or within centers. Valuable items such as shell beads, metal objects, alabaster and foreign ceramics were found in small quantities at different sites in the settlement hierarchy, including small sites.

I found no indicators of attached specialists or craft specialization restricted to the centers. There were signs of ceramic production at some sites such as C-67, Bella Vista (C-72), and at the regional center Jatun Talasa Huankarani (C-48), suggesting ceramic production was an activity carried out in some settlements, including small ones, probably at the household level.

Although our analysis did not reveal evidence that wealth strategies were associated with political leadership or centralization in Cinti, the existence of such strategies cannot be ruled out as the most highly valued items may have been perishable materials such as textiles.

Prestige Strategies

Assessment of prestige strategies is challenging, because in prestige strategies, high status is not dependent on economic processes, and high status need not be associated with wealth or material privilege. Of course, serving activities, feasting, and leadership in communal ceremonies are part of political leadership in many societies with strong wealth differentiation. As I have defined the prestige strategy, therefore, leadership is *not accompanied* by significant wealth differences (in staple goods or wealth items).

If prestige strategies alone were operating in Cinti I expected to find: (1) no strong functional differences among sites with *markas* distinguished only by size and greater proportions of elements relating to communal ritual (ceremonial architecture, cemeteries); (2) the *marka* site would display public areas or public architecture but not have evidence for marked household wealth differences in house size, construction materials or elaboration; (3) little economic variability among households, with the elite distinguished by limited status badges (ornaments or costume materials) rather than traditional wealth markers; and (4) differential participation in feasting activities, with “elite” areas, or the *marka* site, displaying higher proportions of serving vessels for food preparation and consumption (bowls) or drink preparation and serving (jars for chicha, cups) than other loci.

None of these expectations were met.

Political Centers and Functional Differentiation

One expectation of the prestige model is that there should not be strong functional differences among sites, with the *markas* or centers distinguished from other sites only by greater proportions of elements related to communal ritual such as ceremonial architecture and cemeteries. In Cinti the centers, especially Jatun Talasa Huankarani (C-48), did not exhibit great functional differences from other settlements including large villages. However, C-48 lacked the elements related to communal ritual such as public/ceremonial architecture, or cemeteries. C-48 was also functionally distinct in its architectural elaboration, encircling walls, and degree of internal segmentation and residential zonation (reflecting its function as a high status residential site).

Household Wealth Differences

Significant interhousehold wealth differences are not expected where a pure prestige strategy is prevalent. In general, domestic construction techniques and house size seem to be similar in all the settlements, but the status/wealth differentiation at C-48 was most strongly seen in domestic architecture. Sectors 2 and 3 at C-48 exhibited markedly more labor intensive or elaborate architecture with thicker walls, greater use of stone in construction, higher and more precisely built residential terrace faces, and more careful shaping and placing of stones used in domestic buildings. Sector 3 at C-48 also displayed a significantly higher proportion of fine ware pottery than other sectors of the site.

Feasting and Food Processing Activities

An expectation of the prestige strategy was differential participation in feasting activities, with the centers (or elites areas of centers) displaying higher proportions of serving vessels than other settlements. In the surface collection assemblages, regional centers, in general, exhibited higher proportions of serving vessels (as measured against the mean proportion for Cinti settlements as a whole) in some sectors, including Sectors 1, 3 and 6 of Palcamayu (C-18) during the ERD period, Sector 3 of Jatun Talasa Huankarani (C-48) during the LRD and LH periods, and Sector 2 of C-45 during the LH period. These differences in serving vessel proportions suggest that feasting and serving activities did form part of leadership strategies, however they took place in the context of significant wealth differences, so were likely components of a broader set of elite activities.

Observing changes through the sequence allows discerning the evolution of elite activities. For instance, during the ERD period, site and household level differences were weak, probably while particular families or groups were building the basis for some social differentiation cultivating and enhancing agricultural areas, and giving feasts, as manifested in the proportions of serving and storage vessels at the largest site (Palcamayu C-18) in the valley. During the LRD period, these aspects become more evident, the regional center, Jatun Talasa Huankarani (C-48), especially Sector 3, shows a markedly higher proportion of serving vessels and fine ware compared to other sectors and sites, suggesting this was an elite area where special activities were carried out. The high density of mortars and other grinding implements (evident when compared with other sectors within the site), and even hoes in Sector 3 suggest people living in this zone were engaged in intensified processing of chicha and/or food. These processes are familiar in Andean contexts such as the Mantaro Valley Wanka II elite households, where food processing and chicha brewing identified by the presence of grinding stones, mortars, and other equipment indicates that elite residences were differentially engaged in these activities (Hastorf 1993).

The archeological correlates for a prestige strategy were not meet in the Cinti case, in part, because I did not find evidence for the expected activities *independent* of wealth differences. I conclude that the prestige strategy was not a major basis for Cinti leadership or elite status.

AYLLU ORGANIZATIONAL PRINCIPLES AND THE ARCHAEOLOGICAL RECORD

One of the goals of this research was to examine whether the archaeological patterns of prehispanic sociopolitical organization in Cinti suggested polities were in any way incompatible with the centralized, hierarchical models more commonly used by archaeologists. Thus my approach involved making a distinction between a "model of" *ayllu* organization (developed from the ethnohistorical literature to describe a social organization and social fields that existed in the prehispanic past) and a "model for" archaeologically investigating *ayllu* organization in prehistory. It is the latter, based on the prestige strategy, that generated the archaeological expectations used in this study. Therefore, to interpret the results of this research, it is useful to discuss the relationship between *ayllu* organization principles and the expectations of the archaeological construct.

Settlement Patterns and *Ayllu* Organization

The *ayllu*, as generally described in the ethnohistoric accounts, is based on a system of inclusive, nested socio-territorial hierarchies, with dual division in each one of these levels. Therefore, it has been assumed by some prehistorians that nested hierarchies and dual divisions should be physically manifested in archaeological settlement. Evidences for dual organization in settlement patterns have been identified in the Tarama region (Parsons et al. 2000) or, at the intrasite level, in the Mantaro valley (D'Altroy 1992; DeMarrais 2001 among others).

These studies highlight one of the aspects of *ayllu* organization that make problematical developing an archaeological model for studying the *ayllu*: How does the inclusive, nested hierarchy of the *ayllu* organization correspond to different levels of settlement patterns? For instance, which of the *ayllu* levels is represented by the individual sites in the archaeological record? Drawing from ethnographic information, such as the Yura Valley in Potosí (Harman 1987; Rasnake 1988), I believe that minor *ayllus* may well have been actual socio-residential units, represented by communities or sets of communities, while major *ayllus* were more abstract, conceptual categories. The difficulty is that the conceptual (emic) categories used by Andean people in thinking about the *ayllu* organization mainly referred conceptually to territories, rather than to settlements (Rasnake 1988). The *ayllu* principles define social relationships within groups of people from a given area, and the nature of the processes of hierarchical group formation (Urton 1985 quoted in Rasnake 1988). In this respect, *ayllu* principles may have described a social field rather than a physical settlement pattern.

It follows from this that inclusive hierarchies and dual divisions may often not be seen or easily identified in the archaeological record because they were, fundamentally, particularly at the larger level, structural and symbolic conceptual categories that are organizational rather than spatial. These divisions were used and experienced by people in a way that is not tangible materially. As Hayden (1984:80) pointed out, the emic categories used by people for classifying or organizing things are not the same that archaeologist use as scientists for classifying things or in resolving specific problems.

Seen in this context, I hoped my research would serve to address two questions. First, assuming that *ayllu* organization characterized the prehispanic Cinti Valley (as the ethnohistory indicates), are the ethnohistorical models (“models of”) correct in emphasizing the *ayllu* polity as fundamentally different from centralized polities in its decentralized leadership, and elite status divorced from wealth? Second, how useful was my prestige strategy construct and its expectations as an operational construct ("model for") to study *ayllu* organization? In the first case, I hoped my research would tell us something about the "footprint" of *ayllu* organization. In the second case, I hoped my research would provide some lessons on how archaeologists can approach an emic sociopolitical organization with the rigor of falsifiable material expectations.

***Marka*s as Central Places**

A key difference between the *ayllu* polity and the traditional centralized polity model is the nature of the central site. In the latter model, the dominant settlement is a central place, residential site for a regional elite and to administrative, economic, and ceremonial functions not found at other settlements in the settlement system. In the *ayllu* polity model, the *marka* is primarily a nexus for regional wide ceremony, rather than an elite site. It does not necessarily have a larger residential population than other settlements, because its functions revolve around what may be intermittent ceremony, rather than the political economy of a regional elite. Thus, it is expected that the *marka* will be larger than other settlements primarily in public spaces.

In the Cinti case, the regional center C-48 (Jatun Talasa Huankarani), as the only potential *marka* site, deviates from these expectations. It is likely that, as it was the most important settlement in the valley, leaders resided there and ritual/special activities were conducted there, although public or ceremonial areas were not identified. Therefore, C-

48 indicates that the *marka* has more of the attributes of the central place in the traditional, hierarchical models than implied in the current *ayllu* models.

How Centralized Was the Cinti Regional Polity?

The issue of political decentralization in the *ayllu* model has to take into consideration problems of scale if it is going to be solved adequately. There are two different situations; first at a macroregional level or scale, one can talk of political “decentralization” in the *ayllu* model because political entities were organized within as confederations. This means that the Qaraqara confederation was formed by distinct “nations” or groups, as is described in the early colonial documents. The archaeological record for such organization probably would consist of a series of polities spread over a territory of highlands and valleys without a macroregional hierarchical organization in terms of settlement patterns. Second, at a regional level or scale, *ayllu* polities in the *ayllu* model present an organization with a hierarchy of *marka*s of two or three levels. In this manner, the observed decentralization in *ayllu* organization was likely something to have existed at the macroregional level, and may have been less a characteristic of political organization at the regional level and below.

Cinti regional settlement patterns are consistent with the expectations for a centralized, hierarchical polity rather than with the decentralization implied in the *ayllu* model. From the ERD on, settlement patterns consisted of a pyramid of sites, with the largest site (C-48), at least, having the characteristics of a functionally distinct center. Secondary and tertiary centers were surrounded by clusters of smaller settlements. Moreover, the rank size distributions from the ERD indicate a regional settlement integration suggestive of a centralized administrative hierarchy entirely consistent with the centralized, hierarchical polity model. There was no regional evidence of any settlement duality. Overall, the regional settlement patterns in Cinti indicate that, if the Valley was occupied by an *ayllu* polity, the forces that structured site growth and interaction in this Cinti polity were little different from the forces that govern these matters in the centralized, hierarchical polity model typical adopted by archaeologists. In sum, the settlement system revealed by my research was almost entire amenable to interpretation using the centralized, hierarchical polity model, with no indications that a quite different "indigenous Andean model" (Isbell 1997) is necessary to understand the development of Cinti settlement.

An intriguing - - and potentially very significant - - exception to the conclusions presented above stems from the proportions of serving vessels recorded in the surface collections at different sites. As discussed in Chapter 5, high proportions of serving vessels were associated with the elite Sector 3 of C-48. This association is consistent with much archaeological evidence that elites, cross-culturally, are differentially involved in serving activities. In the Andes and elsewhere (Dietler and Hayden 2001), high proportions of serving vessels are often used as an archaeological correlate of elite households. Yet some small Cinti sites contained very high proportions of serving vessels.

If high proportions of serving vessels were a marker of high status or wealth, this pattern contradicts the notion that elites should be residing at the centers and therefore feasting activities should be concentrated there. Instead, it suggests the possibility that certain smaller sites could have housed families or groups that might have been engaged in feasts.

This observation, as discussed in the previous chapter, could indicate that high status individuals or elites were not completely concentrated at C-48 or other centers, but were instead “dispersed” through the system even to the smallest settlement units. Such a pattern is not consistent with traditional centralized models of complex societies, but is consistent with the *ayllu* model, particularly as described by Netherly (1993:14) who argues that a model of prehispanic polities featuring a “centralized core” of managerial rulers, “does not work well for the Andes...where the functions of the central core were largely delegated.” It is further possible that political leadership at these lower levels of was not associated with wealth differences or staple finance (hence no high investment domestic architecture at these small sites), but was involved in serving/ceremonial activities alone; i.e. a prestige strategy.

There are alternative explanations. For example, proportions of serving vessels may not be a reliable indicator of status, because they may result from lower proportions of other kinds of vessels. Another possibility is that with the Inka domination of the Cinti Valley in the LH period, local elites become embedded within the state structure, and feasting activities, as reflected in proportions of serving vessels, appear to have increased probably as part of policies of imperial reciprocity. It is interesting to note that some sites located near agricultural terrace systems such as Talasa Cochaca (C-16) and Santa Rosa (C-53) have higher proportion of serving vessels suggesting that serving activities probably related to agricultural activities were carried out there. Finally, sites located near roads such as Frente Patronato (C-68), Palca Chica (C-79) and Palca

Grande II (C-85) present higher proportions of serving vessels, suggesting serving or feasting associated with caravan movement activities.

THE CENTRALIZED MODEL AND THE *AYLLU* MODEL: IMPLICATIONS FOR SOUTHERN BOLIVIA PREHISTORY

As Isbell and Silverman (2002) point out, we can gain much insight in the study of general cultural processes through a detailed examination of the uniqueness of Andean forms of social organization. Although some elements that characterize the *ayllu*, such as dual organization and prestige strategies can be found in other societies around the world, and thus are not exclusive from Andean societies, one value of considering the *ayllu* model is that it steers us from thoughtlessly reifying the models we are accustomed to using, towards considering what is historically contingent for prehispanic societies.

This perspective highlights aspects of the *ayllu* model, considered both as a "model of" and as a "model for". The Cinti research suggests that, as a "model of," the *ayllu* organization may have been more idealized, conceptual, and prescriptive than recent proponents of "Andean uniqueness" have argued. In its settlement "footprint," and in the processes that generated the "footprint," the *ayllu* polity of the Cinti Valley closely resembled centralized, hierarchical polities. Thus the Cinti Valley has helped to refine our understanding of the *ayllu* polity as a construct. One hesitates to say that the ethnohistorians are "wrong" about the nature of prehispanic society, yet, on the other hand, there is no reason to accept uncritically ethnohistoric accounts of fragmentary sources and indeterminate time depth. In developing their "model of," ethnohistorians have relied on sketchy administrative records and oral accounts. Naturally, the way an informant might describe their own sociopolitical system - - the relationships, the values, the principles - - might bear little resemblance to the system as manifested in material residues. The *ayllu* model is a societal construct as viewed from the inside of a society; it is an emic, cognitive perspective, and describes the structure of a society, but in a form that is not necessarily materially tangible. In this sense, such models are historically specific. The way in which people think or organize their social structure and space is important to understand how societies developed historically. Understanding and considering this principles and cognitive aspects should and will generate a better understanding of social organization in the southern Andes.

The Cinti research has also underscored some of the strengths and weaknesses of the "model for" *ayllu* society that I developed in Chapter 1. The expectations generated by the model were of generally utility; that is, they could be archaeologically addressed (and largely rejected). However, my "model for" had several limitations. First, as any archaeologist recognizes, it is difficult to discern status differentiation that is not accompanied by significant material differentiation. This problem was exacerbated by an archaeological record in which organic materials did not preserve, and for which epigraphy provides no help. Second, activities of the prestige strategy such as feasting, or greater participation in public ceremony, are not exclusive to that strategy, they may accompany wealth and staple strategies. And third, the Cinti research has convinced me that archaeologists and ethnohistorians should be hesitant about using society-wide or polity-wide characterizations concerning political leadership and status differentiation.

The principles surrounding elite status and authority on one societal level may be very different from those operating on other societal levels (such as the community level).

PREHISPANIC SOCIOPOLITICAL ORGANIZATION IN SOUTHERN BOLIVIA

One of the contributions of this research is to show that processes of social complexity in the southern interandean valleys, particularly in Cinti, were product of a long local trajectory of development. Based in a lack of problem oriented research in these areas, and influenced by the Murra's model of verticality, scholars have tended to portray these valleys as the "empty" areas where polities from the highlands established colonies, or in other cases, local populations were seen as the passive recipients of highland influences. For example, based on ethnohistorical accounts and colonial history, ethnohistorians have portrayed the Cinti Valley as an area where population was not stable, and considered it as a "*corridor*" rather than an area with well-established populations and a sociopolitical evolution of its own (Presta 1995).

However, this panorama has started changing in the last decade, with new investigations carried out in distinct regions and valleys. In this sense, the present research has provided a diachronic view of local social evolution through time that can be compared with other regions. Although still very limited, it appears that similar trajectories of local development took place in other valleys of southeastern Bolivia. For instance, to the north in Oroncota (Alconini 2002) and Icla (Janusek and Blom n/d), similar sequences of development have been established, including the development of regional autonomous polities. Regions such as Tupiza (Angelo 1999) and Quila Quila (Lima 2000) also present trajectories of local sociopolitical development, although without developing such marked settlement hierarchy as in the Cinti case. South of Cinti, in the Sama region (Michel et al. 2000), the local trajectory shows a parallel process of increasing social complexity and settlement hierarchy through time. Most of these investigators agree that agricultural production was an important base for local polities. Terrace systems associated or near regional centers or important sites (i.e. Quila Quila, Icla) suggest control of production was to some degree important for local leaders. However, investigators have also maintained that interregional exchange networks were critical in the political leadership of autonomous polities located through the southern valleys (Angelo 1999; Janusek and Blom n/d; Lecoq and Céspedes 1997a; Lima 2000). In this view, elites created kinship and political ties with external populations, obtained both exotic prestige and utilitarian goods, and created relationships as risk buffering mechanisms. However more research is needed for understanding the details of these exchange systems. At this point it is not clear, even yet for the Cinti Valley, if some items were traded under close elite control, or if craft production formed part of elite wealth strategies.

The Titicaca Basin and Northwest Argentina

Comparing Cinti to other regions in the Andes such the Titicaca Basin and the northwest of Argentina illuminates different trajectories of societal development, and the similarities and differences of elite power strategies in prehispanic societies. Social complexity developed early in the Titicaca Basin, during the Middle and Upper Formative periods (1300 BC - AD 400), with ranked and hierarchical societies with large populations settled in areas rich in agricultural lands and lacustrine resources. These societies constituted peer polities with elites engaged in alliances and warfare, competitive feasting and public ceremony, and dominating exchange of high value objects and intensification of economic production (Stanish 2003). From this landscape Tiwanaku emerged as state (AD 400-1100) integrating polities in the core area and expanding over a broad territory.

In Humahuaca, Argentina, processes of social complexity appear to begin at the end of the Middle Horizon period, emerging from social circumscription and population growth (Nielsen 1996). Nielsen (1996) points out the origins of social hierarchy may be traced only as far back as AD 900, with wealth objects deposited in tombs as part of competitive prestige strategies. Political integration can be identified at the end of the Late Intermediate period (circa AD 1350), indicated by a hierarchical functional relationship among settlements. Associated with this political integration was an intensification of agricultural production manifested in terrace system construction, increased animal husbandry, and the circulation of prestige goods such as polychrome ceramics, metal ornaments, shell items, and snuff tablets for hallucinogens. Macroregional alliances among elites are evidenced by common ceramic styles, and long distance trade that provided access to prestige goods that served as symbolic and ritual capital (Nielsen 1996).

The Calchaquí Valley south from Humahuaca (D'Altroy et al. 2000) presents a sequence with the development of local polities during the Regional Developments period (AD 1000 - 1480). Marked population growth, agricultural intensification, craft production, a two tier settlement hierarchy and functional differences among sites all developed during this period. Settlement patterns consist of regional centers with outlying villages and hamlets, suggesting the presence of several small polities with regional centers. Inka conquest probably stemmed from interest in the mineral resources of this region, and control of production of fine craft goods made from mica, shell, alabaster, semi-precious stone and metal (D'Altroy et al. 2000). Both pre-Inka and Inka period leaders exported the metal items used in political and ritual activities.

In comparison with these regions, the Cinti processes of social complexity bear slightly more similarity with developments in the northwest of Argentina than with those in the Titicaca Basin. Economic strategies, especially staple ones, were prevalent in all the regions, as manifested in agricultural and herding intensification. Wealth strategies need more research in all the areas, but appear to have figured more importantly in both the Titicaca Basin and Argentina than in the Cinti Valley. In the Titicaca Basin, for example, differential access to obsidian was a hallmark of high status, and the Tiwanaku state may have practiced state control of obsidian (Giesso 2003). However, we do not know to what extent other goods were controlled by elites, or if craft production of special valuables were controlled. The circulation of exotic valuables in the Humahuaca and Calchaquí Valleys suggest a form of wealth strategy in which local elites used high value items for establishing alliances at a macroregional level.

FUTURE RESEARCH

The higher proportions of serving vessels in some small sites - - Palca Chica (C-79), Palca Grande II (C-85) or Cochaca (C-16) - - during the LRD and LH periods are not expectations of the centralized hierarchy model. One possibility, reviewed previously, is that this reflects the decentralization of leadership expressed in the *ayllu* model. As discussed earlier, the proportion of serving vessels at smaller sites might also suggest direct or indirect changes in local organization, and the existence of rural “elites” or certain groups linked to activities that were important for the Inka. More intensive investigation of the nature of these small sites is certainly in order.

Part of such investigation must involve gaining a better understanding of the use of serving vessels in different residential contexts. Surface information gathered from intersite and intrasite analyses is ambiguous, especially for the LH period. On the one hand, elite residential areas of the regional center Jatun Talasa Huankarani (C-48) presented higher proportions of serving vessels suggesting feasting activities associated with elite activities, on the other hand, some smaller sites also presented high proportions of serving vessels. However, the association between serving vessels and high status needs to be better established before we conclude that proportions of serving vessels themselves reflect status or wealth.

Overall, settlement patterns and surface information are an initial step for a more detailed research that must include not just a top-bottom view but a bottom-up perspective too. In particular, it is important to detail elite strategies, especially wealth and prestige ones, with information gathered from excavation contexts. Therefore future investigation needs to entail excavations at Jatun Talasa Huankarani (C-48) to reveal more about potential central place functions at the site, and to learn more about ways in which Sector 3 households differed from those in other zones of the site.

APPENDIX A

FIGURES

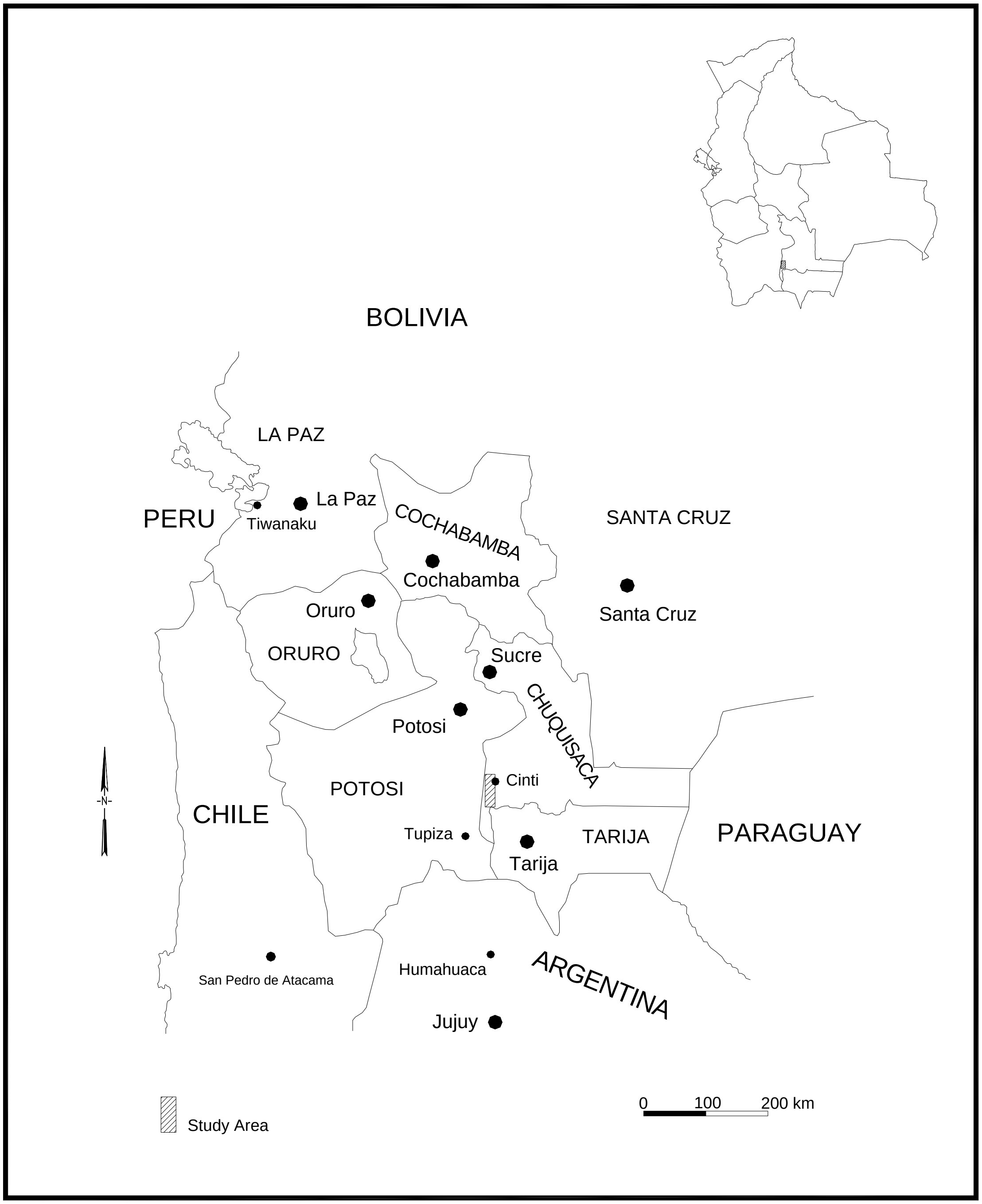


Figure 2.1. Cinti Valley location.

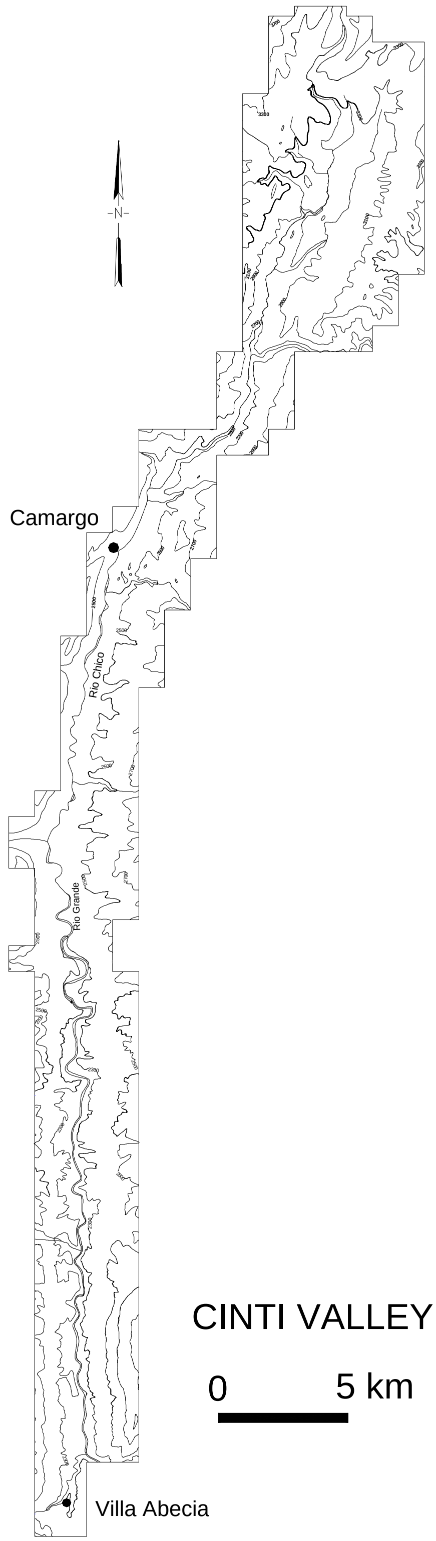


Figure 2.2. Cinti Valley study area.


Upper Valley Landscape


Canyon Landscape

Figure 2.3. Cinti Valley Landscapes.

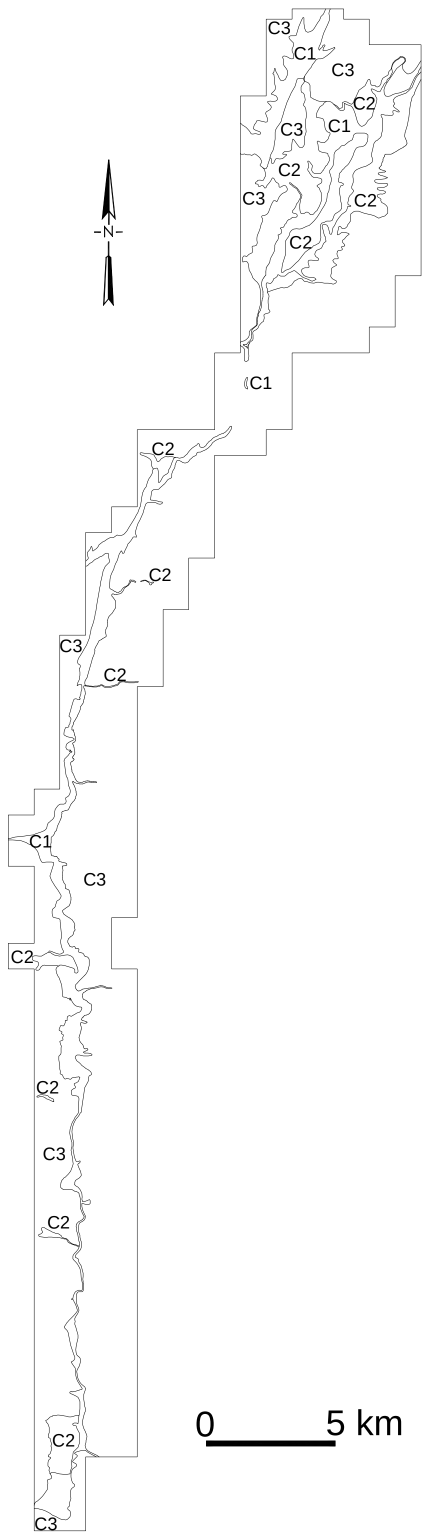


Figure 2.4. Land Categories for the Cinti Valley.

Date	South Central Andes	Southern Valleys	Potosí		Tarija	Chuquisaca		
			Yura	Tupiza	Sama	Cinti	Icla	Oronkota
			Inka	Inka	Inka	Inka	Inka	Inka
1535	Late Horizon	Late Horizon	Yura Foliaceo			Late Huruquilla	Yampara	Late Yampara
1430	Late Intermediate	Late Regional Development		Late Chicha			Moqo	
1200								
1000	Middle Horizon		Yura Poligonal		Tarija-Chicha	Huruquilla	Mayu	Classic Yampara
800		Early Regional Development		Early Chicha				
600			Yura Geométrico Tica Tica			Cinti		
400								Early Yampara
200							Pukarilla	
AD 0 BC	Formative	Formative	Capinchina Tacora	Formative	Formative	Jatun Khasa		
2000	Preceramic	Preceramic	Preceramic		Preceramic	Preceramic	Preceramic	
4000?								

(Regional sequences established in base to information taken from Alconini 2002; Angelo 1999; Janusek and Blom n/d; Lecoq 2001; Lecoq and céspedes 1997a; Michel et al. 2000, and Rivera Casanovas 2002).

Figure 2.5. Chronology for the southern Bolivian Valleys.

Figure 2.6. Southern Bolivia localities mentioned in the text.

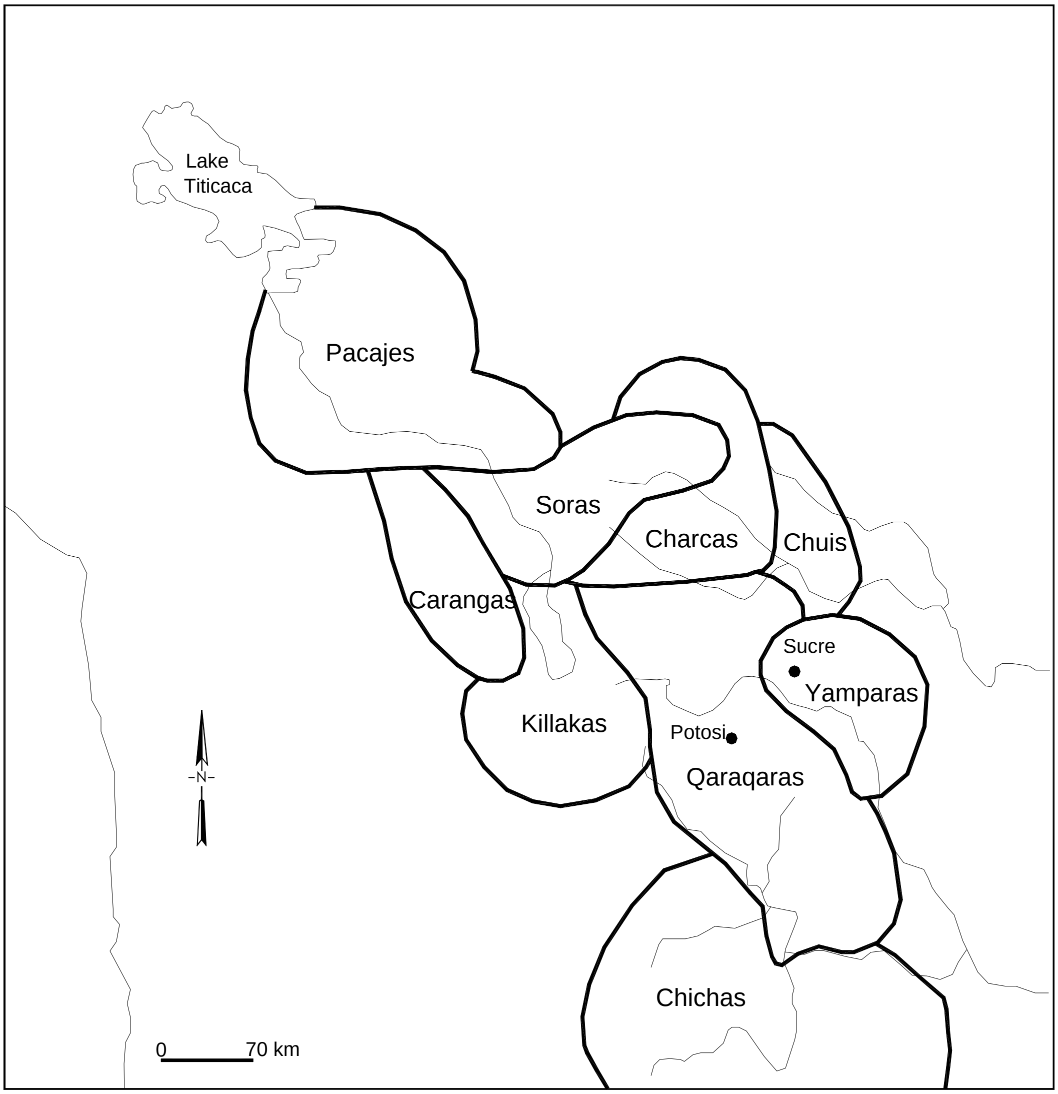
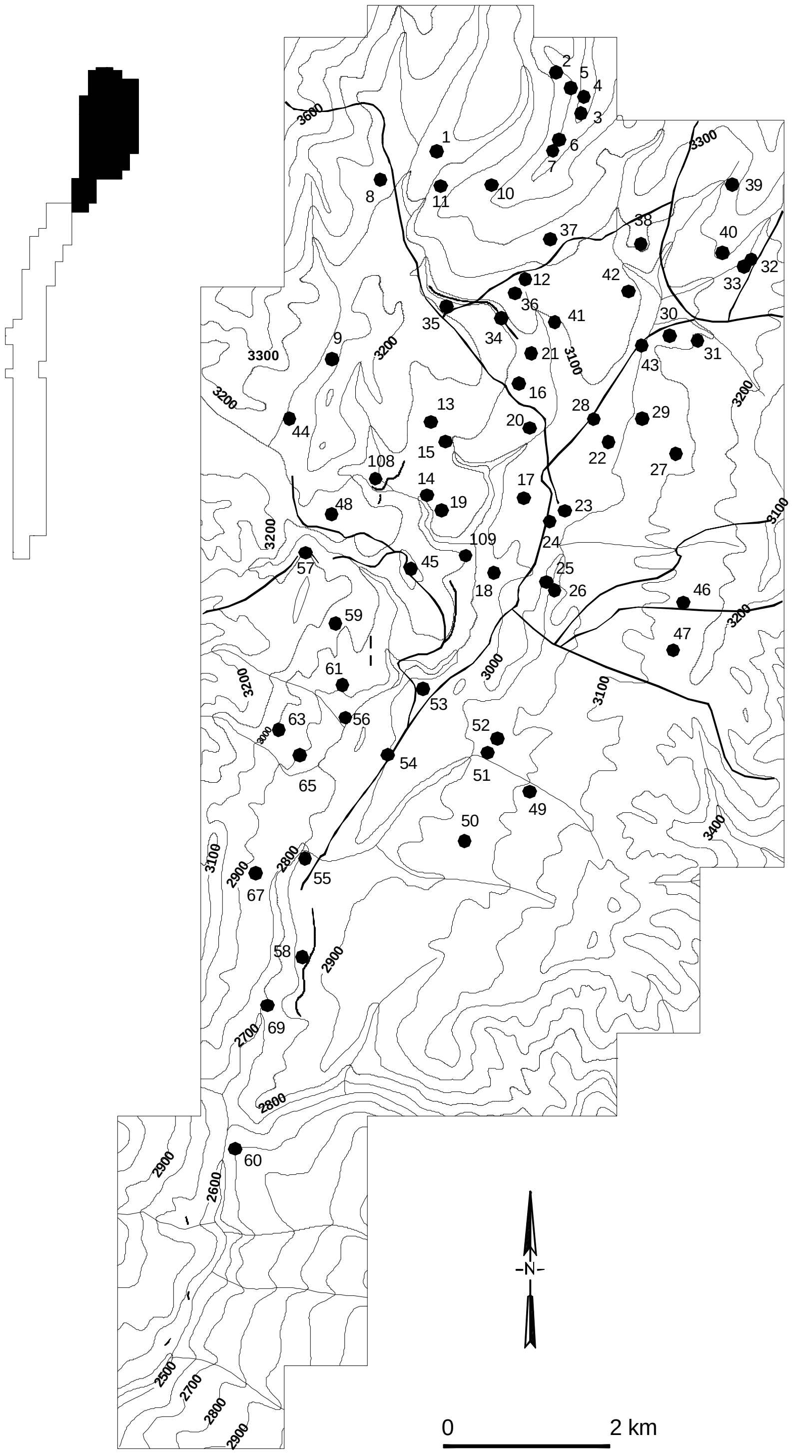
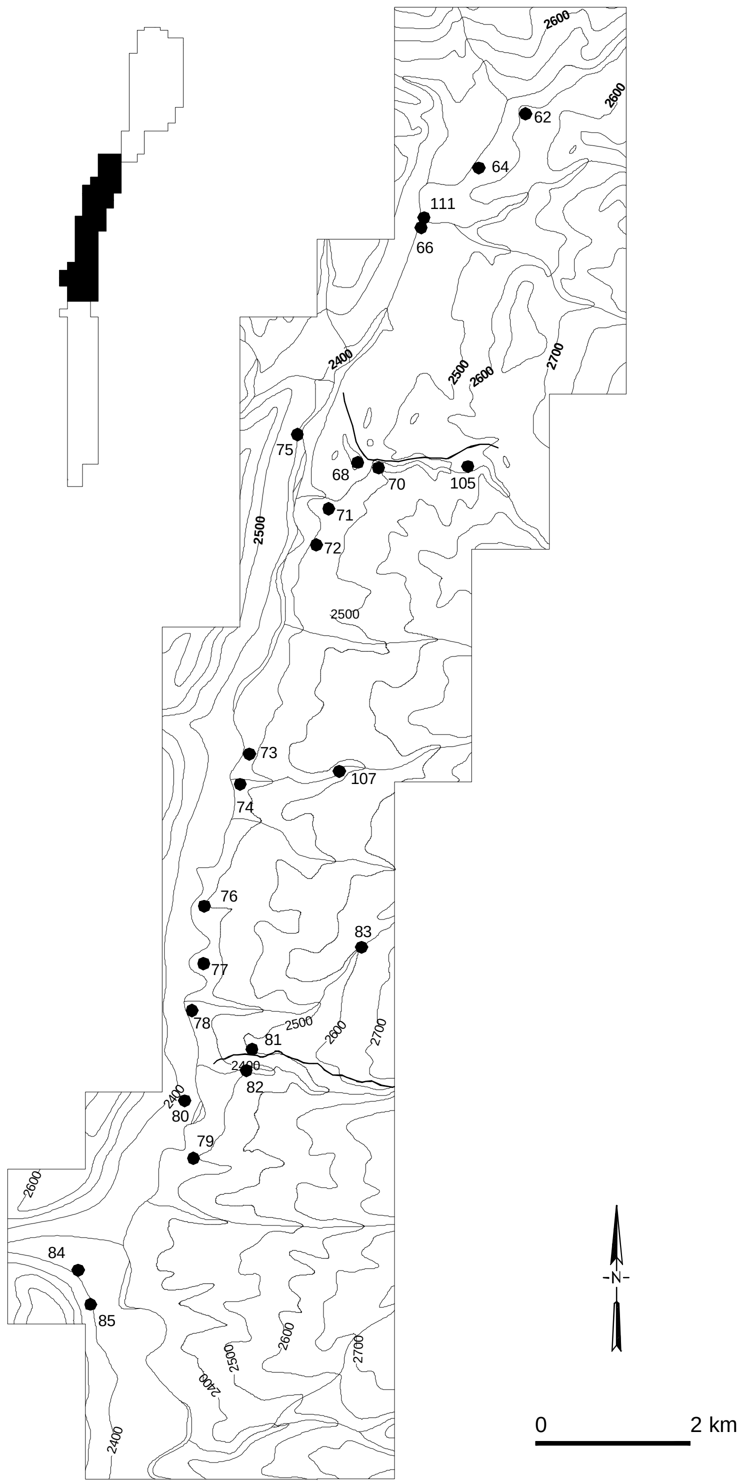


Figure 2.7. Southern Bolivia *señorios* (territorial approximation as based on Bouysse Cassagne 1986 and archaeological data).



— Prehispanic roads

Figure 3.1. Upper valley and corresponding archaeological sites.



— Prehispanic roads

Figure 3.2. Northern canyon and corresponding archaeological sites.

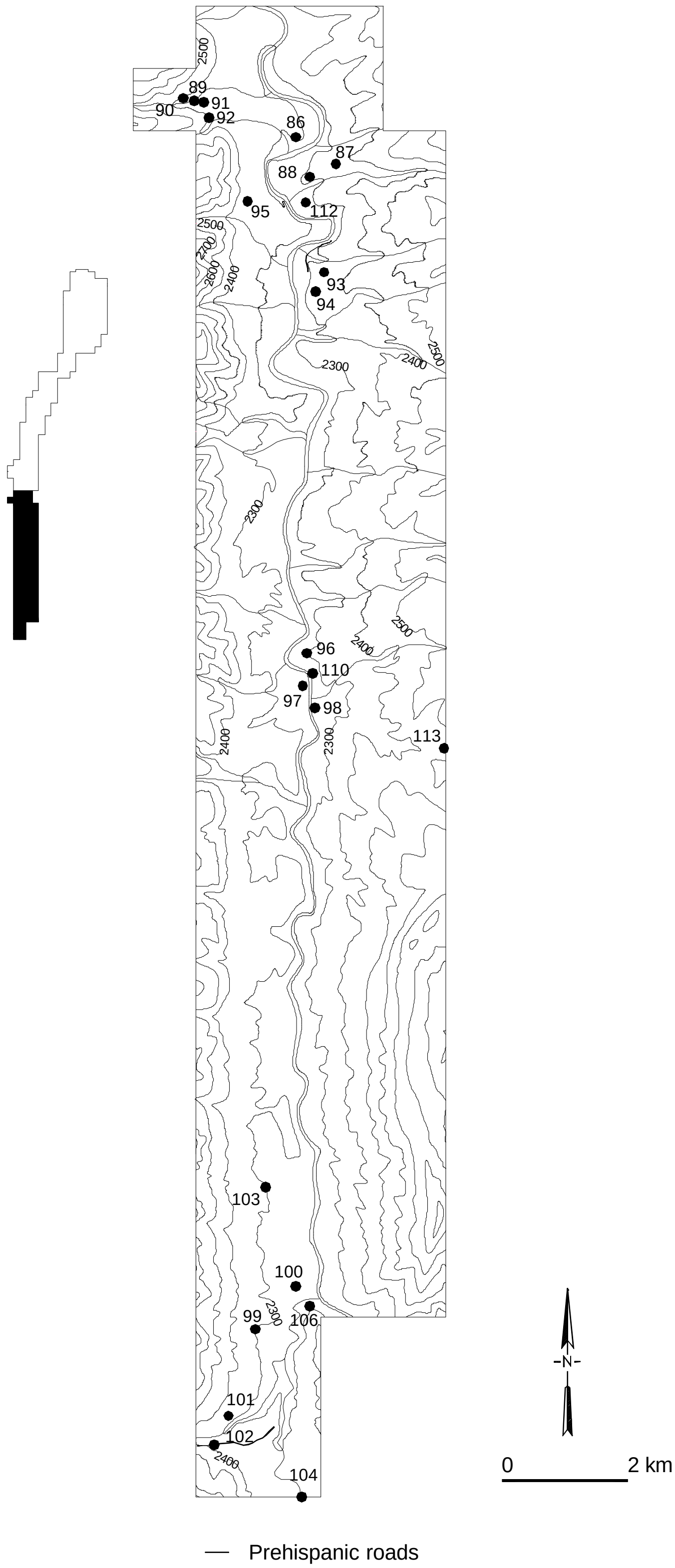


Figure 3.3. Southern canyon and corresponding archaeological sites.

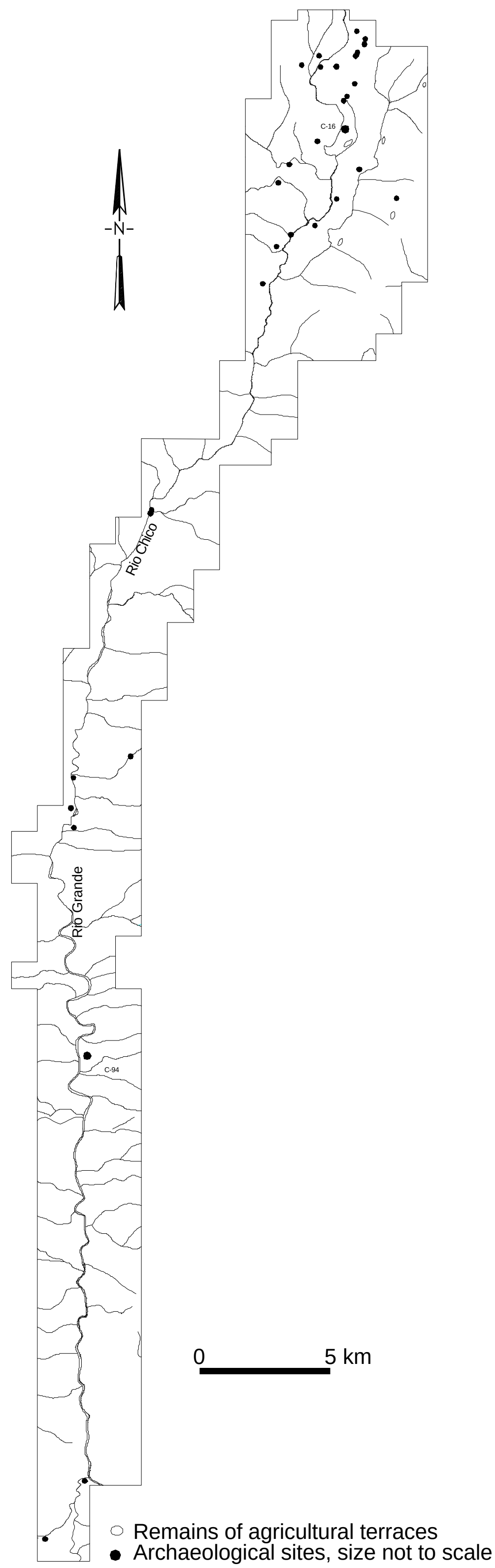


Figure 3.4. Distribution of Formative period sites in the Cinti Valley.

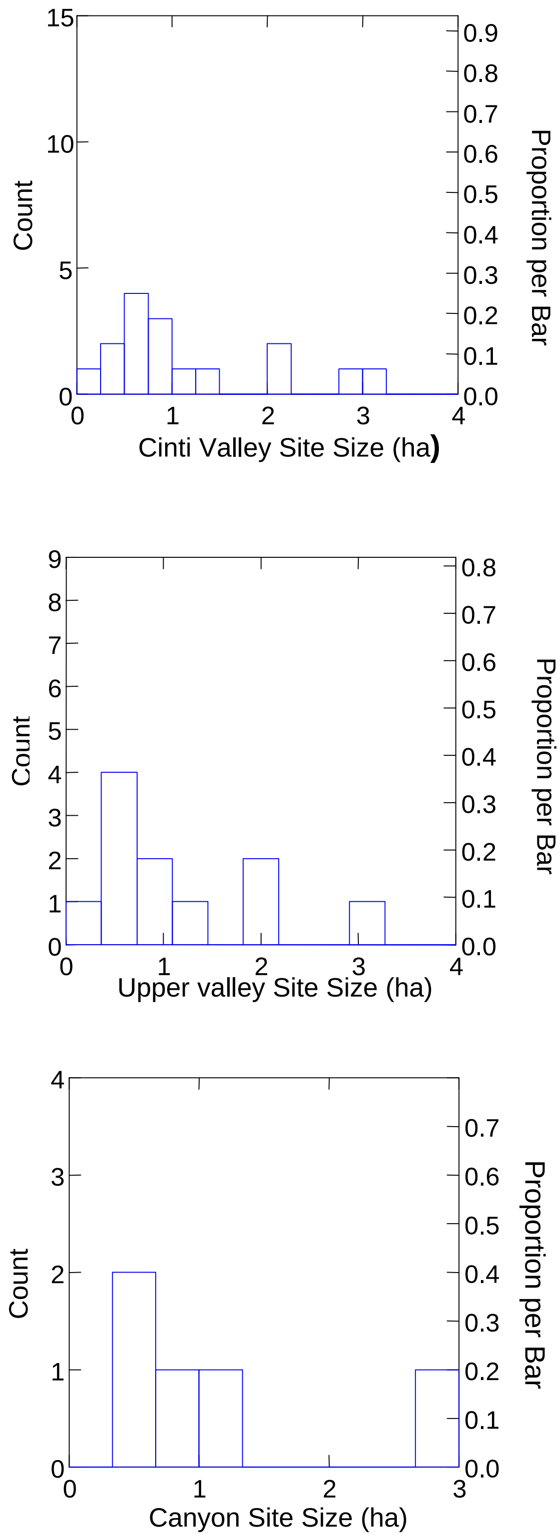


Figure 3.5. Formative period site sizes.

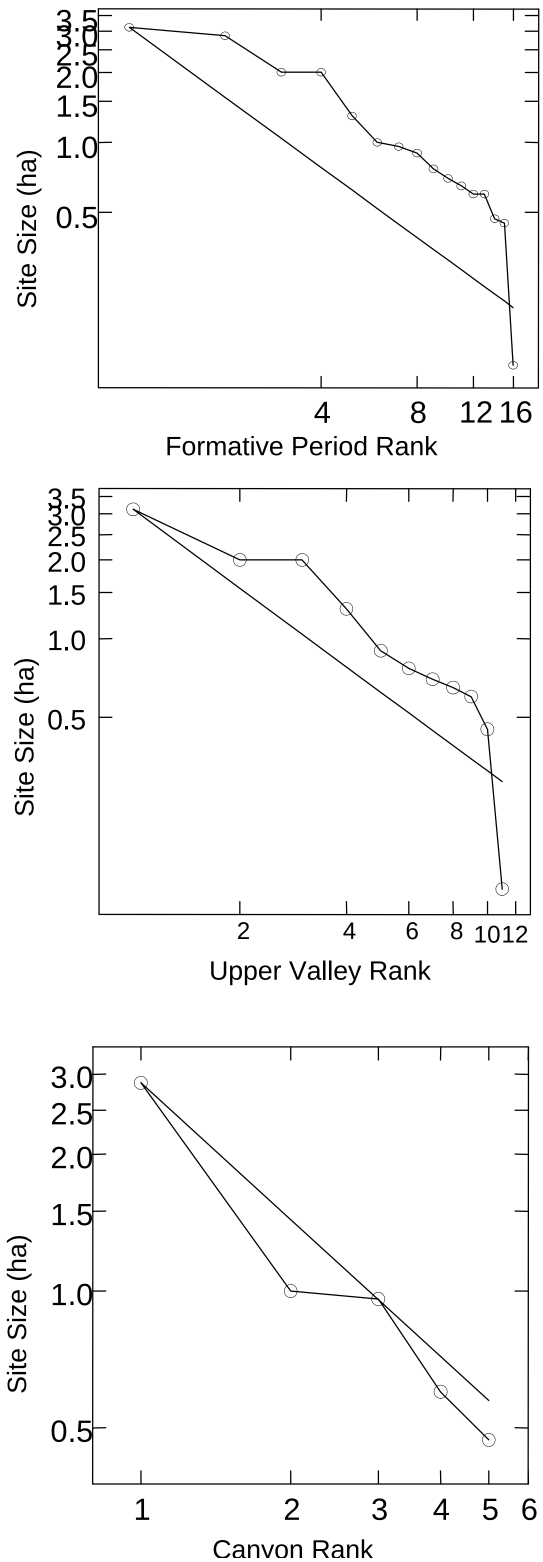


Figure 3.6. Formative period rank size distribution.

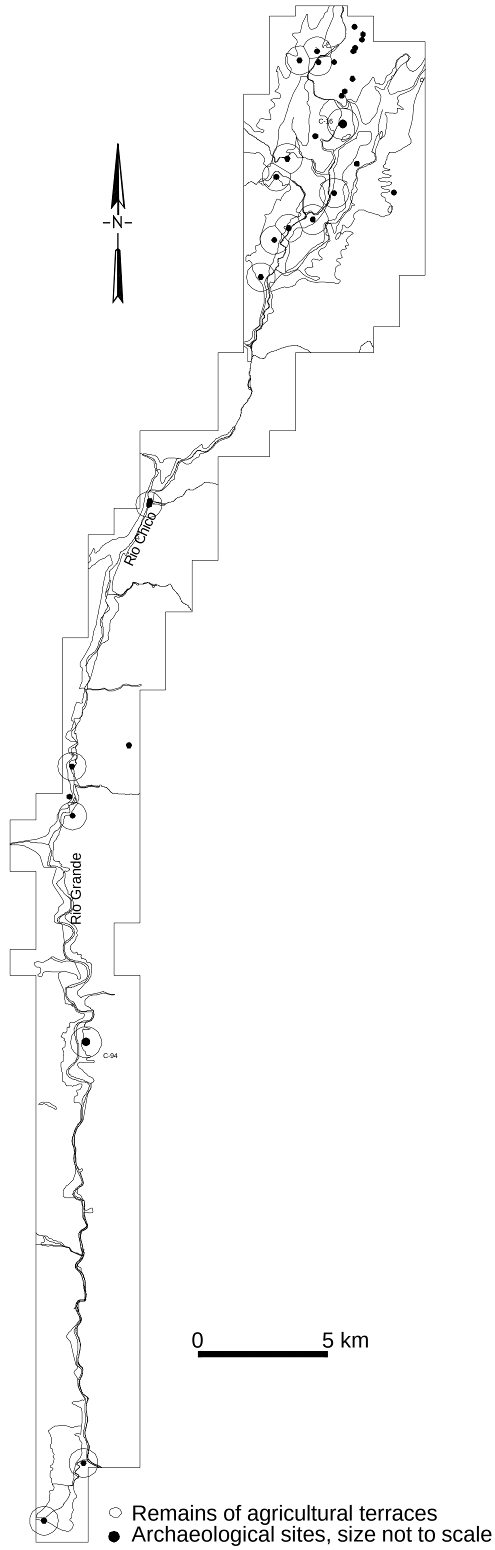


Figure 3.7. Land Categories and catchment areas for Formative period settlements.

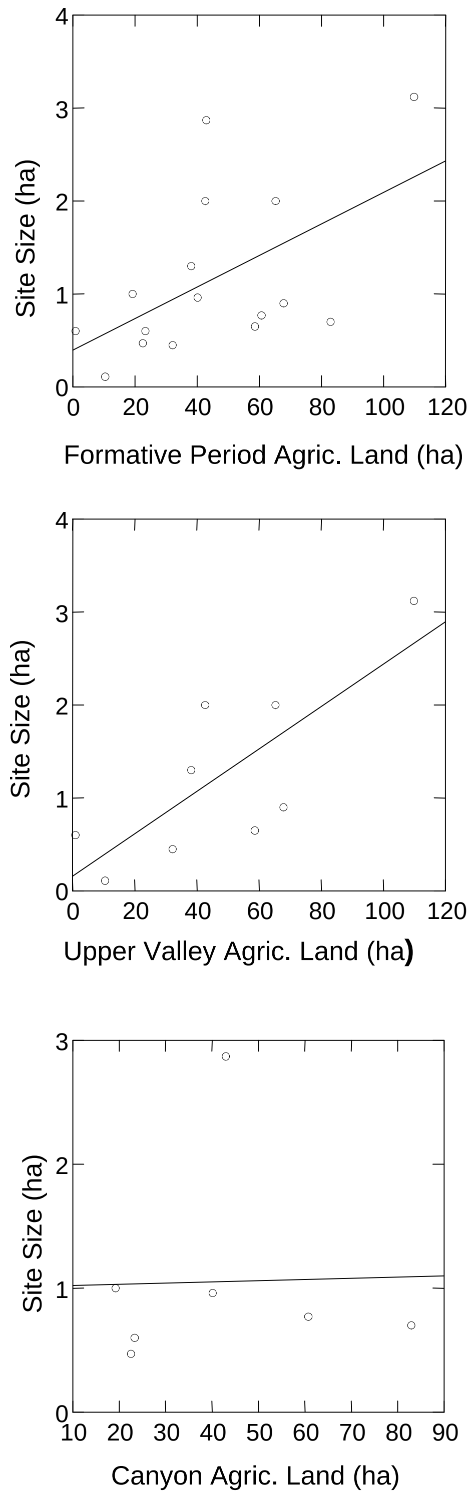


Figure 3.8. Regression analysis of site size and agricultural land for the Formative period settlements.

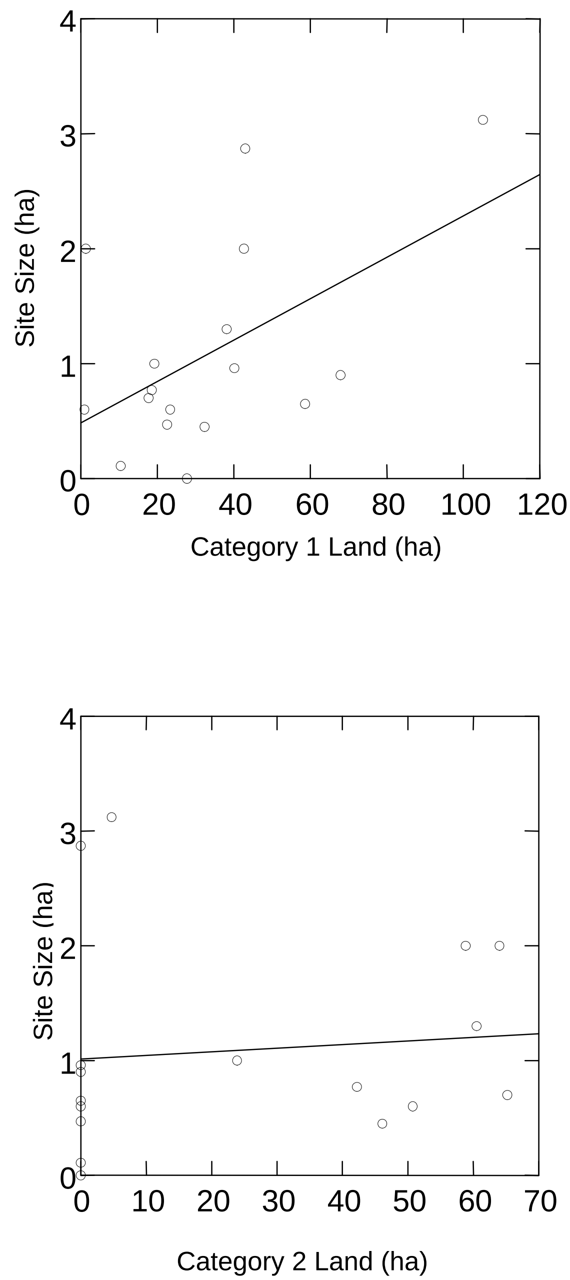


Figure 3.9. Regression analysis of site size and Land Categories 1 and 2 for Formative period settlements.

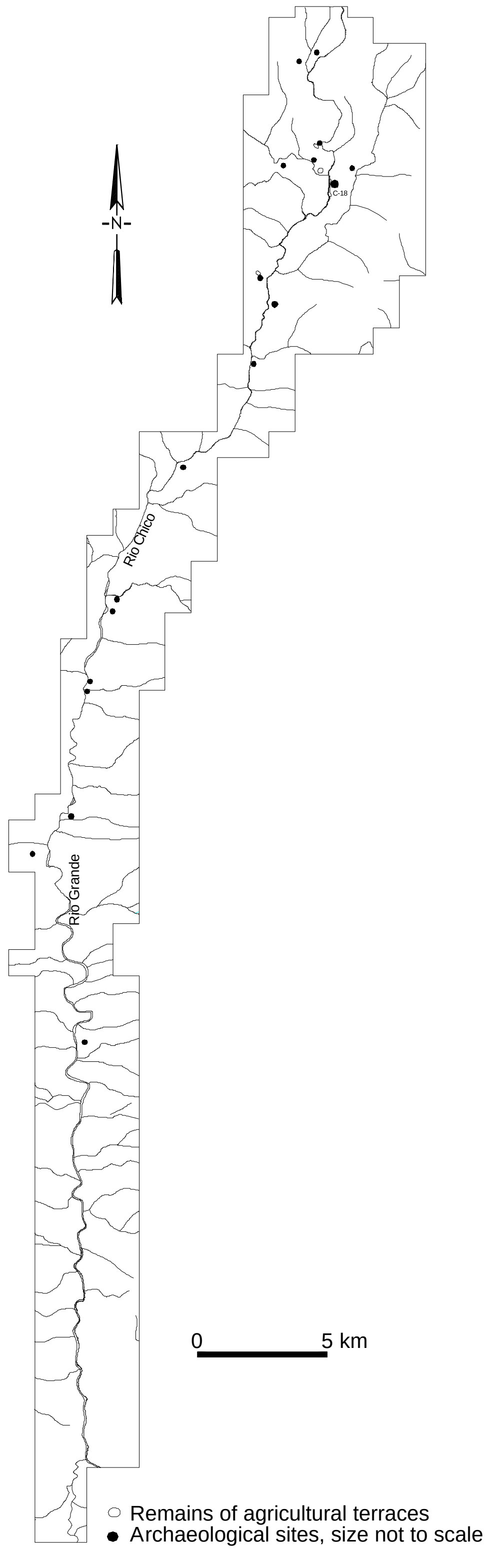


Figure 3.10. Distribution of ERD period sites in the Cinti Valley.

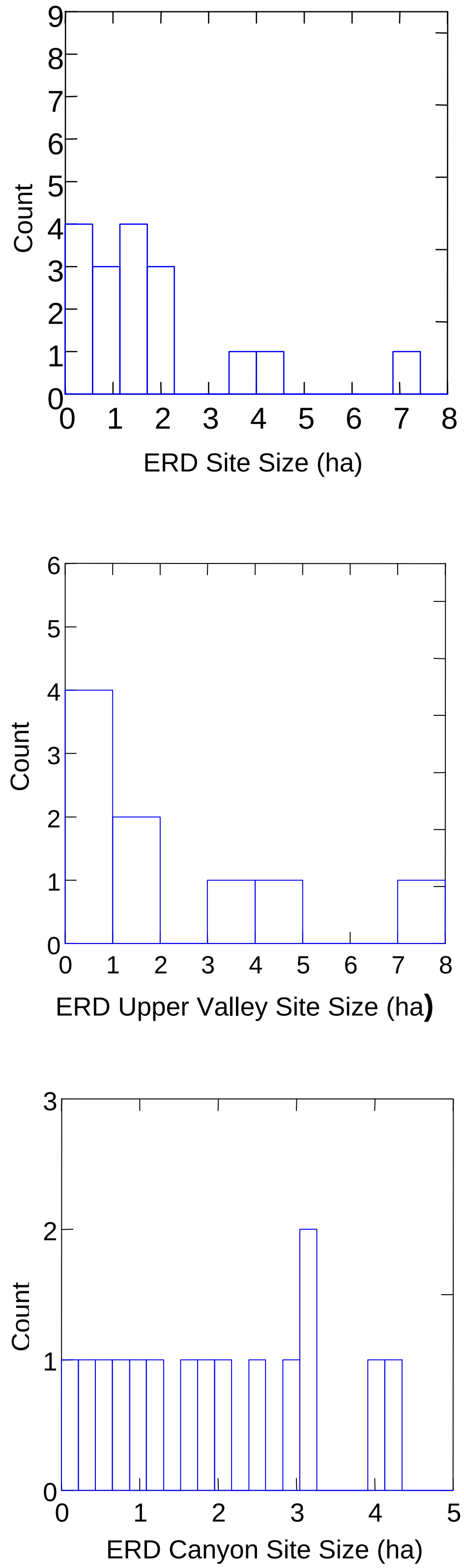


Figure 3.11. ERD period site sizes for the Cinti Valley.

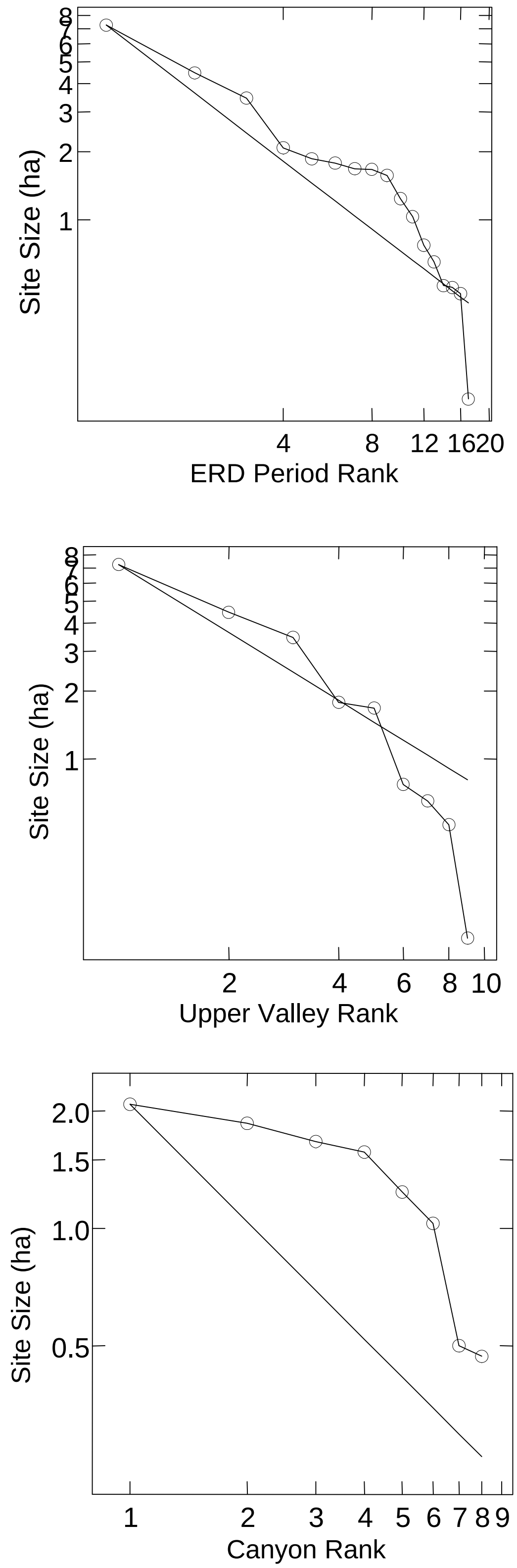


Figure 3.12. ERD period rank size distribution.

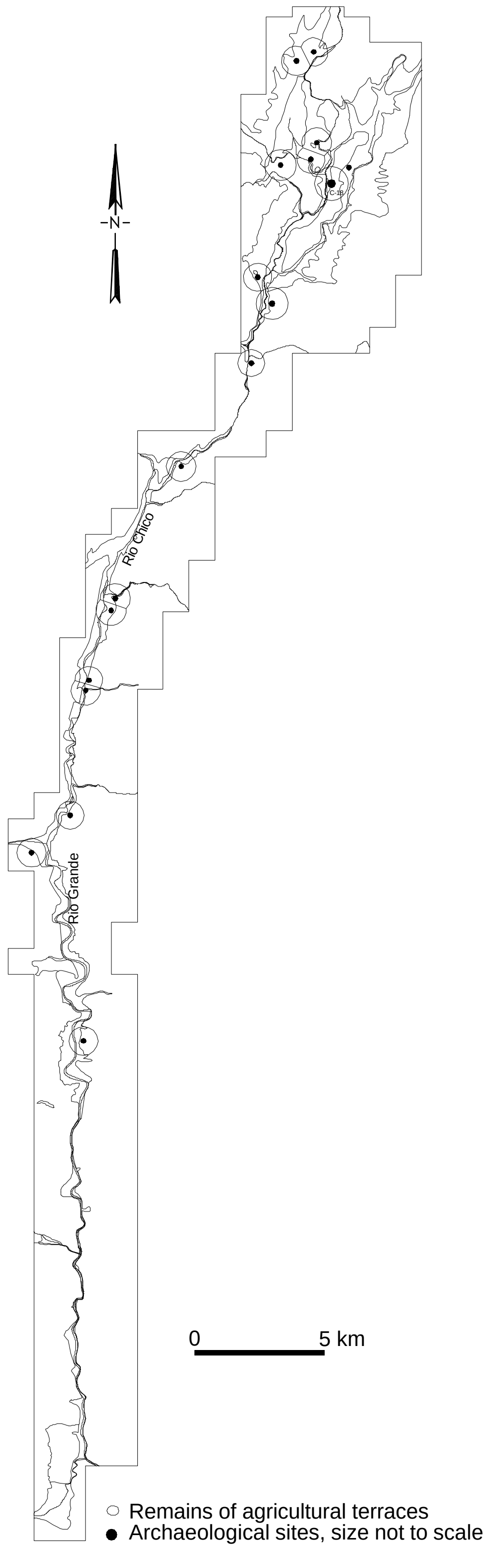


Figure 3.13. Land Categories and catchment areas for ERD period settlements.

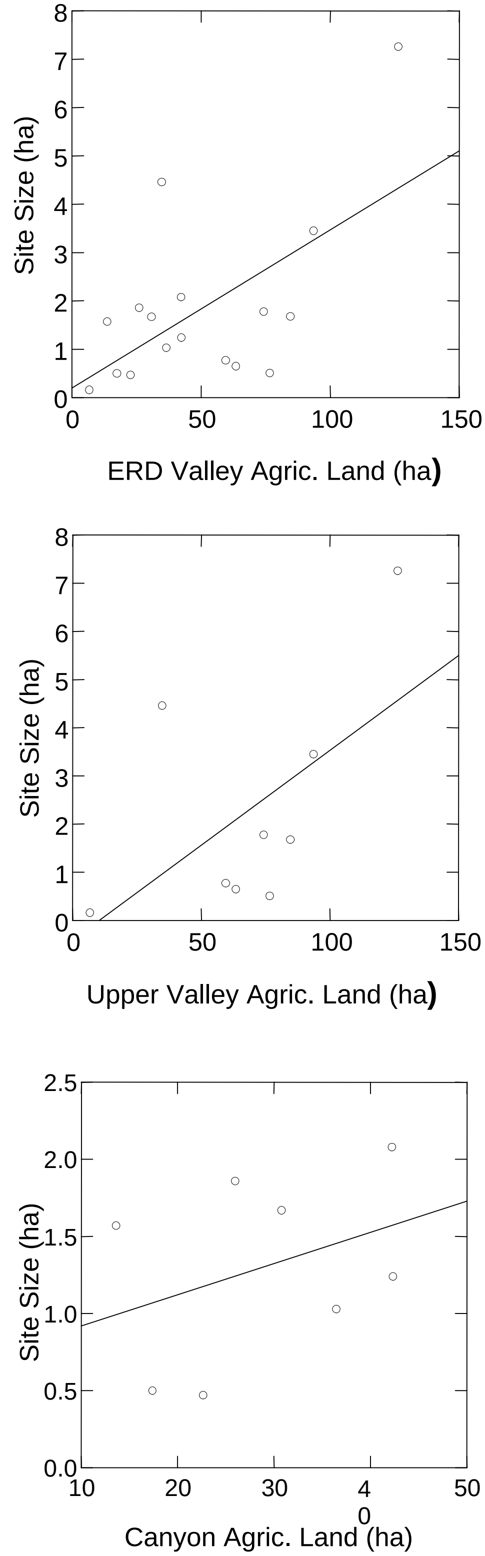


Figure 3.14. Regression analysis of site size and agricultural land for the ERD period settlements.

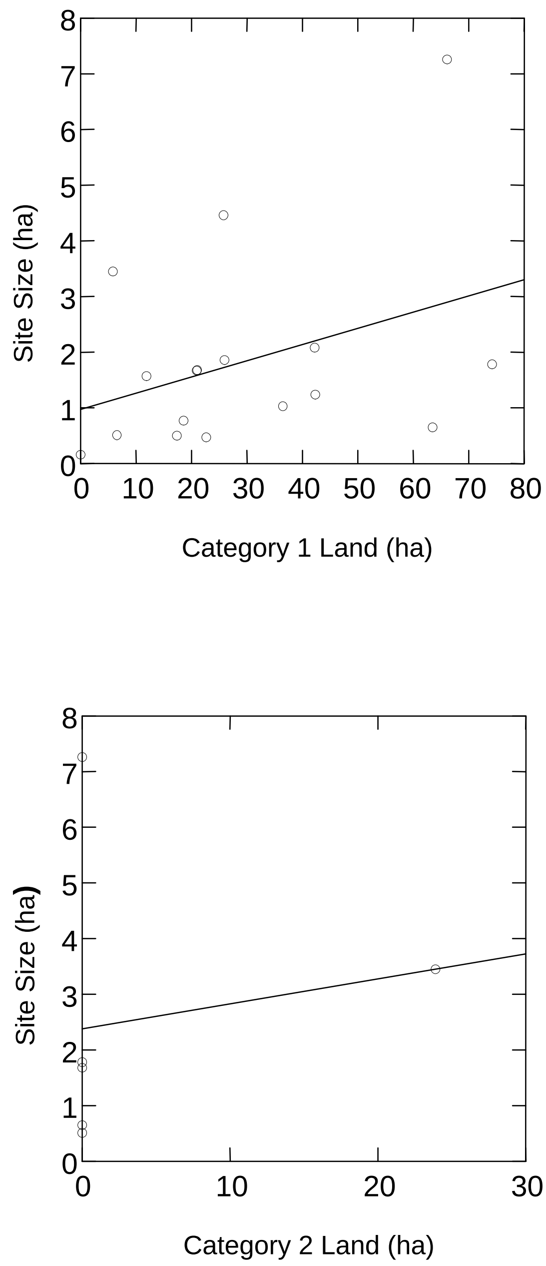


Figure 3.15. Regression analysis of site size and Land Categories 1 and 2 for the ERD period settlements.

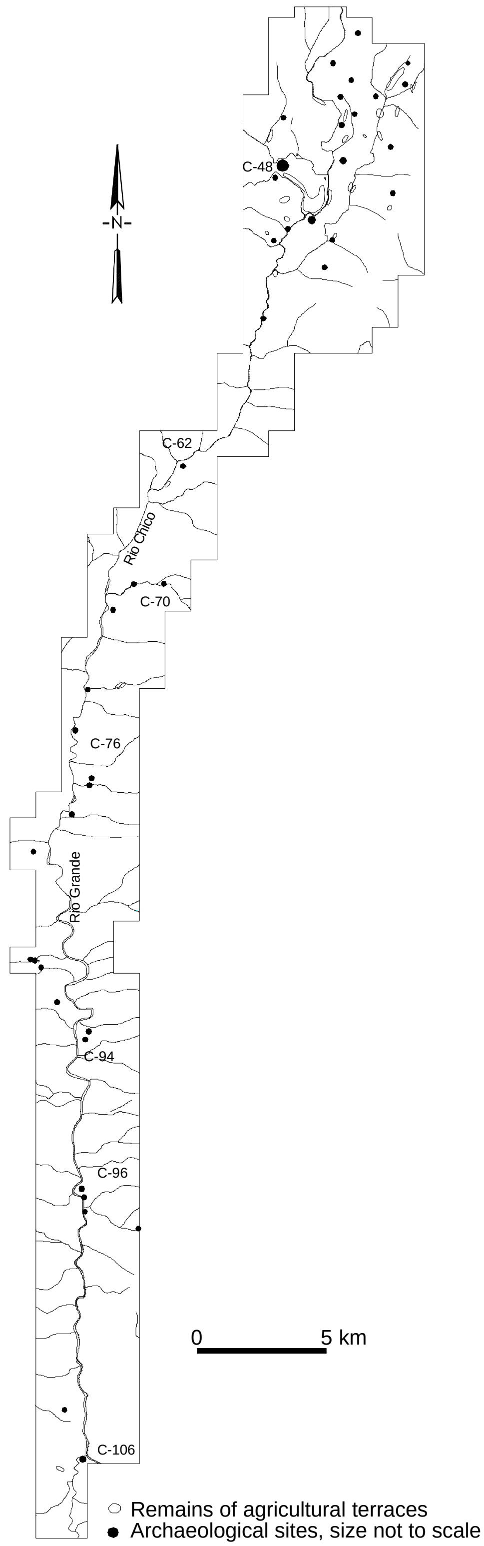


Figure 3.16. LRD period distribution of sites in the Cinti Valley.

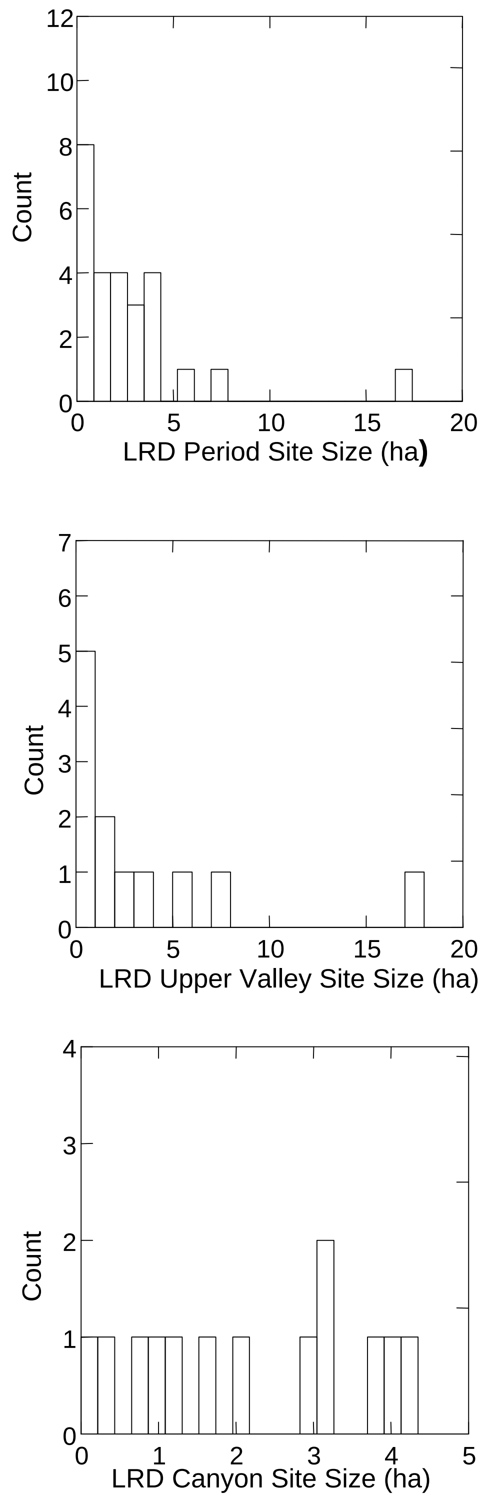


Figure 3.17. LRD period site sizes for the Cinti Valley.

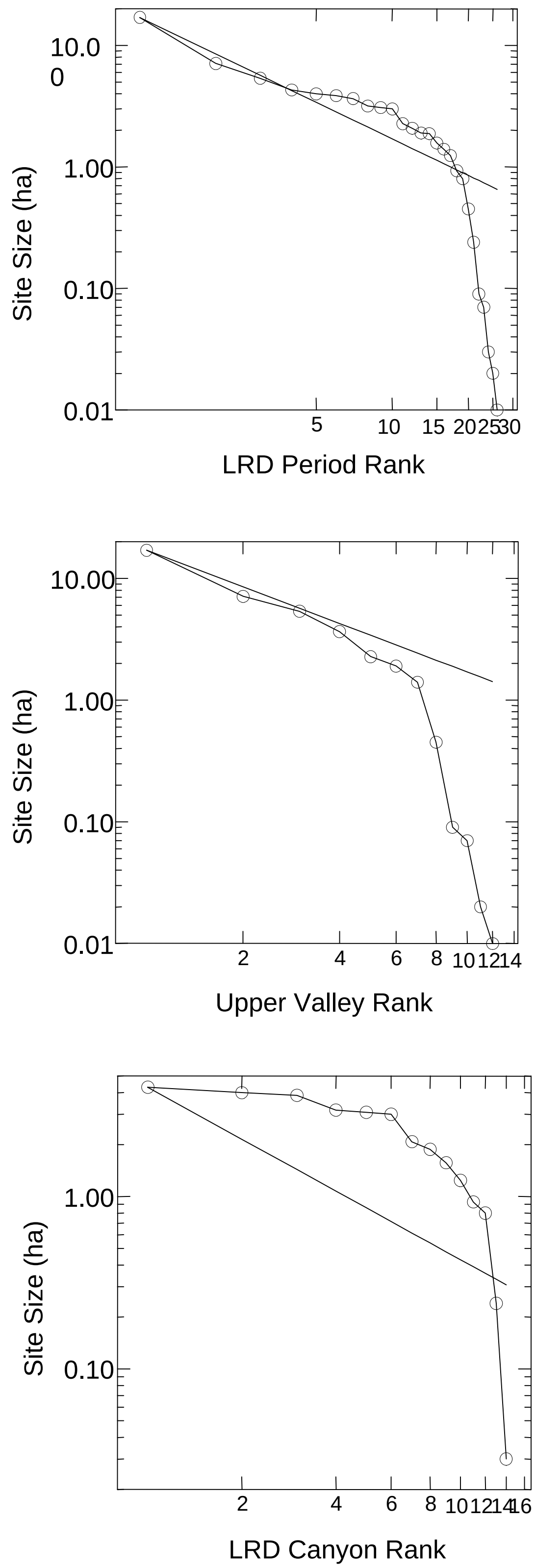


Figure 3.18. LRD period rank size distributions.

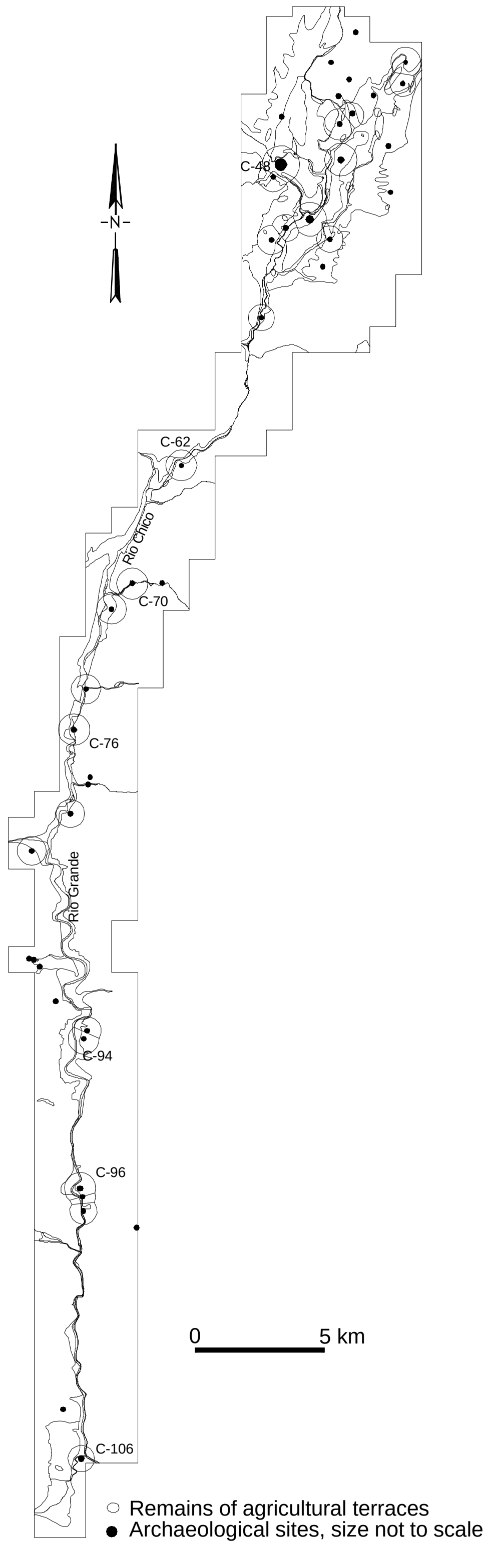


Figure 3.19. Land Categories and catchment areas for LRD period settlements.

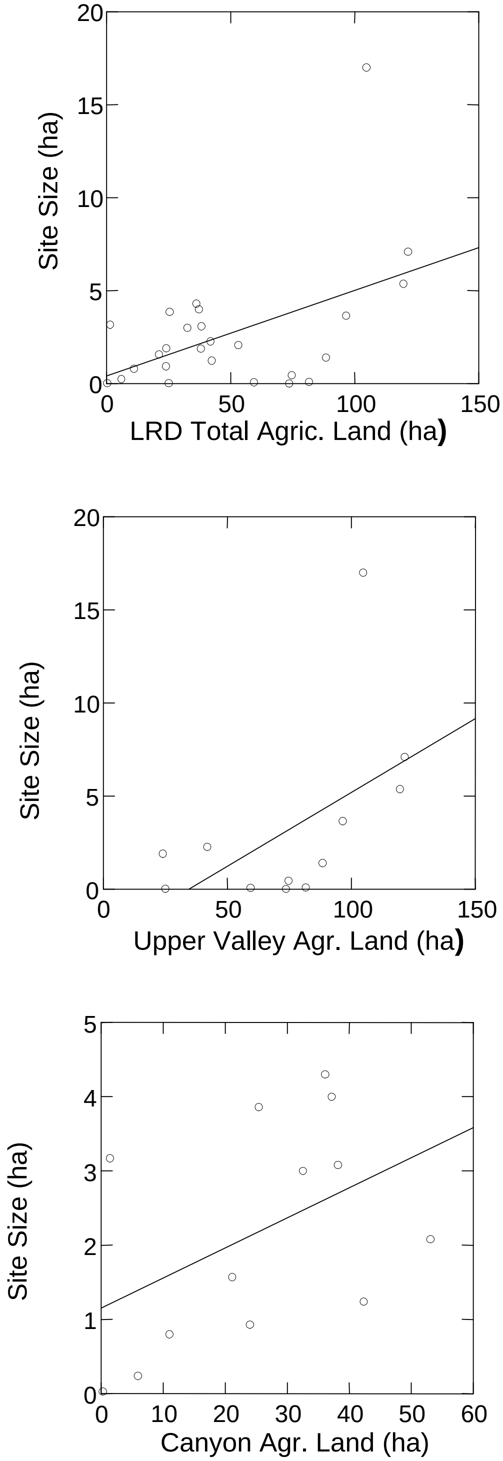


Figure 3.20. Regression analysis of site size and agricultural land for the LRD period settlements.

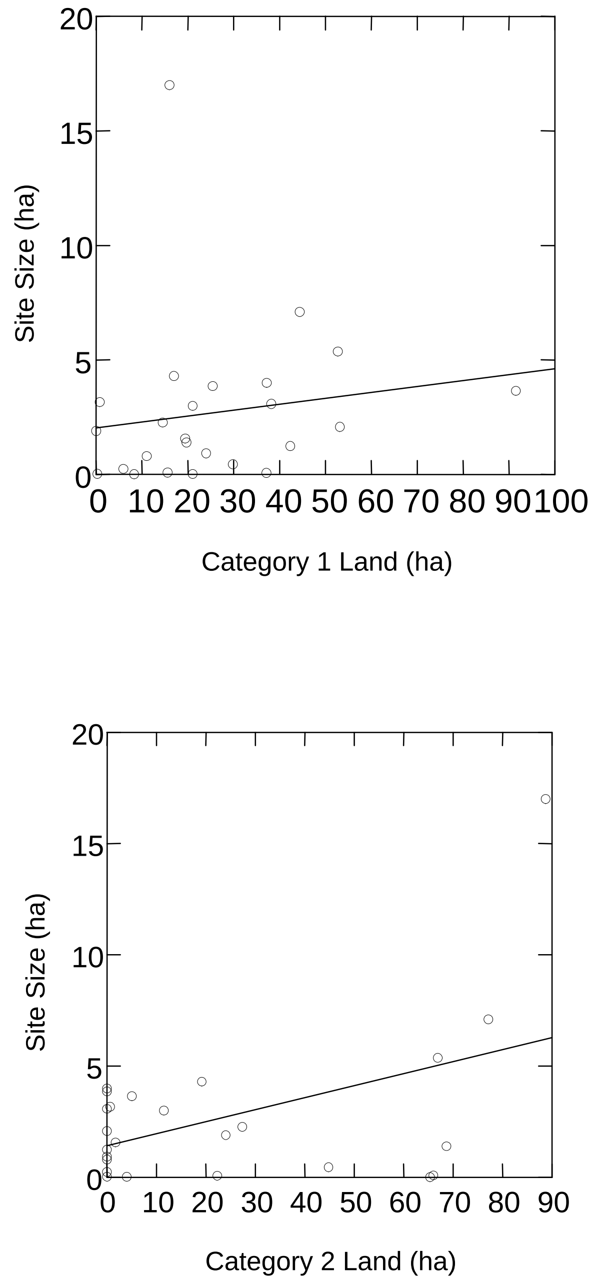
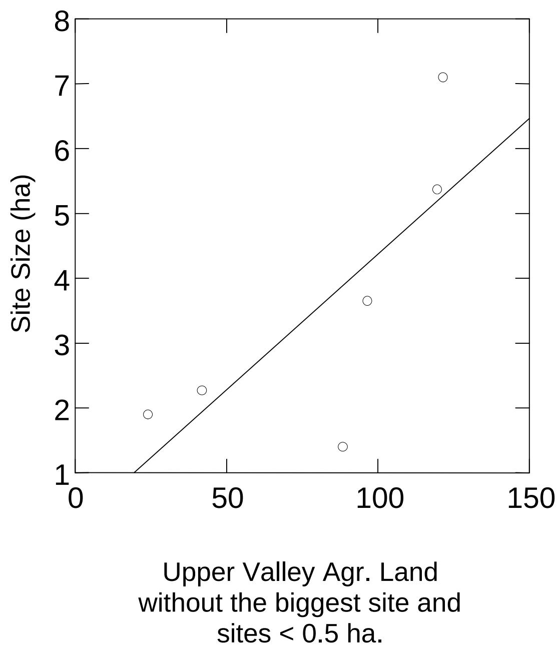


Figure 3.21. Regression analysis for site size and Land Categories 1 and 2 for the LRD period settlements.



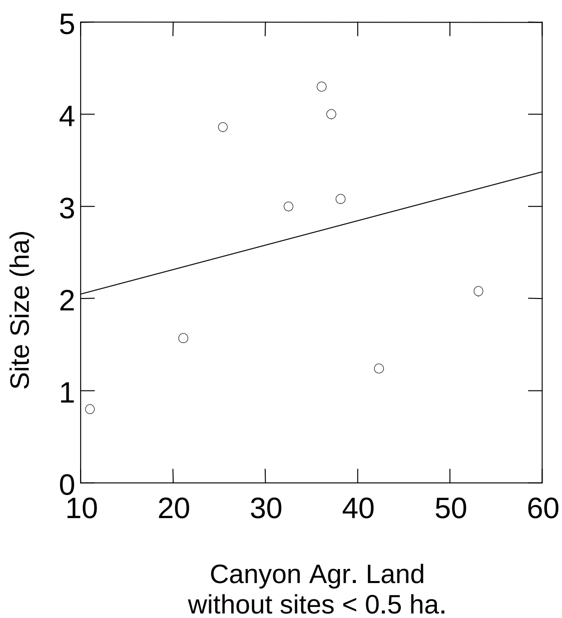


Figure 3.22. Regression analysis of site size and agricultural land for LRD period settlements without the biggest site and sites l<0.5 ha.

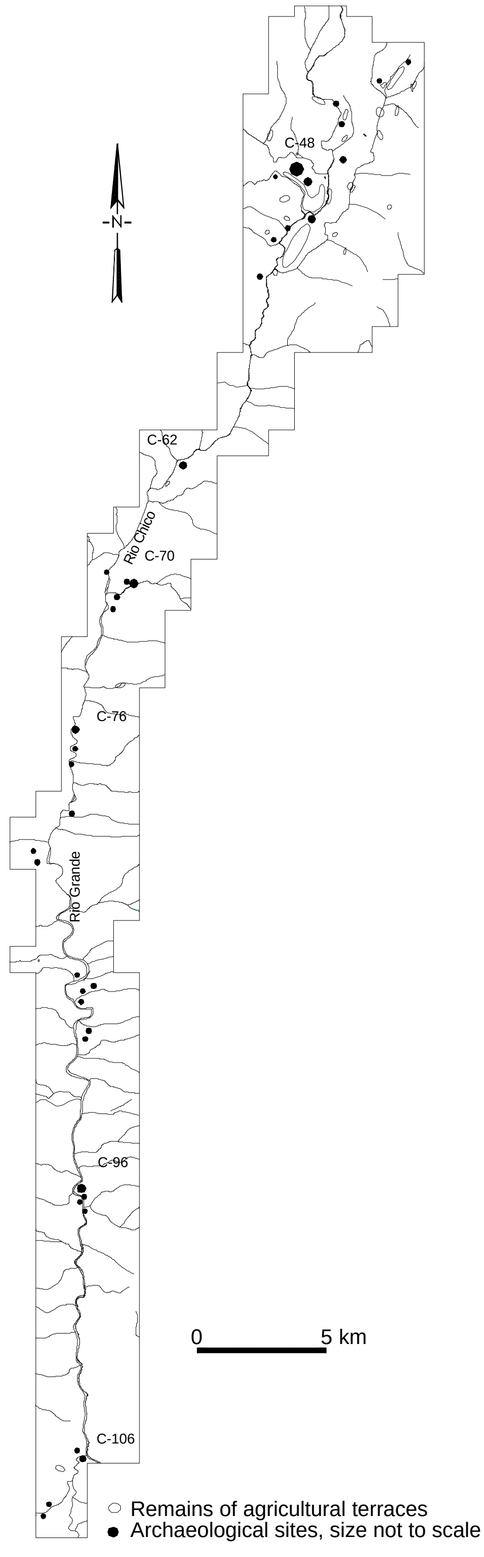


Figure 3.23. LH period distribution of sites in the Cinti Valley.

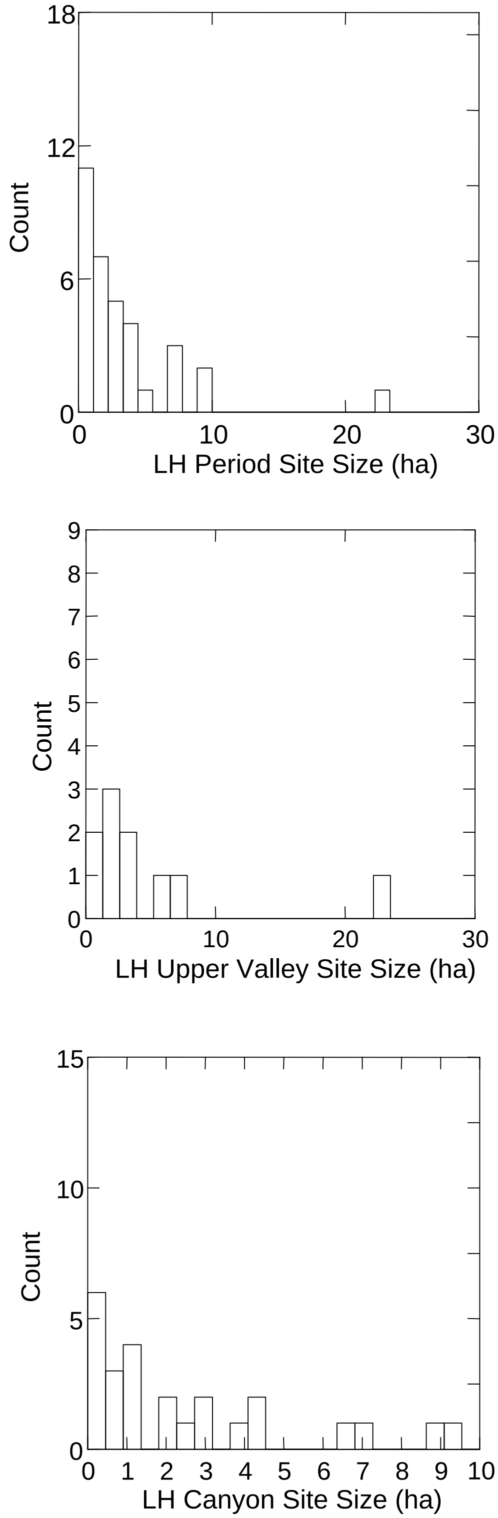


Figure 3.24. LH period site sizes for the Cinti Valley.

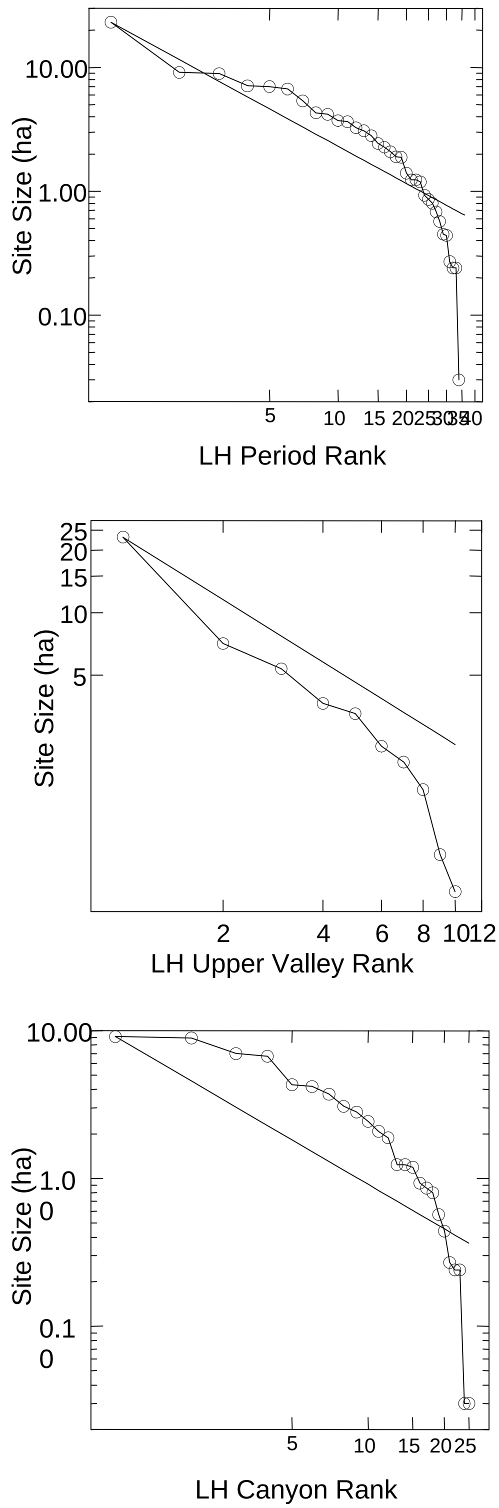


Figure 3.25. LH period rank size distributions.

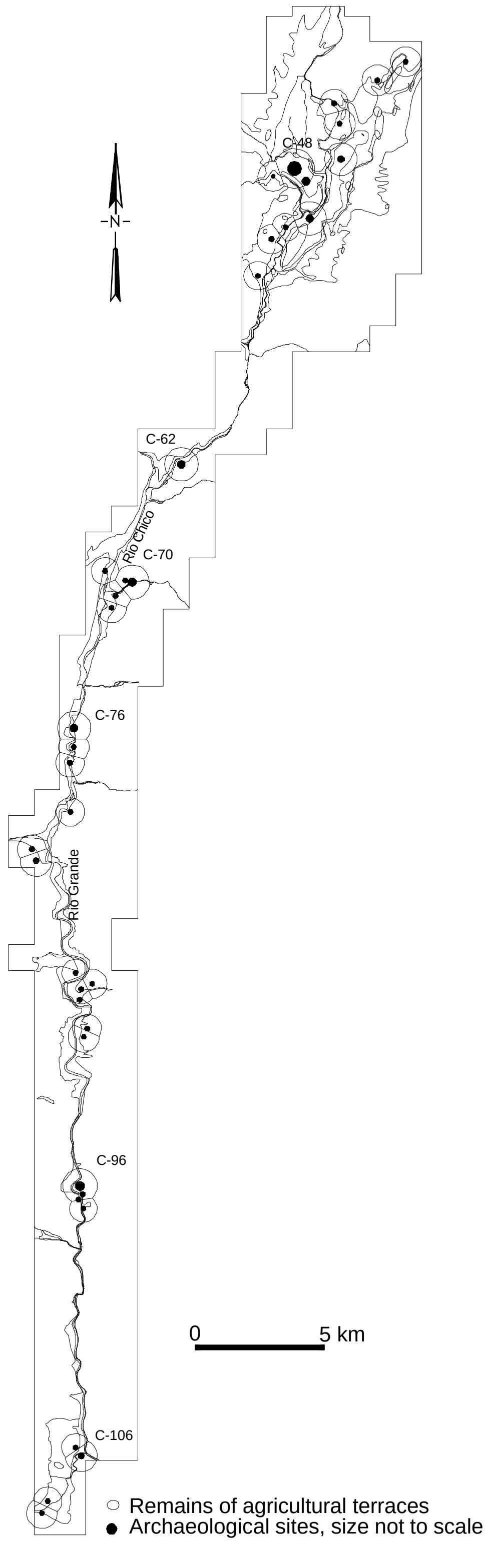
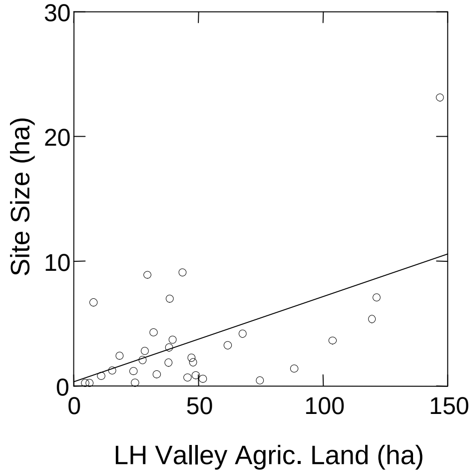
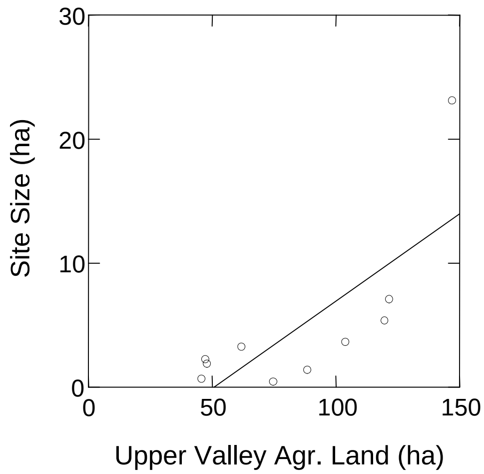


Figure 3.26. Land Categories and catchment areas for the LH period settlements.





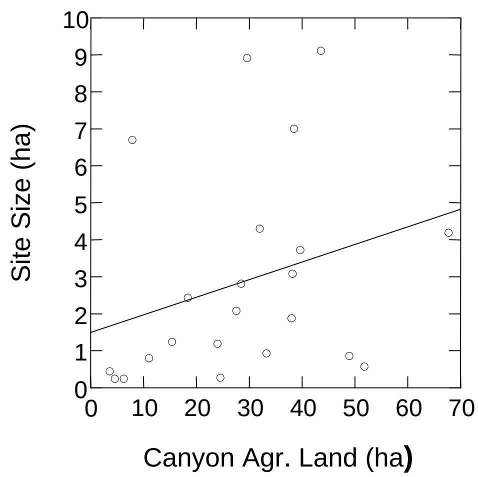
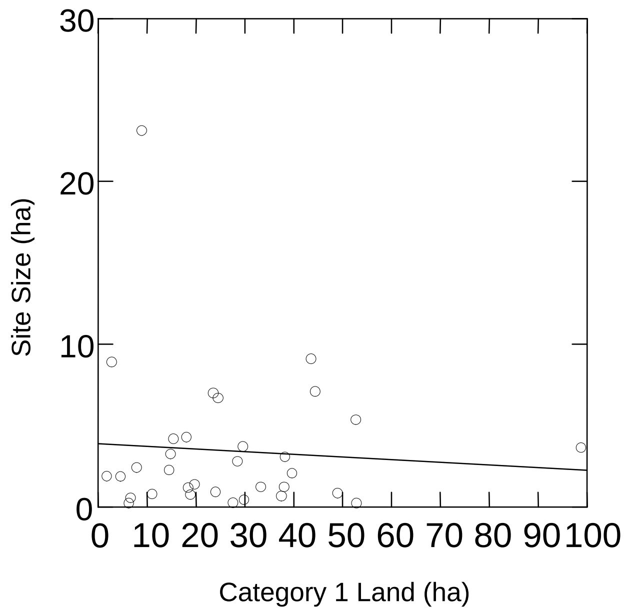


Figure 3.27. Regression analysis of site size and agricultural land for the LH period settlements.



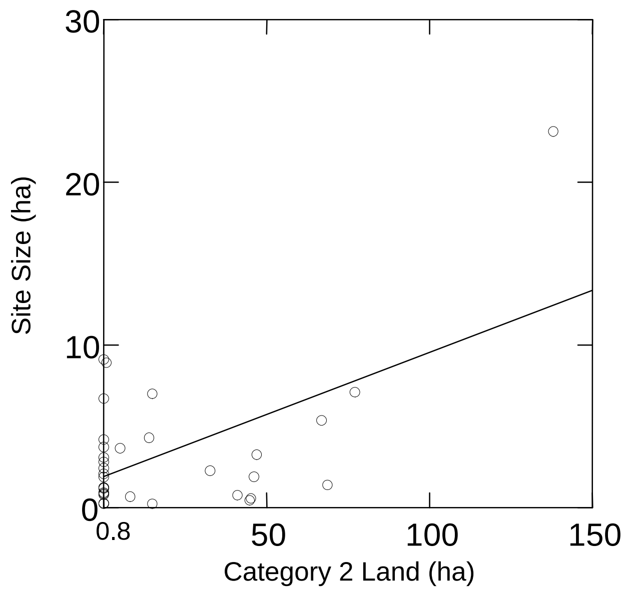


Figure 3.28. Regression analysis for site size and Land Categories 1 and 2 for LH period settlements.

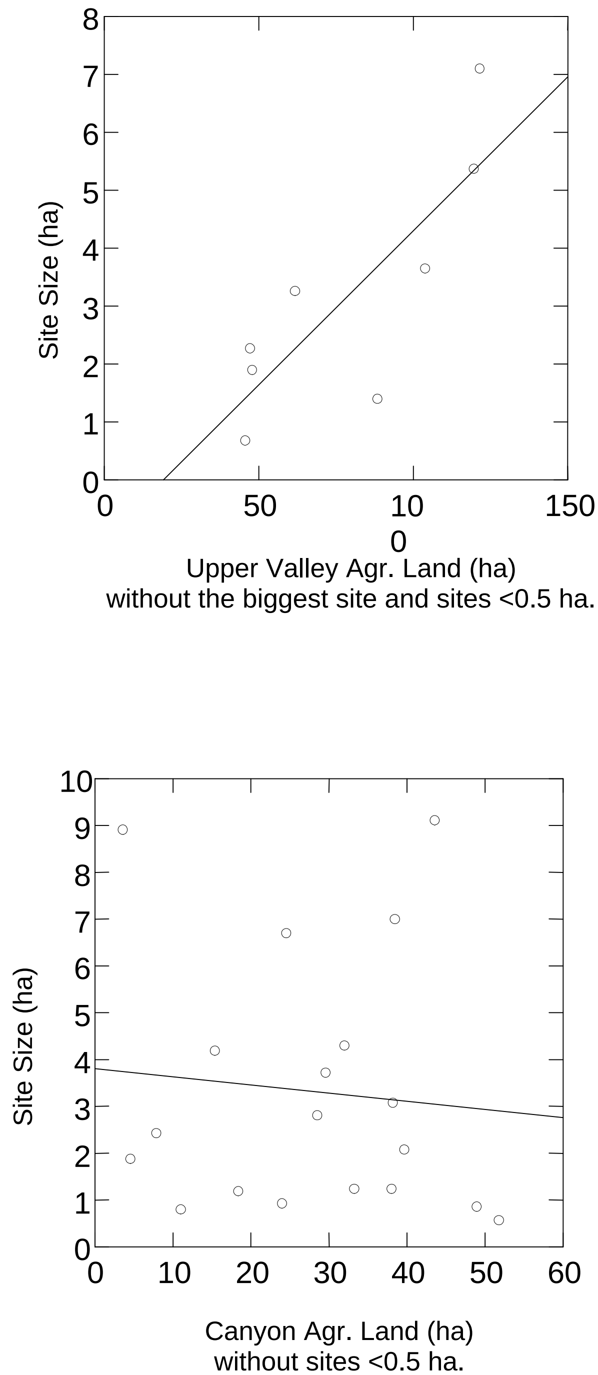
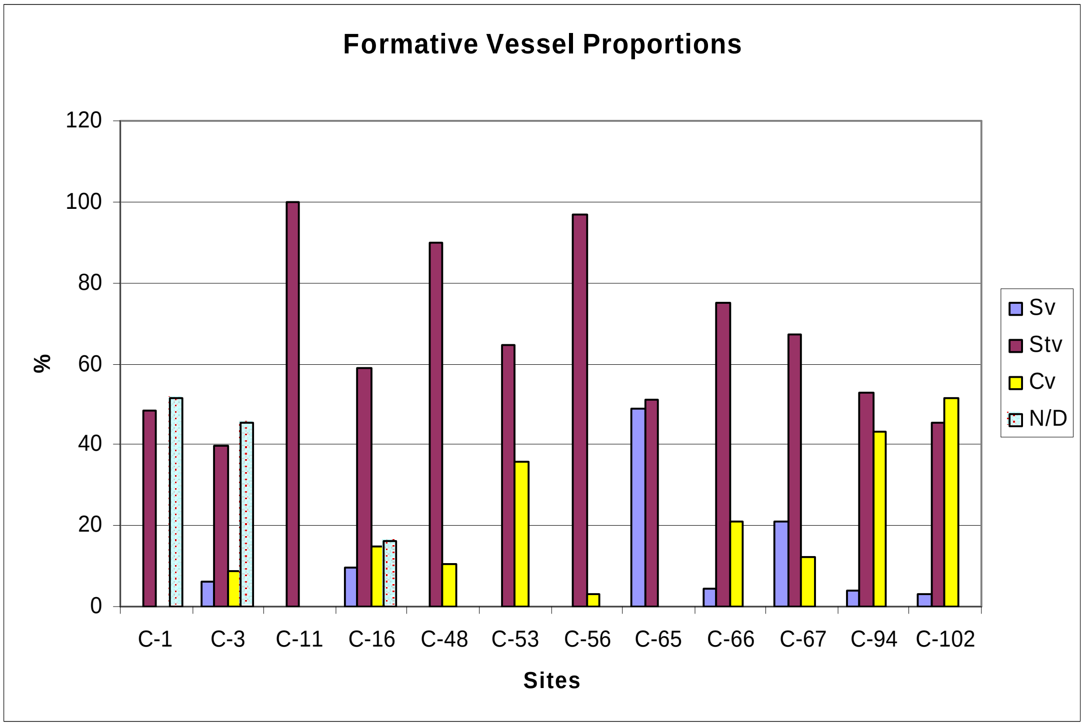


Figure 3.29. Regression analysis of site size and agricultural land for LH period settlements without the biggest site and sites <0.5 ha.



Sv= Serving vessels, Cv= cooking vessels, N/D= undefined.

Figure 4.1. Formative period vessel proportions, confidence level 66%±44 (20 sherds minimum).

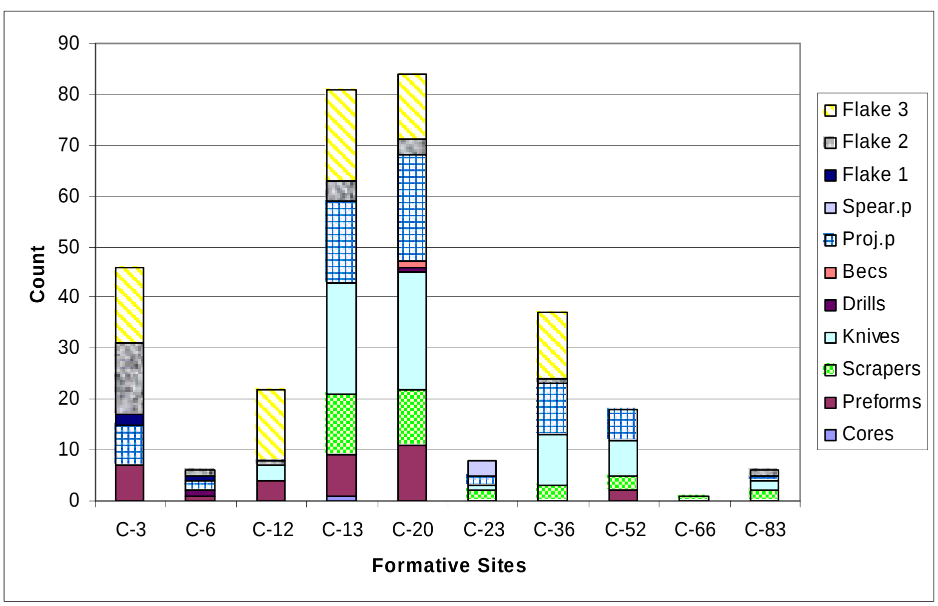


Figure 4.2. Formative period lithic artifact counts.

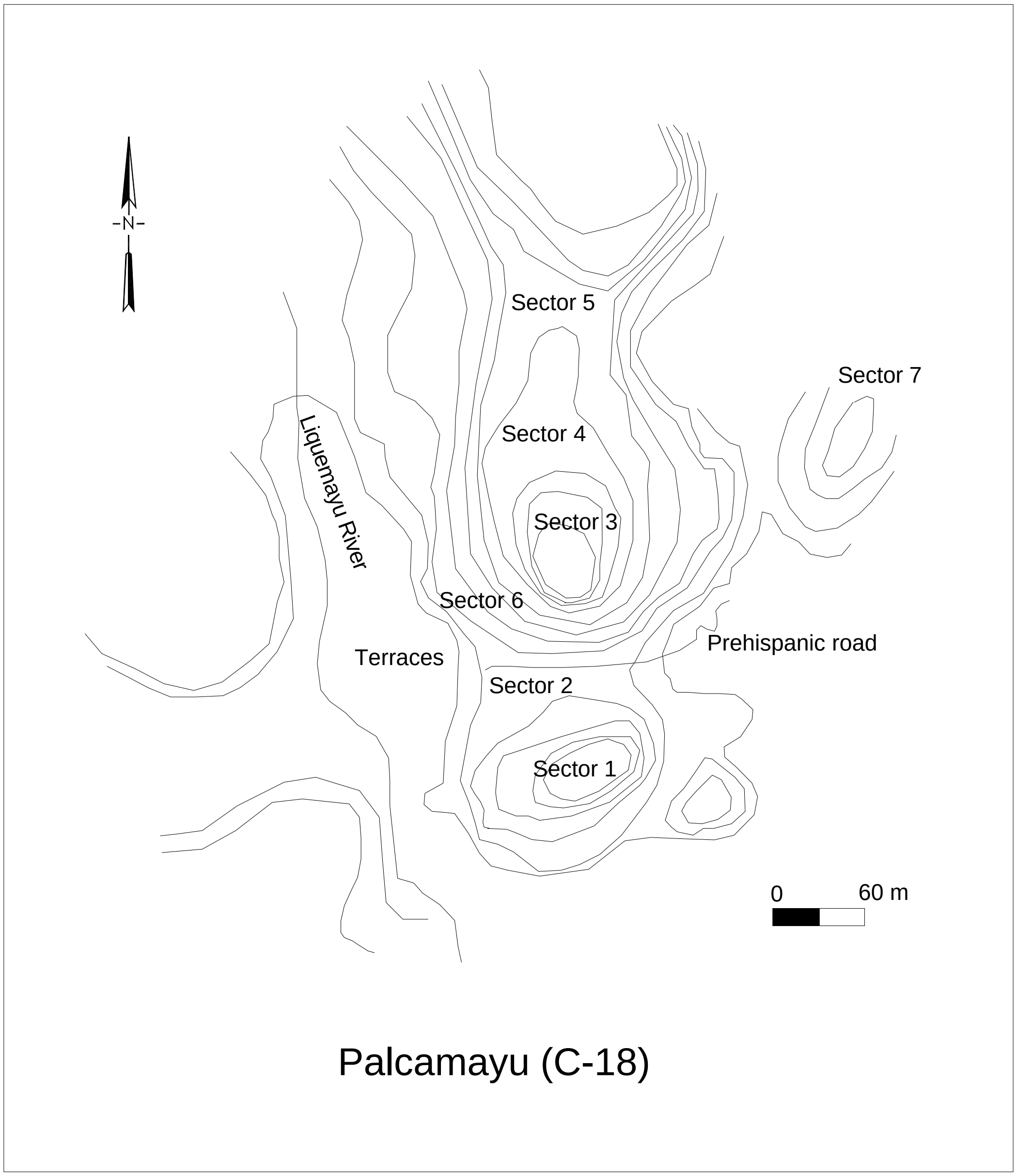


Figure 4.3. Sketch of Palcamayu (C-18).

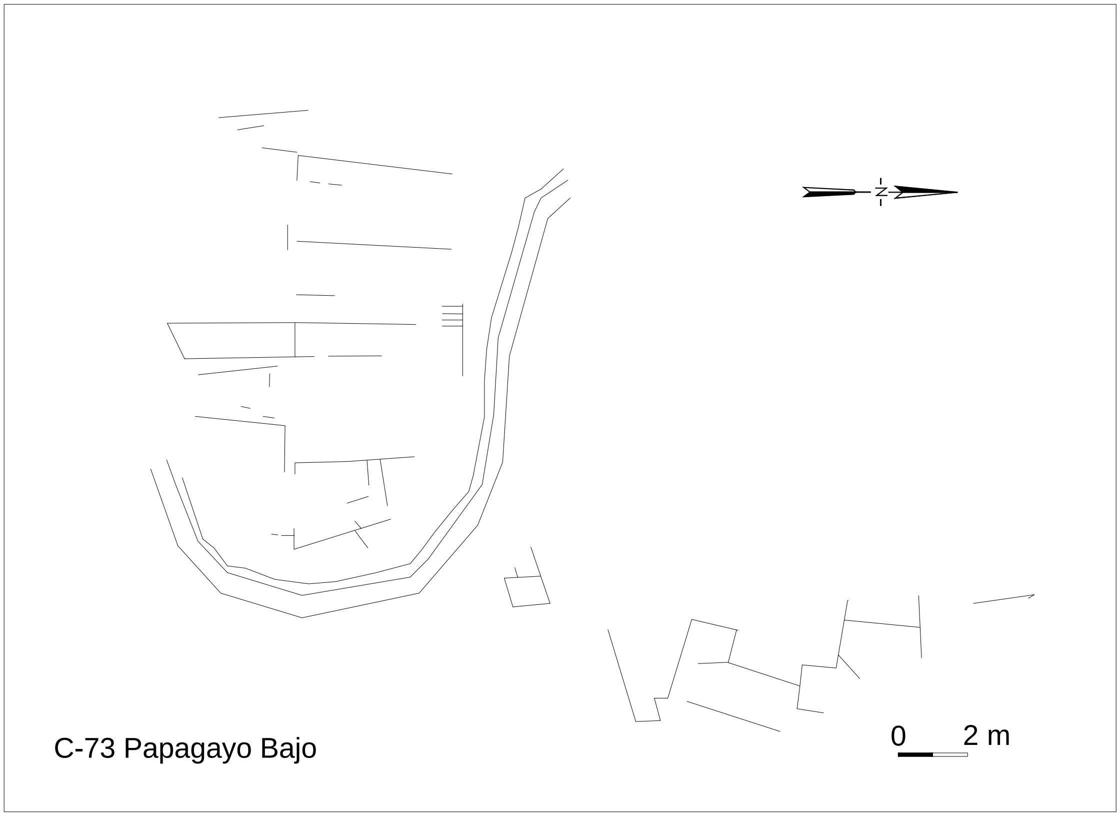
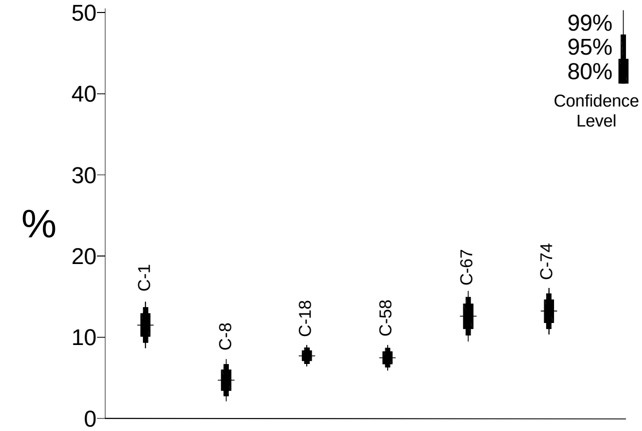
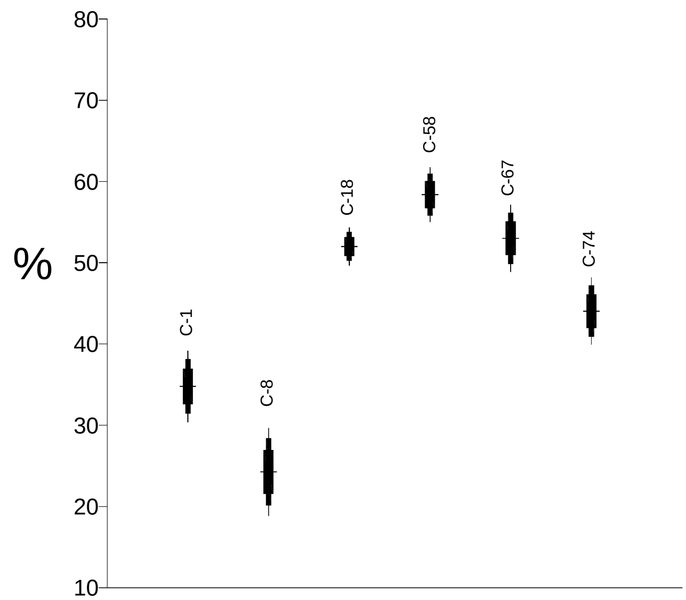


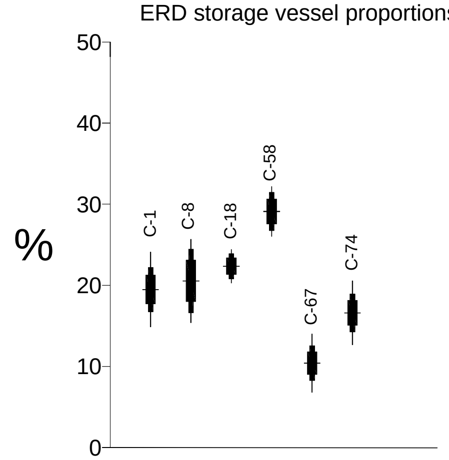
Figure 4.4. Map of Papagayo Bajo (C-73).



ERD period serving vessel proportions.



ERD storage vessel proportions.



ERD cooking vessel proportions.

Figure 4.5. ERD period vessel proportions.

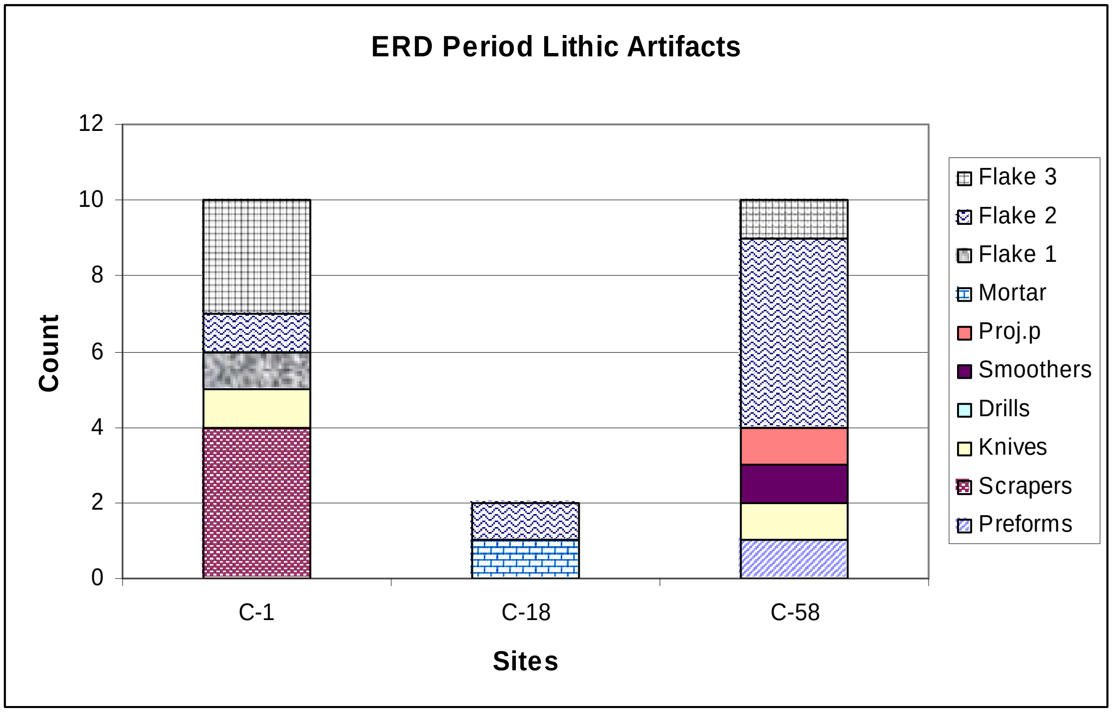


Figure 4.6. ERD period lithic artifacts counts.

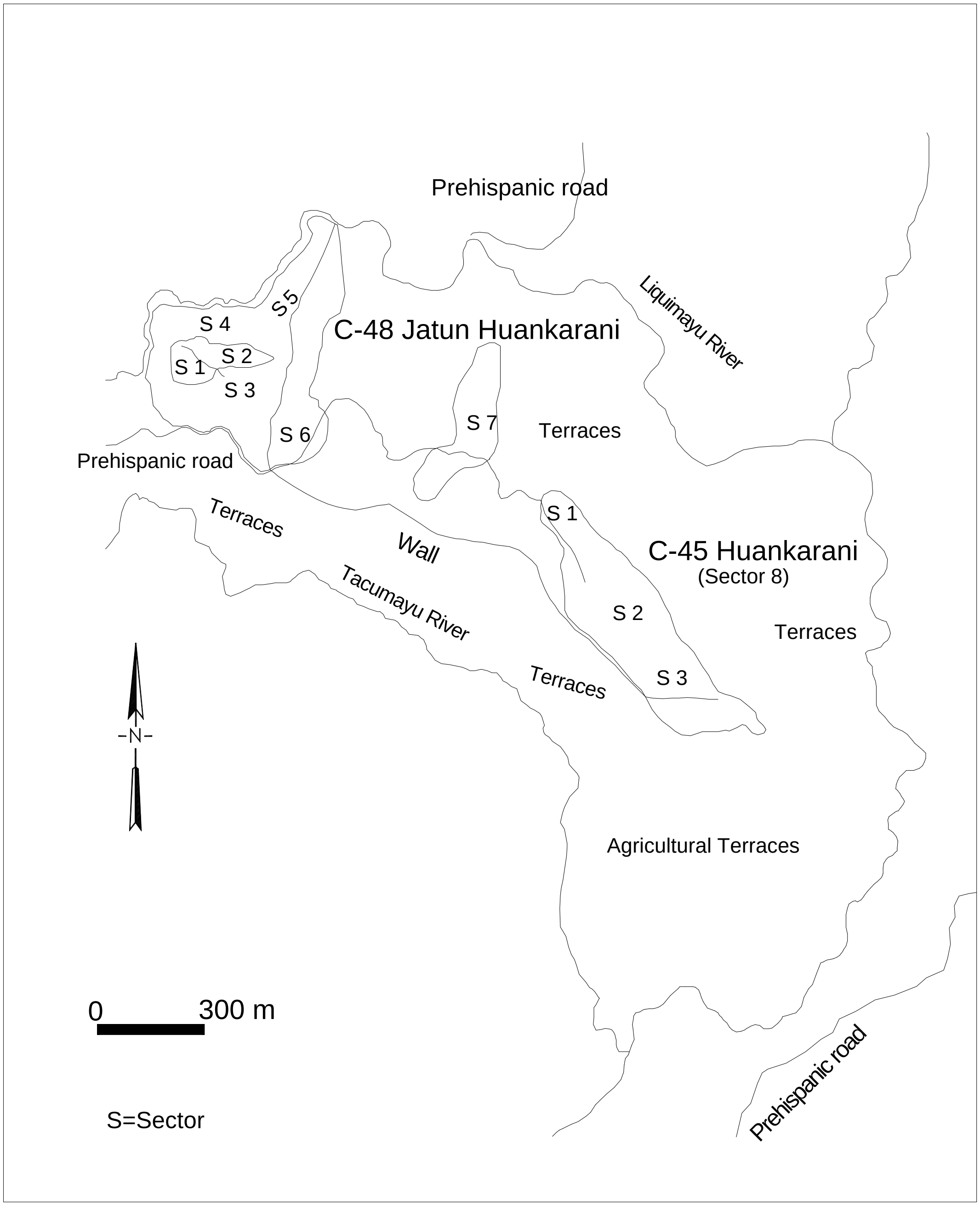


Figure 4.7. Jatun Talasa Huankarani (C-48).

Figure 4.8. Delimiting wall at C-48.

Figure 4.9. C-48, Sector 3, residential terraces.

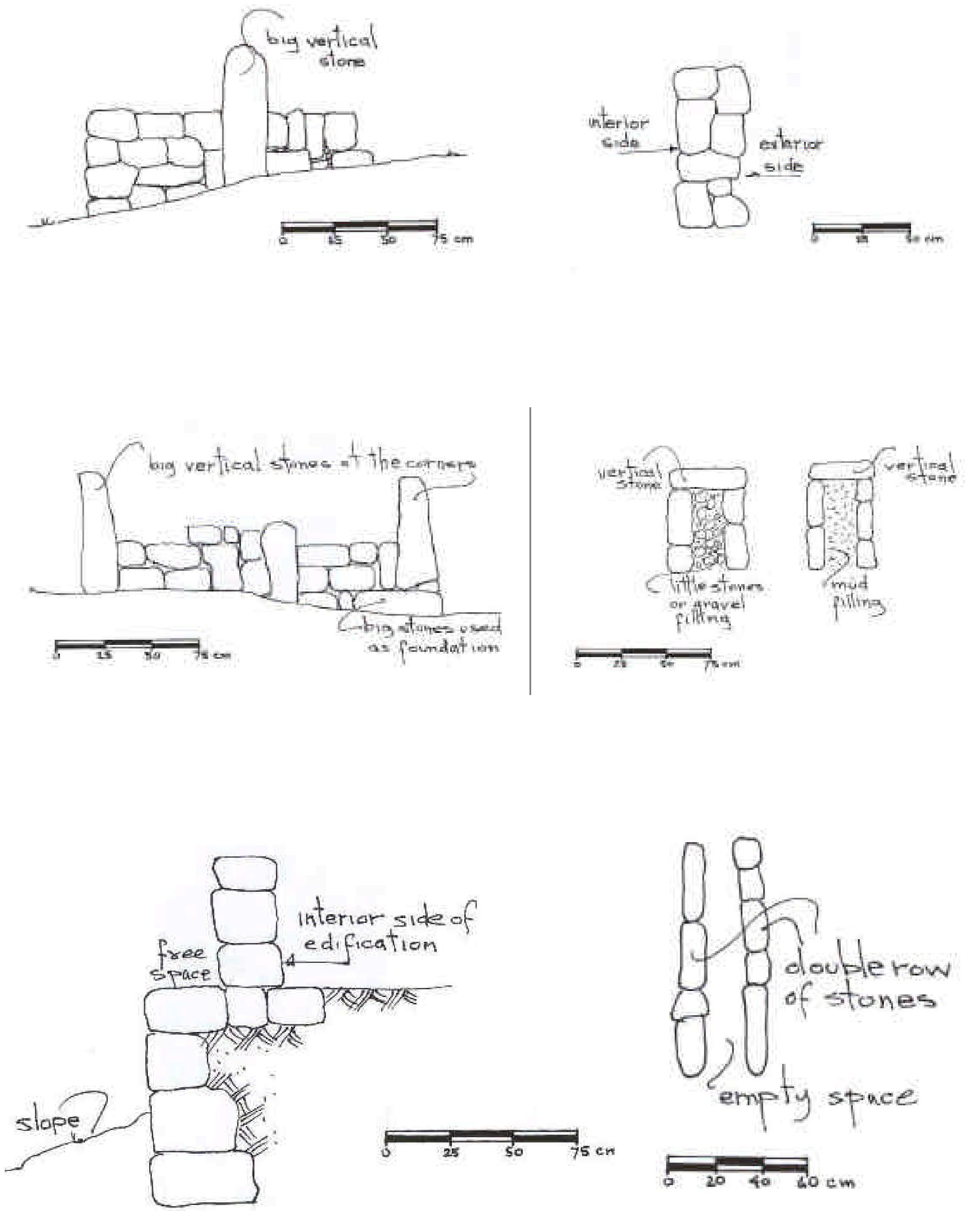


Figure 4.10. Architectural details at C-48, Jatun Huankarani.

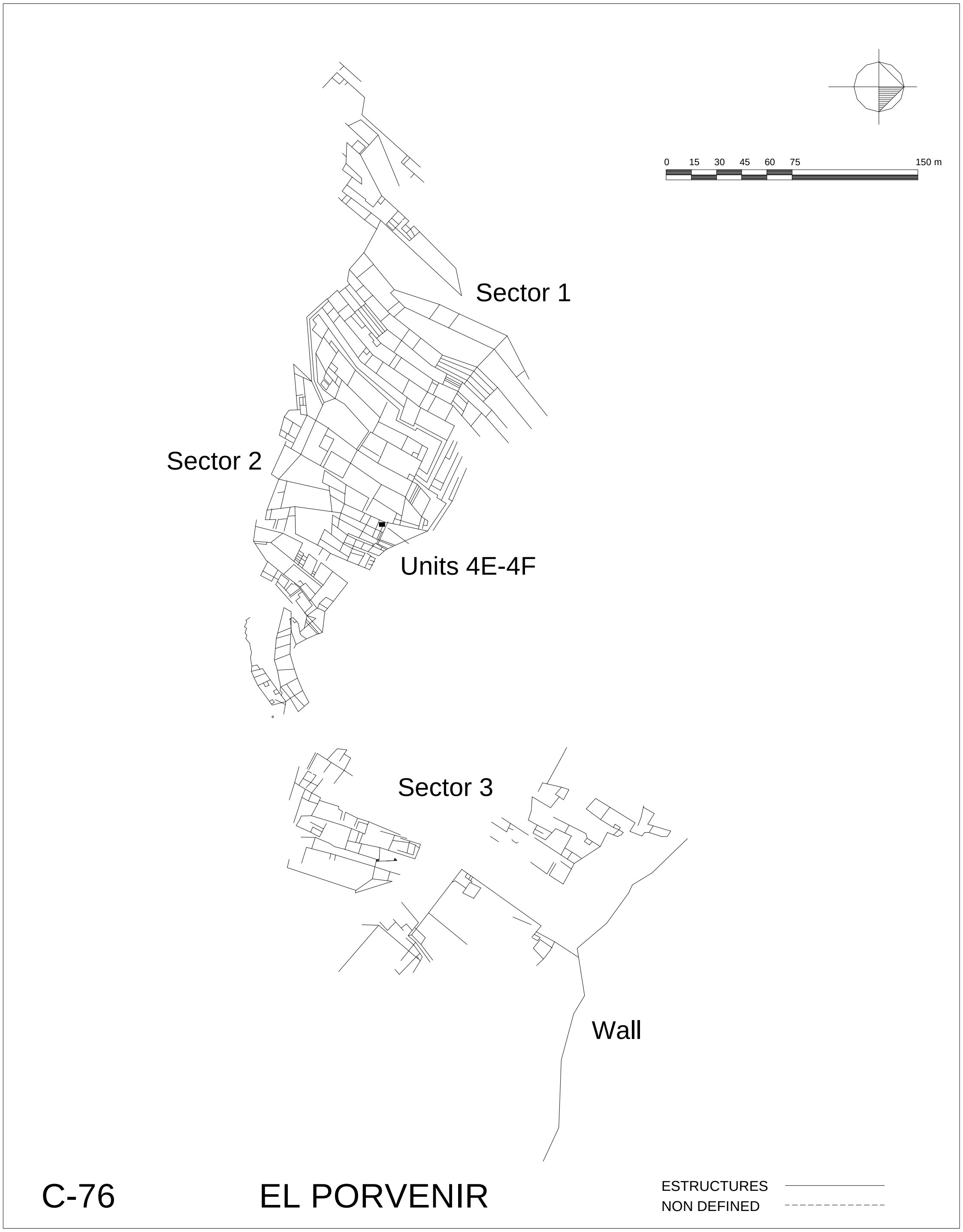


Figure 4.11. El Porvenir (C-76).

Figure 4.12. Bella Vista (C-72).

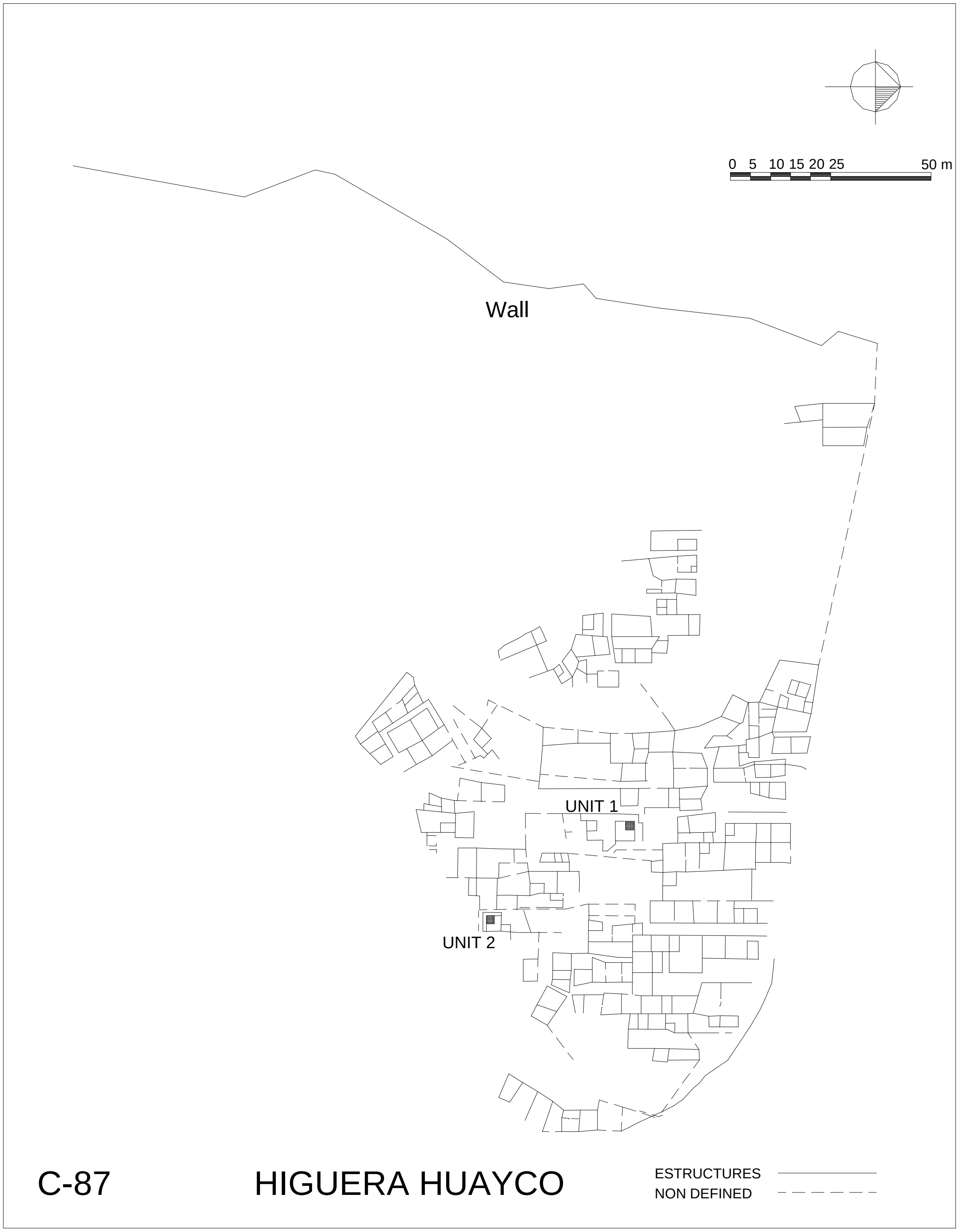


Figure 4.13. Higuerahuayco (C-87).

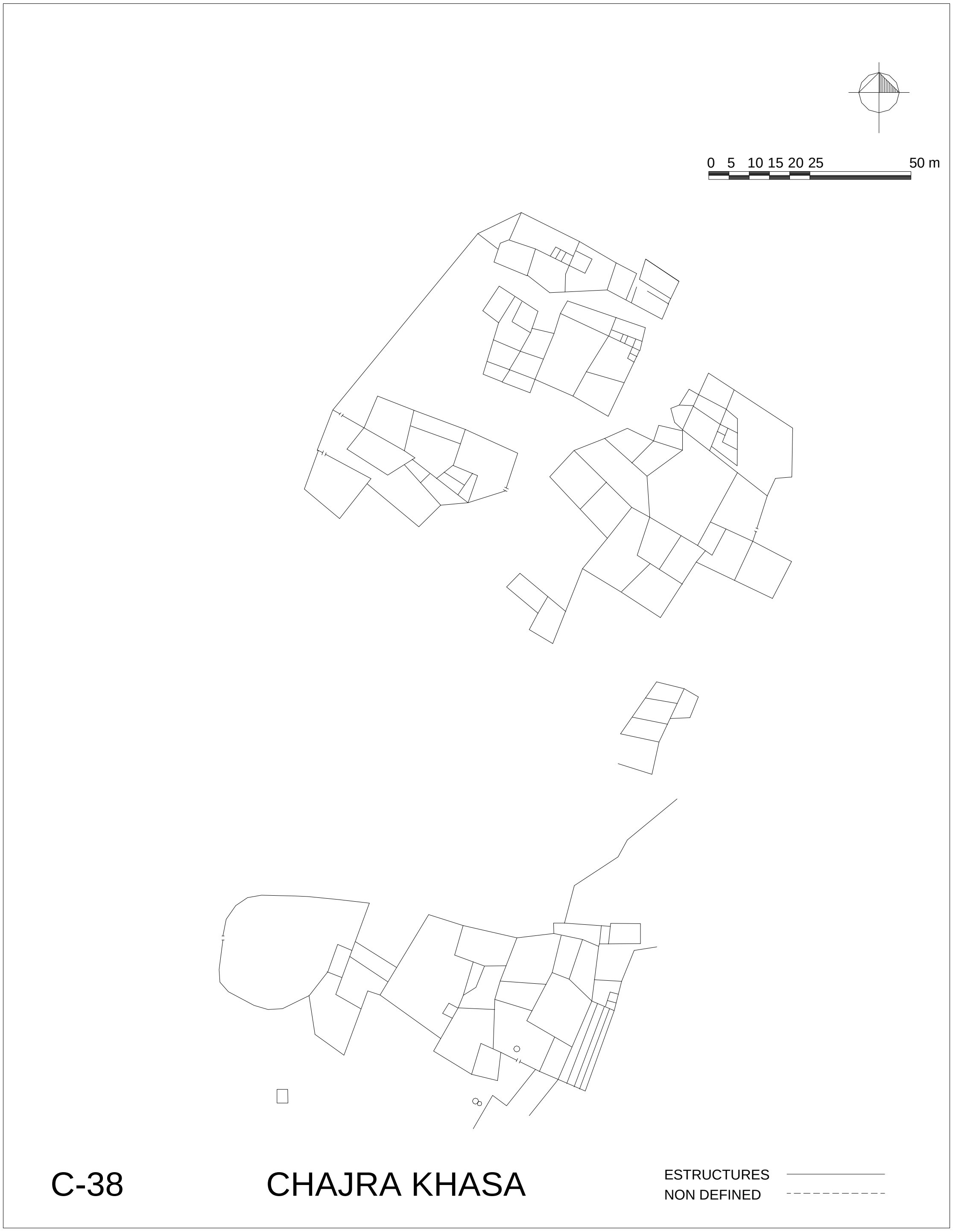


Figure 4.14. Chajra Khasa (C-38).

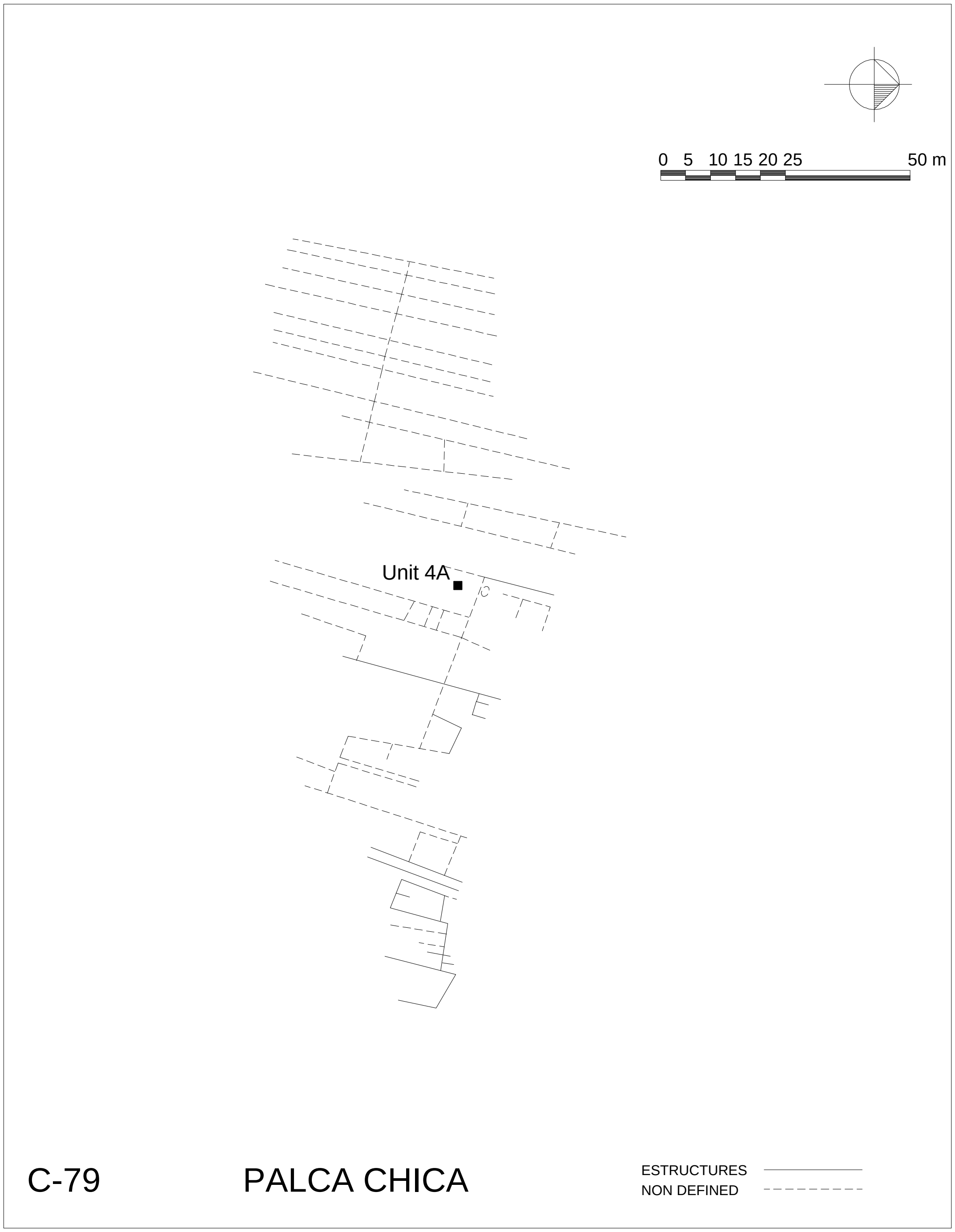


Figure 4.15. Palca Chica (C-79).

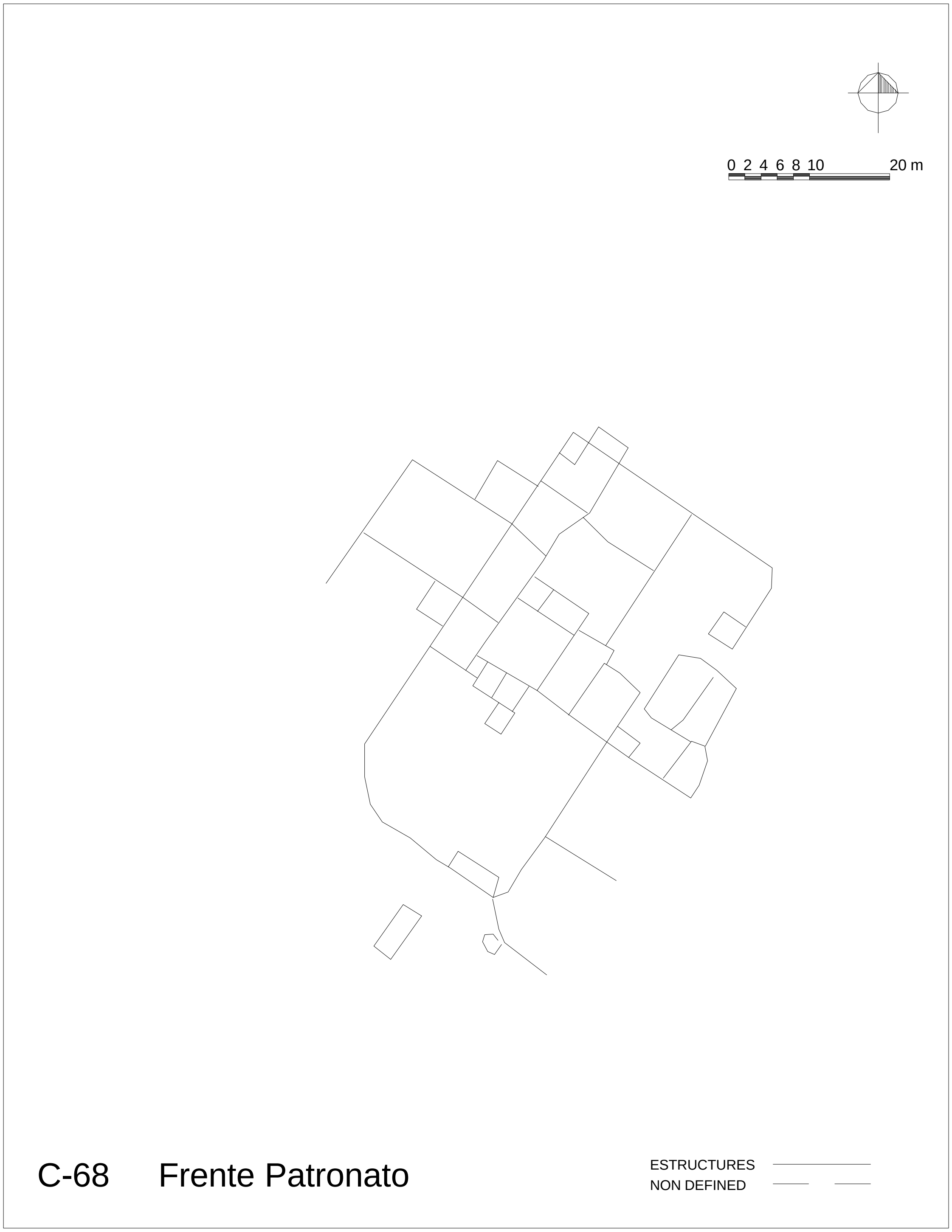


Figure 4.16. Frente Patronato (C-68).

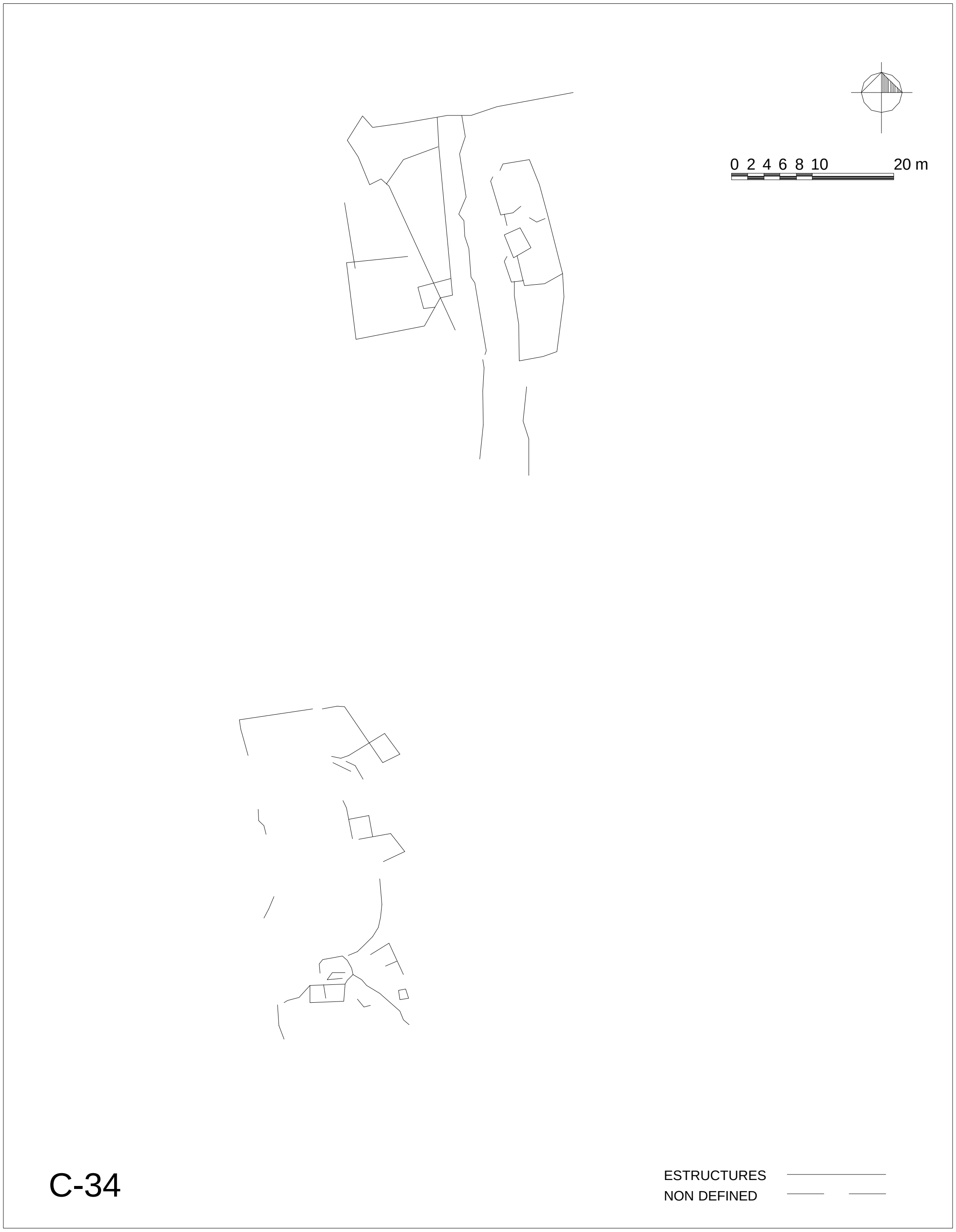


Figure 4.17. Map of C-34.

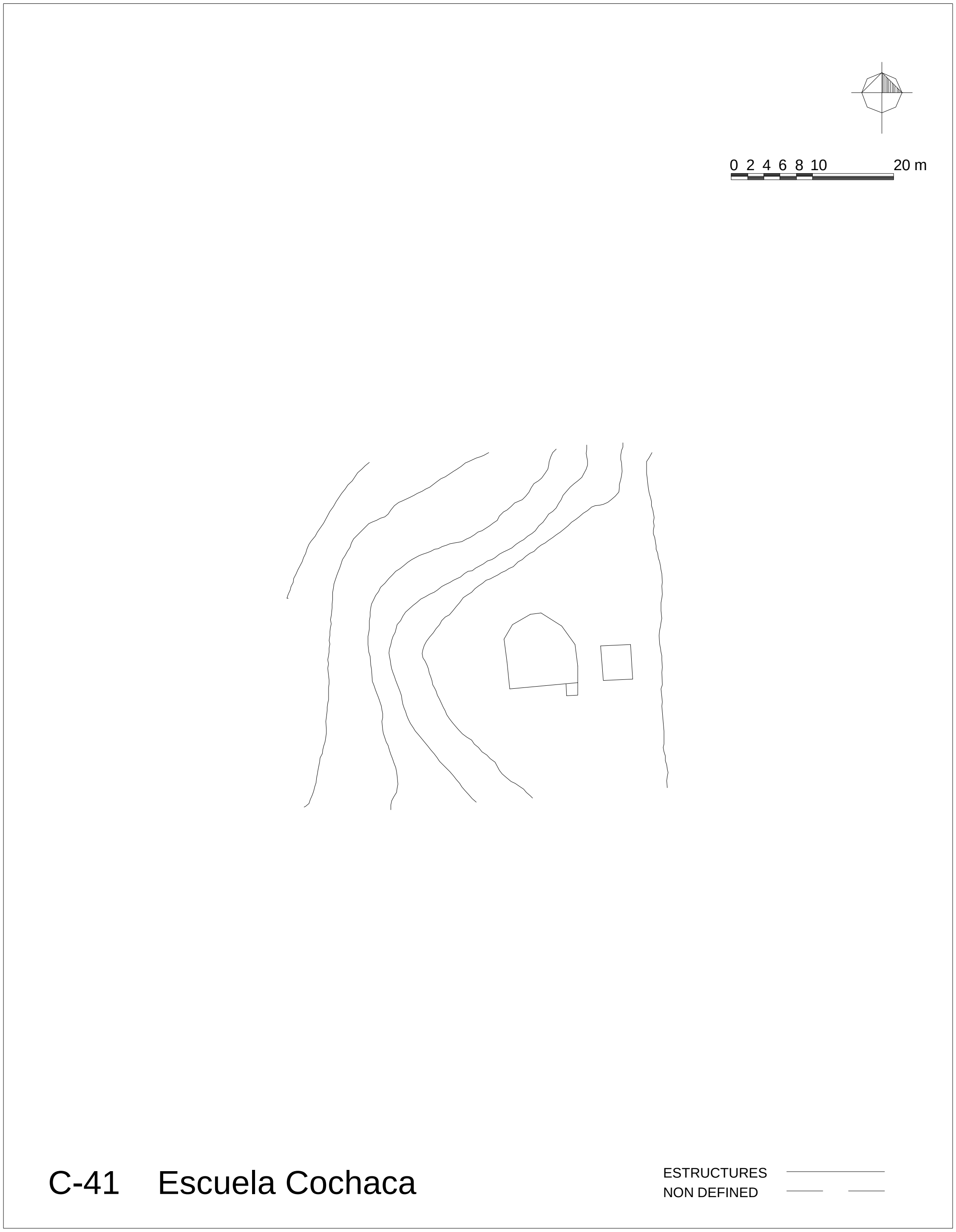


Figure 4.18. Escuela Cochaca (C-41).

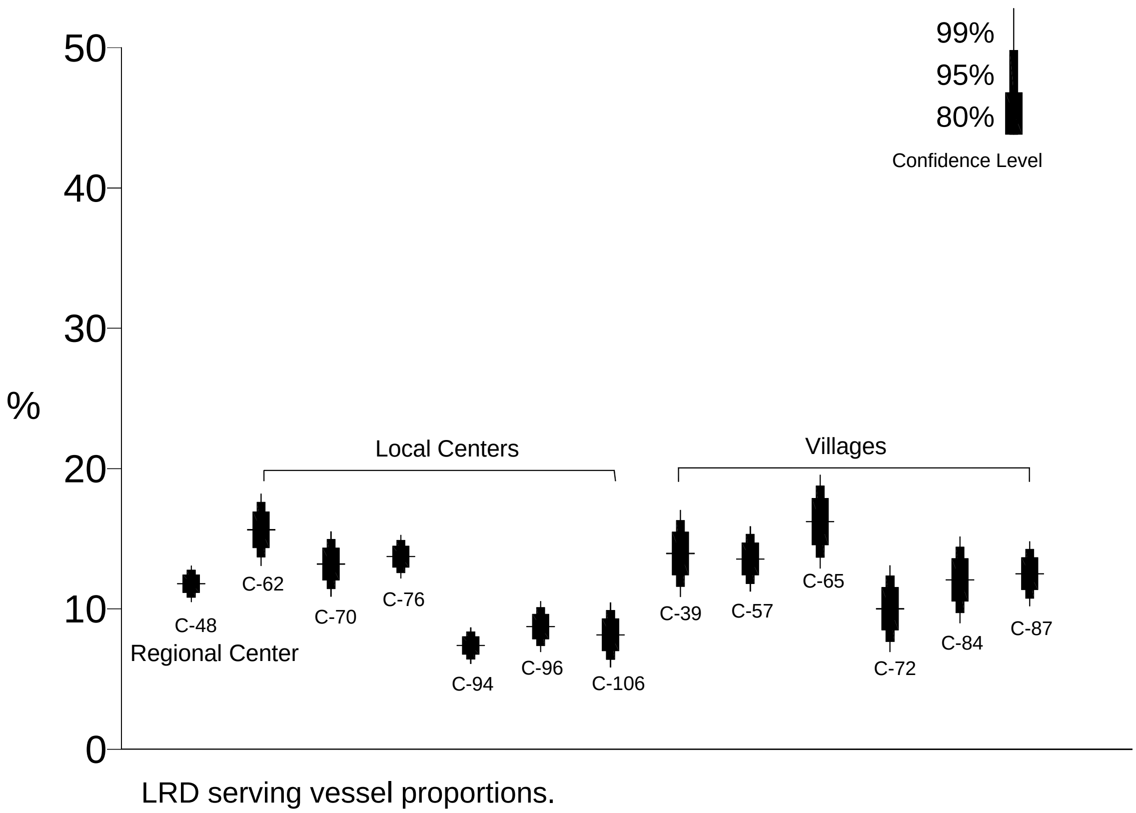


Figure 4.19. LRD period serving vessel proportions.

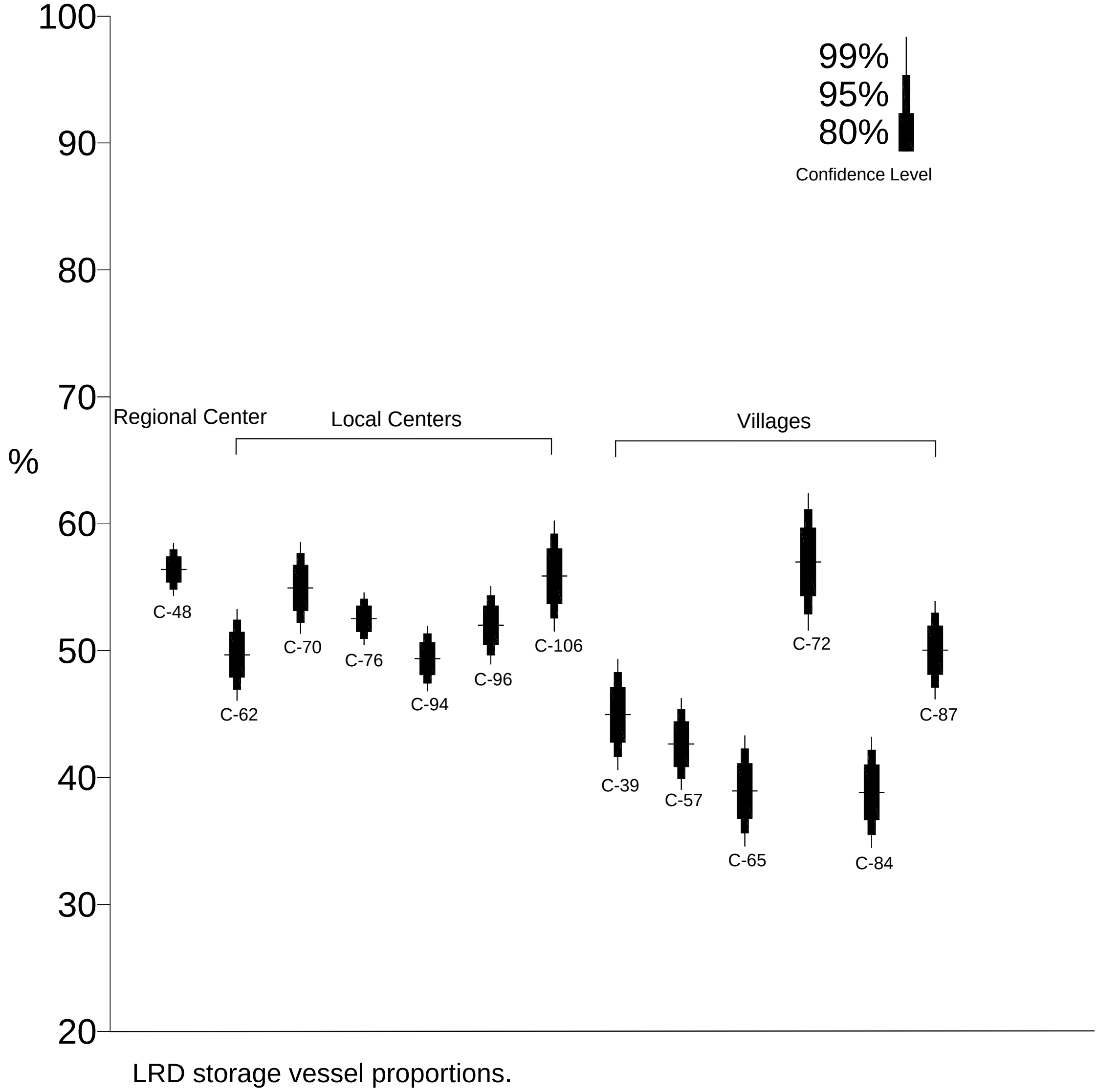


Figure 4.20. LRD period storage vessel proportions.

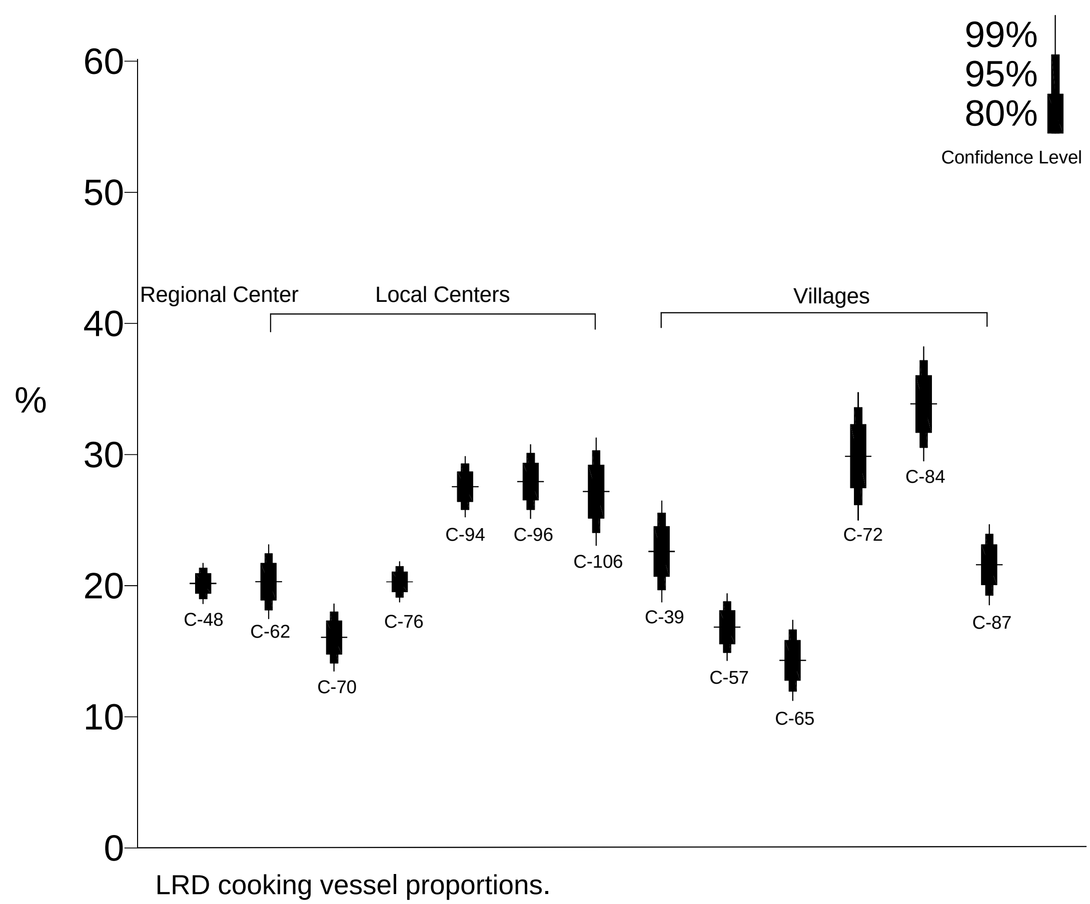


Figure 4.21. LRD period cooking vessel proportions.

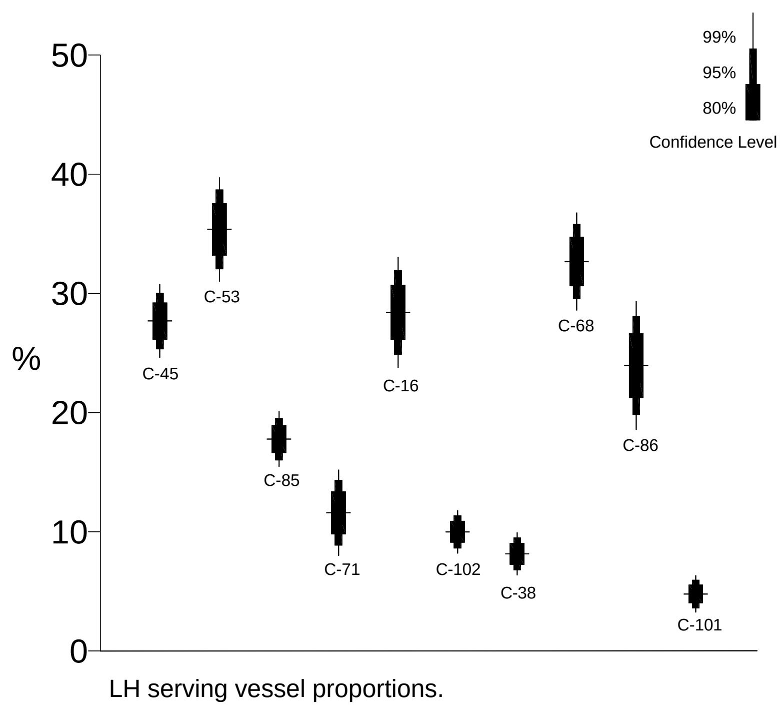


Figure 4.22. LH period serving vessel proportions.

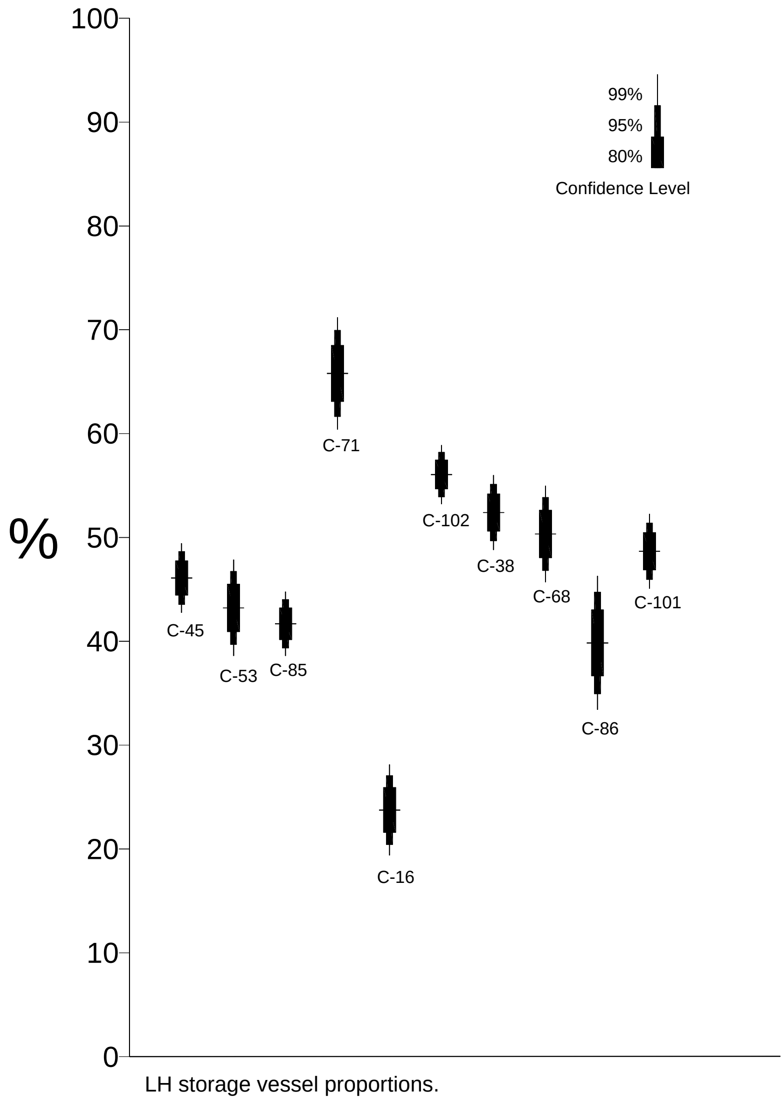


Figure 4.23. LH storage vessel proportions.

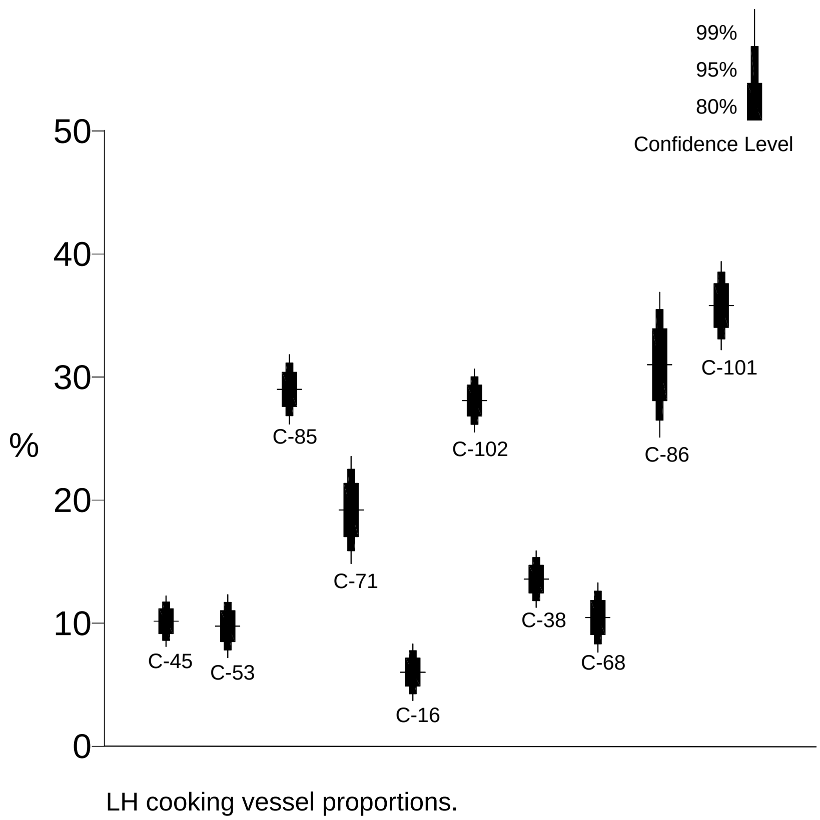


Figure 4.24. LH period cooking vessel propotion.

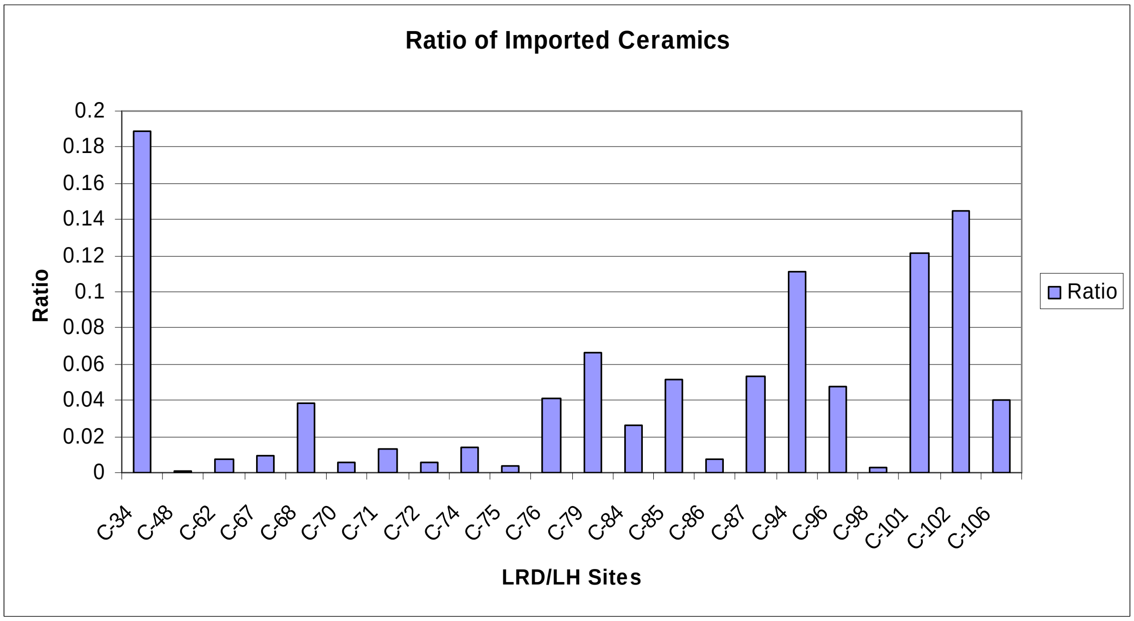
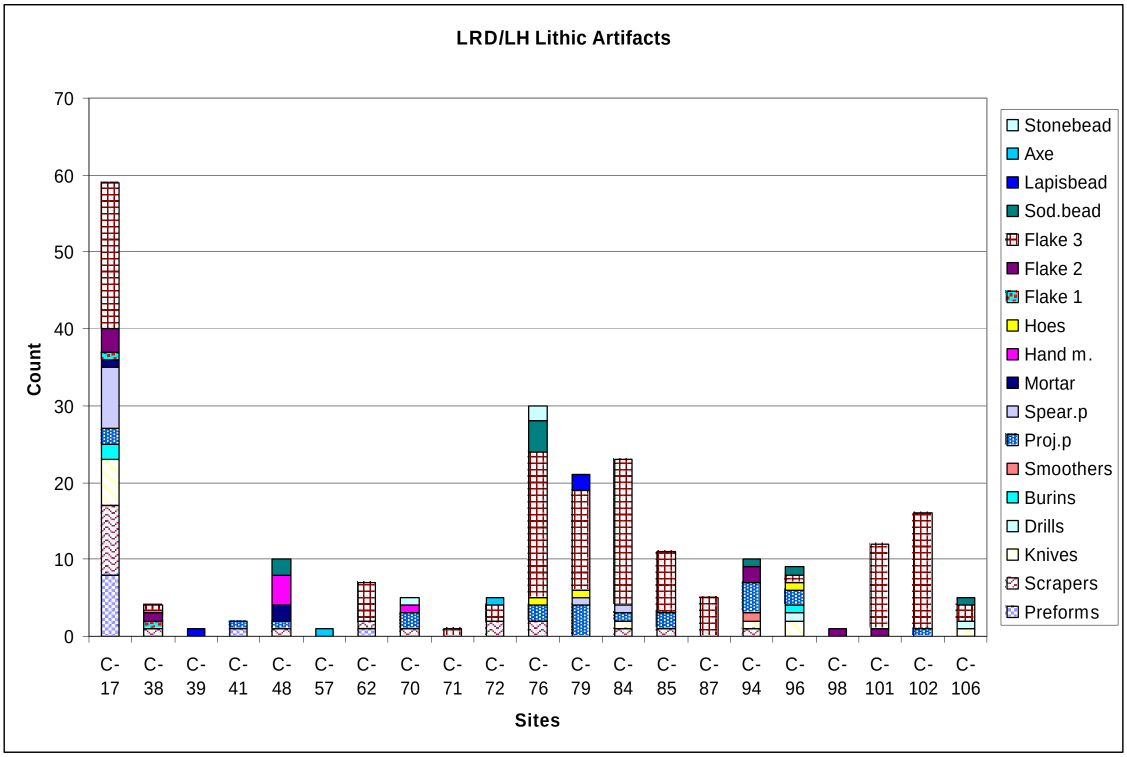


Figure 4.25. Ratio of imported: local ceramics for LRD/LH periods.



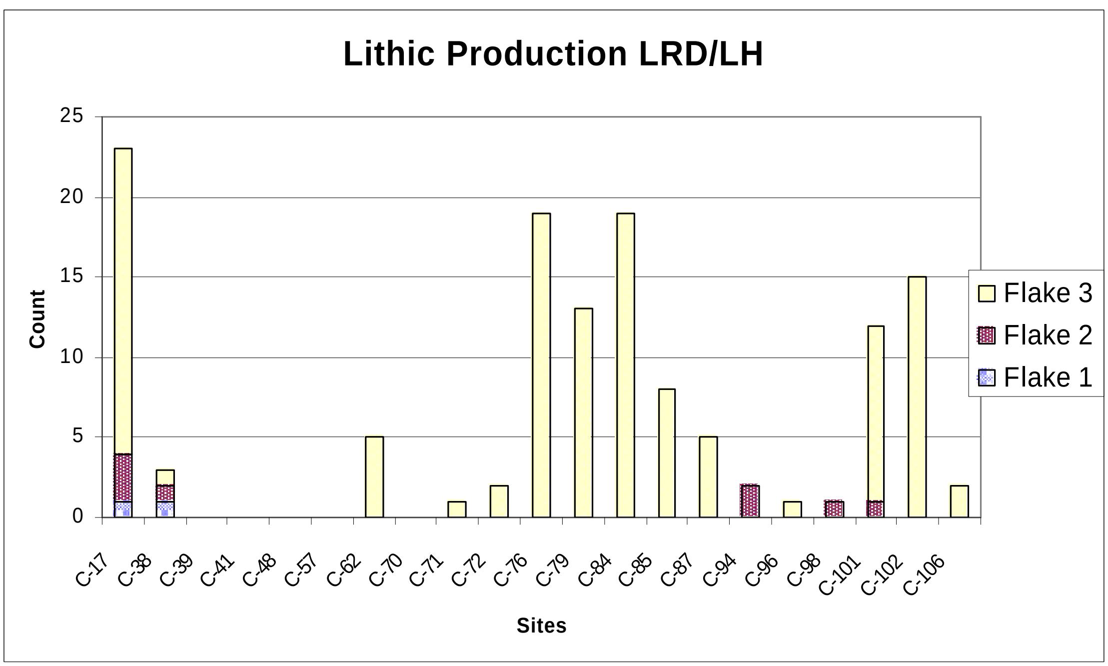
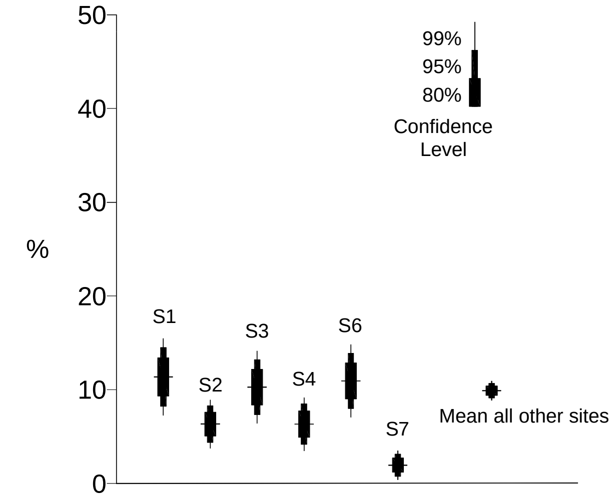
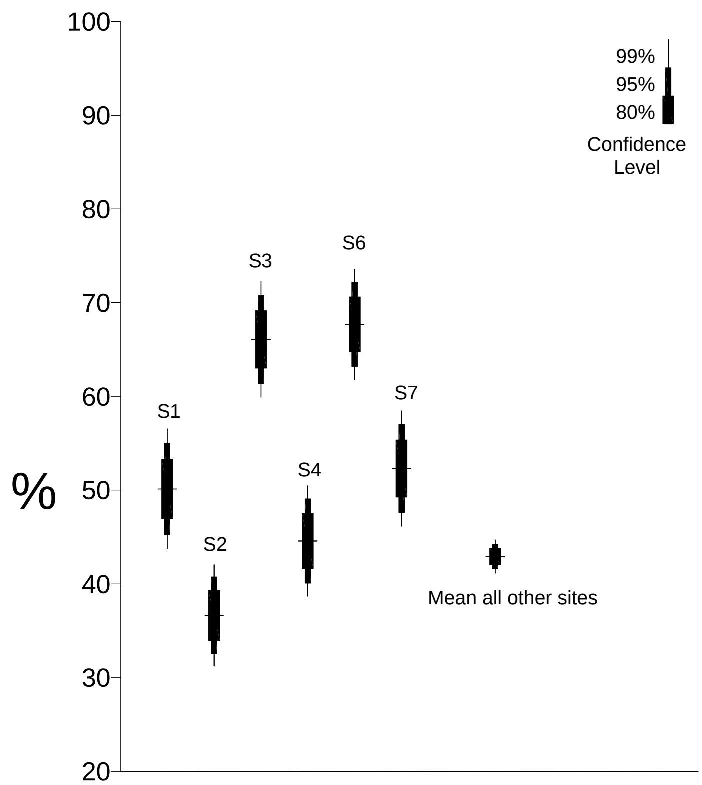


Figure 4.26. Distribution of lithic materials in LRD/LH settlements.

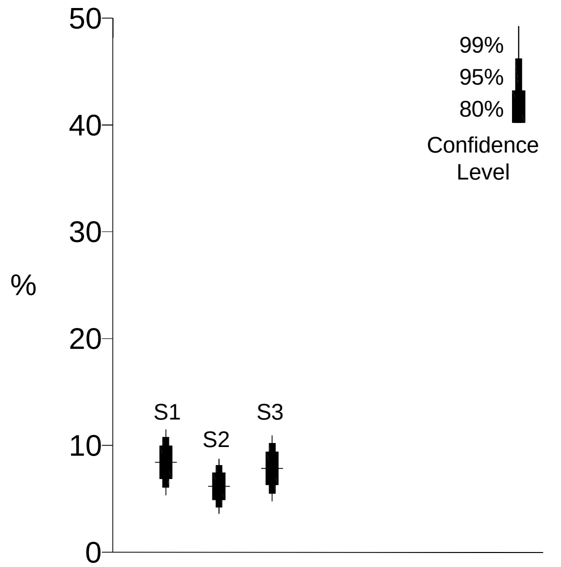


Serving vessel proportions by sectors at C-18.

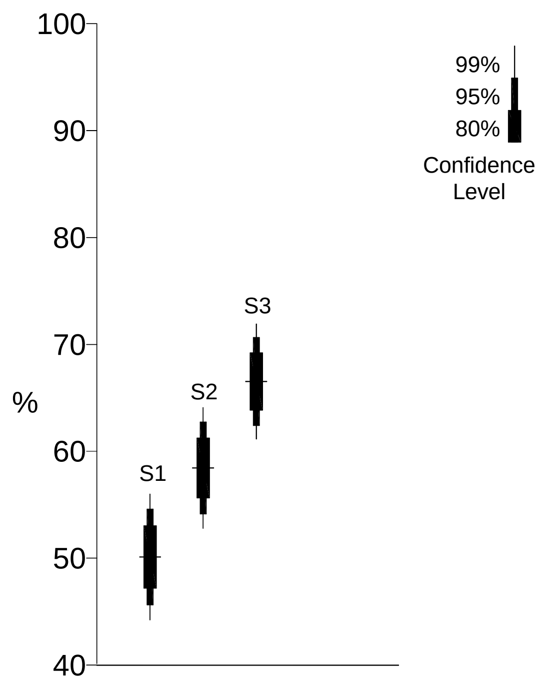


Storage vessel proportions by sectors at C-18.

Figure 5.1.ERD period serving and storage vessel proportions by sectors at C-18.

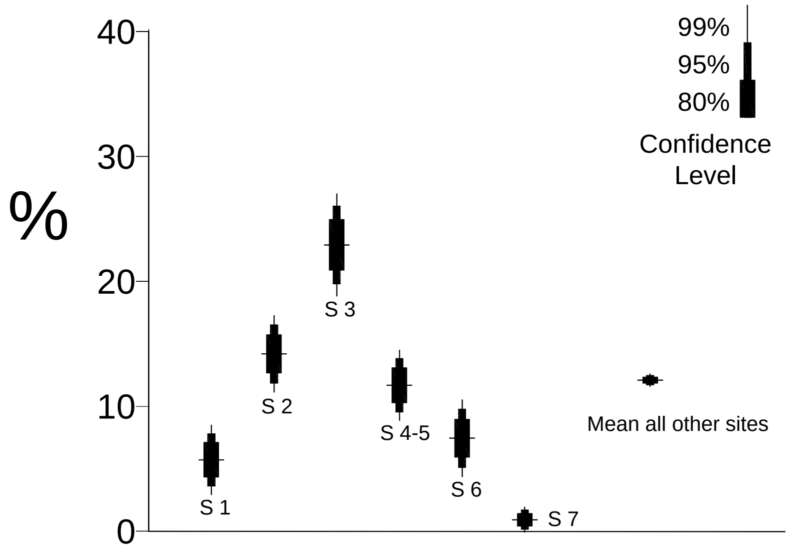


Serving vessel proportions by sectors at C-58.

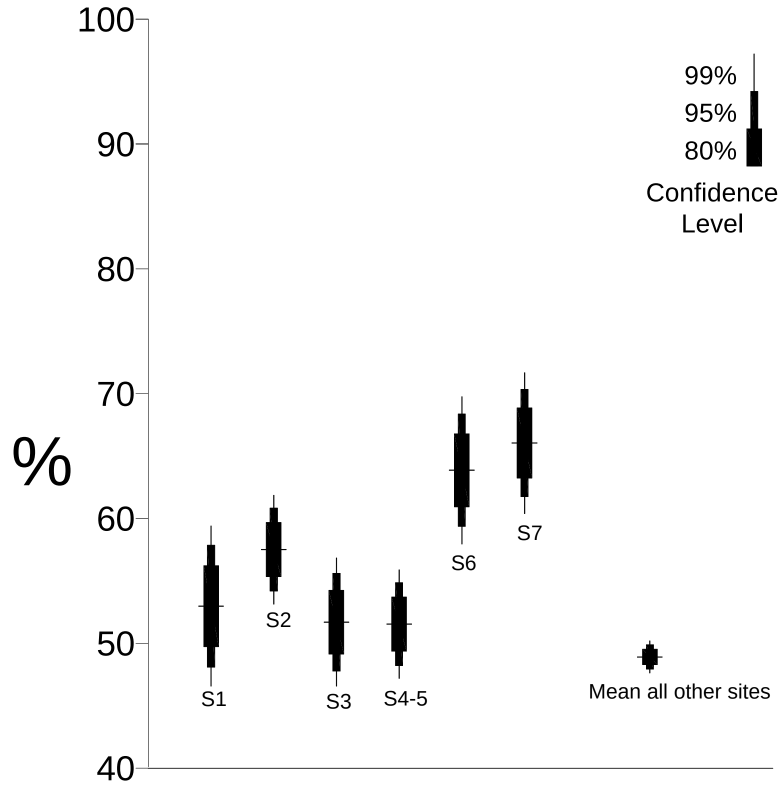


Storage vessel proportions by sectors at C-58.

Figure 5.2. ERD period serving and storage vessel proportion by sectors at C-58.



Serving vessel proportions by sectors at C-48.



Storage vessel proportions by sectors at C-48.

Figure 5.3. LRD period serving and storage vessel proportions by sector at C-48.

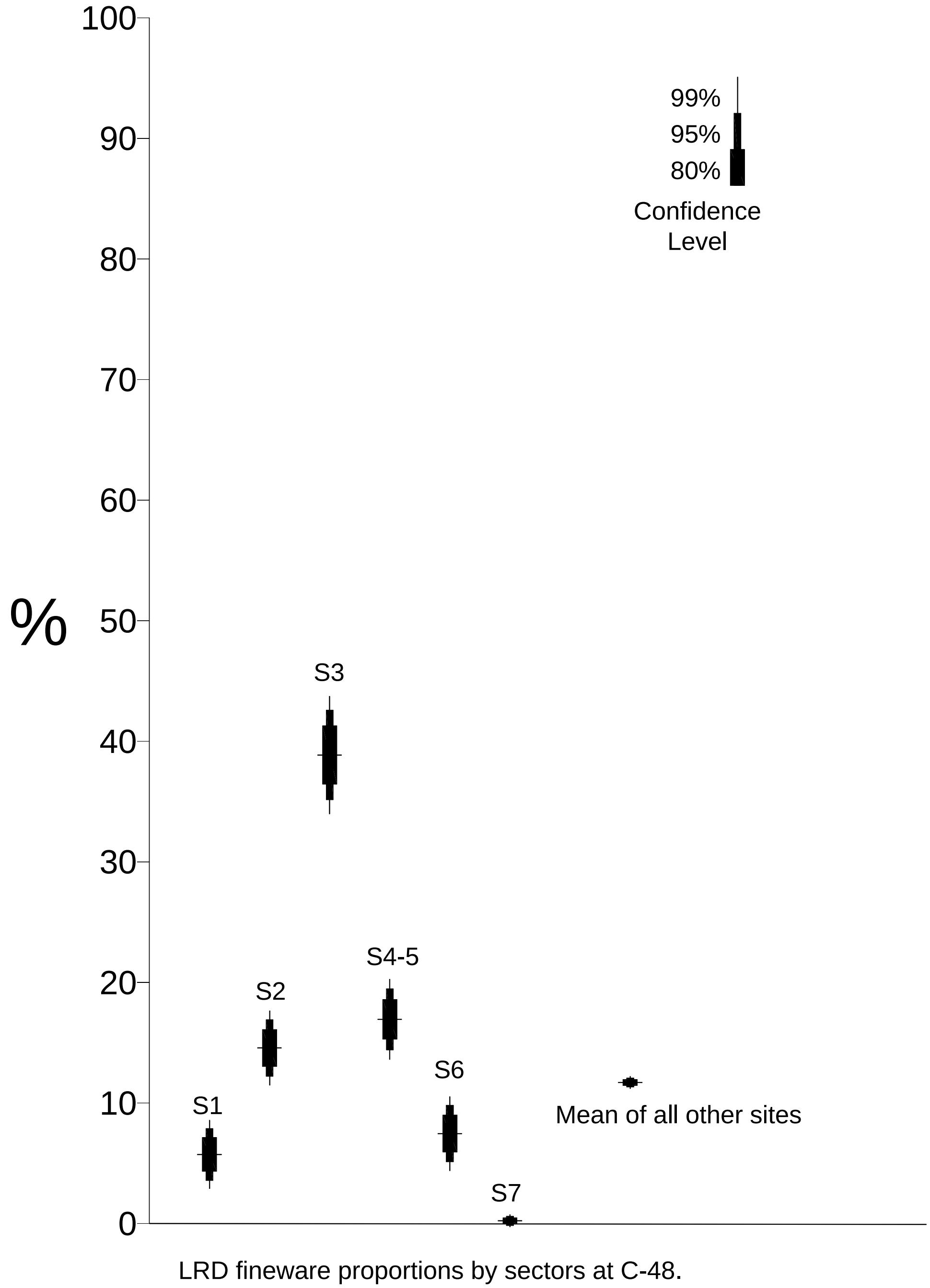


Figure 5.4. LRD period fineware proportions by sectors at C-48.

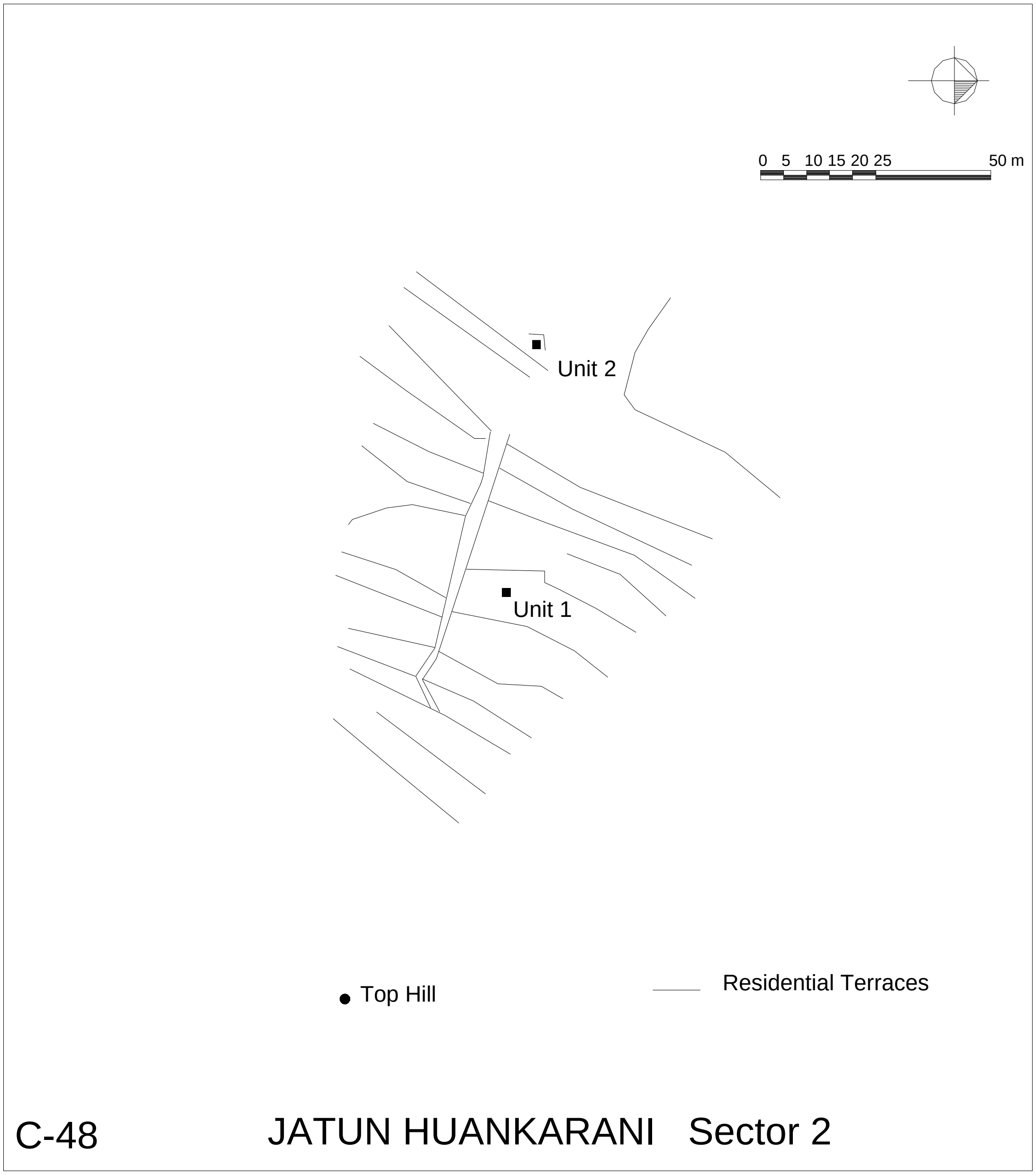
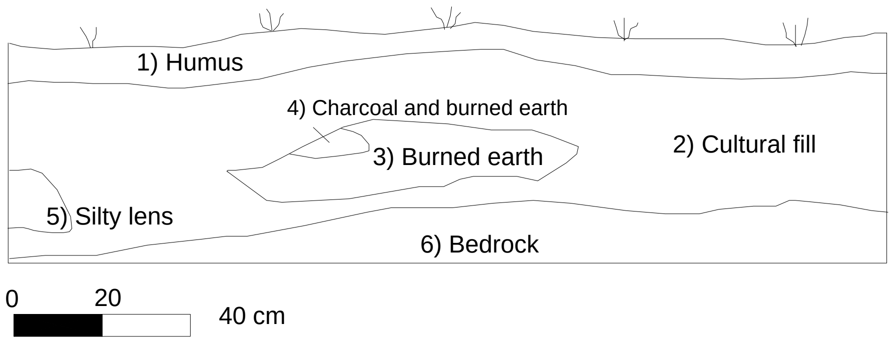


Figure 5.5. C-48, excavation units at Sector 2.

Unit 1, Northern profile



Unit 2, Western profile

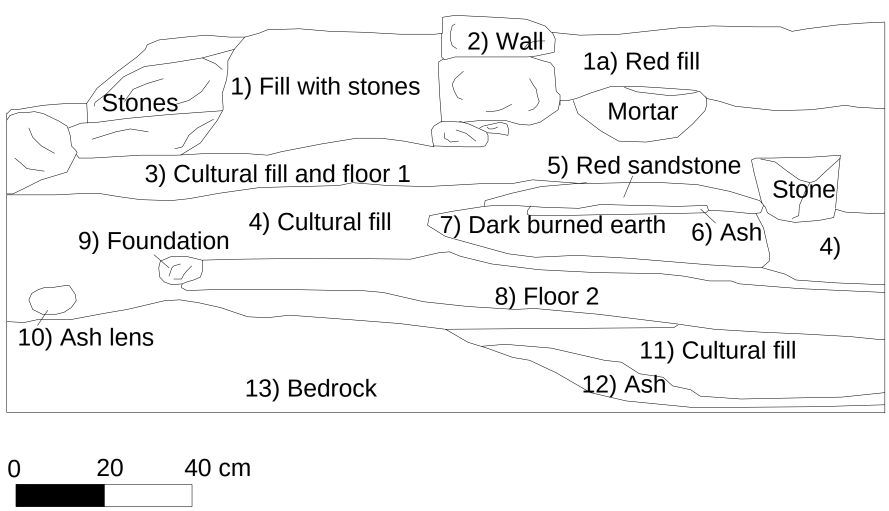


Figure 5.6. C-48 excavation profiles.

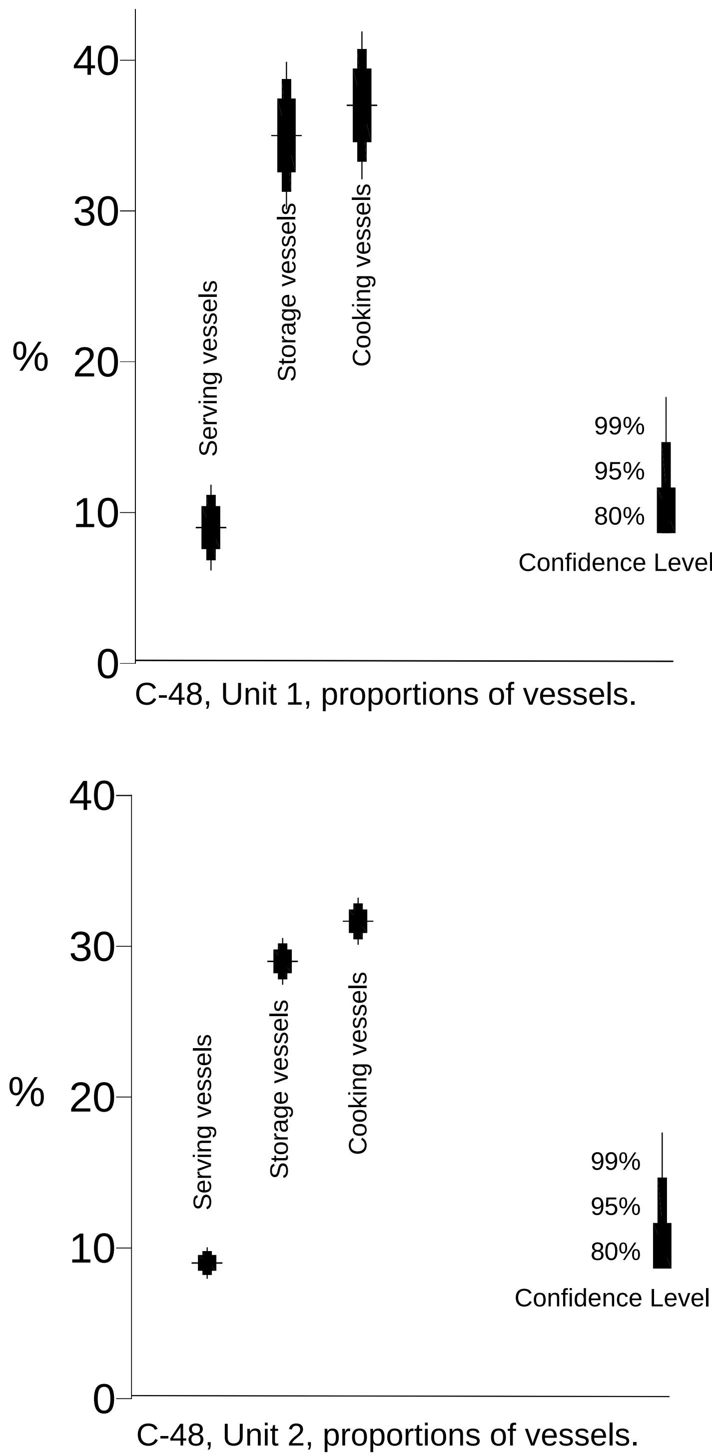
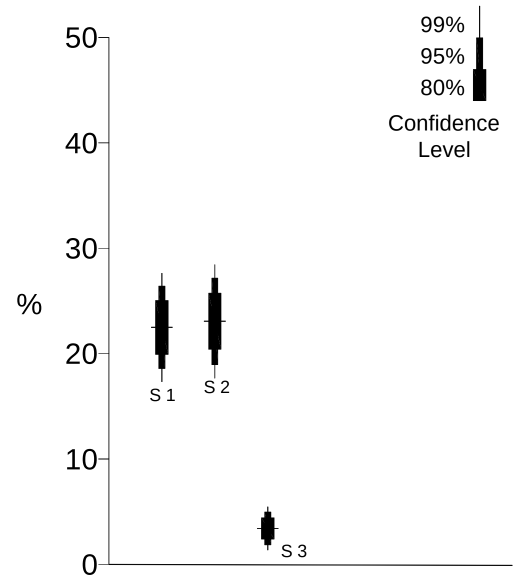
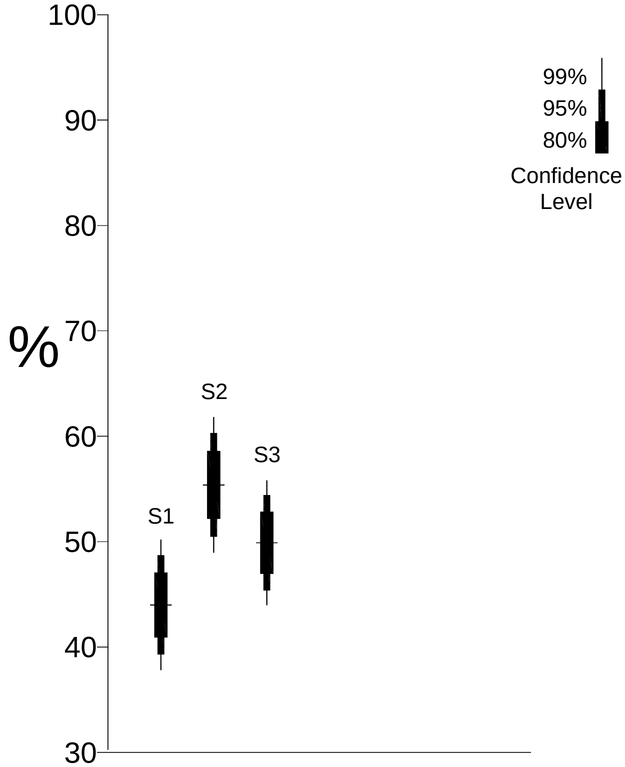


Figure 5.7. Vessel proportions from excavation at C-48.

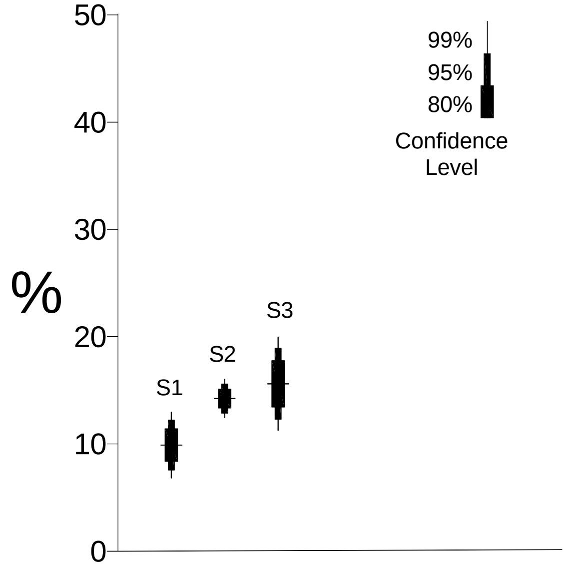


Serving vessel proportions by sectors at C-62.

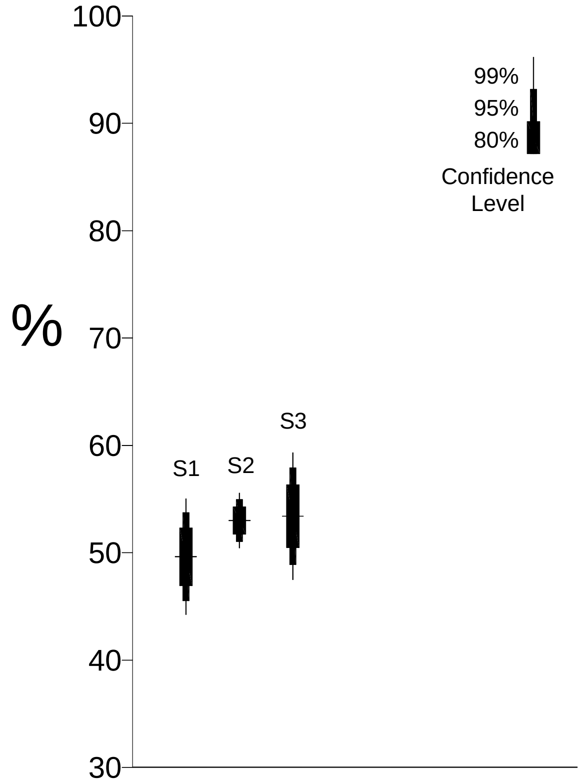


Storage vessel proportions by sectors at C-62.

Figure 5.8. LRD serving and storage vessel proportions by sectors at C-62.

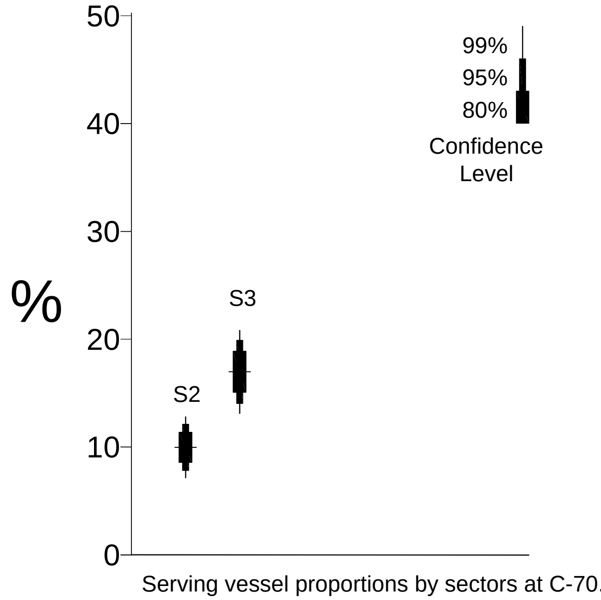


Serving vessel proportions by sectors at C-76.



Storage vessel proportions by sectors at C-76.

Figure 5.9. LRD period serving and storage vessel proportions by sectors at C-76.



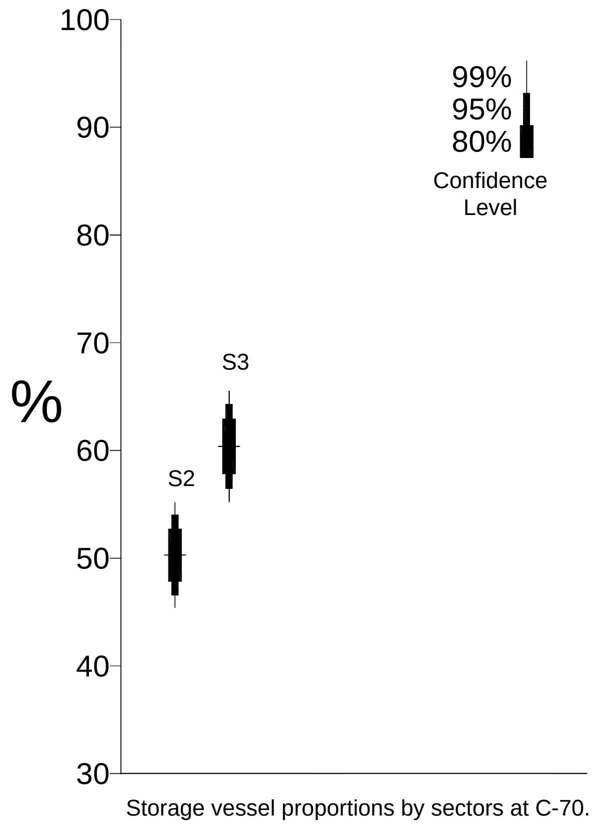
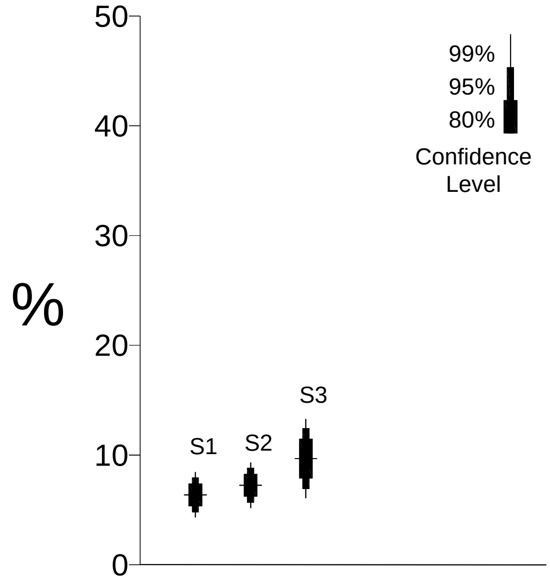
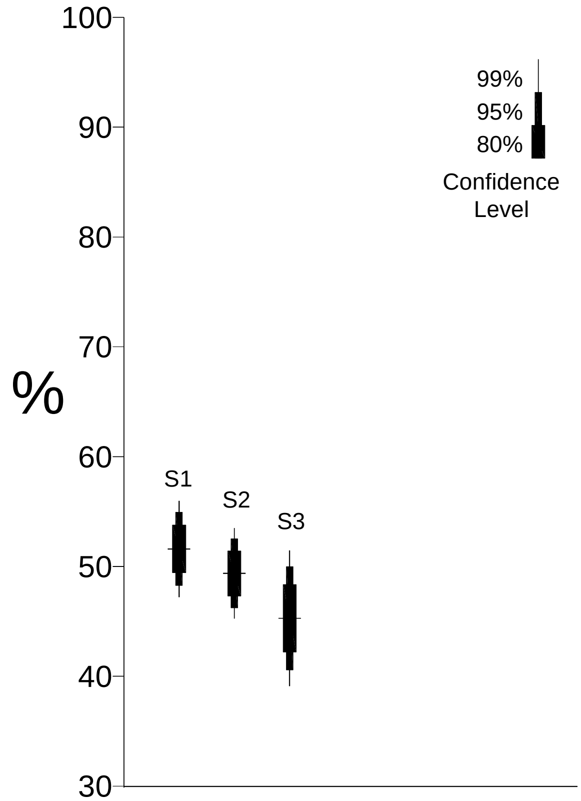


Figure 5.10. LRD period serving and storage vessel proportions by sector at C-70.

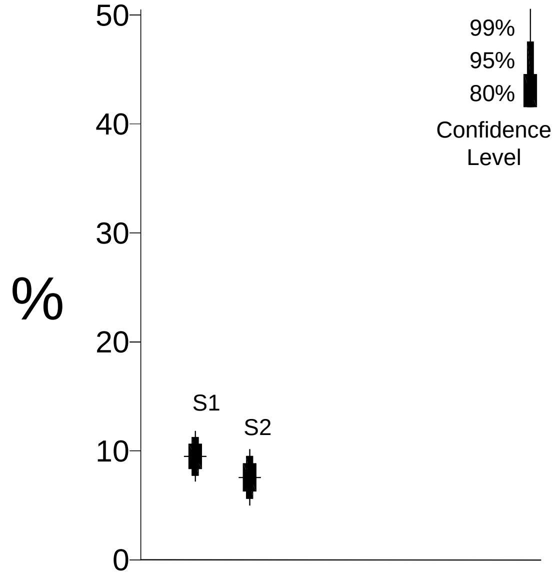


Storage vessel proportions by sectors at C-94.

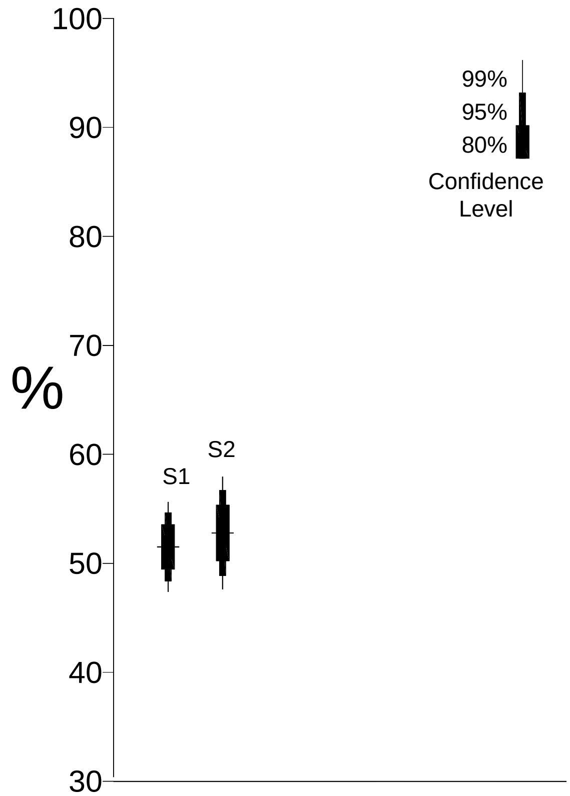


Storage vessel proportions by sectorsat C-94.

Figure 5.11. LRD period serving and storage vessel proportions by sectors at C-94.



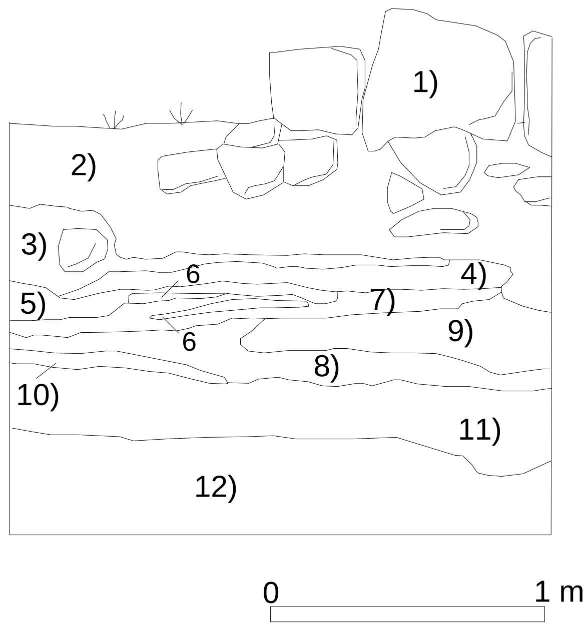
Serving vessel proportions by sectors at C-96.



Storage vessel proportions by sectors at C-96.

Figure 5.12. LRD period serving and storage vessel proportions by sectors at C-96.

Unit 3E, Northern profile



1) Wall
2) Cultural fill
3) Chalky sandstone
4) Silty sandy layer
5) Silty sandy layer with inclusions
6) Ash lens
7) Cultural fill
8) Surface
9) fill, ash and silt
10) Sandy fill
11) Floor 3
12) Bedrock

Figure 5.13. C-76, Unit 3E profile.

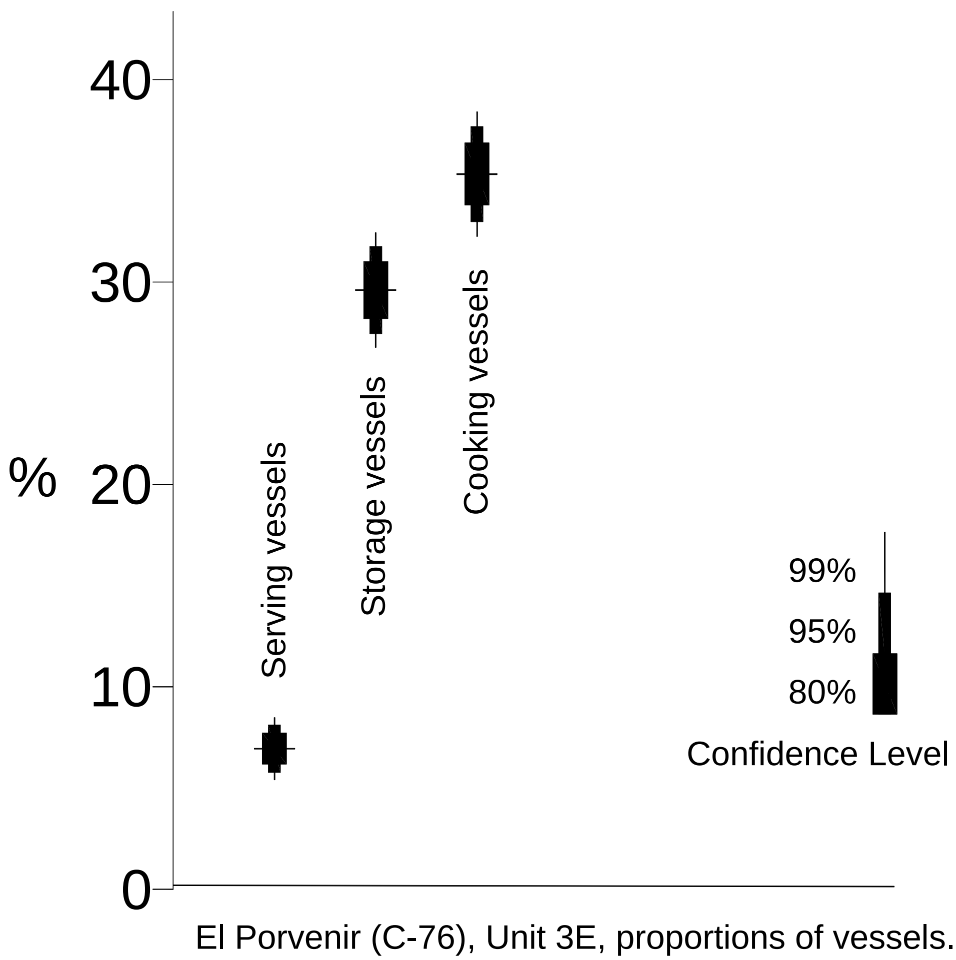
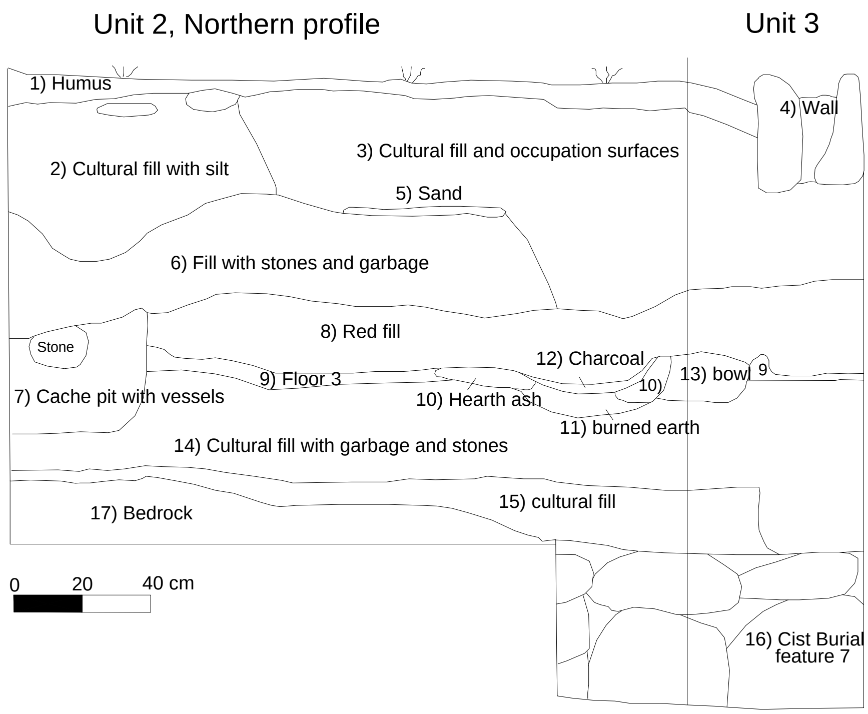


Figure 5.14. LRD period vessel proportions from excavation at C-76.



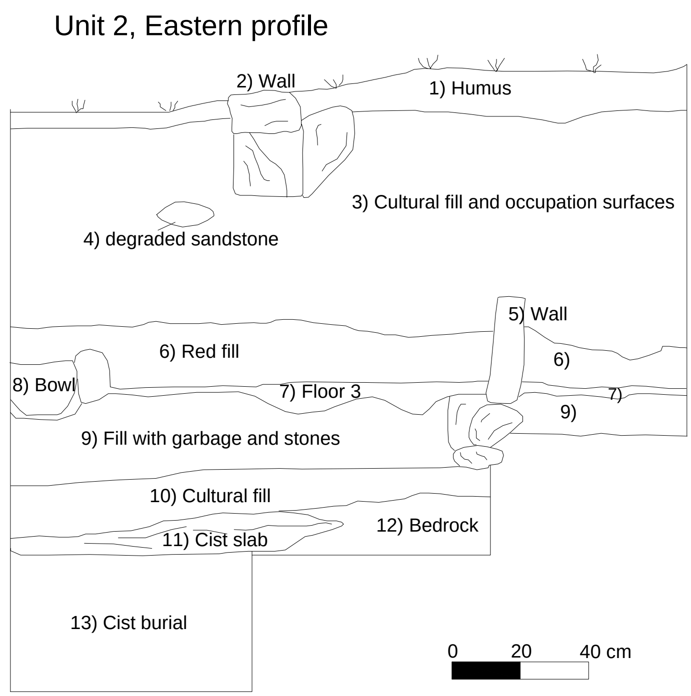


Figure 5.15. C-72, excavation profiles.

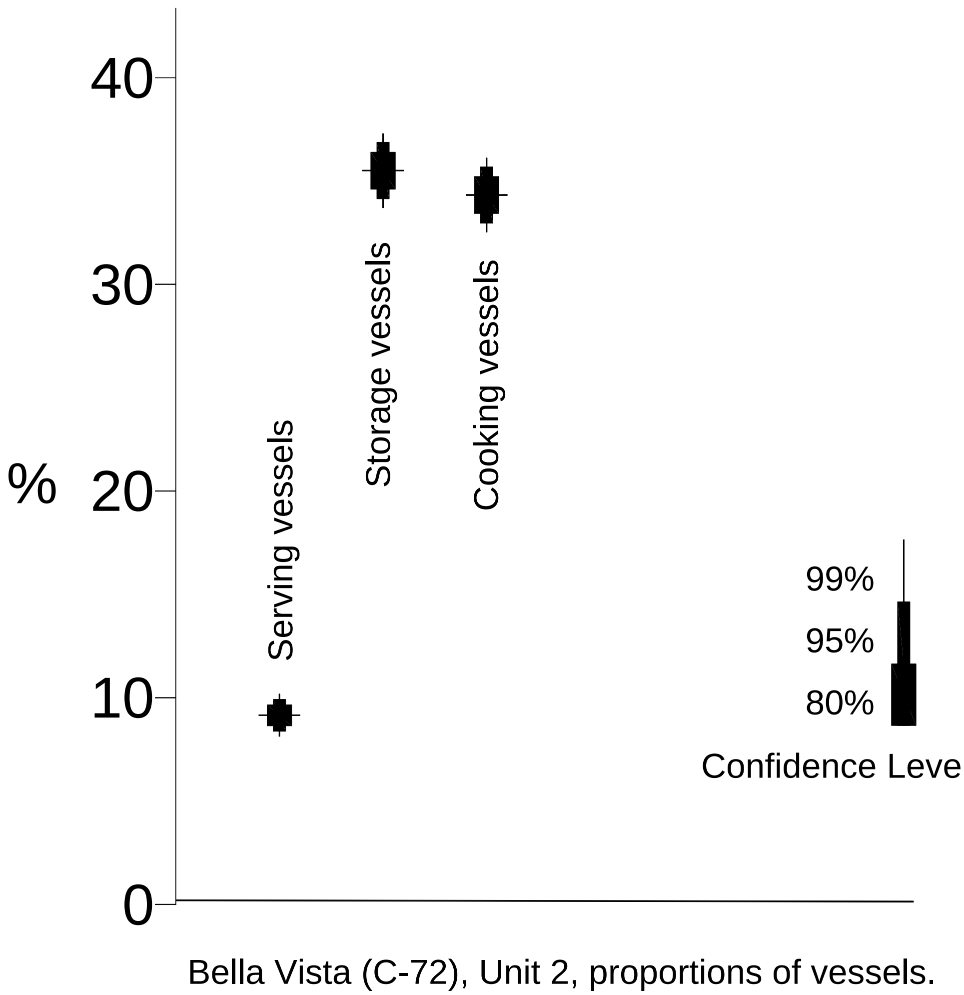
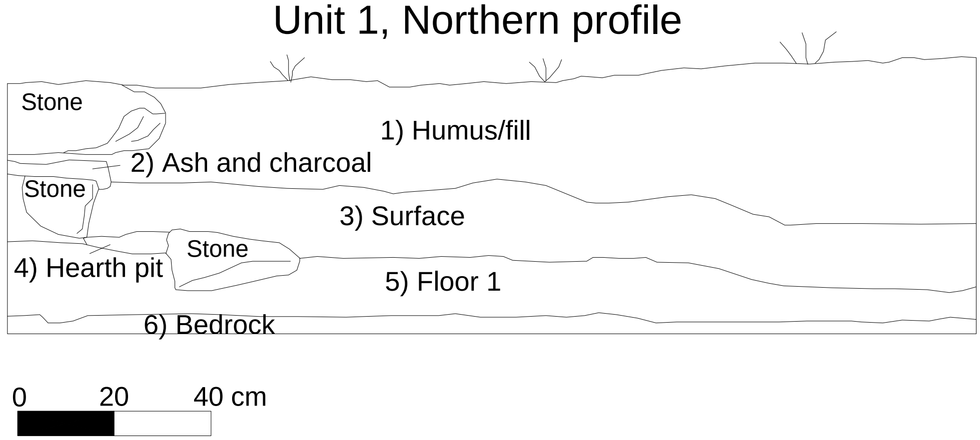


Figure 5.16. LRD period vessel proportions from excavation at C-72.

Unit 1, Northern profile



Unit 2, Northern profile inside structure

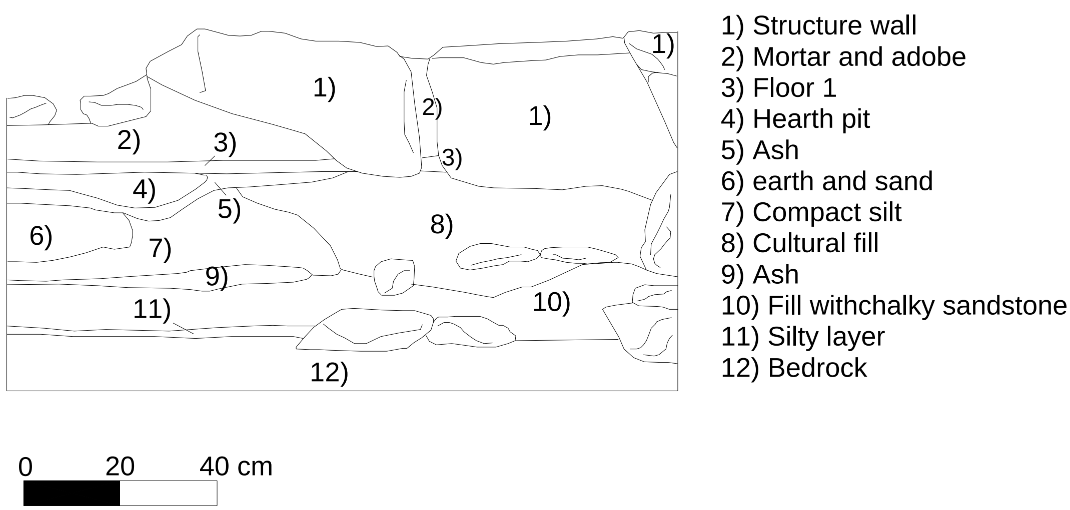


Figure 5.17. C-87 excavation profiles.

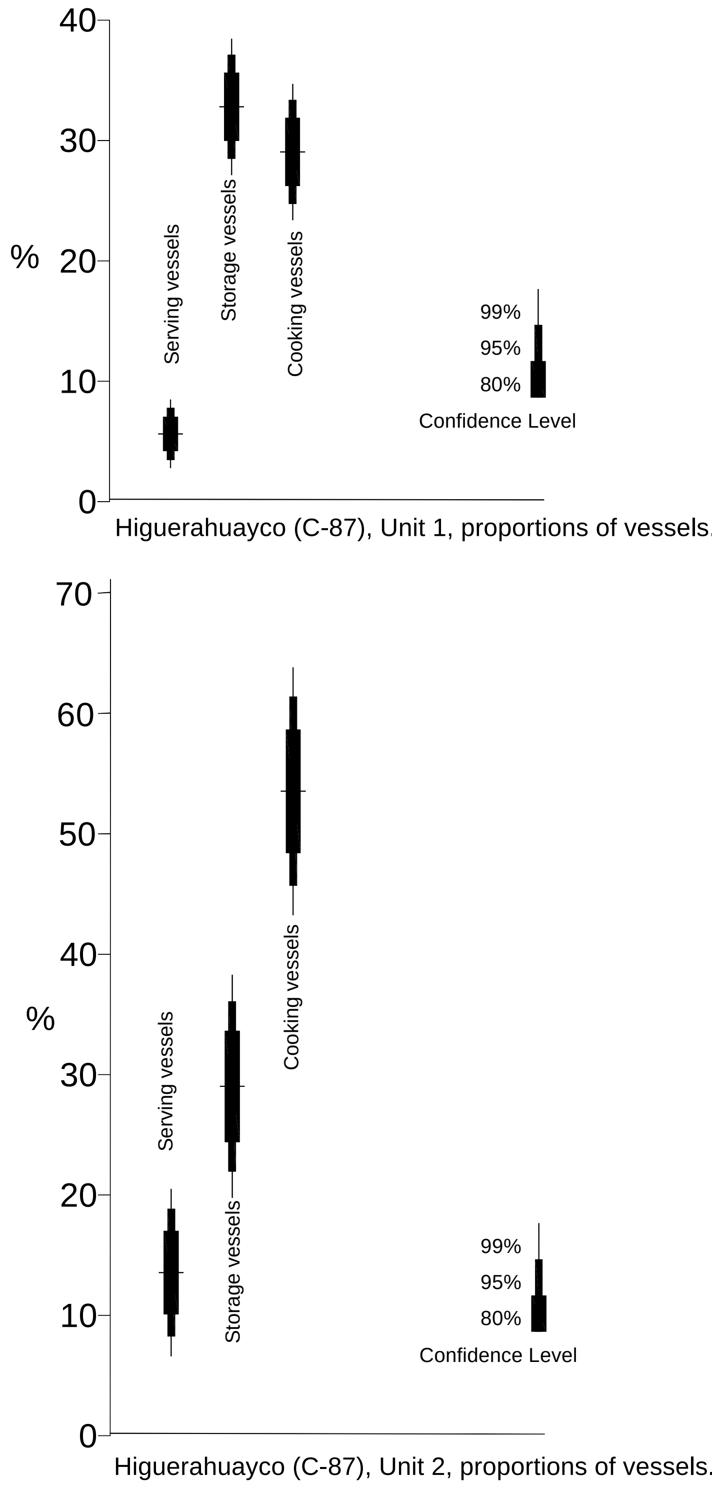
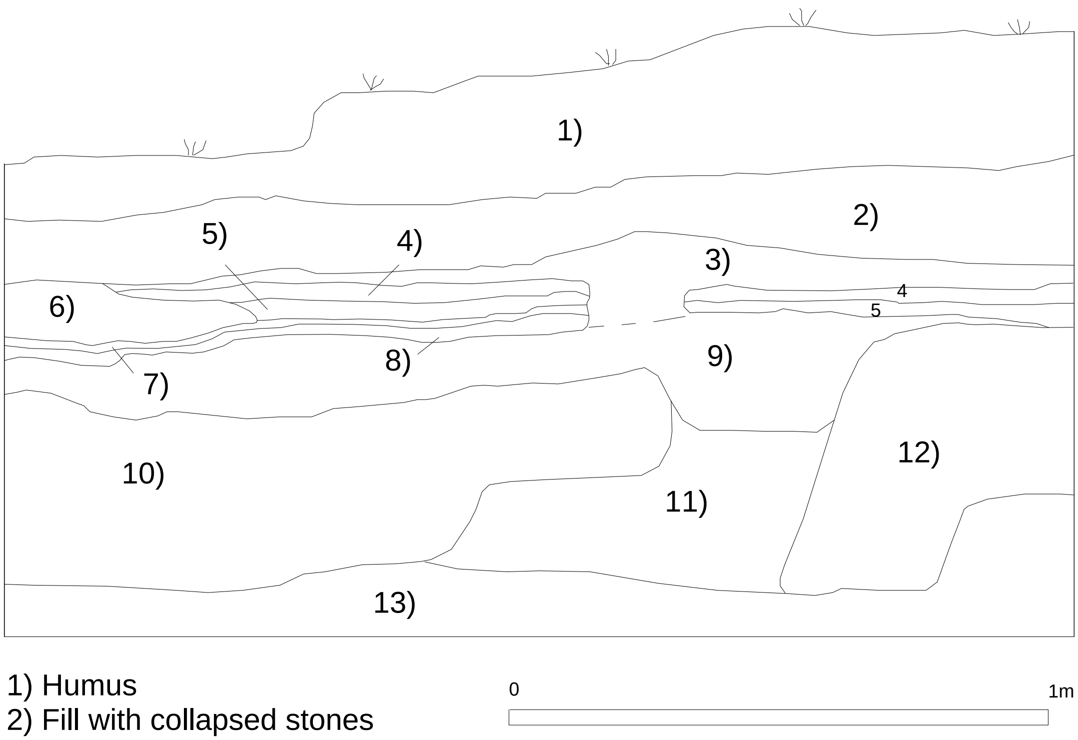


Figure 5.18. LRD period vessel proportions from excavation at C-87.

Unit 4A, Northern profile



1) Humus
2) Fill with collapsed stones
3) Floor 1
4) Floor 2
5) Chalky sandstone
6) Hearth pit
7) Dark silty layer
8) Silty layer
9) Fill
10) Fill with garbage
11) Siltt
12) Fill with garbage
13) Bedrock

Figure 5.19. C-79, Unit 4A excavation profile.

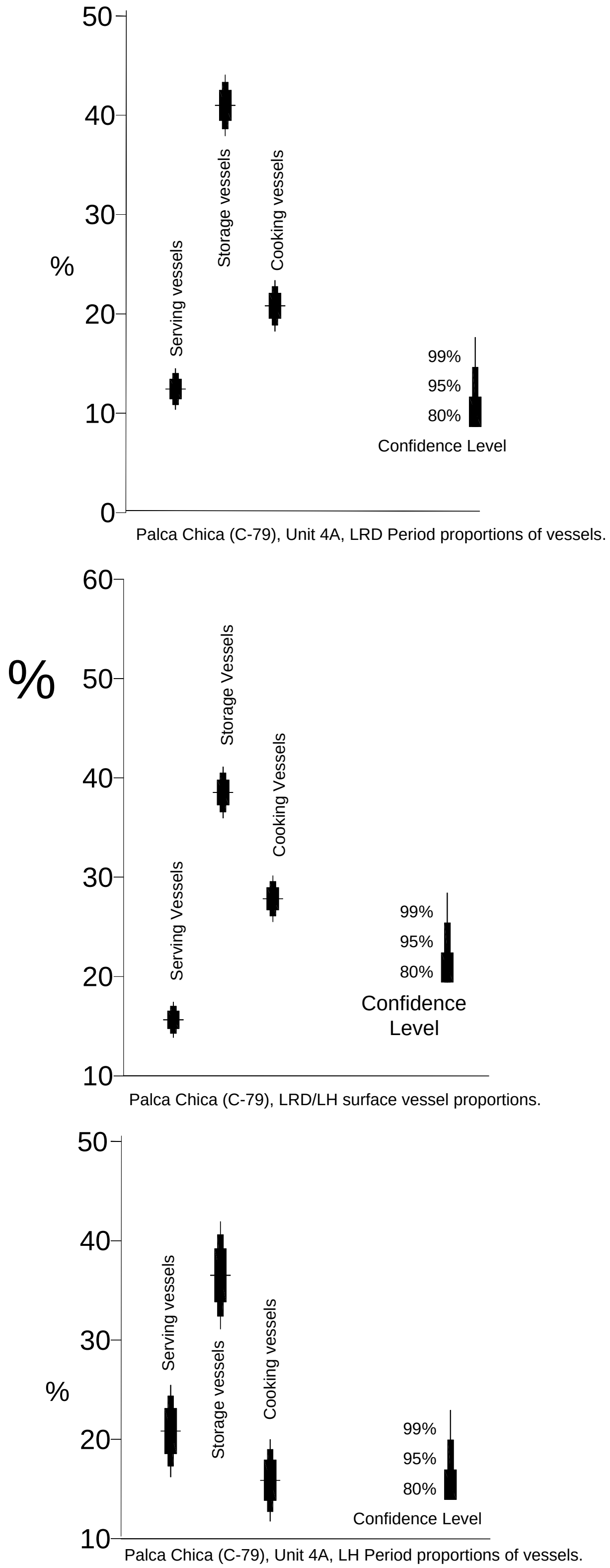
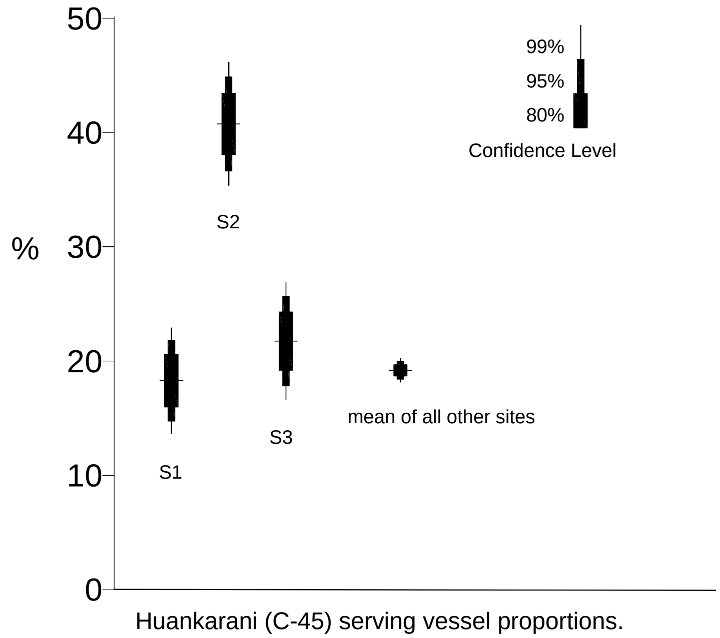


Figure 5.20. LRD/LH vessel proportions from surface and excavation at C-79.



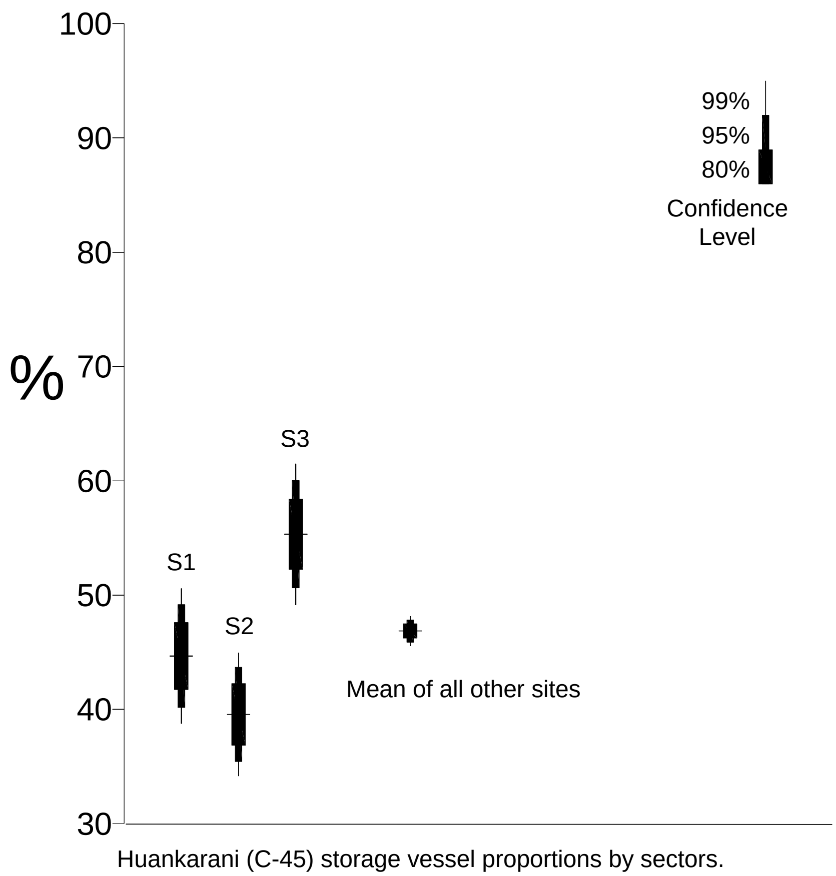
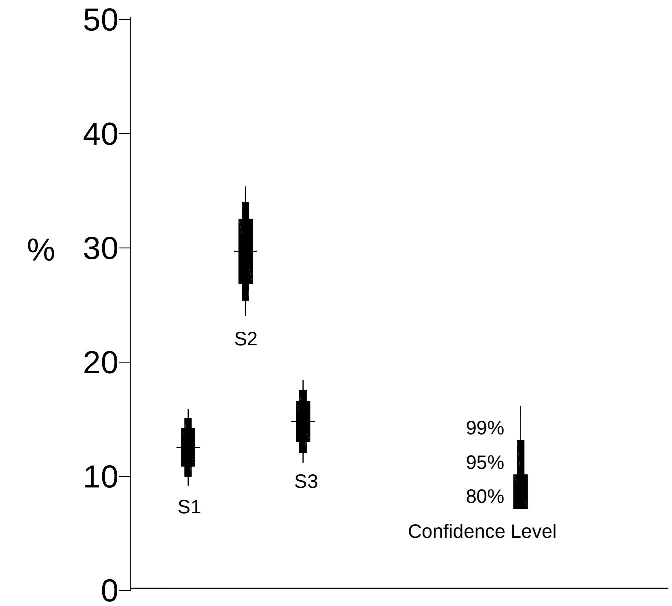
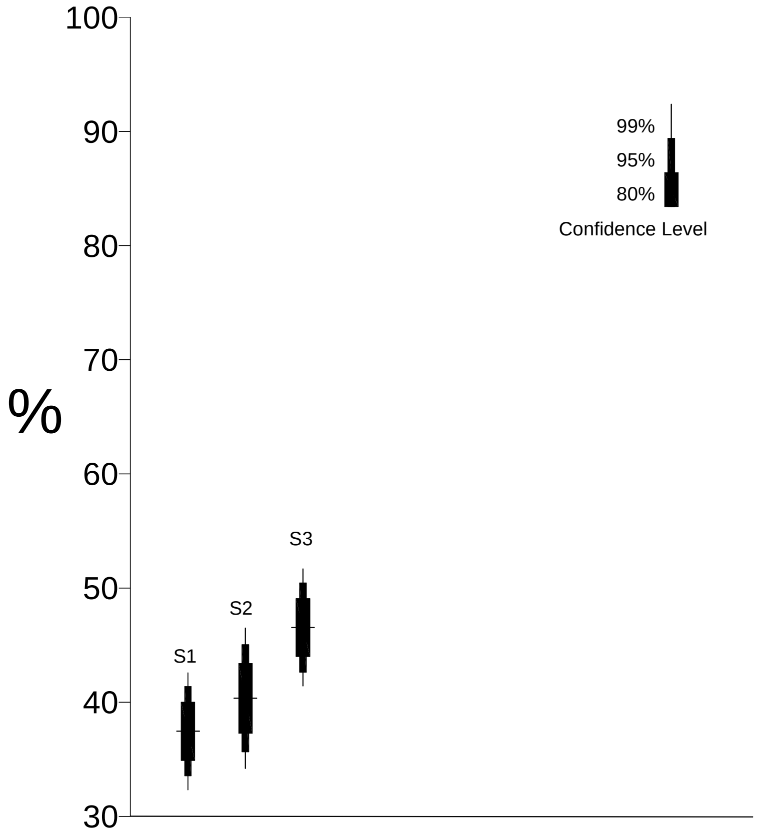


Figure 5.21. LH period serving and storage vessel proportions by sectors at C-45.



Palca Grande II (C-85), serving vessel proportions by sectors.



Palca Grande II (C-85) storage vessel proportions by sectors.

Figure 5.22. LH serving and storage vessel proportions by sectors at C-85.

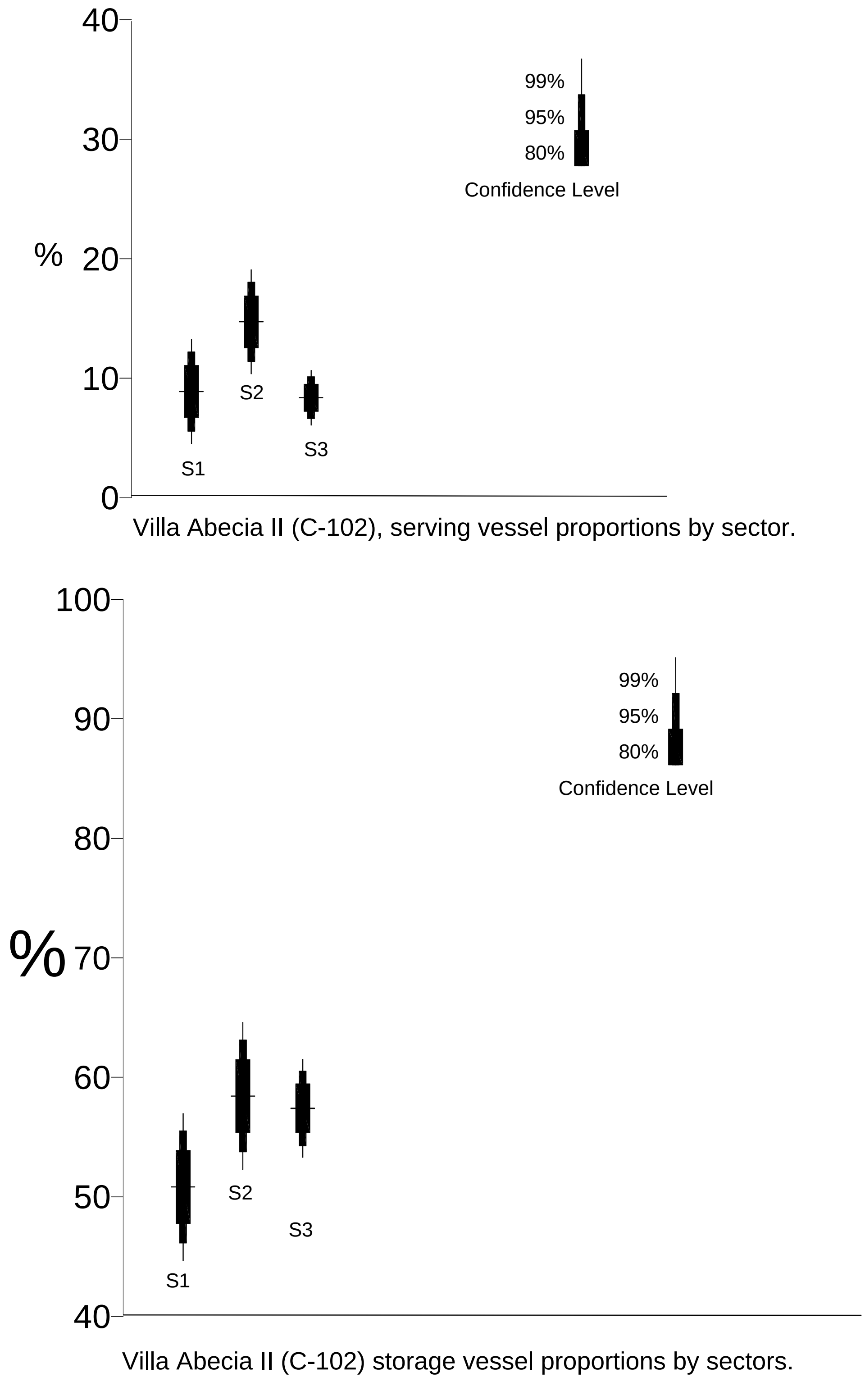


Figure 5.23. LH period serving and storage vessel proportions by sectors at C-102.

APPENDIX B

TABLES

Table 2.1. Rainfall patterns for the Cinti Valley (CORDECH 1994).

Station	Altitude (masl)	Annual rainfall mean (mm)	Wet months mean (mm)	Dry months mean (mm)
Muyuquiri	3120	530	93	9.2
La Torre	2500	365	65	7.4
San Pedro	2338	291	45	3.0
Palca Grande	2342	216	33	3.1
San Roque	2350	270	81	8.0
Villa Abecia	2200	248	51	5.3

Table 2.2. Temperature patterns for the Cinti Valley, after Cortés (1994).

Station	Altitude (masl)	Temp. Annual mean (°c)	Temp. Max. (°c)	Temp. Min. (°c)
Muyuquiri	3120	12.6		
La Torre	2500	18.0	35.5	-3
San Pedro	2338	16.0		
Palca Grande	2342	16.0		
San Roque	2350	17.3	41.0	-10.4
Villa Abecia	2200	17.0		

Data gathered during 1975-1984 by the SENAMHI. Some stations have more detailed information than the others.

Table 2.3. Agricultural land categories.

Categories agricultural Land	**Soil Landscapes**		
	Alluvial	**Piedmont**	**Slopes**
1 (Good)	C.1.45 C.14.1		
2 (Moderate good)		C.1.9 C.1.27 C.1.62 C.6.1	
3 (Bad)			C.1.9 C.1.27 C.1.45 C.1.62 C.6.1

Table 3.1. Population estimates by periods for Cinti sites.

F-Sites	Site Size (ha)	Occupation Area (ha)	Pop. Range A	Pop. Range B
C-1	0.65	0.49	57	65
C-8	0.9	0.68	79	90
C-11	0.11	0.09	10	12
C-16	3.12	2.34	271	309
C-18	1.3	0.98	114	129
C-48	2	1.5	174	198
C-53	2	1.5	174	198
C-56	0.45	0.34	39	45
C-57	0.6	0.45	52	59
C-65	0.7	0.53	61	70
C-67	0.77	0.58	67	77
C-78	0.6	0.45	52	59
C-79	0.47	0.36	42	47
C-94	2.87	2.16	250	285
C-102	0.96	0.72	83	95
C-106	1	0.75	87	99
Total	**18.5**	**13.92**	**1612**	**1837**
ERD Sites	**Site Size (ha)**	**Occupation Area (ha)**	**Pop. Range A**	**Pop. Range B**
C-1	0.65	0.49	57	65
C-8	1.78	1.34	155	177
C-14	0.51	0.38	44	50
C-15	1.68	1.26	146	166
C-18	7.26	5.45	632	719
C-48	3.45	2.59	300	342
C-58	4.46	3.35	389	442
C-60	0.16	0.12	14	16
C-62	1.67	1.25	145	165
C-67	0.77	0.58	67	77
C-71	1.86	1.4	162	185
C-72	2.08	1.56	181	206
C-73	0.5	0.37	43	49
C-74	1.57	1.18	137	156
C-79	0.47	0.35	41	46
C-84	1.24	0.93	108	123
C-94	1.03	0.77	89	102
Total	**31.14**	**23.37**	**2710**	**3086**

Table 3.1. Continued.

LRD Sites	Site Size (Ha)	Reduced Size (Ha)	Pop. Range A	Pop. Range B
C-16	3.65	2.74	318	362
C-17	5.37	4.03	467	532
C-39	2.27	1.71	198	226
C-40	0.01	0.0075	1	1
C-41	0.07	0.06	7	8
C-48	17	12.75	1479	1683
C-51	0.09	0.07	8	9
C-53	7.1	5.33	618	704
C-56	0.45	0.34	39	45
C-57	1.9	1.43	155	177
C-62	3	2.25	261	297
C-65	1.4	1.05	122	139
C-69	0.02	0.015	2	2
C-70	3.17	2.38	276	288
C-72	2.08	1.56	181	206
C-74	1.57	1.18	137	183
C-76	3.86	2.9	336	383
C-79	0.93	0.7	81	92
C-84	1.24	0.93	108	123
C-93	0.8	0.6	70	79
C-94	3.08	2.31	268	305
C-96	4	3	348	396
C-98	0.24	0.18	21	24
C-106	4.3	3.23	375	426
C-110	0.03	0.0225	3	3
Total	**67.63**	**50.775**	**5879**	**6693**
LH Sites	**Site Size (ha)**	**Occupation Area (ha)**	**Pop. Range A**	**Pop. Range B**
C-16	3.65	2.74	318	362
C-17	5.37	4.03	467	532
C-34	0.68	0.51	59	67
C-38	3.26	2.45	284	323
C-39	2.27	1.71	198	226
C-48	23.12	17.34	2011	2289
C-53	7.1	5.33	618	704
C-56	0.45	0.34	39	45
C-57	1.9	1.43	166	189

Table 3.1. Continued

C-62	7	5.25	609	693
C-65	1.4	1.05	122	139
C-67	0.77	0.58	67	77
C-68	0.44	0.33	38	44
C-70	8.91	6.69	776	883
C-71	3.72	2.79	324	368
C-72	2.08	1.56	181	206
C-75	0.27	0.21	24	28
C-76	6.7	5.03	583	664
C-77	2.43	1.83	212	242
C-78	1.19	0.9	104	119
C-79	0.93	0.7	81	92
C-84	1.24	0.93	108	123
C-85	4.19	3.15	365	416
C-86	0.24	0.18	21	24
C-87	1.88	1.41	164	186
C-88	1.24	0.93	108	123
C-93	0.8	0.6	70	79
C-94	3.08	2.31	268	305
C-96	9.11	6.84	793	903
C-97	0.03	0.02	2	3
C-98	0.24	0.18	21	24
C-100	0.57	0.43	50	57
C-101	0.86	0.65	75	86
C-102	2.81	2.11	245	278
C-106	4.3	3.23	375	426
C-110	0.03	0.02	2	3
Total	**114.76**	**85.79**	**9948**	**11328**

Ocupation area= site size minus 25% of non residential space.estimated.

Table 3.2. Catchment areas and land categories by periods for Cinti sites.

F-Sites	Site Size (ha)	Catch. Area (ha)	Category 1 land (ha)	Category 2 land (ha)	Category 3 land (ha)
C-1	0.65	65.26	58.63	0	6.63
C-8	0.9	81.11	67.88	0	13.23
C-11	0.11	53.49	10.43	0	43.06
C-16	3.12	109.86	105.15	4.71	0
C-18	1.3	98.63	38.13	60.5	0
C-48	2	95.1	1.29	64	29.81
C-53	2	101.49	42.65	58.84	0
C-56	0.45	78.45	32.35	46.1	0
C-57	0.6	82.65	0.91	50.74	31
C-65	0.7	82.98	17.74	65.21	0.03
C-66	0	78.53	27.75	0	50.78
C-67	0.77	94.09	18.54	42.22	33.33
C-78	0.6	92.26	23.35	0	68.91
C-79	0.47	90.76	22.55	0	68.21
C-94	2.87	108.57	42.98	0	65.59
C-102	0.96	95.91	40.15	0	55.76
C-106	1	96.32	19.25	23.89	53.18
Total	**18.5**	**1505.46**	**569.73**	**416.21**	**519.52**
ERD-Sites	**Site Size (ha)**	**Catch. Area (ha)**	**Category 1 land (ha)**	**Category 2 land (ha)**	**Category 3 land (ha)**
C-1	0.65	81.53	63.46	0	18.07
C-8	1.78	90.02	74.21	0	15.81
C-14	0.51	76.56	6.55	70.01	0
C-15	1.68	88.4	21.02	63.57	3.81
C-18	7.26	126.3	66.11	60.19	0
C-48	3.45	111.44	5.82	87.72	17.9
C-58	4.46	114.86	25.78	8.96	80.12
C-60	0.16	85.6	0	6.69	78.91
C-62	1.67	101.47	20.93	9.84	70.7
C-67	0.77	93.2	18.57	40.91	33.72
C-71	1.86	76.59	25.96	0	50.63
C-72	2.08	78.9	42.22	0	35.68
C-73	0.5	62.07	17.39	0	44.68
C-74	1.57	76.42	11.89	1.72	62.81
C-79	0.47	90.76	22.65	0	68.11
C-84	1.24	98.3	42.33	0	55.97
C-94	1.03	96.57	36.46	0	60.11
Total	**31.14**	**1548.99**	**501.35**	**349.61**	**697.03**

Table 3.2. Continued.

LRD-Sites	Site Size (ha)	Catch. Area (ha)	Category 1 land (ha)	Category 2 land (ha)	Category 3 land (ha)
C-16	3.65	96.52	91.5	5.02	0
C-17	5.37	119.59	52.69	66.9	0
C-39	2.27	99.96	14.51	27.37	58.08
C-40	0.01	73.63	8.31	65.32	0
C-41	0.07	59.47	37.1	22.27	0.1
C-48	17	130.62	16	88.72	25.9
C-51	0.09	82.94	15.58	66.02	1.34
C-53	7.1	121.49	44.36	77.13	0
C-56	0.45	74.62	29.82	44.8	0
C-57	1.9	61.98	0	24.03	37.95
C-62	3	109.34	21.05	11.49	76.8
C-65	1.4	88.77	19.72	68.67	0.38
C-69	0.02	81.05	21.03	4	56.02
C-70	3.17	110.11	0.79	0.62	108.7
C-72	2.08	104.11	53.1	0	51.01
C-74	1.57	100.78	19.42	1.71	79.65
C-76	3.86	113.38	25.41	0	87.97
C-79	0.93	95.66	23.98	0	71.68
C-84	1.24	98.3	42.32	0	55.98
C-93	0.8	56.95	11.01	0	45.94
C-94	3.08	82.94	38.18	0	44.76
C-96	4	94.92	37.17	0	57.75
C-98	0.24	73	5.92	0	67.08
C-106	4.3	79.67	16.95	19.17	43.55
C-110	0.03	26.13	0.26	0	25.87
Total	**67.63**	**2235.93**	**646.18**	**593.24**	**996.51**
LH-Sites	**Site Size (ha)**	**Catch.area (ha)**	**Category 1 land (ha)**	**Category 2 land (ha)**	**Category 3 land (ha)**
C-16	3.65	103.81	98.78	5.03	0
C-17	5.37	119.59	52.7	66.89	0
C-34	0.68	82.89	37.48	8.12	37.29
C-38	3.26	109.23	14.81	46.94	47.48
C-39	2.27	105.24	14.51	32.65	58.08
C-48	23.12	151.56	8.89	137.99	4.68
C-53	7.1	121.49	44.36	77.13	0
C-56	0.45	74.62	29.82	44.8	0
C-57	1.9	83.56	1.75	46.12	35.69

Table 3.2. Continued.

C-62	7	125.44	23.54	14.92	86.98
C-65	1.4	88.77	19.72	68.67	0.38
C-67	0.77	94.09	18.84	41.02	34.23
C-70	8.91	117.03	2.76	0.82	113.45
C-71	3.72	70.6	29.57	0	41.03
C-72	2.08	75.46	39.64	0	35.82
C-75	0.27	85.34	27.58	0	57.76
C-76	6.7	109.43	24.53	0	84.9
C-77	2.43	71.33	7.87	0	63.46
C-78	1.19	79.18	18.38	0	60.8
C-79	0.93	95.66	23.98	0	71.68
C-84	1.24	67.53	33.24	0	34.29
C-85	4.19	91.22	15.38	0	75.84
C-86	0.24	70.71	52.81	14.9	3
C-87	1.88	74.57	4.56	0	70.01
C-88	1.24	63.99	38.01	0	25.98
C-93	0.8	56.95	11.01	0	45.94
C-94	3.08	82.94	38.18	0	44.76
C-96	9.11	125.06	43.55	0	81.51
C-98	0.24	77.42	6.26	0	71.16
C-100	0.57	55.03	6.6	45.18	3.25
C-101	0.86	70.21	48.94	0	21.27
C-102	2.81	87.61	28.49	0	59.12
C-106	4.3	91.86	18.04	13.93	59.89
Total	**113.76**	**2979.42**	**884.58**	**665.11**	**1429.73**

Table 3.3. Mean maize and potato production (k/ha) estimated for Chuquisaca, Cinti and the Mantaro valleys.

Source	Region	Maize	Potato
Pozo Uribe (1991)	Chuquisaca	700 k/ha	4364 k/ha
Vetté and Rojas (1998)	Chuquisaca	1388 k/ha	5504 k/ha
ZONISIG (2000)	Chuquisaca	1380 k/ha	4140 k/ha
Farmers (2000)	Cinti	700-1000 k/ha	2500-8000 k/ha
Hastorf (1993)	Mantaro (First Bench)	139 k/ha	1534 k/ha
Hastorf (1993)	Mantaro (Valley Irrigation)	463 k/ha	2311 k/ha
Hastorf (1993)	Mantaro (Fertile Lowland)	947 k/ha	1022 k/ha

Table 3.4. Maize and potato production and kilocalories according to category of land by periods for Cinti sites.

F-Sites	Category 1 (ha)	Maize K/ha	Kcal/ha	Potato K/ha	Kcal/ha	Category 2 (ha)	Maize K/ha	Kcal/ha	Potato k/ha	Kcal/ha
C-1	58.63	58630	199342	146575	469040	0	0	0	0	0
C-8	67.88	67880	230792	169700	543040	0	0	0	0	0
C-11	10.43	10430	35462	26075	83440	0	0	0	0	0
C-16	105.15	105150	357510	262875	841200	4.71	3297	11209.8	11775	37680
C-18	38.13	38130	129642	95325	305040	60.5	42350	143990	151250	484000
C-48	1.29	1290	4386	3225	10320	64	44800	152320	160000	512000
C-53	42.65	42650	145010	106625	341200	58.84	41188	140039.2	147100	470720
C-56	32.35	32350	109990	80875	258800	46.1	32270	109718	115250	368800
C-57	0.91	910	3094	2275	7280	50.74	35518	120761.2	126850	405920
C-65	17.74	17740	60316	44350	141920	65.21	45647	155199.8	163025	521680
C-67	18.54	18540	63036	46350	148320	42.22	29554	100483.6	105550	337760
C-78	23.35	23350	79390	58375	186800	0	0	0	0	0
C-79	22.55	22550	76670	56375	180400	0	0	0	0	0
C-94	42.98	42980	146132	107450	343840	0	0	0	0	0
C-102	40.15	40150	136510	100375	321200	0	0	0	0	0
C-106	19.25	19250	65450	48125	154000	23.89	16723	56858.2	59725	191120
Total	541.98	541980	1842732	1354950	4335840	416.21	291347	990579.8	1040525	3329680
ERD-Site	**Category 1 (ha)**	**Maize K/ha**	**Kcal/ha**	**Potato K/ha**	**Kcal/ha**	**Category 2 (ha)**	**Maize k/h**	**Kcal/ha**	**Potato K/ha**	**Kcal/ha**
C-1	63.46	63460	215764	158650	507680	0	0	0	0	0
C-8	74.21	74210	252314	185525	593680	0	0	0	0	0
C-14	6.55	6550	22270	16375	52400	70.01	49007	166623.8	175025	560080
C-15	21.02	21020	71468	52550	168160	63.57	44499	151296.6	158925	508560
C-18	66.11	66110	224774	165275	528880	60.19	42133	143252.2	150475	481520
C-48	5.82	5820	19788	14550	46560	87.72	61404	208773.6	219300	701760
C-58	25.78	25780	87652	64450	206240	8.96	6272	21324.8	22400	71680
C-60	0	0	0	0	0	6.69	4683	15922.2	16725	53520

Table 3.4. Continued.

C-62	20.93	20930	71162	52325	167440	9.84	6888	23419.2	24600	78720
C-67	18.57	18570	63138	46425	148560	40.91	28637	97365.8	102275	327280
C-71	25.96	25960	88264	64900	207680	0	0	0	0	0
C-72	42.22	42220	143548	105550	337760	0	0	0	0	0
C-73	17.39	17390	59126	43475	139120	0	0	0	0	0
C-74	11.89	11890	40426	29725	95120	1.72	1204	4093.6	4300	13760
C-79	22.65	22650	77010	56625	181200	0	0	0	0	0
C-84	42.33	42330	143922	105825	338640	0	0	0	0	0
C-94	36.46	36460	123964	91150	291680	0	0	0	0	0
Total	501.35	501350	1704590	1253375	4010800	349.61	244727	832071.8	874025	2796880
LRD-Site	**Category 1 (ha)**	**Maize k/ha**	**Kcal/ha**	**Potato k/ha**	**Kcal/ha**	**Category 2 (ha)**	**Maize k/h**	**Kcal/ha**	**Potato k/ha**	**Kcal/ha**
C-16	91.5	91500	311100	228750	732000	5.02	3514	11947.6	12550	40160
C-17	52.69	52690	179146	131725	421520	66.9	46830	159222	167250	535200
C-39	14.51	14510	49334	36275	116080	27.37	19159	65140.6	68425	218960
C-40	8.31	8310	28254	20775	66480	65.32	45724	155461.6	163300	522560
C-41	37.1	37100	126140	92750	296800	22.27	15589	53002.6	55675	178160
C-48	16	16000	54400	40000	128000	88.72	62104	211153.6	221800	709760
C-51	15.58	15580	52972	38950	124640	66.02	46214	157127.6	165050	528160
C-53	44.36	44360	150824	110900	354880	77.13	53991	183569.4	192825	617040
C-56	29.82	29820	101388	74550	238560	44.8	31360	106624	112000	358400
C-57	0	0	0	0	0	24.03	16821	57191.4	60075	192240
C-62	21.05	21050	71570	52625	168400	11.49	8043	27346.2	28725	91920
C-65	19.72	19720	67048	49300	157760	68.67	48069	163434.6	171675	549360
C-69	21.03	21030	71502	52575	168240	4	2800	9520	10000	32000
C-70	0.79	790	2686	1975	6320	0.62	434	1475.6	1550	4960
C-72	53.1	53100	180540	132750	424800	0	0	0	0	0
C-74	19.42	19420	66028	48550	155360	1.71	1197	4069.8	4275	13680

Table 3.4. Continued.

C-76	25.41	25410	86394	63525	203280	0	0	0	0	0
C-79	23.98	23980	81532	59950	191840	0	0	0	0	0
C-84	42.32	42320	143888	105800	338560	0	0	0	0	0
C-93	11.01	11010	37434	27525	88080	0	0	0	0	0
C-94	38.18	38180	129812	95450	305440	0	0	0	0	0
C-96	37.17	37170	126378	92925	297360	0	0	0	0	0
C-98	5.92	5920	11560	14800	47360	0	0	0	0	0
C-106	16.95	16950	57630	42375	135600	19.17	13419	456246	47925	153360
C-110	0.26	260	884	650	2080	0	0	0	0	0
Total	646.18	646180	2188444	1615450	5169440	593.24	415268	1822532.6	1483100	4745920
LH-Site	**Category 1 (ha)**	**Maize k/ha**	**Kcal/ha**	**Potato k/ha**	**Kcal/ha**	**Category 2 (ha)**	**Maize k/ha**	**Kcal/ha**	**Potato k/ha**	**Kcal/ha**
C-16	98.78	98780	335852	246950	790240	5.03	3521	11971.4	12575	40240
C-17	52.7	52700	179180	131750	421600	66.89	46823	149833.6	167225	535120
C-34	37.48	37480	127432	93700	299840	8.12	5684	19325.6	20300	64960
C-38	14.81	14810	50354	37025	125885	46.94	32858	111717.2	117350	375520
C-39	14.51	14510	49334	36275	116080	32.65	22855	77707	81625	261200
C-48	8.89	8890	30226	22225	71120	137.99	96593	328416.2	344975	1103920
C-53	44.36	44360	150824	110900	354880	77.13	53991	183569.4	192825	617040
C-56	29.82	29820	101388	74550	238560	44.8	31360	106624	112000	358400
C-57	1.75	1750	5950	4375	14000	46.12	32284	109765.6	115300	368960
C-62	23.54	23540	80036	58850	188320	14.92	10444	35509.6	37300	119360
C-65	19.72	19720	67048	49300	157760	68.67	48069	163434.6	171675	549360
C-70	2.76	2760	9384	6900	22080	0.82	574	1951.6	2050	6560
C-71	29.57	29570	100538	73925	236560	0	0	0	0	0
C-72	39.64	39640	134776	99100	317120	0	0	0	0	0
C-75	27.58	27580	93772	68950	220640	0	0	0	0	0
C-76	24.53	24530	83402	61325	196240	0	0	0	0	0

Table 3.4. Continued.

C-77	7.87	7870	26758	19675	62960	0	0	0	0	0
C-78	18.38	18380	62492	45950	147040	0	0	0	0	0
C-79	23.98	23980	81532	59950	19184	0	0	0	0	0
C-84	33.24	33240	113016	83100	265920	0	0	0	0	0
C-85	15.38	15380	52292	38450	123040	0	0	0	0	0
C-86	52.81	52810	179554	132025	422480	14.9	10430	35462	37250	119200
C-87	4.56	4560	15504	11400	36480	0	0	0	0	0
C-88	38.01	38010	129234	95025	304080	0	0	0	0	0
C-93	11.01	11010	37434	27525	88080	0	0	0	0	0
C-94	38.18	38180	129812	95450	305440	0	0	0	0	0
C-96	43.55	43550	148070	108875	348400	0	0	0	0	0
C-98	6.26	6260	21284	15650	50080	0	0	0	0	0
C-100	6.6	6600	22440	16500	52800	45.18	31626	107528.4	112950	361440
C-101	48.94	48940	166396	122350	391520	0	0	0	0	0
C-102	28.49	28490	96866	71225	227920	0	0	0	0	0
C-106	18.04	18040	61336	45100	144320	13.93	9751	33153.4	34825	111440
Total	865.74	865740	2943516	2164350	6760669	624.09	436863	1475969.6	1560225	4992720

Table 3.5. Estimates of legume/fruit production by categories of land.

Land Categories	**Total Hectares**	**Productive ha***	**Legume Fruit Prod 400 k/ha.**	**Legume Fruit Prod. 8000 k/ha**
Category 1	3,181	2,863	1,145,200	22,904,000
Category 2	2,548.15	2,293.34	917,336	18,346,720
Category 3	19,626.51	9,813.25	3,925,300	78,506,000
Total	**25,355.66**	**14,969.59**	**5,987,836**	**119,756,720**

*Productive hectares in Categories 1 and 2 are calculating by subtracting 10% of the land total to compensate for the presence of rivers and rocky outcrops. For Category 3 land, 50% is subtracted for the same reasons.

Table 3.6. Estimates of population by Period and annual Caloric Requirements.

Period	**Estimate of Population**	**Annual Caloric Requirements (Kilocalories)**	**Total Legume Fruit Production (Kilocalories)**
Formative	1,612 -1,837	900,221,.4 - 1,025,872.6	19,939,494 – 398,789,877.6
ERD	2,710 - 3,086	1,508,931.9 -1,723,376.7	
LRD	5,879 - 6,693	3,283,127.5 - 3,737,705.8	
LH	9,948 -11,328	5,464,560.6 - 6,326,121.6	

F= Formative, ERD= Early Regional Development Period, LRD= Late Regional Development Period, LH= Late Horizon.

Table 3.7. Estimates of population by periods for Cinti sites and kilocalories required annually by that population.

F-Sites	Pop. Range A	Kcal	Pop. Range B	Kcal
C-1	57	31831.65	65	36299.25
C-8	79	44117.55	90	50260.5
C-11	10	5584.5	12	6701.4
C-16	271	151339.95	309	172561.05
C-18	114	63663.3	129	72040.05
C-48	174	97170.3	198	110573.1
C-53	174	97170.3	198	110573.1
C-56	39	21779.55	45	25130.25
C-57	52	29039.4	59	32948.55
C-65	61	34065.45	70	39091.5
C-67	67	37416.15	77	43000.65
C-78	52	29039.4	59	32948.55
C-79	42	23454.9	47	26247.15
C-94	250	139612.5	285	159158.25
C-102	83	46351.35	95	53052.75
C-106	87	48585.15	99	55286.55
Total	**1612**	**900221.4**	**1837**	**1025872.65**
ERD Sites	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-1	57	31831.65	65	36299.25
C-8	155	86559.75	177	98845.65
C-14	44	24571.8	50	27922.5
C-15	146	81533.7	166	92702.7
C-18	632	352940.4	719	401525.55
C-48	300	167535	342	190989.9
C-58	389	217237.05	442	246834.9
C-60	14	3350.7	16	8935.2
C-62	145	80975.25	165	92144.25

Table 3.7. Continued.

C-67	67	37416.15	77	43000.65
C-71	162	90468.9	185	103313.25
C-72	181	101079.45	206	115040.7
C-73	43	24013.35	49	27364.05
C-74	137	76507.65	156	87118.2
C-79	41	22896.45	46	25688.7
C-84	108	60312.6	123	68689.35
C-94	89	49702.05	102	56961.9
Total	**2710**	**1508931.9**	**3086**	**1723376.7**
LRD-Sites	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-16	318	177587.1	362	202158.9
C-17	467	260796.15	532	297095.4
C-39	198	110573.1	226	126209.7
C-40	1	558.45	1	558.45
C-41	7	3909.15	8	4467.6
C-48	1479	825947.55	1683	939871.35
C-51	8	4467.6	9	5026.05
C-53	618	345122.1	704	393148.8
C-56	39	21779.55	45	25130.25
C-57	155	86559.75	177	98845.65
C-62	261	145755.45	297	165859.65
C-65	122	68130.9	139	77624.55
C-69	2	1116.9	2	1116.9
C-70	276	154132.2	288	160833.6
C-72	181	101079.45	206	115040.7
C-74	137	76507.65	183	102196.35
C-76	336	187639.2	383	213886.35
C-79	81	45234.45	92	51377.4

Table 3.7. Continued.

C-84	108	60312.6	123	68689.35
C-93	70	39091.5	79	44117.55
C-94	268	149664.6	305	170327.25
C-96	348	194340.6	396	221146.2
C-98	21	11727.45	24	13402.8
C-106	375	209418.75	426	237899.7
C-110	3	1675.35	3	1675.35
Total	**5879**	**3283127.55**	**6693**	**3737705.85**
LH-Site	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-16	318	177587.1	362	202158.9
C-17	467	260796.15	532	297095.4
C-34	59	32948.55	67	37416.15
C-38	284	158599.8	323	180379.35
C-39	198	110573.1	226	126209.7
C-48	2011	1123042.95	2289	1278292.05
C-53	618	345122.1	704	393148.8
C-56	39	21779.55	45	25130.25
C-57	166	92702.7	189	105547.05
C-62	609	340096.05	693	387005.85
C-65	122	68130.9	139	77624.55
C-67	67	37416.15	77	43000.65
C-68	38	21221.1	44	24571.8
C-70	776	433357.2	883	493111.35
C-71	324	180937.8	368	205509.6
C-72	181	10179.45	206	115040.7
C-75	24	13402.8	28	15636.6
C-76	583	325576.35	664	370810.8
C-77	212	118391.4	242	135144.9

Table 3.7. Continued.

C-78	104	58078.8	119	66455.55
C-79	81	45234.45	92	51377.4
C-84	108	60312.6	123	68689.35
C-85	365	203834.25	416	232315.2
C-86	21	11727.45	24	13402.8
C-87	164	91585.8	186	103871.7
C-88	108	60312.6	123	68689.35
C-93	70	39091.5	79	44117.55
C-94	268	149664.6	305	170327.25
C-96	793	442850.85	903	504280.35
C-97	2	1116.9	3	1675.35
C-98	21	11727.45	24	13402.8
C-100	50	27922.5	57	31831.65
C-101	75	41883.75	86	48026.7
C-102	245	136820.25	278	155249.1
C-106	375	209418.75	426	237899.7
C-110	2	1116.9	3	1675.35
Total	**9948**	**5464560.60**	**11328**	**6326121.60**

Table 3.8. Maize production and estimated kilocalories for Cinti population by periods.

F-Sites	Site Size (ha)	Agr.land (ha)	Mpk/ha	Mpkcal(-20%)	Pop. Range A	Kcal	Pop. Range B	Kcal
C-1	0.65	58.63	58630	159473.6	57	31831.65	65	36299.25
C-8	0.9	67.88	67880	184633.6	79	44117.55	90	50260.5
C-11	0.11	10.43	10430	28369.6	10	5584.5	12	6701.4
C-16	3.12	109.86	108447	294975.84	271	151339.95	309	172561.05
C-18	1.3	38.13	38130	103713.6	114	63663.3	129	72040.05
C-48	2	65.29	46090	125364.8	174	97170.3	198	110573.1
C-53	2	42.65	42650	116008	174	97170.3	198	110573.1
C-56	0.45	32.35	32350	87992	39	21779.55	45	25130.25
C-57	0.6	0.91	910	2475.2	52	29039.4	59	32948.55
C-65	0.7	82.95	63387	172412.64	61	34065.45	70	39091.5
C-67	0.77	60.76	48094	130815.68	67	37416.15	77	43000.65
C-78	0.6	23.35	23350	63512	52	29039.4	59	32948.55
C-79	0.47	22.55	22550	61336	42	23454.9	47	26247.15
C-94	2.87	42.98	42980	116905.6	250	139612.5	285	159158.25
C-102	0.96	40.15	40150	109208	83	46351.35	95	53052.75
C-106	1	19.25	19250	52360	87	48585.15	99	55286.55
Total	**18.5**	**718.12**	**665278**	**1809556.16**	**1612**	**900221.4**	**1837**	**1025872.65**

ERD- Sites	Site Size (ha)	Agr.land (ha)	Mpk/ha	MpKcal(-20%)	Pop.Range A	Kcal	Pop.Range B	Kcal
C-1	0.65	63.46	63460	172611.2	57	31831.65	65	36299.25
C-8	1.78	74.21	74210	201851.2	155	86559.75	177	98845.65
C-14	0.51	76.56	55557	151115.04	44	24571.8	50	27922.5
C-15	1.68	84.59	65519	178211.68	146	81533.7	166	92702.7
C-18	7.26	126.3	108243	294420.96	632	352940.4	719	401525.55
C-48	3.45	93.54	67224	182849.28	300	167535	342	190989.9
C-58	4.46	34.74	32052	87181.44	389	217237.05	442	246834.9

Table 3.8. Continued.

C-60	0.16	6.69	4683	12737.76	14	3350.7	16	8935.2
C-62	1.67	30.77	27818	75664.96	145	80975.25	165	92144.25
C-67	0.77	59.48	47207	128403.04	67	37416.15	77	43000.65
C-71	1.86	25.96	25960	70611.2	162	90468.9	185	103313.25
C-72	2.08	42.22	42220	114838.4	181	101079.45	206	115040.7
C-73	0.5	17.39	17390	47300.8	43	24013.35	49	27364.05
C-74	1.57	13.61	13094	35615.68	137	76507.65	156	87118.2
C-79	0.47	22.65	22650	61608	41	22896.45	46	25688.7
C-84	1.24	42.33	42330	115137.6	108	60312.6	123	68689.35
C-94	1.03	36.46	36460	99171.2	89	49702.05	102	56961.9
Total	**31.14**	**850.96**	**746077**	**2029329.44**	**2710**	**1508931.9**	**3086**	**1723376.7**
LRD-Sites	**Site Size (ha)**	**Agr.land (ha)**	**Mpk/ha**	**MpKcal(-20%)**	**Pop.Range A**	**Kcal**	**Pop.Range B**	**Kcal**
C-16	3.65	96.52	95014	258438.08	318	177587.1	362	202158.9
C-17	5.37	119.59	99520	270694.4	467	260796.15	532	297095.4
C-39	2.27	41.88	33669	91579.68	198	110573.1	226	126209.7
C-40	0.01	73.63	54034	146972.48	1	558.45	1	558.45
C-41	0.07	59.37	52689	143314.08	7	3909.15	8	4467.6
C-48	17	104.72	78104	212442.88	1479	825947.55	1683	939871.35
C-51	0.09	81.6	61794	168079.68	8	4467.6	9	5026.05
C-53	7.1	121.49	98351	267514.72	618	345122.1	704	393148.8
C-56	0.45	74.62	61180	166409.6	39	21779.55	45	25130.25
C-57	1.9	24.03	16821	45753.12	155	86559.75	177	98845.65
C-62	3	32.54	29093	79132.96	261	145755.45	297	165859.65
C-65	1.4	88.39	67789	184386.08	122	68130.9	139	77624.55
C-69	0.02	25.03	23830	64817.6	2	1116.9	2	1116.9
C-70	3.17	1.41	1224	3329.28	276	154132.2	288	160833.6

Table 3.8. Continued.

C-72	2.08	53.1	53100	144432	181	101079.45	206	115040.7
C-74	1.57	21.13	20617	56078.24	137	76507.65	183	102196.35
C-76	3.86	25.41	25410	69115.2	336	187639.2	383	213886.35
C-79	0.93	23.98	23980	65225.6	81	45234.45	92	51377.4
C-84	1.24	42.32	42320	115110.4	108	60312.6	123	68689.35
C-93	0.8	11.01	11010	29947.2	70	39091.5	79	44117.55
C-94	3.08	38.18	38180	103849.6	268	149664.6	305	170327.25
C-96	4	37.17	37710	101102.4	348	194340.6	396	221146.2
C-98	0.24	5.92	5920	9248	21	11727.45	24	13402.8
C-106	4.3	36.12	30369	411100.8	375	209418.75	426	237899.7
C-110	0.03	0.26	260	707.2	3	1675.35	3	1675.35
Total	**67.63**	**1239.42**	**1061988**	**3208781.28**	**5879**	**3283127.55**	**6693**	**3737705.85**
LH-Sites	**Site Size (ha)**	**Agr.land (ha)**	**Mpk/ha**	**MpKcal(-20%)**	**Pop.Range A**	**Kcal**	**Pop.Range B**	**Kcal**
C-16	3.65	103.81	102301	278258.72	318	177587.1	362	202158.9
C-17	5.37	119.59	99523	270702.56	467	260796.15	532	297095.4
C-34	0.68	45.6	43164	117406.08	59	32948.55	67	37416.15
C-38	3.26	61.75	47668	129656.96	284	158599.8	323	180379.35
C-39	2.27	47.16	37365	101632.8	198	110573.1	226	126209.7
C-48	23.12	146.88	105483	286913.76	2011	1123042.95	2289	1278292.05
C-53	7.1	121.49	98351	267514.72	618	345122.1	704	393148.8
C-56	0.45	74.62	61180	166409.6	39	21779.55	45	25130.25
C-57	1.9	47.87	34034	92572.48	166	92702.7	189	105547.05
C-62	7	38.46	33984	92436.48	609	340096.05	693	387005.85
C-65	1.4	88.39	67789	184386.08	122	68130.9	139	77624.55
C-67	0.77	59.86	47554	129346.88	67	37416.15	77	43000.65
C-68	0.44	0	0	0	38	21221.1	44	24571.8

Table 3.8. Continued.

C-70	8.91	3.58	3334	2267.12	776	433357.2	883	493111.35
C-71	3.72	29.57	29570	80430.4	324	180937.8	368	205509.6
C-72	2.08	39.64	39640	107820.8	181	101079.45	206	115040.7
C-75	0.27	27.58	27580	75017.6	24	13402.8	28	15636.6
C-76	6.7	24.53	24530	66721.6	583	325576.35	664	370810.8
C-77	2.43	7.87	7870	21406.4	212	118391.4	242	135144.9
C-78	1.19	18.38	18380	49993.6	104	58078.8	119	66455.55
C-79	0.93	23.98	23980	65225.6	81	45234.45	92	51377.4
C-84	1.24	33.24	33240	90412.8	108	60312.6	123	68689.35
C-85	4.19	15.38	15380	41833.6	365	203834.25	416	232315.2
C-86	0.24	67.71	63240	172012.8	21	11727.45	24	13402.8
C-87	1.88	4.56	4560	12403.2	164	91585.8	186	103871.7
C-88	1.24	38.01	38010	103387.2	108	60312.6	123	68689.35
C-93	0.8	11.01	11010	29947.2	70	39091.5	79	44117.55
C-94	3.08	38.18	38180	103849.6	268	149664.6	305	170327.25
C-96	9.11	43.55	43550	118456	793	442850.85	903	504280.35
C-97	0.03	0	0	0	2	1116.9	3	1675.35
C-98	0.24	6.26	6260	17027.2	21	11727.45	24	13402.8
C-100	0.57	51.78	6600	17952	50	27922.5	57	31831.65
C-101	0.86	48.94	48940	133116.8	75	41883.75	86	48026.7
C-102	2.81	28.49	28940	78716.8	245	136820.25	278	155249.1
C-106	4.3	31.97	18040	49068.8	375	209418.75	426	237899.7
C-110	0.03	0	0	0	2	1116.9	3	1675.35
Total	**114.26**	**1549.69**	**1309230**	**3554304.24**	**9948**	**5555460.6**	**11328**	**6326121.6**

Table 3.9. Potato production and estimated kilocalories for Cinti population by periods.

F-Sites	Site Size (ha)	Agr.land (ha)	Ppk/ha	PpKcal(-20%)	Pop. Range A	Kcal	Pop. Range B	Kcal
C-1	0.65	58.63	146575	375232	57	31831.65	65	36299.25
C-8	0.9	67.88	169700	434432	79	44117.55	90	50260.5
C-11	0.11	10.43	26075	66752	10	5584.5	12	6701.4
C-16	3.12	109.86	274650	703104	271	151339.95	309	172561.05
C-18	1.3	38.13	95325	244032	114	63663.3	129	72040.05
C-48	2	65.29	163225	417856	174	97170.3	198	110573.1
C-53	2	42.65	106625	272960	174	97170.3	198	110573.1
C-56	0.45	32.35	80875	207040	39	21779.55	45	25130.25
C-57	0.6	0.91	2275	5824	52	29039.4	59	32948.55
C-65	0.7	82.95	207375	530880	61	34065.45	70	39091.5
C-67	0.77	60.76	151900	388864	67	37416.15	77	43000.65
C-78	0.6	23.35	58375	149440	52	29039.4	59	32948.55
C-79	0.47	22.55	56375	144320	42	23454.9	47	26247.15
C-94	2.87	42.98	107450	275072	250	139612.5	285	159158.25
C-102	0.96	40.15	100375	256960	83	46351.35	95	53052.75
C-106	1	19.25	48125	123200	87	48585.15	99	55286.55
Total	**18.5**	**718.12**	**1795300**	**4595968**	**1612**	**900221.4**	**1837**	**1025872.65**
ERD- Sites	**Site Size (ha)**	**Agr.land (ha)**	**Ppk/ha**	**PpKcal(-20%)**	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-1	0.65	63.46	158650	406144	57	31831.65	65	36299.25
C-8	1.78	74.21	185525	474944	155	86559.75	177	98845.65
C-14	0.51	76.56	191400	489984	44	24571.8	50	27922.5
C-15	1.68	84.59	211475	541376	146	81533.7	166	92702.7
C-18	7.26	126.3	315750	808320	632	352940.4	719	401525.55
C-48	3.45	93.54	233850	598656	300	167535	342	190989.9
C-58	4.46	34.74	86850	222336	389	217237.05	442	246834.9

Table 3.9. Continued.

C-60	0.16	6.69	16725	42816	14	3350.7	16	8935.2
C-62	1.67	30.77	76925	196928	145	80975.25	165	92144.25
C-67	0.77	59.48	148700	380672	67	37416.15	77	43000.65
C-71	1.86	25.96	64900	166144	162	90468.9	185	103313.25
C-72	2.08	42.22	105550	270208	181	101079.45	206	115040.7
C-73	0.5	17.39	43475	111296	43	24013.35	49	27364.05
C-74	1.57	13.61	34025	87104	137	76507.65	156	87118.2
C-79	0.47	22.65	56625	144960	41	22896.45	46	25688.7
C-84	1.24	42.33	105825	270912	108	60312.6	123	68689.35
C-94	1.03	36.46	91150	233344	89	49702.05	102	56961.9
Total	**31.14**	**850.96**	**2127400**	**5446144**	**2710**	**1508931.9**	**3086**	**1723376.7**
LRD-Sites	**Site Size (ha)**	**Agr.land (ha)**	**Ppk/ha**	**PpKcal(-20%)**	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-16	3.65	96.52	241300	617728	318	177587.1	362	202158.9
C-17	5.37	119.59	298975	765376	467	260796.15	532	297095.4
C-39	2.27	41.88	104700	268032	198	110573.1	226	126209.7
C-40	0.01	73.63	184075	471232	1	558.45	1	558.45
C-41	0.07	59.37	148425	379968	7	3909.15	8	4467.6
C-48	17	104.72	261800	670208	1479	825947.55	1683	939871.35
C-51	0.09	81.6	204000	522240	8	4467.6	9	5026.05
C-53	7.1	121.49	303725	777536	618	345122.1	704	393148.8
C-56	0.45	74.62	186550	477568	39	21779.55	45	25130.25
C-57	1.9	24.03	60075	153792	155	86559.75	177	98845.65
C-62	3	32.54	81350	208256	261	145755.45	297	165859.65
C-65	1.4	88.39	220975	565696	122	68130.9	139	77624.55
C-69	0.02	25.03	62575	160192	2	1116.9	2	1116.9
C-70	3.17	1.41	3525	9024	276	154132.2	288	160833.6

Table 3.9. Continued.

C-72	2.08	53.1	132750	339840	181	101079.45	206	115040.7
C-74	1.57	21.13	52825	135232	137	76507.65	183	102196.35
C-76	3.86	25.41	63525	162624	336	187639.2	383	213886.35
C-79	0.93	23.98	59950	153472	81	45234.45	92	51377.4
C-84	1.24	42.32	105800	270848	108	60312.6	123	68689.35
C-93	0.8	11.01	27525	70464	70	39091.5	79	44117.55
C-94	3.08	38.18	95450	244352	268	149664.6	305	170327.25
C-96	4	37.17	92925	237888	348	194340.6	396	221146.2
C-98	0.24	5.92	14800	37888	21	11727.45	24	13402.8
C-106	4.3	36.12	90300	231168	375	209418.75	426	237899.7
C-110	0.03	0.26	650	1664	3	1675.35	3	1675.35
Total	**67.63**	**1239.42**	**3098550**	**7932288**	**5879**	**3283127.55**	**6693**	**3737705.85**
LH-Sites	**Site Size (ha)**	**Agr.land (ha)**	**Ppk/ha**	**PpKcal(-20%)**	**Pop. Range A**	**Kcal**	**Pop. Range B**	**Kcal**
C-16	3.65	103.81	259525	664384	318	177587.1	362	202158.9
C-17	5.37	119.59	228975	586176	467	260796.15	532	297095.4
C-34	0.68	45.6	114000	291840	59	32948.55	67	37416.15
C-38	3.26	61.75	154375	395200	284	158599.8	323	180379.35
C-39	2.27	47.16	117900	301824	198	110573.1	226	126209.7
C-48	23.12	146.88	367200	940032	2011	1123042.95	2289	1278292.05
C-53	7.1	121.49	303725	777536	618	345122.1	704	393148.8
C-56	0.45	74.62	186550	477568	39	21779.55	45	25130.25
C-57	1.9	47.87	119675	306368	166	92702.7	189	105547.05
C-62	7	38.46	96150	246144	609	340096.05	693	387005.85
C-65	1.4	88.39	270275	691904	122	68130.9	139	77624.55
C-67	0.77	59.86	149650	383104	67	37416.15	77	43000.65
C-68	0.44	0	0	0	38	21221.1	44	24571.8

Table 3.9. Continued.

C-70	8.91	3.58	8950	22912	776	433357.2	883	493111.35
C-71	3.72	29.57	73925	189248	324	180937.8	368	205509.6
C-72	2.08	39.64	99100	253696	181	101079.45	206	115040.7
C-75	0.27	27.58	68950	176512	24	13402.8	28	15636.6
C-76	6.7	24.53	61325	156992	583	325576.35	664	370810.8
C-77	2.43	7.87	19675	50368	212	118391.4	242	135144.9
C-78	1.19	18.38	45950	117632	104	58078.8	119	66455.55
C-79	0.93	23.98	59950	153472	81	45234.45	92	51377.4
C-84	1.24	33.24	83100	212736	108	60312.6	123	68689.35
C-85	4.19	15.38	38450	98432	365	203834.25	416	232315.2
C-86	0.24	67.71	169275	433344	21	11727.45	24	13402.8
C-87	1.88	4.56	11400	29184	164	91585.8	186	103871.7
C-88	1.24	38.01	95025	243264	108	60312.6	123	68689.35
C-93	0.8	11.01	27525	70464	70	39091.5	79	44117.55
C-94	3.08	38.18	95450	244352	268	149664.6	305	170327.25
C-96	9.11	43.55	108875	278720	793	442850.85	903	504280.35
C-97	0.03	0	0	0	2	1116.9	3	1675.35
C-98	0.24	6.26	15650	40064	21	11727.45	24	13402.8
C-100	0.57	51.78	129450	331392	50	27922.5	57	31831.65
C-101	0.86	48.94	122350	313216	75	41883.75	86	48026.7
C-102	2.81	28.49	71225	182336	245	136820.25	278	155249.1
C-106	4.3	31.97	79925	204608	375	209418.75	426	237899.7
C-110	0.03	0	0	0	2	1116.9	3	1675.35
Total	**114.26**	**1549.69**	**3853525**	**9865024**	**9948**	**5555460.6**	**11328**	**6326121.6**

Table 4.1. Counts and proportions of ceramics from systematic surface collections by period, site and sector.

Formative Period Functional Categories of Vessels

Site	Sector	Serving Vessels		Storage Vessels		Cooking Vessels		Non Defined		Total	
C-1	1,2	0		62	48.44%	0		66	51.56%	128	100%
C-3	1,2,3	8	6.25%	51	39.84%	11	8.60%	58	45.31%	128	100%
C-8	1	0		6	100%	0		0		6	100%
C-11	1	0		25	100%	0		0		25	100%
C-16	1,2,3	40	9.74%	243	59.12%	61	14.84%	67	16.30%	411	100%
C-18	1	1	20%	2	40%	2	40%	0		5	100%
C-48	4,5	0		35	89.74%	4	10.26%	0		39	100%
C-53	1,2,3	0		152	64.40%	84	35.60%	0		236	100%
C-56	1	0		32	97%	1	3%	0		33	100%
C-65	1,2	22	48.89%	23	51.11%	0		0		45	100%
C-66	1	1	4.17%	18	75%	5	20.83%	0		24	100%
C-67	1,2	17	20.73%	55	67.07%	10	12.20%	0		82	100%
C-78	1	4	50%	4	50%	0		0		8	100%
C-94	1,2,3	2	3.77%	28	52.83%	23	43.40%	0		53	100%
C-102	1,2,3	1	3.03%	15	45.45%	17	51.52%	0		33	100%

ERD Period Functional Categories of Vessels

Site	Sector	Serving Vessels		Storage Vessels		Cooking Vessels		Non Defined		Total	
C-1	1	59	16.43%	156	43.45%	68	18.94%	76	21.17%	359	100%
	2	26	6.84%	101	26.58%	76	20%	177	46.58%	380	100%
Total		85	11.50%	257	34.78%	144	19.49%	253	34.23%	739	100%
C-8	1	19	4.70%	98	24.26%	83	20.54%	204	50.50%	404	100%
C-14	1	15	4.27%	199	56.69%	88	25.07%	49	13.96%	351	100%
C-18	1	44	11.37%	194	50.13%	100	25.84%	49	12.66%	387	100%
	2	32	6.34%	185	36.64%	98	19.40%	190	37.62%	505	100%
	3	40	10.28%	257	66.07%	51	13.11%	41	10.54%	389	100%
	4	28	6.33%	197	44.57%	126	28.51%	91	20.59%	442	100%

Table 4.1. Continued.

	6	43	10.94%	266	67.68%	78	19.85%	6	1.53%	393	100%
	7	8	1.95%	215	52.31%	112	27.25%	76	18.49%	411	100%
Total		195	7.72%	1314	52.00%	565	22.35%	453	17.93%	2527	100%
C-58	1	39	8.42%	232	50.11%	143	30.89%	49	10.58%	463	100%
	2	30	6.17%	284	58.44%	152	31.28%	20	4.11%	486	100%
	3	38	7.85%	322	66.53%	122	25.21%	2	0.41%	484	100%
Total		107	7.47%	838	58.48%	417	29.10%	71	4.95%	1433	100%
C-67	1	35	10.57%	147	44.41%	46	13.89%	103	31.11%	331	100%
	2	55	14.32%	232	60.42%	32	8.33%	65	16.93%	384	100%
Total		90	12.59%	379	53.00%	78	10.91%	168	23.50%	715	100%
C-74	1	80	16.77%	164	34.38%	78	16.35%	147	30.81%	469	100%
	2	41	9.09%	239	53.00%	76	16.85%	90	19.95%	446	100%
Total		121	13.22%	403	44.04%	154	16.83%	237	25.91%	915	100%
LRD Period Functional Categories of Vessels											
Site	Sector	Serving Vessels		Storage Vessels		Cooking Vessels		Non Defined		Total	
C-17	1	11	61.11%	6	33.33%	0		1	5.56%	18	100%
	2	1	1.23%	28	34.57%	46	56.79%	6	7.41%	81	100%
Total		12	12.12%	34	34.34%	46	46.47%	7	7.07%	99	100%
C-39	1	33	7.38%	181	40.49%	131	29.30%	80	17.90%	425	100%
	2	75	19.53%	167	43.48%	44	11.45%	63	16.40%	349	100%
Total		108	13.95%	348	44.96%	175	22.61%	143	18.47%	774	100%
C-41	1	7	21.88%	15	46.87%	2	6.25%	8	25.00%	32	100%
C-48	1	22	5.72%	200	52.08%	99	25.78%	63	16.40%	384	100%
	2	119	14.20%	482	57.51%	130	15.51%	107	12.77%	838	100%
	3	141	22.92%	318	51.70%	125	20.32%	31	5.04%	615	100%
	4,5	91	11.69%	401	51.54%	149	19.15%	115	17.48%	777	100%
	6	32	7.45%	274	63.86%	83	19.34%	40	9.32%	429	100%
	7	4	0.93%	282	66.04%	114	26.69%	27	6.32%	427	100%

Table 4.1. Continued.

Total		409	11.79%	1957	56.40%	700	20.17%	404	11.64%	3470	100%
C-57	1	25	5.93%	191	45.36%	63	14.96%	142	33.73%	421	100%
	2	69	17.33%	154	38.69%	65	16.33%	110	27.63%	398	100%
	3	71	17.83%	174	43.71%	77	19.34%	76	19.09%	398	100%
Total		165	13.56%	519	42.64%	205	16.84%	328	26.95%	1217	100%
C-62	1	92	22.49%	180	44.00%	93	22.73%	44	10.75%	409	100%
	2	90	23.07%	216	55.38%	40	10.25%	44	11.28%	390	100%
	3	16	3.42%	233	49.89%	124	26.55%	94	20.12%	467	100%
Total		198	15.64%	629	49.68%	257	20.30%	182	14.38%	1266	100%
C-65	1	59	13.02%	249	54.97%	69	15.23%	76	16.78%	453	100%
	2	68	20.60%	56	16.98%	43	13.03%	163	49.39%	330	100%
Total		127	16.22%	305	38.95%	112	14.30%	239	30.52%	783	100%
C-69	1	9	15.52%	31	53.45%	18	31.03%	0		58	100%
C-70	2	68	9.97%	343	50.29%	137	20.09%	134	19.65%	682	100%
	3	99	16.98%	352	60.38%	66	11.32%	66	11.32%	583	100%
Total		167	13.20%	695	54.94%	203	16.05%	200	15.81%	1265	100%
C-72	1	21	8.04%	177	67.81%	56	21.45%	7	2.68%	261	100%
	2	35	11.74%	142	47.65%	111	37.24%	10	3.35%	298	100%
Total		56	10.02%	319	57.07%	167	29.87%	17	3.04%	559	100%
C-76	1	53	9.89%	266	49.63%	101	18.84%	116	21.64%	536	100%
	2	349	14.22%	1300	52.99%	502	20.46%	302	12.31%	2453	100%
	3	69	15.61%	236	53.40%	93	21.04%	44	9.95%	442	100%
Total		471	13.73%	1802	52.52%	696	20.29%	462	13.46%	3431	100%
C-84	1	92	12.07%	296	38.84%	258	33.86%	116	15.22%	762	100%
C-87	1	46	9.72%	269	56.87%	85	17.97%	73	15.43%	473	100%
	2	100	14.40%	315	45.38%	167	24.06%	112	16.13%	694	100%
Total		146	12.51%	584	50.04%	252	21.60%	185	15.85%	1167	100%
C-94	1	50	6.37%	405	51.60%	179	22.80%	151	19.23%	785	100%
	2	69	7.23%	471	49.37%	249	26.10%	165	17.30%	954	100%

Table 4.1. Continued.

	3	41	9.67%	192	45.28%	168	39.62%	23	5.42%	424	100%
Total		160	7.39%	1068	49.38%	596	27.55%	339	15.67%	2163	100%
C-96	1	88	9.50%	477	51.51%	251	27.11%	110	11.88%	926	100%
	2	45	7.56%	314	52.78%	174	29.24%	62	10.42%	595	100%
Total		133	8.74%	791	52.00%	425	27.94%	172	11.31%	1521	100%
C-98	1	6	5.94%	64	63.36%	31	30.70%	0		101	100%
C-106	1	63	8.15%	432	55.88%	210	27.17%	68	8.80%	773	100%
LHPeriodFunctional Categories of vessels											
Site	Sector	Serving Vessels		Storage Vessels		Cooking Vessels		Non Defined		Total	
C-16	1	43	44.79%	19	19.79%	7	7.29%	27	28.12%	96	100%
	3	122	25.15%	119	24.53%	28	5.77%	216	44.53%	485	100%
Total		165	28.40%	138	23.75%	35	6.02%	243	41.82%	581	100%
C-34	1	19	9.13%	66	31.73%	98	47.11%	25	12.02%	208	100%
C-38	1	25	5.59%	182	40.71%	70	15.66%	170	38.03%	447	100%
	2	35	9.04%	223	57.62%	49	12.66%	80	20.67%	387	100%
	3	42	10.05%	251	60.05%	51	12.20%	74	17.70%	418	100%
Total		102	8.15%	656	52.40%	170	13.58%	324	25.87%	1252	100%
C-45	1	79	18.28%	193	44.67%	78	18.05%	82	18.98%	432	100%
	2	205	40.75%	199	39.56%	18	3.57%	81	16.10%	503	100%
	3	92	21.75%	234	55.32%	42	9.92%	55	13.00%	423	100%
Total		376	27.69%	626	46.10%	138	10.16%	218	16.05%	1358	100%
C-53	1	145	44.07%	145	44.07%	23	6.99%	16	4.86%	329	100%
	2	116	28.36%	174	42.54%	49	11.98%	70	17.11%	409	100%
Total		261	35.37%	319	43.22%	72	9.76%	86	11.65%	738	100%
C-68	1	26	25.24%	63	61.16%	14	13.59%	0		103	100%
	2	224	33.84%	322	48.64%	66	9.97%	50	7.55%	662	100%
Total		250	32.68%	385	50.33%	80	10.46%	50	6.53%	765	100%
C-71	1	58	11.60%	329	65.80%	96	19.20%	17	3.40%	500	100%

Table 4.1. Continued.

C-75	1	11	31.42%	18	51.42%	5	14.28%	0		35	100%
C-77	1	24	23.30%	38	36.89%	15	14.56%	26	25.24%	103	100%
C-78	1	22	50.00%	14	31.81%	3	6.81%	4	9.09%	44	100%
C-79	1	144	14.80%	358	36.80%	238	24.46%	233	23.94%	973	100%
	2	201	16.30%	492	39.90%	376	30.49%	164	13.30%	1233	100%
Total		345	15.64%	850	38.53%	614	27.83%	397	18.00%	2206	100%
C-85	1	72	12.54%	215	37.45%	206	35.88%	81	14.11%	574	100%
	2	120	29.70%	163	40.34%	111	27.47%	10	2.47%	404	100%
	3	90	14.80%	283	46.54%	143	23.51%	92	15.13%	608	100%
Total		282	17.78%	661	41.68%	460	29.00%	183	11.54%	1586	100%
C-86	1	92	23.95%	153	39.84%	119	31.00%	20	5.21%	384	100%
C-88	1	5	18.51%	16	59.26%	6	22.22%	0		27	100%
C-97	1	13	39.39%	9	27.27%	11	33.33%	0		33	100%
C-100	1	1	2.70%	13	35.13%	16	43.24%	7	18.91%	37	100%
C-101	1	22	5.01%	214	48.74%	152	34.62%	51	11.61%	439	100%
	2	32	4.64%	335	48.62%	252	36.57%	70	10.16%	689	100%
Total		54	4.79%	549	48.67%	404	35.81%	121	10.73%	1128	100%
C-102	1	38	8.89%	217	50.82%	137	32.08%	35	8.20%	427	100%
	2	62	14.72%	246	58.43%	96	22.80%	17	4.04%	421	100%
	3	78	8.37%	535	57.40%	267	28.64%	52	5.58%	932	100%
Total		178	10.00%	998	56.06%	500	28.09%	104	5.84%	1780	100%

Table 4.2. Formative period lithic artifacts count.

Formative Period	**Sites**									
	C-3	C-6	C-12	C-13	C-20	C-23	C-36	C-52	C-66	C-83
Cores				1						
Preforms	7	1	4	8	11			2		
Scrapers				12	11	2	3	3	1	2
Knives			3	22	23	1	10	7		2
Drills		1			1					
Becs					1					
Projectile points	8	2		16	21	2	10	6		1
Spear points						3				
Flake 1	2	1								
Flake 2	14	1	1	4	3		1			1
Flake 3	15		14	18	13		13			
Total	46	6	22	81	84	8	37	18	1	6

Table 4.3. Evidences of ceramic production and smelting activities for the ERD and LRD/LH periods.

Artifacts	**ERD Period Sites**		
	C-18	C-58	C-67
Discs	1	1	
Crucibles			1
Wasters			9
Total	1	1	10

Artifacts	**LRD/LH Period Sites**								
	C-39	C-48	C-57	C-76	C-79	C-85	C-94	C-101	C-102
Discs	3	1	1	1		2			
Smoothers	2						2	2	3
Crucibles				4					
Wasters					1				
Total	5	1	1	5	1	2	2	2	3

Table 4.4. ERD period lithic artifacts count.

Artifacts	ERD Period Sites		
	C-1	C-18	C-58
Cores			
Preforms			1
Scrapers	4		
Knives	1		1
Drill			
Burin			
Smoothers			1
Projectile points			1
Spear points			
Mortar		1	
Hand Mortar			
Hoes			
Hammer			
Primary Flake	1		
Secondary Flake	1	1	5
Tertiary Flake	3		1
Sodalite Bead			
Total	10	2	10

Table 4.5. Special objects from surface.

Site	**Special Objects**				
	Copper	Crucible	Shell	Shell Beads	Spondylus Beads
C-18	1				
C--48			1(D)	1(D)	
C-75	1				
C-76		1		1	1(D)
C-79				1/1(D)	
C-85	1				
C-87				1(D)	
C-94				1/2(D)	
C-96				1(D)	
C-100				1	

D= diagnostic, non systematic collection.

Table 4.6. Sherd counts of imported ceramics by styles for LRD/LH periods.

Site	Yampara	Chicha	Tarija	Altiplano	Pacaje	Inka
C-34		1(D)	143	3		
C-48	3(D)	1(D)		1(D)		1/1(D)
C-62	1(D)	6/9(D)				
C-67		6		1		
C-68		25/15(D)			1(D)	5(D)
C-70		4/12(D)				
C-71		6/1(D)		1(D)		4/2(D)
C-72		4/2(D)				
C-74		11				
C-75		1		1	1	
C-76	1(D)	32/3(D)				
C-79	1/3(D)	49/9(D)		1(D)		
C-84		20/2(D)				
C-85		39/3(D)				1
C-86		6/1(D)				
C-87		41/1(D)				
C-94		86/9(D)				
C-96		34/7(D)	2	1		
C-98		2				
C-101		93/11(D)				1
C-102		111/7(D)		1		
C-106		31/13(D)				
Total	1/8(D)	607/107(D)	145	7/3(D)	1/1(D)	7/8(D)

(D)= Sherds collected in non systematic diagnostic collections.

Table 4.7. Sherd counts, proportions, and ratios of imported styles in systematic collections.

Site	Number of sherds	%	Ratio
C-34	146	70.19	0.18863049
C-48	1	0.03	0.00129199
C-62	6	0.47	0.00775194
C-67	7	0.98	0.00904393
C-68	30	3.92	0.03875969
C-70	4	0.31	0.00516796
C-71	10	2	0.0129199
C-72	4	0.71	0.00516796
C-74	11	1.2	0.01421189
C-75	3	8.57	0.00387597
C-76	32	0.93	0.04134367
C-79	51	2.31	0.06589147
C-84	20	2.62	0.02583979
C-85	40	2.52	0.05167959
C-86	6	1.56	0.00775194
C-87	41	3.51	0.05297158
C-94	86	3.97	0.11111111
C-96	37	2.43	0.04780362
C-98	2	1.98	0.00258398
C-101	94	8.33	0.12144703
C-102	112	6.29	0.14470284
C-106	31	4.01	0.04005168
Total	774		

%= proportion of imported sherds considering the total number of sherds in systematic collections at each site.

Ratio= is calculated dividing each site imported sherds by the total number of imported sherds from all sites.

Table 4.8. LRD/LH periods lithic artifacts counts.

Artifacts	**LRD/LH Periods Sites**																				
	C-17	C-38	C-39	C-41	C-48	C-57	C-62	C-70	C-71	C-72	C-76	C-79	C-84	C-85	C-87	C-94	C-96	C-98	C-101	C-102	C-106
Cores																					
Preshapes	8			1			1														
Scrapers	9	1			1		1	1		2	2		1	1		1					
Knives	6												1			1	2				1
Drill																	1				1
Burin	2																1				
Smoothers																1					
Projectile P.	2			1	1			2			2	4	1	2		4	2			1	
Spear Point	8											1	1								
Mortar	1				2																
Hand Mortar					4			1													
Hoes											1	1					1				
Hammer																					
PrimaryFlake	1	1																			
Second.Flake	3	1														2		1	1		
Tertiary Flake	19	1					5		1	2	19	13	19	8	5		1		11	15	2
Sodalite bead					2						4					1	1				1
Lapisl. bead			1									2									
Axe						1				1											
Stone bead								1			2										
Total	59	4	1	2	10	1	7	5	1	5	30	21	23	11	5	10	9	1	12	16	5

Table 5.1. Counts and proportions of fineware and domestic ceramics from sectors of C-48 for the LRD Period.

C-48	**Fineware**	**%**	**Domestic**	**%**	**Total**	**%**
S1	22	5.73	362	94.27	384	100
S2	122	14.56	716	85.44	838	100
S3	239	38.86	376	61.14	615	100
S4-5	125	16.94	583	83.06	778	100
S6	32	7.46	397	92.54	429	100
S7	1	0.23	426	99.77	427	100
Total	541	15.58	2930	84.41	3471	100

Table 5.2. Counts and proportions of ceramic materials from excavation.

C-48	**Unit 1**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	Non defined	Total
N/d	1	Humus	14	71	28	30	143
N/d	2	Cultural Fill	13	48	42	21	124
N/d	3	Cultural Fill	17	42	82	40	181
N/d	4	Cultural Fill	3	8	55	21	87
N/d	5	Cultural Fill	5	37	9	0	51
Total			**52 (9%)**	**206 (35%)**	**216 (37%)**	**112 (19%)**	**586 (100%)**
C-48	**Unit 2**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	Non defined	Total
1	1	Cultural Fill	370	1297	1273	1420	4360
1	2	Cultural Fill	3	10	12	6	31
2	Floor 1	Living floor	3	8	17	0	28
2	Feature 1	Charcoal&ash	10	27	66	5	108
3	3	Cultural Fill	3	16	27	2	48
4	Floor 2	Living floor	28	40	57	8	133
5	4	Cultural Fill	17	18	54	3	92
6	5	Ashes	9	12	30	0	51
Total			**443 (9%)**	**1428 (29%)**	**1536 (32%)**	**1444 (28%)**	**4851 (100%)**
C-72	**Unit 2**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	Non defined	Total
1	1	Humus	7	38	5	9	59
1	2	Humus	8	46	8	20	82
1	3	Cultural Fill	11	24	20	39	94
2	Floor 1	Living floor	11	33	31	64	139
3	4	Cultural Fill	17	48	50	4	119
4	Floor 2	Living floor	11	66	41	20	138
5	5	Cultural Fill	35	162	95	28	320
5	6	Cultural Fill	135	421	604	341	1501
5	7	Cultural Fill	58	249	249	183	739

Table 5.2. Continued.

6	8	Cultural Fill	9	37	58	20	124
6	9	Cultural Fill	16	84	56	38	194
7	Feature 6	Hearth Pit	2	9	9	0	20
7	Floor 3, L10,11	Living floor	8	25	17	12	62
8	12	Cultural Fill	32	150	116	67	365
8	13	Cultural Fill	11	50	43	23	127
9	14	Cultural Fill	9	33	24	6	72
Bedrock	Feature 7	Cist tomb	0	0	0	0	0
Bedrock	Feature 8	Cist tomb	0	0	0	0	0
Total			**380(9.15%)**	**1475(35.5%)**	**1426(34.32%)**	**874(21.03%)**	**4155(100%)**
C-87	**Unit 1**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	No defined	Total
1	1	Humus	3	37	17	29	86
1	2	Humus	2	8	3	15	28
2	3	Surface	8	34	21	52	115
2	4	Surface	6	38	66	36	146
3	5	Floor 1	5	21	17	7	50
3	Feature 1	Hearth pit	0	2	0	0	2
Total			**24 (5.62%)**	**140(32.79%)**	**124(29.04%)**	**139(32.55%)**	**427 (100%)**
C-87	**Unit 2**	**Interior Structure**					
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	No defined	Total
1	1	Humus	1	4	1	2	8
2	2	Collapsed adobe	4	9	3	1	17
2	3	Collapsed adobe	0	0	11	0	11
3	4	Cultural fill	1	2	10	0	13
4	5	Cultural fill	1	1	10	0	12
5	Floor 1	Surface	0	0	1	0	1
6	Floor 2, L6	Surface	0	1	8	3	12

Table 5.2. Continued.

6	Feature 2	Hearth pit	0	5	1	0	6
7	7	Cult.fill&ash	3	6	12	0	21
7	8	Cultural fill	2	1	6	0	9
Total			12	29	63	6	110
C-87	**Unit 2**	**Exterior Structure**					
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	No defined	Total
1	1	Humus	1	7	6	0	14
2	2	Cultural Fill	3	0	0	0	3
3	3	Cultural Fill	2	2	1	0	5
3	4	Cultural Fill	1	1	1	0	3
	Floor 1	Surface	1	1	0	0	2
4	5	Wall mortar	1	3	6	0	10
5	6	Cult.fill&ash	0	0	1	0	1
6	7	Cultural Fill	0	2	5	0	7
Total			9	16	20	0	45
Total	**Unit 2**		**21 (13.55%)**	**45 (29.03%)**	**83 (53.55%)**	**6 (3.87%)**	**155 (100%)**
C-76	**Unit 3E**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	No defined	Total
1	1	Cultural Fill	18	30	15	7	70
1	2	Cultural Fill	4	12	35	9	60
1	3	Cultural Fill	7	14	31	18	70
2	4a	Surface	12	21	41	31	105
2	4b	Surface	5	35	15	28	83
3	Feature 2	Ash	1	2	2	3	8
3	Floor 2, L5a	Surface	3	9	18	24	54
3	5b	Surface	6	9	14	17	46
4	6	Cultural Fill	17	75	188	120	400
4	7	Cultural Fill	9	67	43	29	148

Table 5.2. Continued.

4	7	Cultural Fill	11	75	53	93	232
5	8	Collapsed adobe	10	70	47	44	171
5	9	Collapsed adobe	3	28	19	9	59
6	10a (Floor 3)	Living Floor	2	8	22	5	37
6	10b (Floor 3)	Living Floor	0	5	6	0	11
Total			**108(6.95%)**	**460(29.6%)**	**549(35.33%)**	**437(28.12%)**	**1554 (100%)**
C-79	**Unit 4A**						
Strata	Level	Nature	Serving V.	Storage V.	Cooking V.	No defined	Total
1	1	Humus	22	33	1	14	70
2	2	Collapsed stone	3	18	2	1	24
2	3	Collapsed stone	8	11	0	2	21
2	4	Collapsed stone	21	24	3	1	49
2	5	Collapsed stone	24	47	21	42	134
2	6	Cultural fill	12	16	3	26	57
3	Feature 3	Hearth pit	1	1	6	3	11
3	7 (floor 1)	Living floor	14	34	44	46	138
Total LH			**105(20.83%)**	**184(36.51%)**	**80(15.87%)**	**135(26.79%)**	**504(100%)**
4	8a	Cultural fill	2	11	20	14	47
4	8b (floor 2)	Living floor	5	12	19	13	49
4	Floor 2	Living floor	1	11	34	21	67
4	Feature 2	Hearth pit	1	19	35	19	74
5	9	Cultural fill	21	65	35	62	183
5	10	Cultural fill	143	395	174	254	966
5	11	Cultural fill	23	133	11	23	190
Total LRD			**196(12.44%)**	**646(40.99%)**	**328(20.81%)**	**406(25/76%)**	**1576(100%)**

Table 5.3. Radiocarbonic 14C dates for Cinti sites.

AA	Site	Sample ID	D13C	Date	14C age (BP)	Calibrated age range (2s)
AA45696	C-48	9 Unit 1, Level 3	-25.4	R05-05-02	912+-49	1024 - 1216 AD
AA45697	C-48	56 Unit 2, Floor 2	-24.9	R05-05-02	991+-46	912 - 1172 AD
AA45698	C-72	53 Unit 2, Floor 2	-22.9	R05-05-02	861+-56	1038 - 1267 AD
AA45699	C-72	110 Unit 2 F6	-23	R05-05-02	958+-51	996 - 1192 AD
AA45700	C-72	173 Unit 2 F7	-22.2	R05-05-02	1,227+-56	676 - 946 AD
AA45701	C-80	253 Unit 1 Level 1	-24.5	R05-05-02	1,919+-45	0 - 218 BC
AA45702	C-83	4 Unit 1 F 1	-23.9	R05-05-02	9,321+-97	9087 - 8286 BC
AA45703	C-87	6 Unit 1 F 1	-24.4	wtd avg	<624+-37>*	1296 - 1399 AD
AA45703	C-87	6 Unit 1 F 1	-24.4	R05-11-02	606+-38	
AA45703	C-87	6 Unit 1 F 1	-24.4	R05-05-02	700+-79	
AA45704	C-87	29 Unit 2 F2	-23	R05-05-02	883+-70	1024 - 1265 AD
DRI						
DRI3312	C-76	114 Unit3E-4F, Cist	-23.41	09-05-97	878+-56	1023 - 1249 AD
DRI 3319	C-79	67 Unit 4A, Floor 2(8a)	-25.38	09-05-97	888+-62	1031- 1272 AD
DRI 3320	C-79	100 Unit 4A, Level 10	-24.65	09-05-97	835+-61	1110-1286 AD

Table 5.4. Special items from excavation.

Provenience			Special Items								
Site N.	Unit	Level	Wasters	Crucibles	Smoothers	Bone tools	Discs	Copper	Shell	Shell beads	Alabaster
C-48	1	3								1	
C-48	1	5						1			
C-48	2	1	2		2		3				
C-48	2	Floor 1					3				
C-48	2	Floor 2				1	2				
C-72	2	6		1			5		1	1	
C-72	2	8			1						
C-72	2	9					1	1			
C-72	2	Feature 1								1	
C-72	2	12								1	
C-87	1	3							1		
C-76	3E	8								1	
C-79	4A	5								1	
C-79	4A	Floor 2								1	
C-79	4A							1			1
C-79	4A	10								1	
Total			2	1	3	1	14	3	2	8	1

Table 5.5. Lithic artifacts from excavation units.

Provenience			Lithic Artifacts							
Site	Unit	Level	Preforms	Knives	Smoother	Proj.Point	Mortar	Mortar Hand	Secondary Flake	Tertiary Flake
C-48	1	5								1
C-48	2	1					1	2		4
C-72	2	Floor 1/F1				1			1	1
C-72	2	3								1
C-72	2	Floor 2							2	5
C-72	2	5				1				
C-72	2	6	2			2		1		6
C-72	2	7			1			2	2	12
C-72	2	8							1	7
C-72	2	9				1			2	19
C-72	2	10				1			1	4
C-72	2	11		1						5
C-72	2	12	2			3			5	18
C-72	2	13							2	6
C-72	2	14							1	4
C-87	1	1							1	5
C-87	1	3								1
C-87	1	5				1			1	3
C-87	2	4						1		
C-76	3E	6				1				
C-79	4A	4				1				
Total			4	1	1	12	1	6	19	102

APPENDIX C

CERAMIC CHRONOLOGY

CERAMIC CHRONOLOGY

The ceramic chronology for the Cinti Valley was constructed using a classification of the most chronologically sensitive type attributes. The attributes used most were decoration and surface finish. Vessel shape also was an important attribute in some cases. Type of pastes and firing were not useful, in general, because these changed little during the prehispanic sequence. Classification of local ceramics was complemented with bibliographical research, and comparing materials with those from neighboring areas, currently held in the Museums of Potosí, Tarija and Cochabamba to identify chronological marker styles or wares. Here I will describe those categories of pottery that were most useful in distinguishing chronological periods in ceramics from the surface collections and excavations in the Cinti valley. Domestic or utilitarian ceramics are only very briefly described here with the exception of the Formative period materials, because they are not, at this point in the research, useful as chronological indicators. A strong continuity in pastes, production techniques, and forms made it difficult to establish chronological differences with domestic materials.

Formative Period

Ceramic materials from this period in the Cinti Valley are described for the first time here. At least two types were identified:

Jatun Khasa Coarse Bicolor (*Jatun Khasa Tosco Bicolor*)

This type is characterized by paste with large lutite and quartz inclusions (>2 mm) that run diagonally in a sherd profile. Firing is not homogeneous, producing oxidized external surfaces with a high orange tone (7.5YR 6/4), and reduced internal surfaces with a high gray color paste (2.5Y 6/1). Internally, the pieces are generally well smoothed, and but exterior surfaces display a coarse finishing in which the smoothing seems to have been done carelessly, leaving small, clotted residues of the paste in which the lutite or quartz inclusions are prominent. Another characteristic of this pottery type is the manufacture technique, first by coiling and then, after the first smoothing for refining the shape, the addition of a new layer of clay and then a new smoothing. This pattern was repeated at least a couple of times for each vessel, producing different layers that are clearly visible in eroded sherds. Each layer peals easily from the one underneath; such technique created coarse, wavy external surfaces.

The most common shapes are open bowls of different sizes (Figure C1). It is striking that the flat bases of open forms are not completely circular, it seems the pieces were formed using a flat surface, probably a stone, on which a rectangular flat base was created, this base was then trimmed to form a more circular shape.

Carusla Scraped or Stamped (*Carusla Estriado o Estampado*)

This pottery is characterized by a paste with lutite and quartz inclusions, generally oxidized firing, and external finishing by smoothing, and scraped or textile stamped surfaces. Such marks appear to be the result of tools and clothes used in the smoothing process, although in some cases the scraping and stamping are so prominent that they look to have been done intentionally as a decorative technique (Figure C2). In some cases, pieces present brown, orange (7.5YR 6/4) or red (10R4/4, 2.5 YR 4/6 or 5/6) slips, more rare are sherds with black slip (7.5YR 3/1). The most common shapes are jars of different sizes, cooking ollas, some of them large (Figure C3, and some open vessels.

Other types

A mixture of other Formative Pottery is grouped here, differences among them can be related to chronological or functional aspects, but future excavations are needed in order to solve these questions. For instance, open bowl sherds with rims presenting an external band have been recovered from some sites. In general, these shapes are well smoothed, and in some cases polished over a yellow or orange slip. Such vessels have been reported in Formative sites of eastern Potosí valleys (Lecoq 2001).

Of particular interest is the presence of Formative sherds in sites near Villa Abecia, in the southernmost part of the research area, that present pastes related to those from Chicha wares, red slips, and in some cases decoration by incision. These types are more likely related to groups located south from Cinti Valley. As Michel López and collaborators suggest (2000), there seems to have been continuity in terms of ceramic pastes and red slips use from the Formative period to later periods.

Early Regional Development Period

Materials from this period in the Cinti valley are characterized in detail for first time here. Posnansky (1945) was the first scholar to publish drawings of these materials from Cinti. They also have been recognized in other nearby areas of eastern Potosí by Lecoq and Céspedes (1997a, b), and were named Tica Tica style and Southeast Tradition.

Cinti

This ceramic style is characterized by a paste with inclusions of crushed lutite, whose size depends on vessel size, the bigger the vessels, the bigger the inclusions. At times mica inclusions are also present, but likely as part of the clay rather than as temper. Vessels present either an oxidized or reduced firing, that produced orange (2.5 YR 5/4, 5/6, 6/6 and 7/6, 5YR 6/4 7/6, 7.5 YR 6/4) or gray (2.5Y 6/1 and 7/1, 10YR 5/1) colors, or a mix of both, in which, some parts of the vessels oxidized while others reduced. Finishing is mainly by smoothing, though some times burnishing is present. Slips are not common, but when present they show gray (2.5Y 6/1), orange (2.5 YR 5/4, 6/4, and 6/6) and brown (7.5 YR 4/3) tones. Decoration is painted in red (2.5YR 4/6, 10R 4/3 and 5/6, 5YR 4/3) or black over orange or gray, although red and black motifs together are also present. It is common to see colors changing from red to red-wine or sepia due to the differential firing in one vessel.

Decorative motifs are geometric and include stepped designs associated with or linked with *grecas* or frets (Figure c4). It is also common to see in kerus the presence of red semicircles in the interior part, close to the rim. Other motifs are volutes associated to serrated lines and to a variety of stepped motifs (Figures C5, C6). The most common vessel shapes are kerus, a variety of cups and bowls, and jars. Funerary urns are also decorated with these motifs.

Cinti with volutes

A variant of the Cinti style displays motifs similar to the Mojocoya style (Branissa 1957; Ibarra Grasso 1973) from northern Chuquisaca, eastern Cochabamba and western Santa Cruz. This decorative style includes volutes, serrated volutes, as well as other stepped designs (Figure C7). These elements suggest some type of link with these regions and with the piedmont valleys. Most of these designs appear in kerus, cups and bowls. Some complete vessels from Cinti with these designs have been published by Posnansky (1945).

Thick Rims Incised and Stamped Tradition

This ceramic tradition was adopted and reproduced in Cinti during the Early Regional Development period and continued throughout the sequence until the Late Horizon (Rivera Casanovas 2003b). Pottery of this style has a broad area of distribution that encompasses most of the interandean valleys of central and southern Bolivia, and parts of the piedmont in the Chaco lowlands (Alconini McElhinny and Rivera Casanovas 2003).

This tradition has particular traits (Alconini McElhinny and Rivera Casanovas 2003). It is characterized by pastes with large inclusions of slate or lutite in most of the cases (>1mm), although mica is also common. The manufacture technique is by coiling, and the finishing is fine - coarse smoothing. Firing produced mainly oxidized (2.5 YR 5/4, 5YR 6/4, 7.5YR 6/6, 10YR 6/4) pastes, although in some cases, shreds display both oxidized and reduced pastes (orange and gray respectively) because of the differential exposure to heat.

Decoration is the most important feature of this tradition, and it is composed of imprints of corncobs and/or textiles, curvilinear and/or zigzag incisions, circular and semicircular dots made with a stick or small cane. This decoration is commonly distributed in a high relief band around the rims of the vessels that forms part of thick rims (Figures C8, C9). In some cases, vessels present anthropomorphic motifs under the band, mainly incised and modeled faces with coffee bean eyes.

The common forms are globular and semi-globular jars, with a narrow neck in relation to the size of the body that varies broadly in size. In some cases these are big jars that may have been used for liquid containers, in other cases, jars are smaller and seems to have been used for serving liquids. Also there are certain types of big semi-spherical and hyperboloid serving dishes or *fuentes*. Jars present horizontal or vertical handles that are replaced in some cases by nubs, lugs or handgrips or *agarraderas*.

Although this tradition appears in the valley during this period, it continued being produced through the Late Regional Development Period and the Late Horizon.

Late Regional Development Period

Huruquilla

Ceramic from this period is known as the “Huruquilla” style (Ibarra Grasso 1973). This style has a broad distribution in eastern Potosí and southwestern Chuquisaca that corresponds in part with the territory once occupied by the Qaraqara Confederation.

Although the main trait of this style is the gray color of the paste, the motifs seem to have regional or local variations that might correspond to the different social groups making up the confederation.

The name **Huruquilla** has been source of confusion and debate for some archaeologists (i.e. Lecoq and Céspedes 1997a, b; Lecoq 1999). These authors see as a serious problem the use of the name Huruquilla for this ceramic style because people tend to associate the name with the ethnohistoric Aullaga Uruquilla, settled in the intersalar region of Potosí, west of the area where the Huruquilla style is present at archaeological sites, and because, according to Lecoq, ceramic styles in that region are different from the Huruquilla style. However, Ibarra Grasso made clear that he was naming the style based on relevant information for the area where it is preponderant. He assigned the name Huruquilla to a gray ceramic style based on the name of a group mentioned in the Matienzo itinerary for that territory, also because in Caiza D, Potosí, there is still an ayllu with that name (Ibarra Grasso 1960:19).

In this study we maintain the denomination Huruquilla for the Late Regional Development period and Late Horizon because: (1) the name has been used for a long time and archaeologist are familiar with this denomination and the style it named, (2) it is used here for naming a particular ceramic style not a "culture", and (3) it identifies a style with a macro-regional presence whose name, if changed would have to be homogenized for the whole area and not just for part of it, as has been done in some studies (i.e. Lecoq and Céspedes 1997a, b; Lecoq 1999).

In the case of Cinti Valley, the Huruquilla style is characterized by the following attributes:

Pastes present gray (2.5Y 5/1, 6/1 and 7/1, 10YR 6/1 and 6/2, 7.5YR 6/1, 6/2 and 7/1, 10YR 7/1) or orange (2.5YR 5/4, 5/6, 6/6 and 6/8, 5YR 5/4, 6/4 and 6/6) colors because of the firing technique used. Less common are brown (5YR 4/3, 7.5YR 6/4), gray pink (10R 7/4, 2.5 YR 8/4, 5YR 6/2 and 7/3) and red (10R 5/6 and 5/8, 2.5 YR 4/4) colors. Pastes have inclusions of ground lutite. Coiling is the manufacture technique and finishing is by smoothing. Slips appear occasionally, mainly in gray tones (2.5Y 6/1), although there are also a variety of other tones that are less common such as orange (2.5 YR 6/6, 5YR 6/3), brown (5YR 5/3, 7.5YR 5/3, 10YR 4/1), gray pink (2.5YR 5/6, 5YR 7/2) and red (10R 4/3, 4/6 and 7/5 YR 4/4).

Decoration is monochrome black over gray or orange, and the common designs are a type of inverted Z, “eyes”, a type of volutes united among them, horizontal or vertical undulating lines, solid triangles or filled either with dots or intermittent lines, serrated motifs, as well as other geometric designs (Figures C10, C11, C12, C13, C14, C15). Fugitive black motifs painted over gray of orange surfaces tend to be lost or erased when exposed to the environment or water. This might be because pure oxides were used to obtain black colors and they don’t stick well on the ceramic surfaces, and tend to get lost or faint.

It has been noted that there are differences in decoration according to use context. For instance, vessels with a more elaborate, careful decoration occur more commonly in well built tombs (see Figures C10, C11) while pieces with less careful or elaborate motifs are present in domestic contexts (Figures C12, C13). Although this observation needs further study, it suggests potential differences in status reflected in access to this style, an interesting venue for research. Also, this observation suggests the coexistence of what we can call “classic” and “decadent, mixed” motifs.

The common shapes are unrestricted forms such as low and high bowls, bell shape bowls (*tazones campaniformes*), cups, kerus and different sizes semi globular jars. Small spouted pitchers with one vertical handle are part of the inventory; Ibarra Grasso (1973) suggests they were used for drinking chicha based on ethnographic observations in the Cochabamba valleys.

This style is related in part to the Yura Poligonal described for eastern Potosí (Lecoq and Céspedes 1997a) present in that region roughly from AD 600 on. The regional distribution of this style is broad, comprising the North and South Cinti Provinces in Chuquisaca, and particular areas of eastern Potosí.

Late Horizon

Late Huruquilla

The Late Horizon Huruquilla pottery is similar to the Huruquilla style described above in terms of pastes and firing. However, there are some technological variations, perhaps a product of Inka influence, manifested in the inclusion of new finishing techniques, and changes in shapes and decoration. For instance, slips are more frequent, as well as gray tones with yellowish (10YR 7/3), pinkish (2.5YR 5/6, 5YR 7/2) and darkish (5N) variants. Firing seems to be better controlled, and vessels present either oxidized or reduced treatments. Coiling is the common method of vessel shaping. It is noteworthy that some vessels, especially bowls, kerus and small pitchers, have much thinner walls compared to the previous period. Vessel shapes are more globular or semi spherical, in the case of the bowls, jars, pitchers and cooking vessels. In the case of the three last forms, vessels with unrestricted rims take rim angles between 30º and 60º, contrasting with the previous period in which the rim angles fall between 60º and 90º. Flared-rim jars are common in this period while long-necked jars seem to have been preponderant before. This characteristic has been also recognized in other areas of the Andes with Inka occupation (i.e. Alconini 2002; Hayashida 1999).

The decoration continues being monochrome, black on gray, or orange in most of the cases. Motifs are volutes, “eyes”, vertical lines with triangular salient and small undulating lines spread in the decorative fields (Figures C16, C17, C18). In general, motifs tend to be drawn with thin lines when compared to the previous period, although there is also a mix of motifs, which Lecoq and Céspedes (1997a) call a “decadent” patterning of designs. The Late Huruquilla presents some patterns of design similar to the Yura Foliaceo of Lecoq and Céspedes (1997a) but also a lot of variation.

Huruquilla Inka

This style is a variation of the Late Huruquilla style characterized by a mix of the local Huruquilla style with Inka decoration and shapes. Within this style, it is typical to find imperial vessel forms reproduced with local pastes, techniques, and local decorative designs. This style is particularly common for plates, aryballus, jars and bowls (Figure C19). For instance, the typical Inka plates with a vertical handle or with a bird-head handle present a gray paste, and the internal decoration depicts classical Inka motifs such as peppers, or dots divided in four fields, while the external part presents just Huruquilla motifs such as triangles or bands. Aryballus with local pastes and Inka motifs or with gray colors, depicting small llamas in the internal rim are also found.

Inka Provincial

Sherds from inka provincial vessels have been recovered in Cinti. In most of the cases they belong to a variety of jars produced both in the highlands and in the southern valleys region (Figures C20, C21). Among these ceramics, La Paya Inka style (Bennett 1936) is common.

Foreign Styles

A variety of imported pottery has been identified in Cinti, particularly those coming from neighboring areas.

Chicha

This style is mostly associated with sites occupied during the Late Horizon in Cinti, however, it is also present during the Late Regional Development period. Chicha style is the most common foreign style in Cinti, especially in the southern part of the valley. Its nuclear area is located in southern Potosí and Tarija (Angelo 1999; Ibarra Grasso and Querejazu Lewis 1986; Michel et al. 2000; Raffino et al. 1987). Well-oxidized pastes with inclusions of white granules, probably sandy lutites (Krapovickas and Aleksandrowicz 1988) characterize this pottery. In some cases, sand is also used as a temper. Raffino and his colleagues (Raffino et al. 1987) have described five varieties which they call the Chicha complex: Chicha Purple; Chicha Orange-Natural;

Chicha Bicolor Purple on Orange; Chicha Bicolor Black on Purple or Orange; and Chicha Reddish. In Cinti, Chicha vessels are commonly polished or burnished and present orange (2.5 YR 6/6) red (10R 4/4), dark red and wine red (7.5R 3/3) slips. Common shapes are low bowls with angular rims, globular jars with open mouths as well as jars with a long neck and unrestricted rims (Figures C22, C23).

The decoration is mainly black on red spirals and volutes, triangles with spirals, spirals with different types of linear appendixes, and stepped figures with spirals (Krapovickas and Aleksandrowicz 1988). Other motifs are bands with filled triangles that form negative motifs; such a technique is also shared with the Yura and Huruquilla styles. These basic designs form complex patterns and figures. Other decorative elements are grid motifs that form part of bands. Decoration can also consist of white bands alone or intercalated with black designs, all present in jars. Jars often show a white band on the internal part of the rim. In some cases, jars present a black slip in the internal part. Domestic materials with Chicha pastes were also present, globular jars and cooking vessels.

Other styles

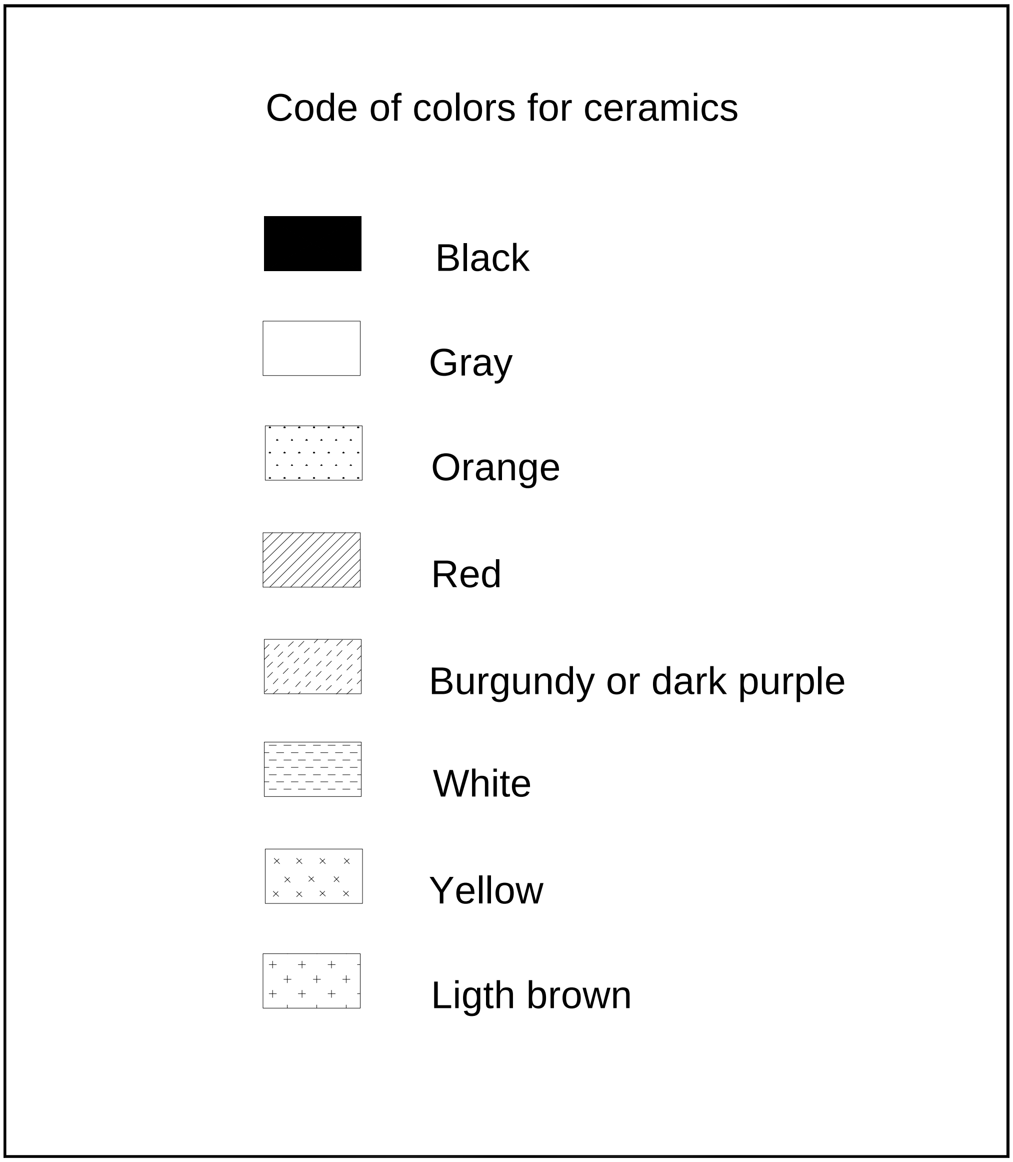
Styles associated with the LRD period are the Yampara, described in detail elsewhere (Alconini 2002; Ibarra Grasso 1973; Ibarra Grasso and Querejazu Lewis 1986), and the Yura (Ibarra Grasso 1960, 1973; Lecoq and Céspedes 1997a). The Yampara style is present at some sites in Cinti, although in low quantities. Open bowls with internal and external polychrome decoration exemplify it (Figure C24). Designs are geometrical, delineated in white. This style is associated with the LRD period, and likely with the LH period too. The Yura style, as typified by Ibarra Grasso (1973) was found in Cinti sites in some excavation units, and it is related to the LRD period.

Other styles associated with the LH period are the Pacajes Inka (Albarracin-Jordan 1996), identified in open bowls with red slip and small llamas in black (Figure C25). There are also other styles that clearly originated in the Altiplano highlands, but they could not be related to a particular group or culture, thereby being designated as "Altiplano" in this dissertation (Figure C25). A group of sherds with an orange oxidized paste, similar to the Chicha has been named Tarija in this study. It corresponds to domestic wares, jars and ollas and in some occasions presents polychrome geometric decoration, white and black on orange (Figure C25).

Domestic Ceramics

Domestic ceramics from the ERD to the LH periods are characterized by orange (2.5YR 5/4, 5/6, 6/6 and 6/8, 5YR 5/4, 6/4 and 6/6) to brown (5YR 4/3, 7.5YR 6/4) pastes, oxidized and reduced firing, and finishing by smoothing that can vary from a poor, coarse treatment to a fine one. In some cases, vessels, especially if they are small, show a certain polishing, and in some cases orange and brown slips were used. Inclusions are composed of lutite, quartz and mica whose size varies according to the vessel's size, the bigger the vessels, the larger the temper.

Common domestic vessel shapes include a variety of bowls that some times seem to have been used as pans, semispherical jars of different sizes, either with long unrestricted necks and a small mouth, or neckless vessels with unrestricted rims and a broad mouth. Jars display a couple of vertical handles, or in many cases nubs or handgrips (*agarraderas*). Bases are mostly flat. Cooking pots are characterized by surfaces with marks of burning and soot. Pastes have more mica and sand, for being resistant to heat, than serving wares, and the shapes are semispherical with short necks and big mouths. Bases are generally flat, although some pots present rounded bases. These pots have vertical handles located between the rim and the upper part of the body or in many cases different types of nubs or grips. Other very common objects are reutilized sherds of a circular shape and an average of 5 cm diameter that seem to have been used as some type of lid.


Code of colors for ceramics
Black
Gray
Orange
Red
Burgundy or dark purple
White
Yellow
Ligth brown

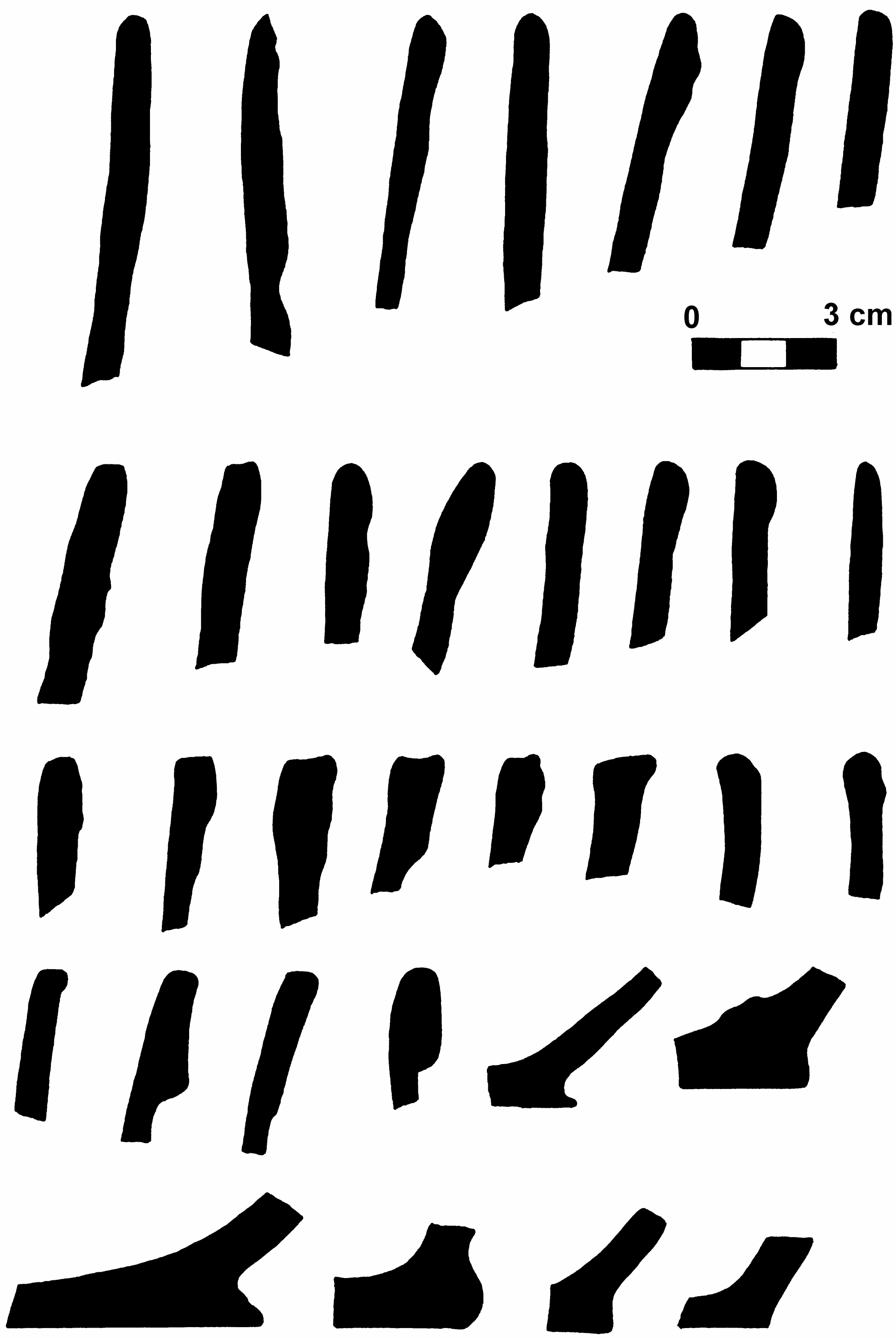


Figure C1. Formative period vessel rims and bases.

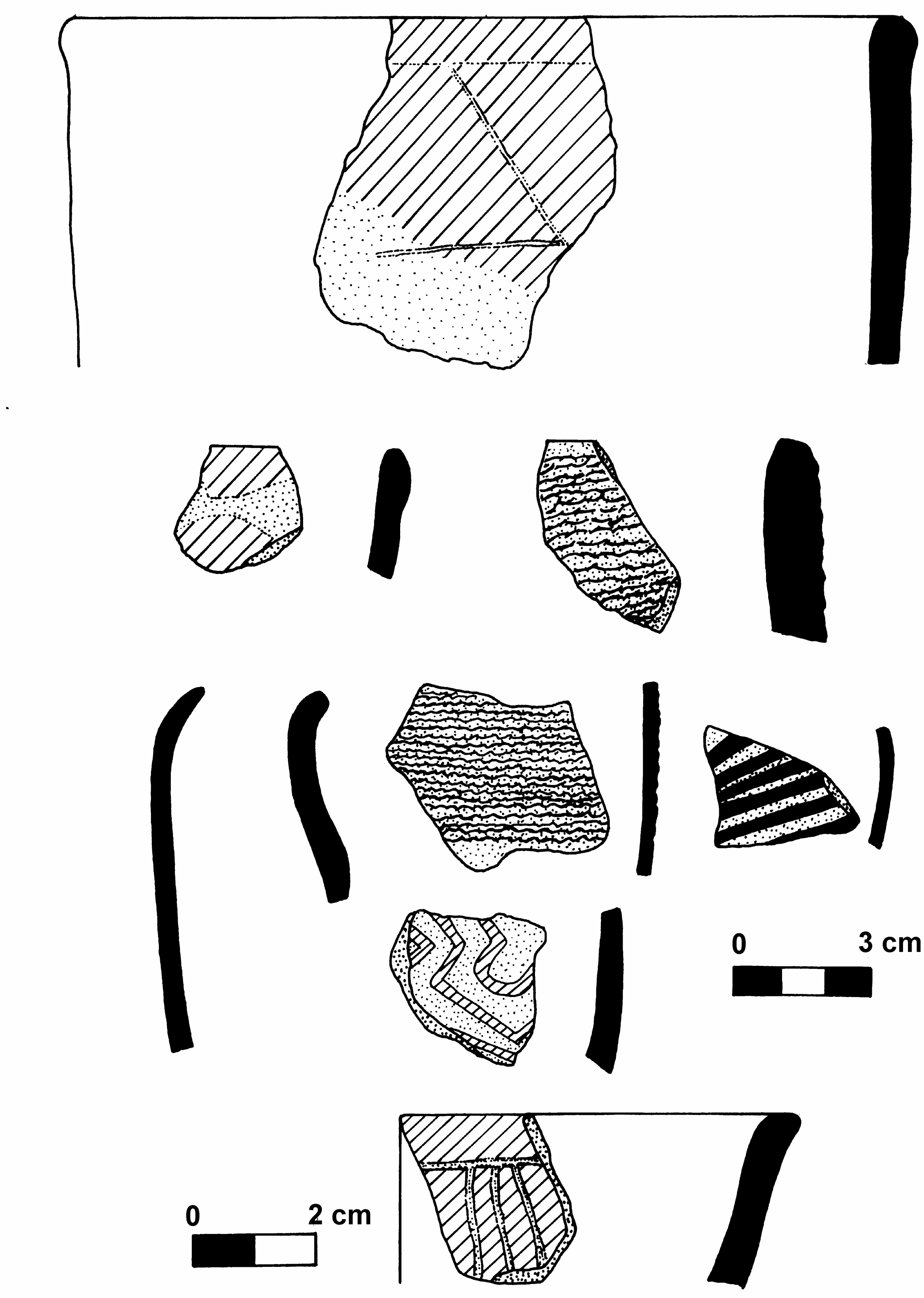


Figure C2. Formative period decorated ceramics.

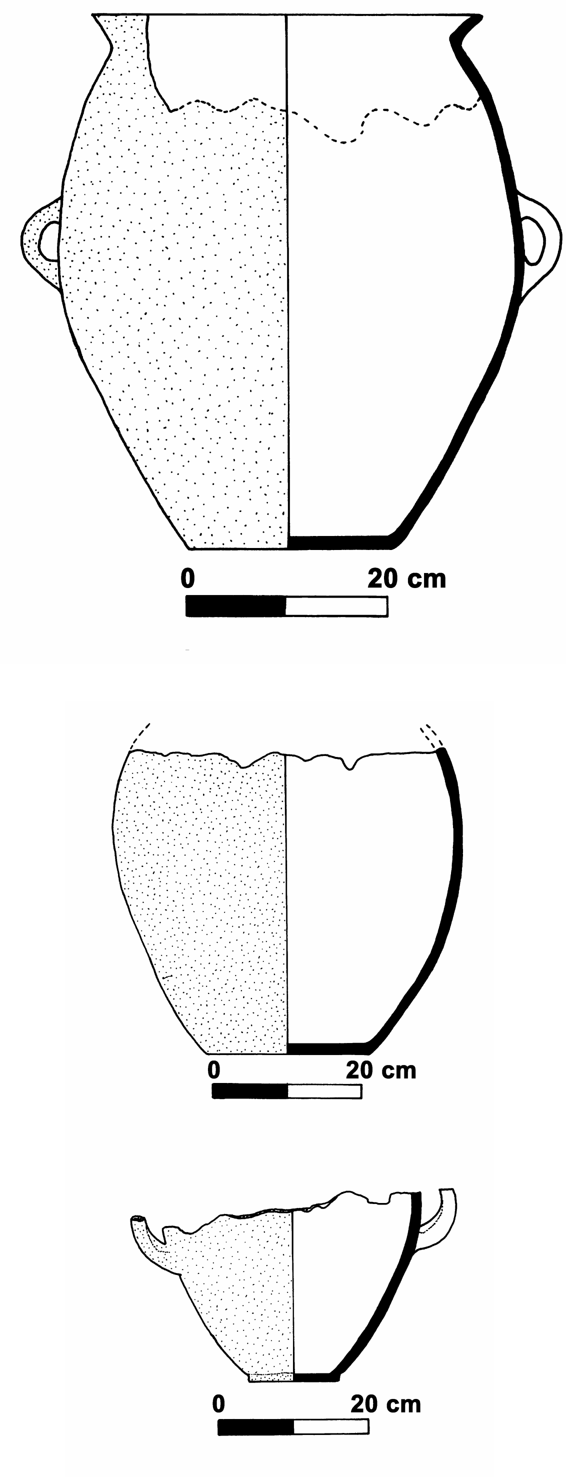


Figure C3. Formative funerary urns (C-80).

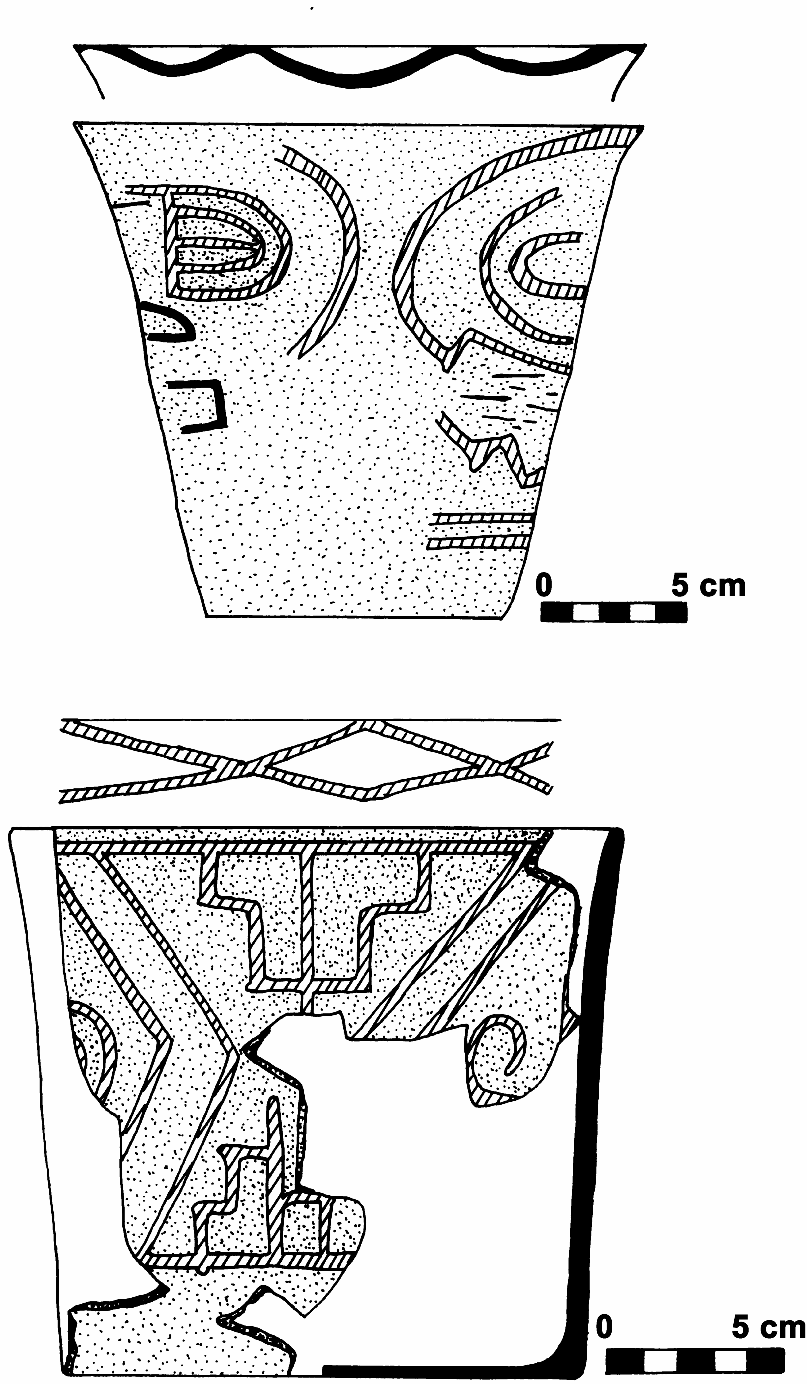


Figure C4. ERD period kerus.

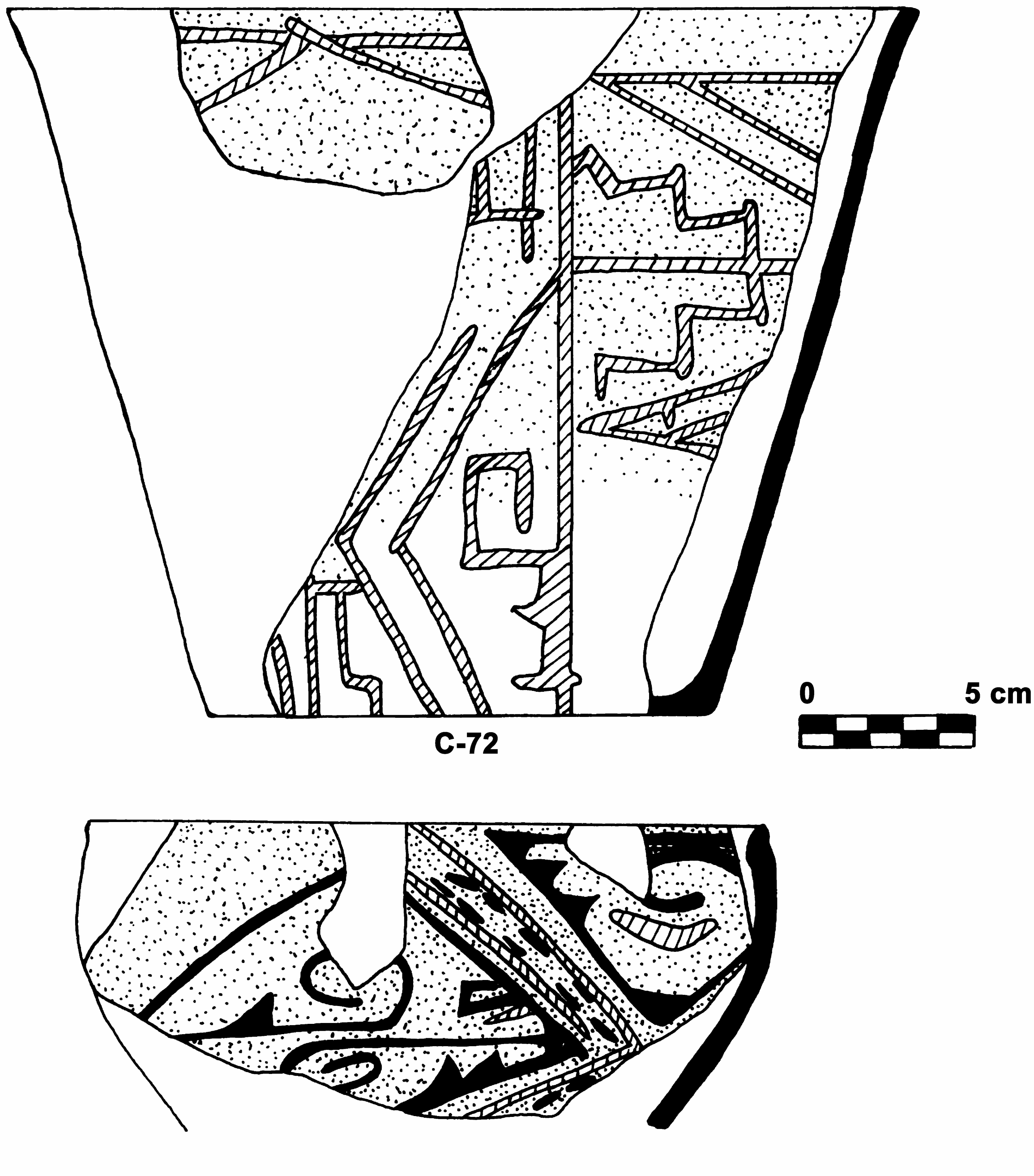


Figure C5. Cinti style with geometric motifs.

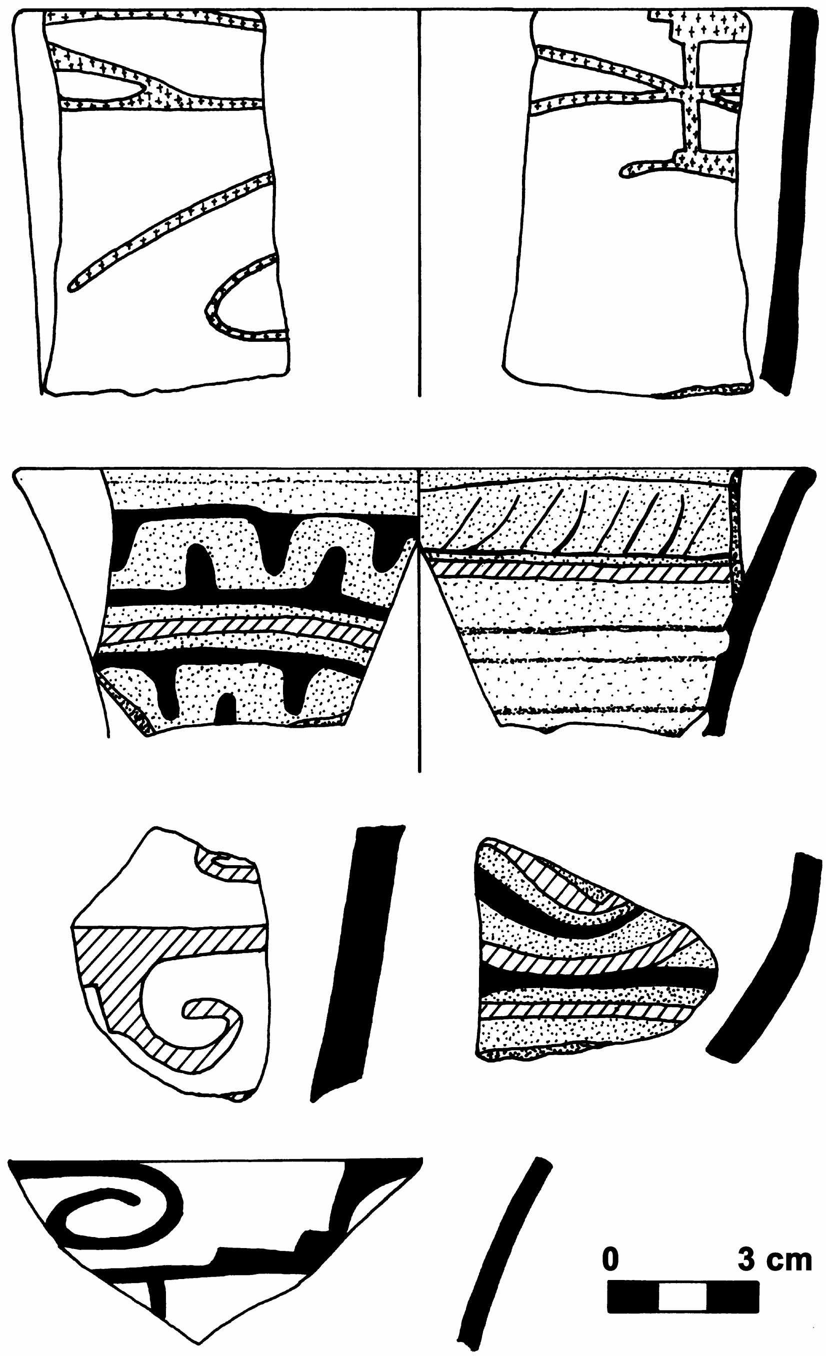


Figure C6. ERD period Cinti style.

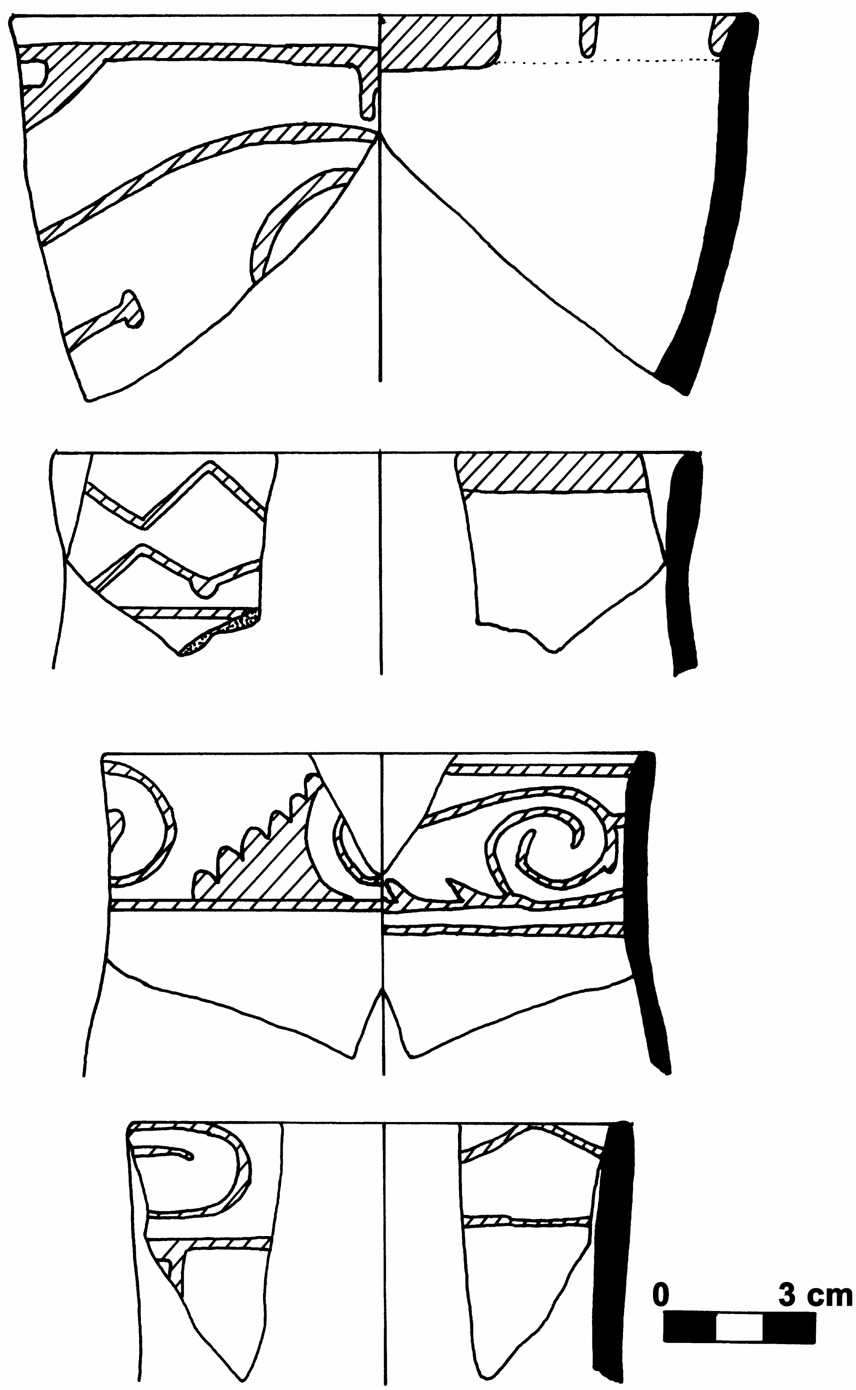


Figure C7. Cinti style with volutes.

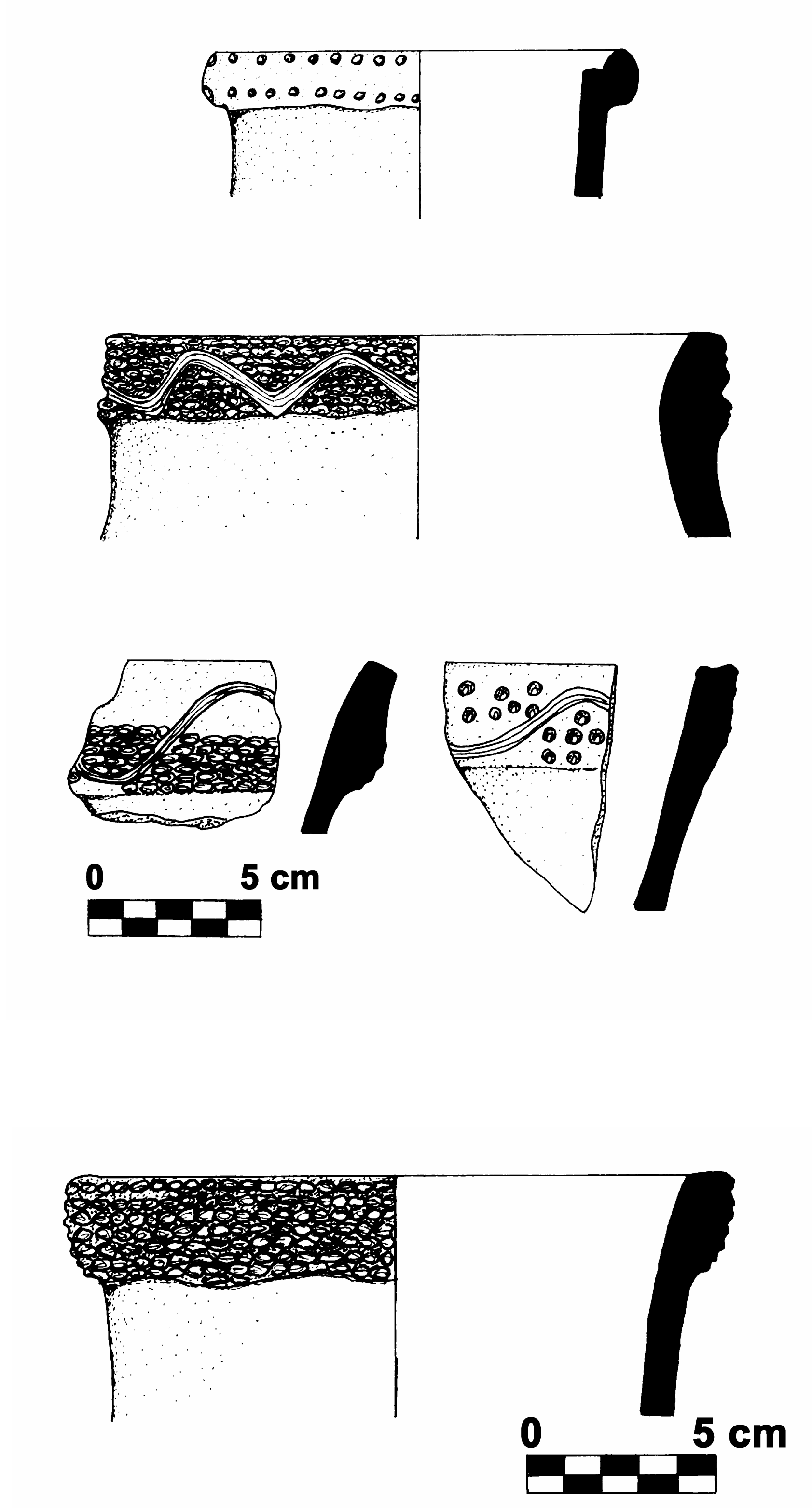


Figure C8. Thick Rims Stamped and Incised Tradition.

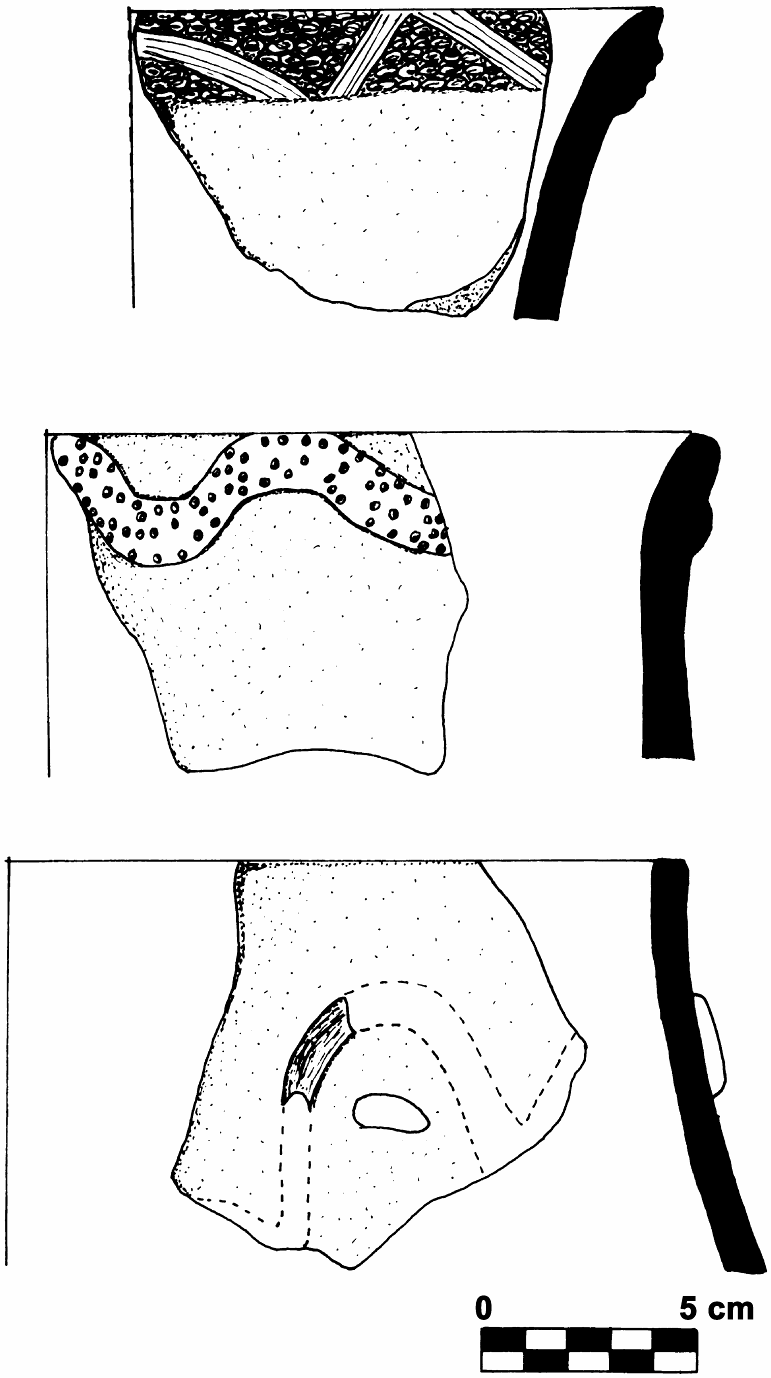


Figure C9. Thick Rims Stamped and Incised jars.

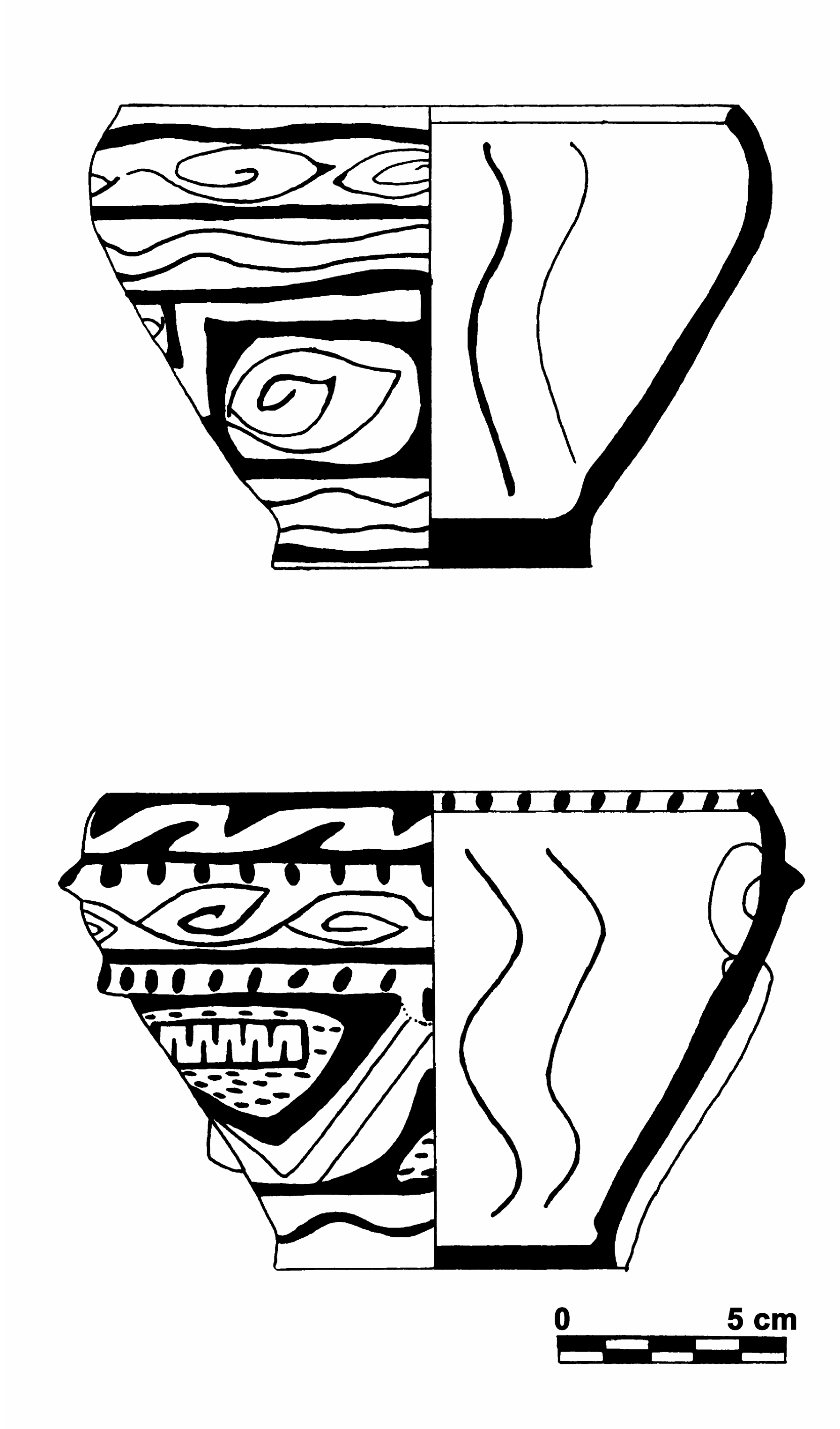
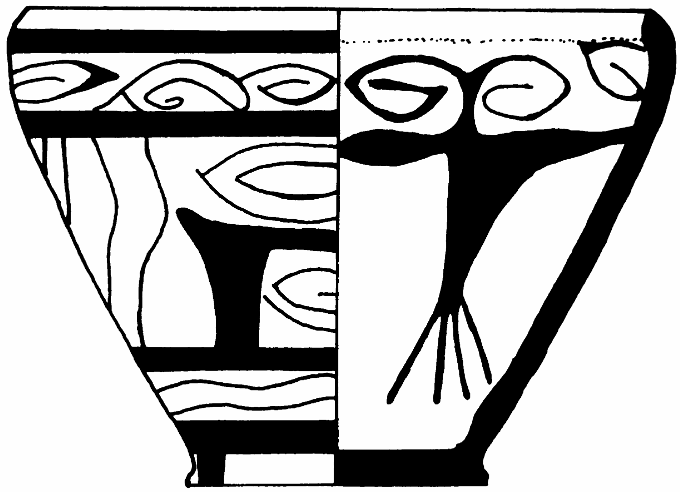


Figure C10. LRD period bowls from C-76, Unit 4E-F, cist tomb.



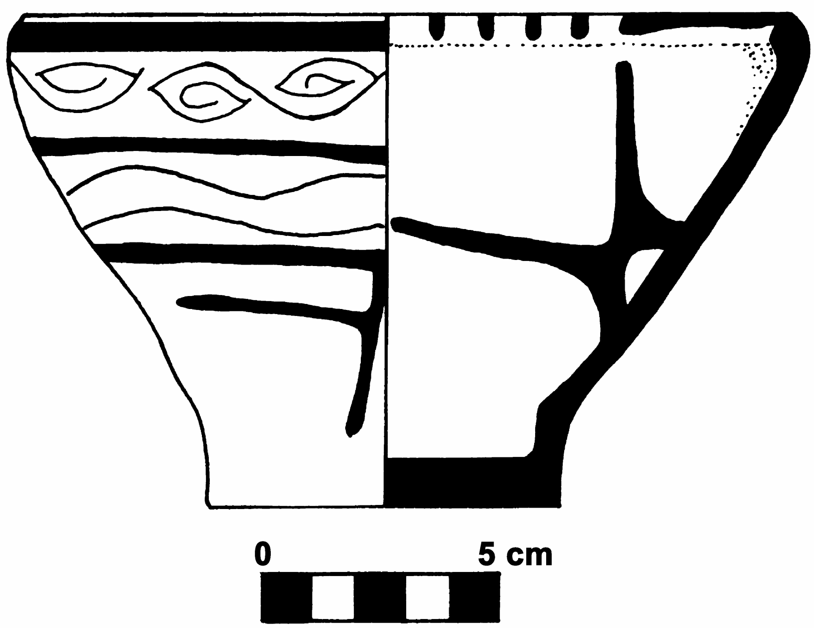


Figure C11. LRD period bowls from C-76, Unit 4E-F, cist tomb.

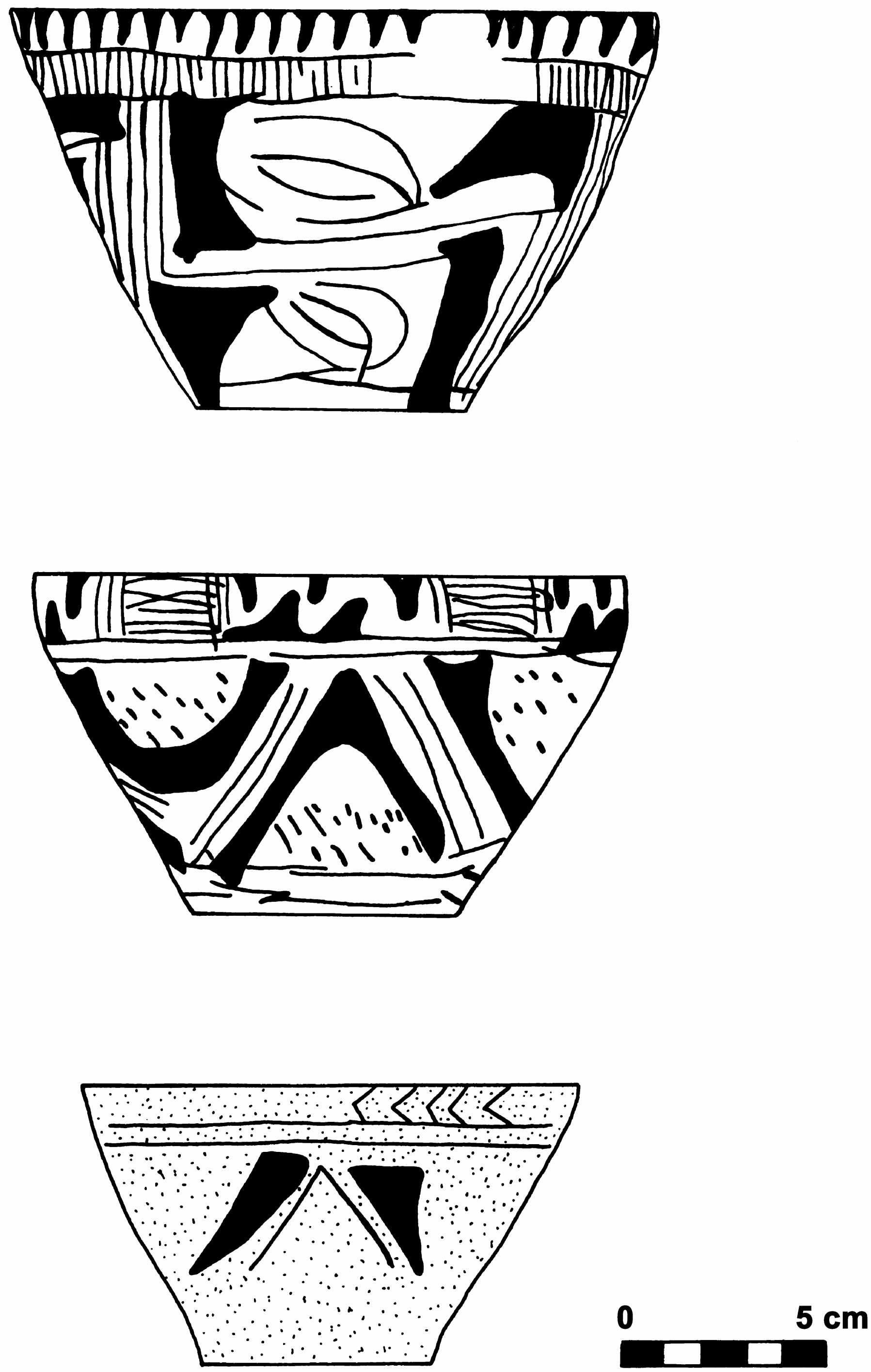


Figure C12. LRD period bowls from a cache pit (Feature 6), Unit 2, C-72.

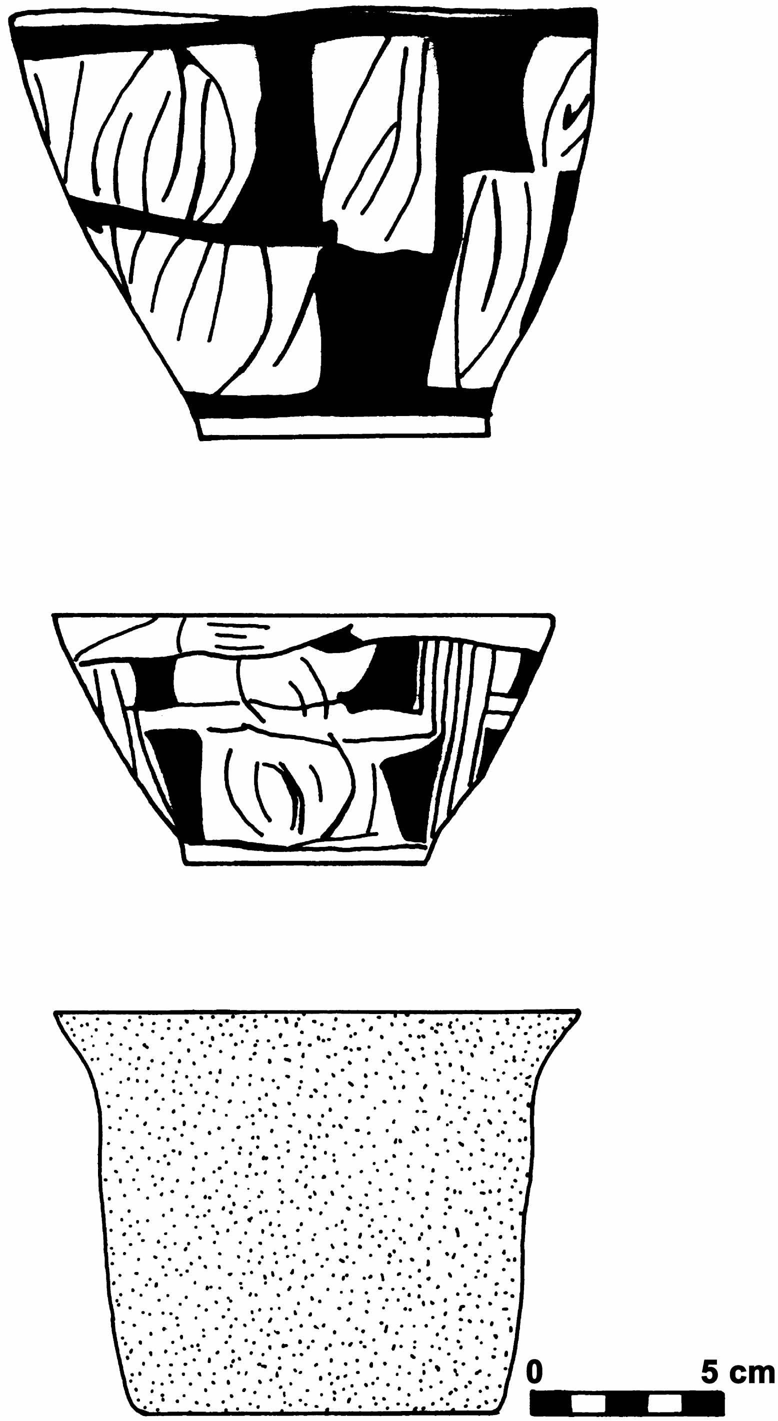


Figure C13. LRD period vessels from a cache pit (feature 6), Unit2, C-72.

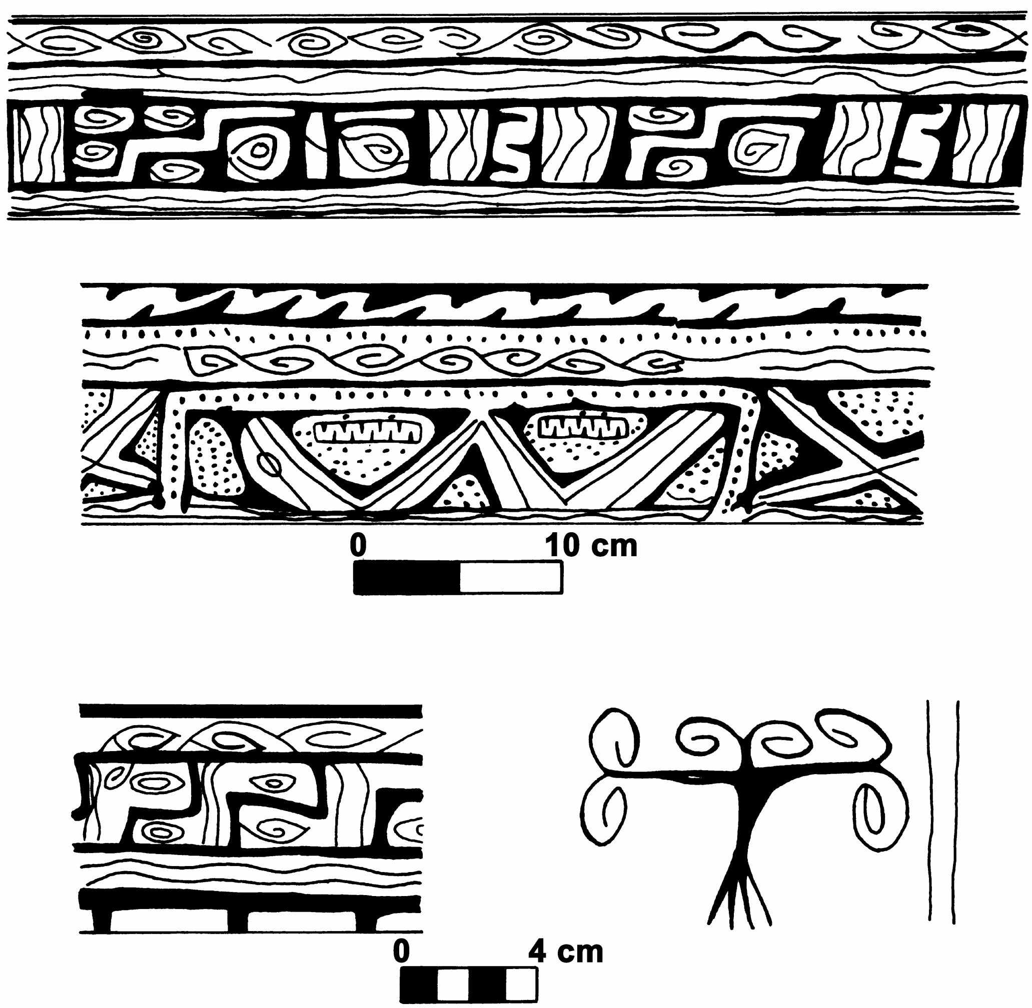


Figure C14. Huruquilla style decorative patterns in bowls from C-76, cist tomb.

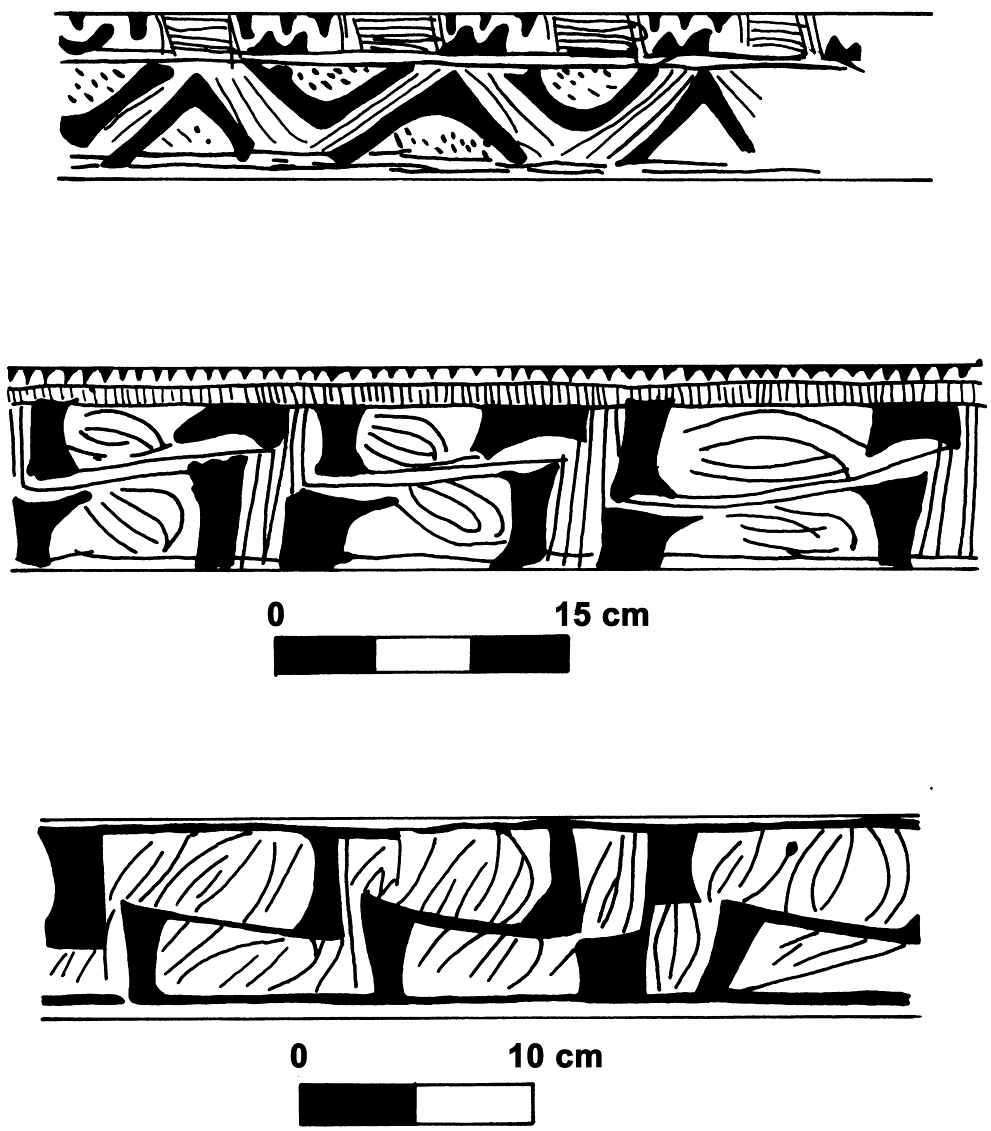


Figure C15. Huruquilla decorative patterns in bowls from C-72, cache pit.

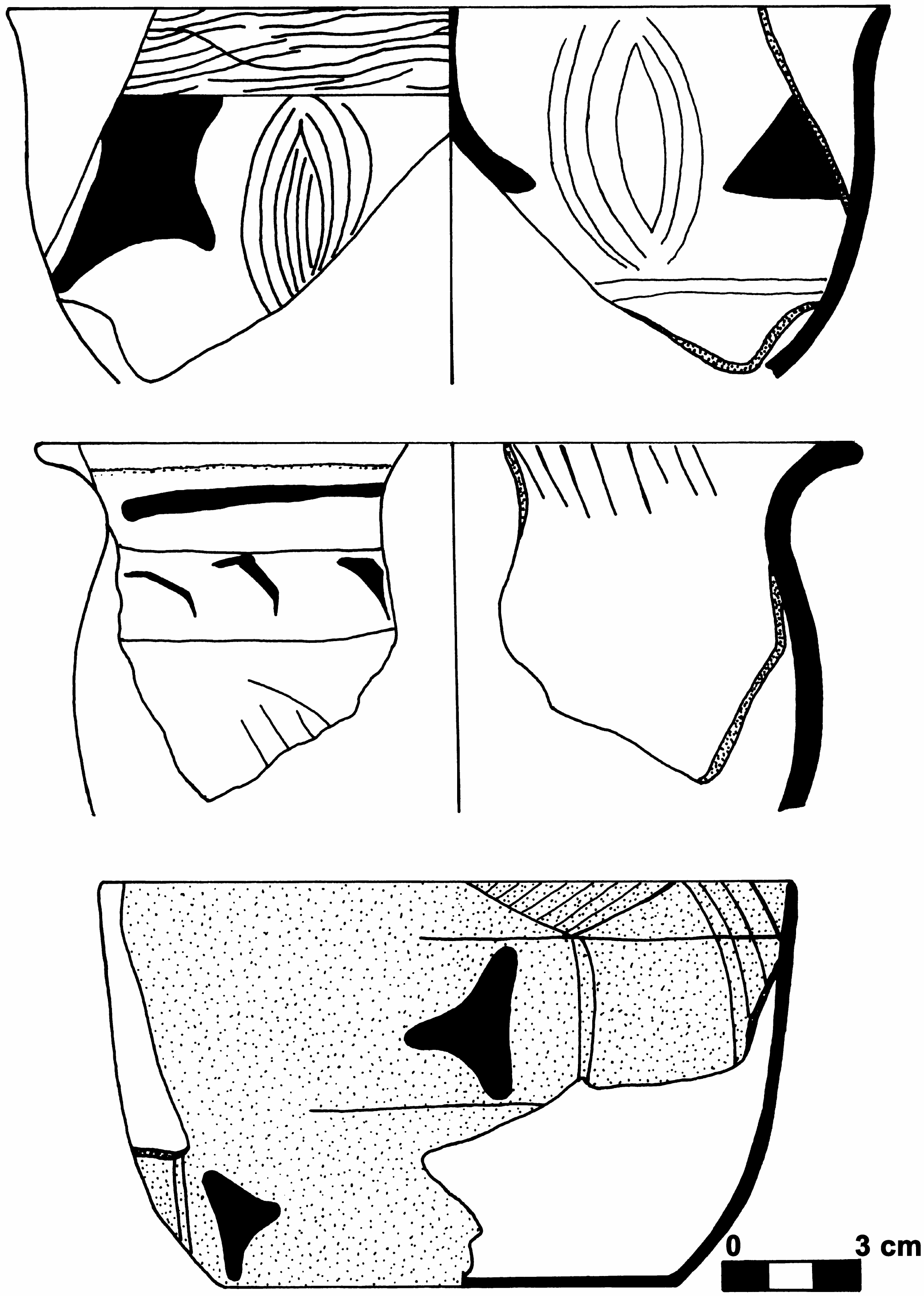


Figure C16. Late Huruquilla style vessels from Cinti.

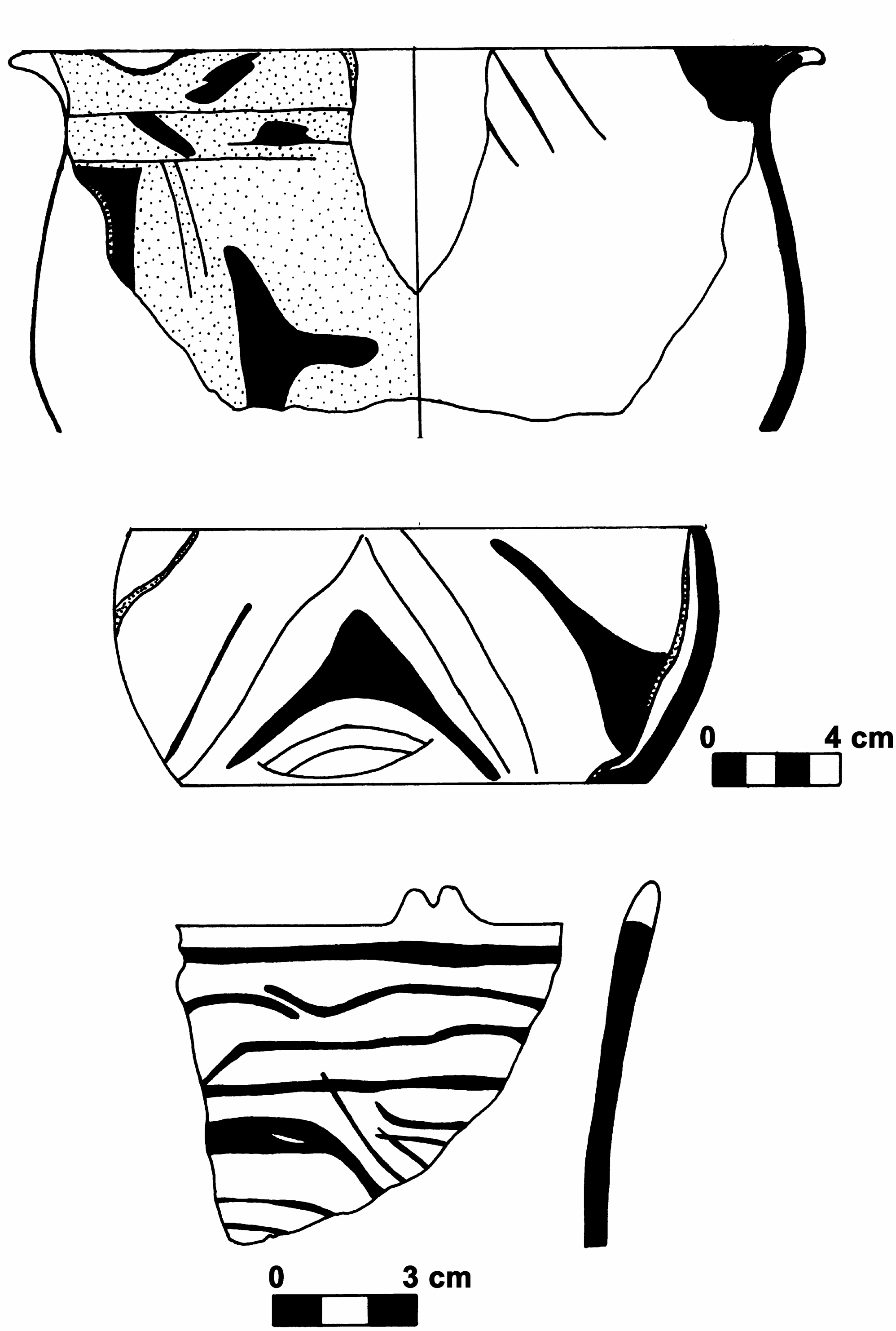


Figure C17. Late Huruquilla style vessels.

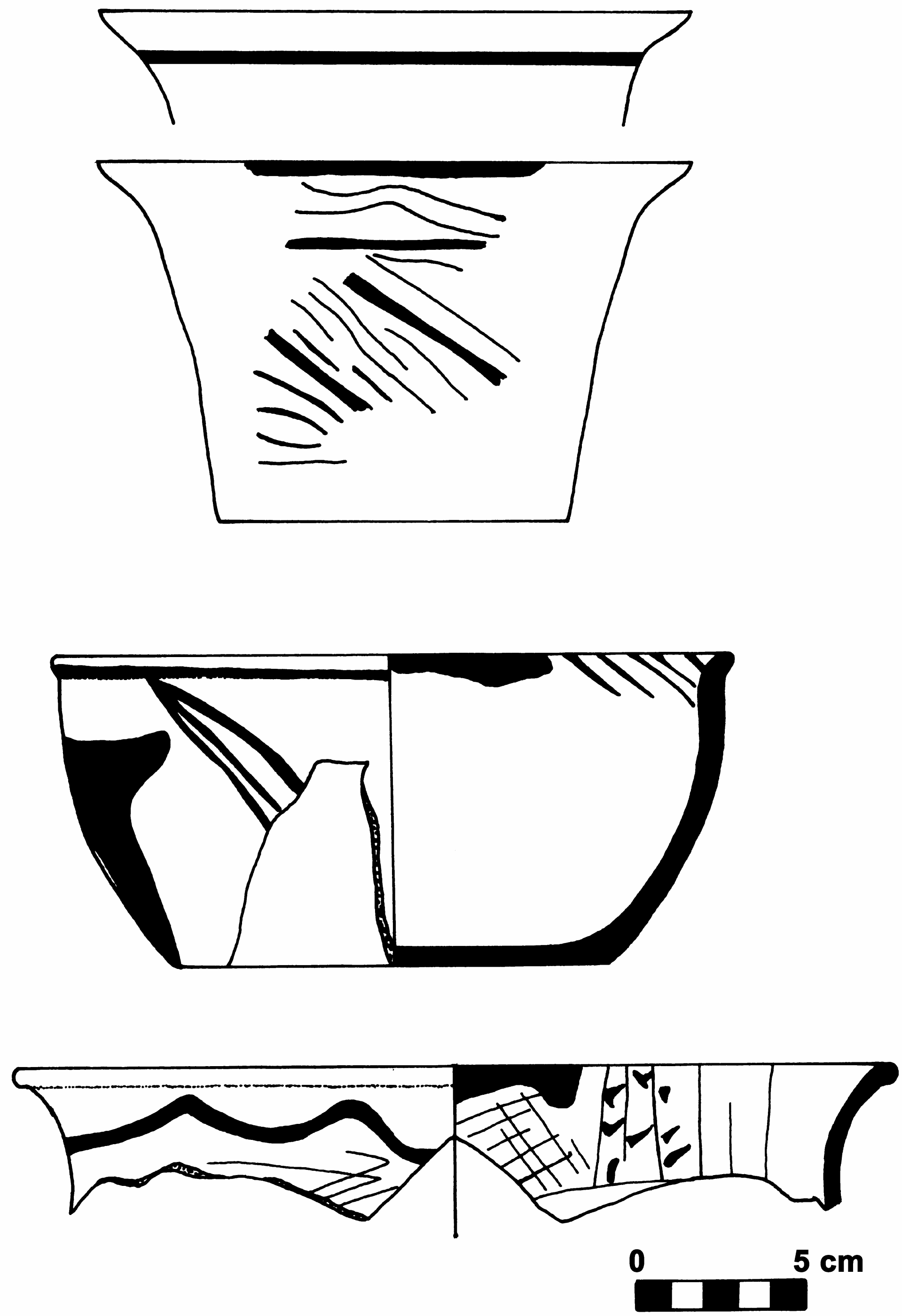


Figure C18. LH period ceramics from Cinti.

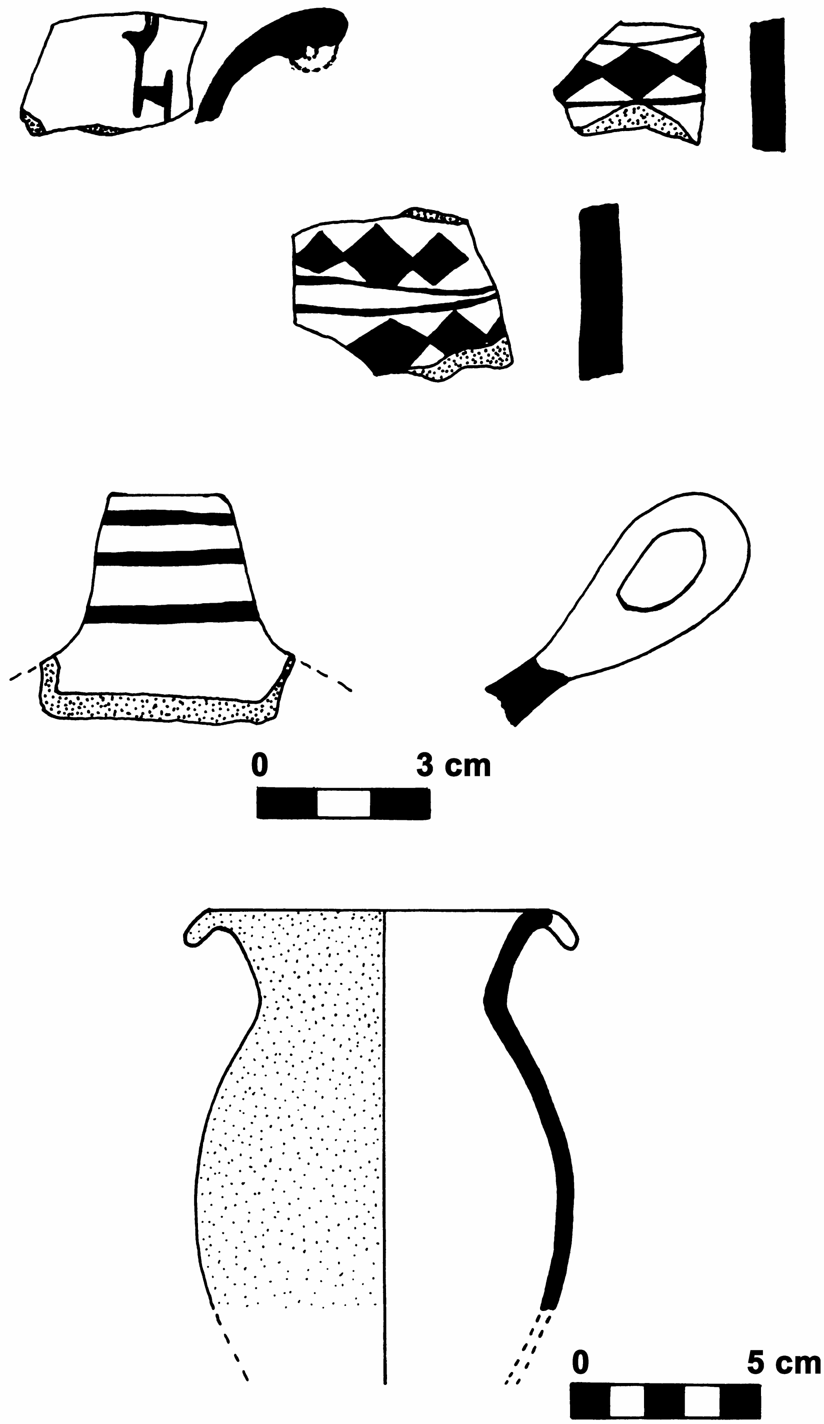


Figure C19. LH period Huruquilla-Inka ceramics from Cinti.

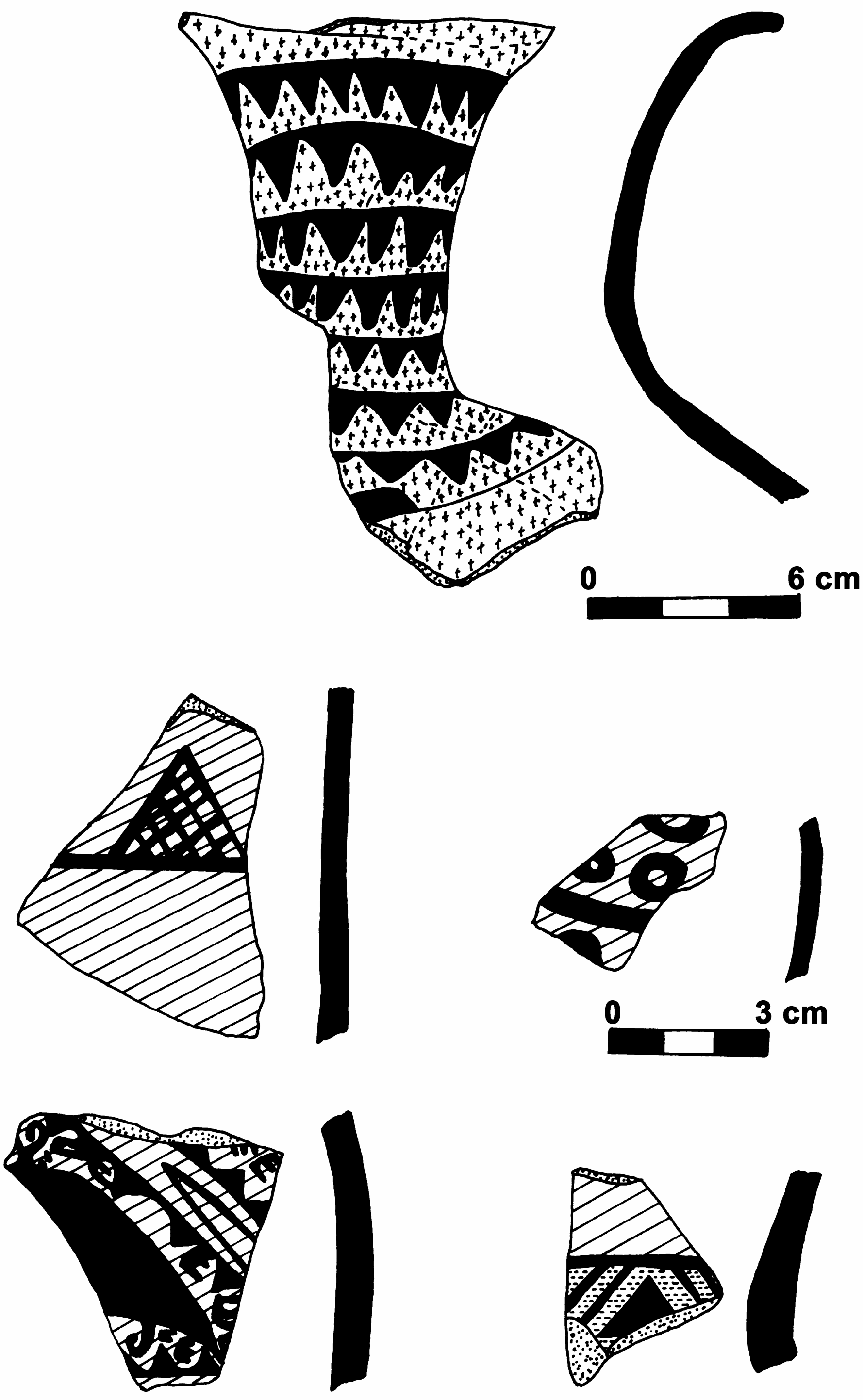


Figure C20. LH period Inka provincial ceramics.

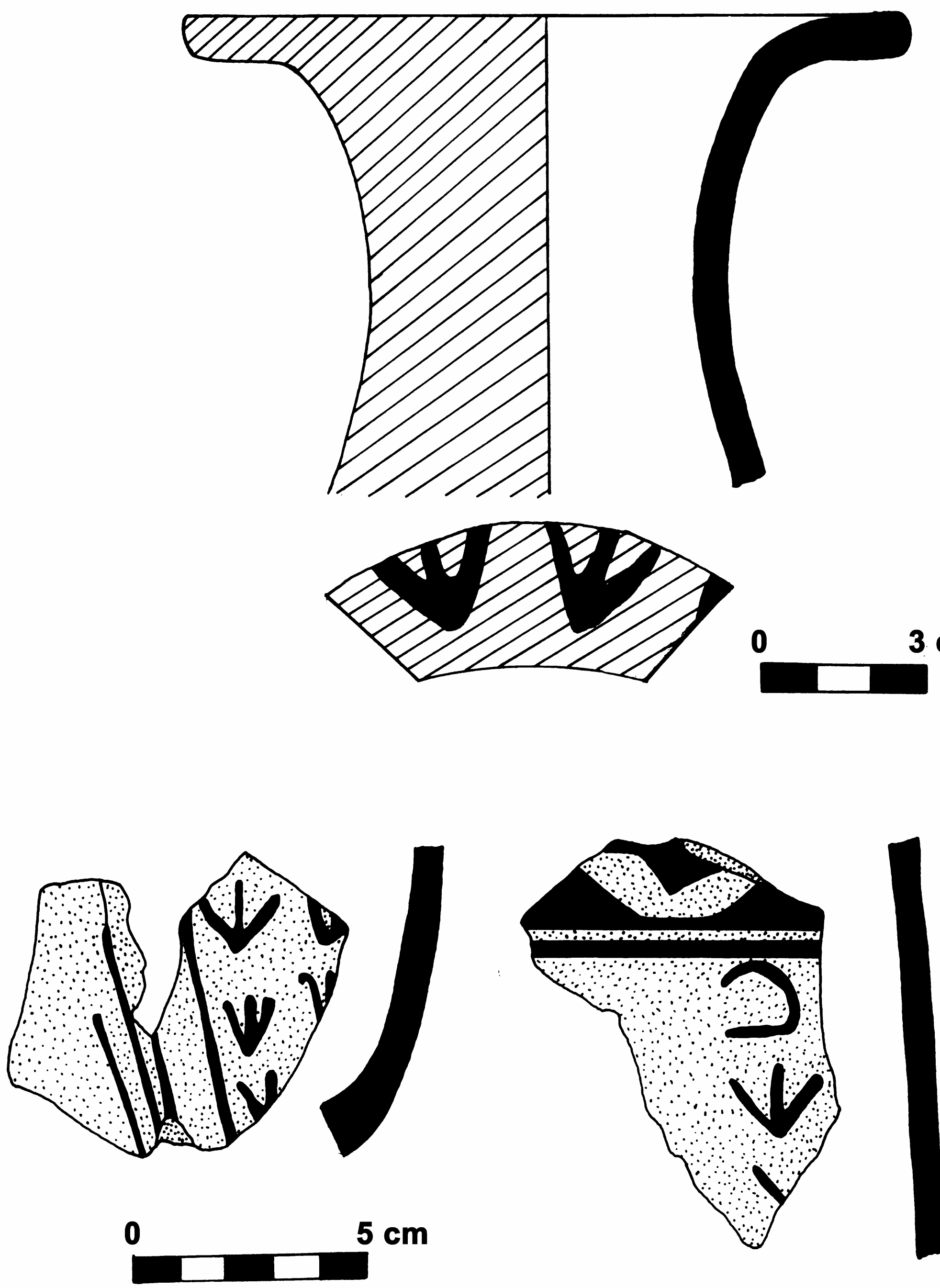


Figure C21. LH period Inka provincial jars.

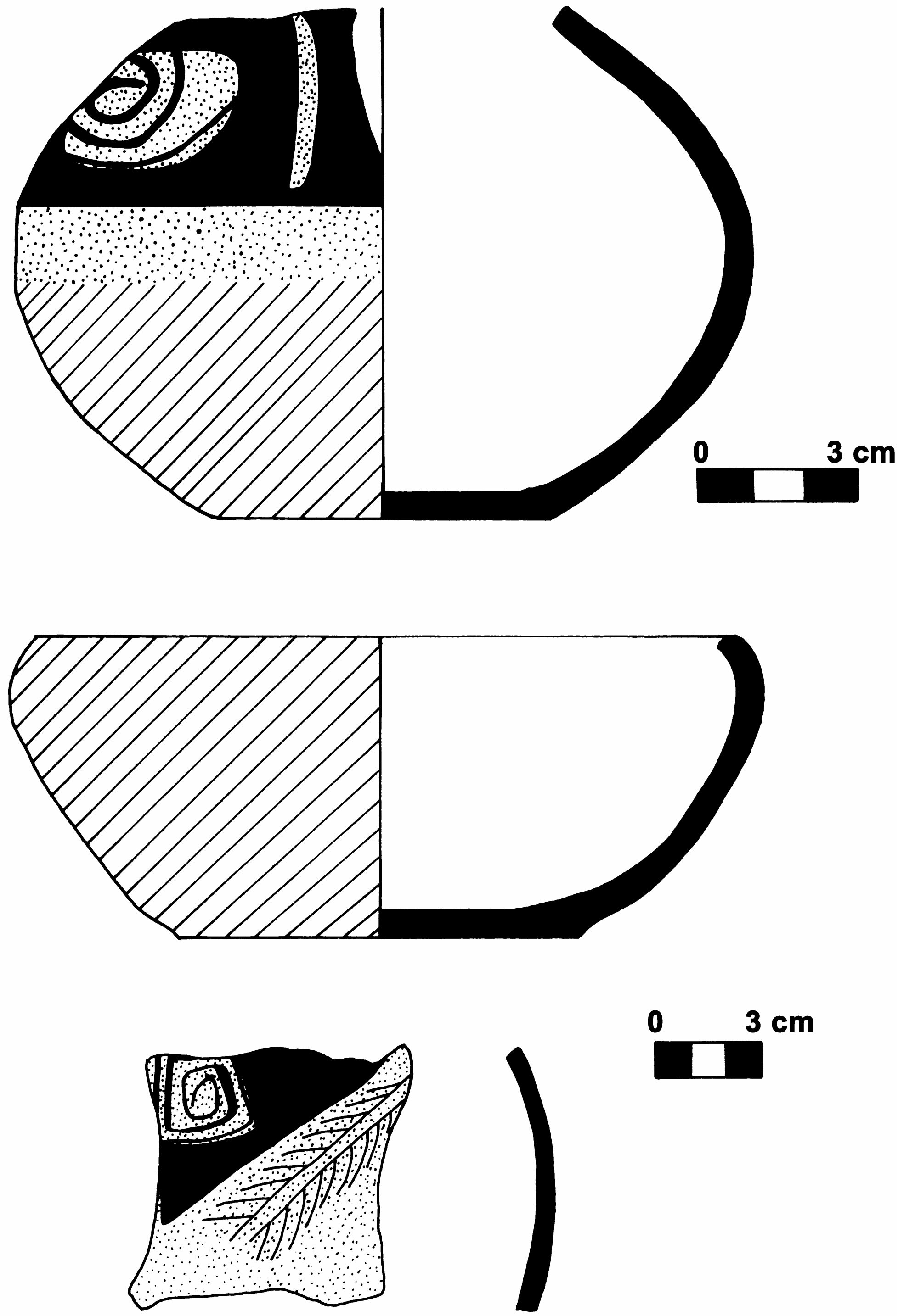


Figure C22. Chicha style ceramics.

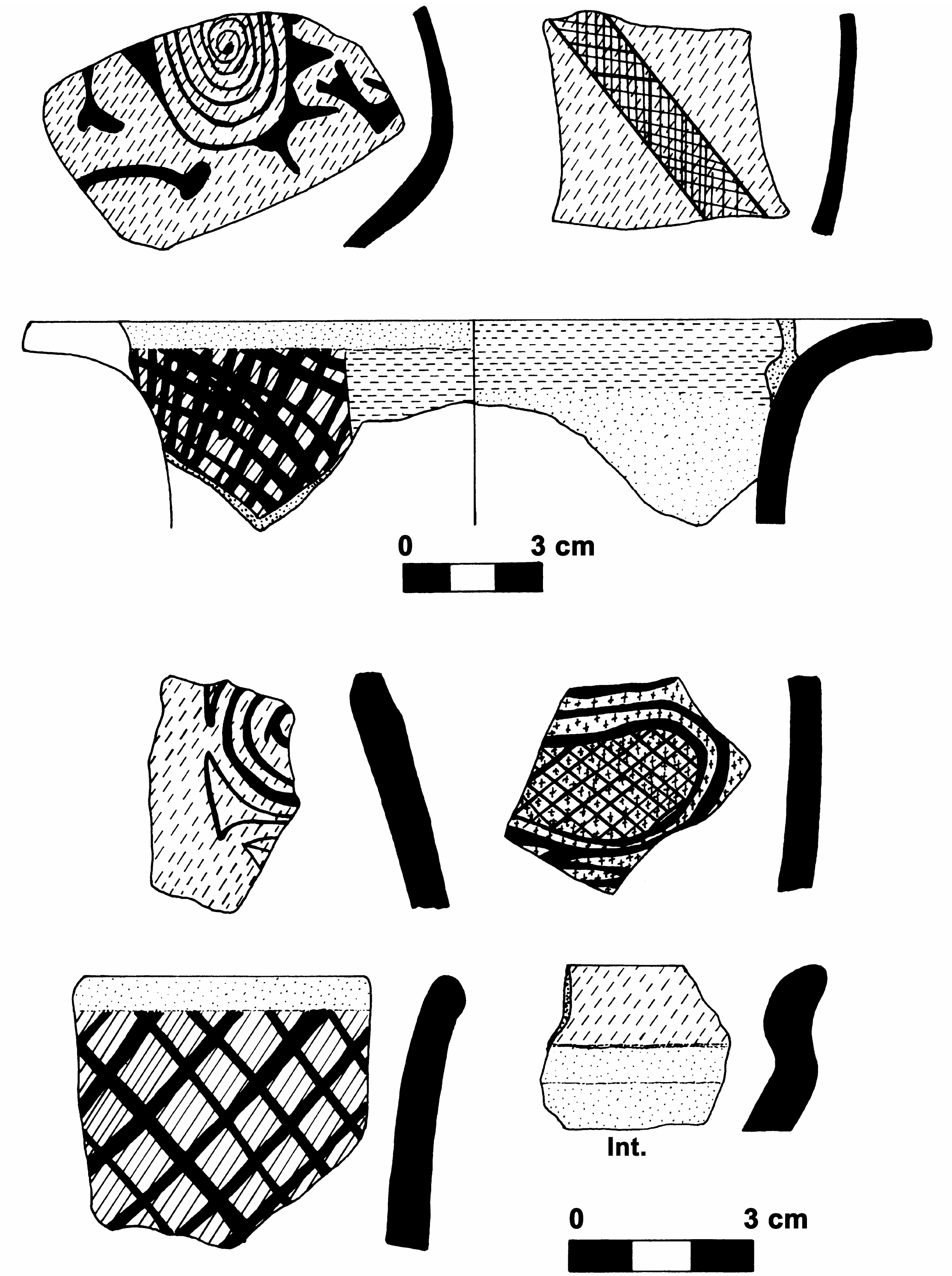


Figure C23. Chicha style decorative patterns.

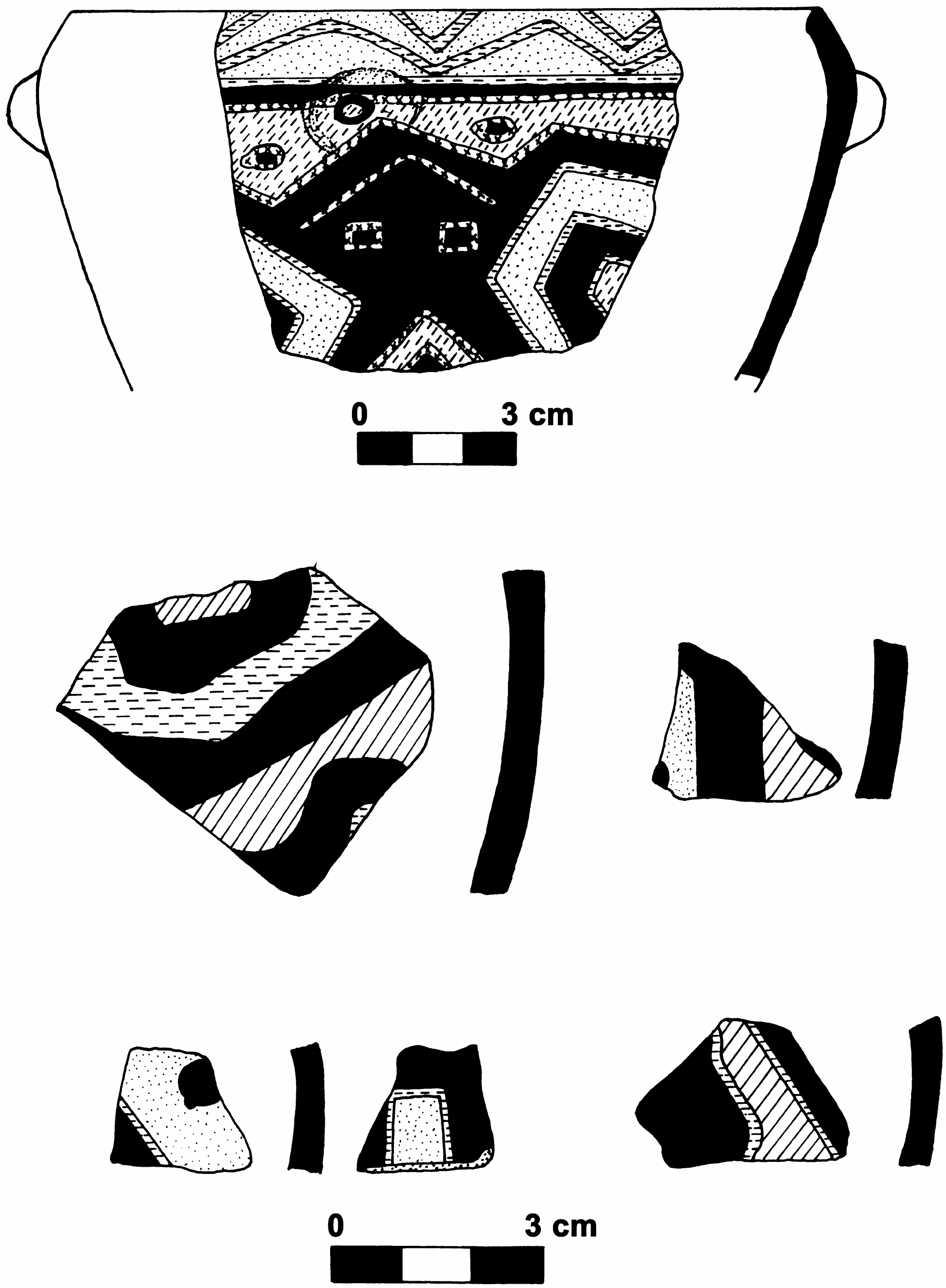


Figure C24. Yampara style ceramics.

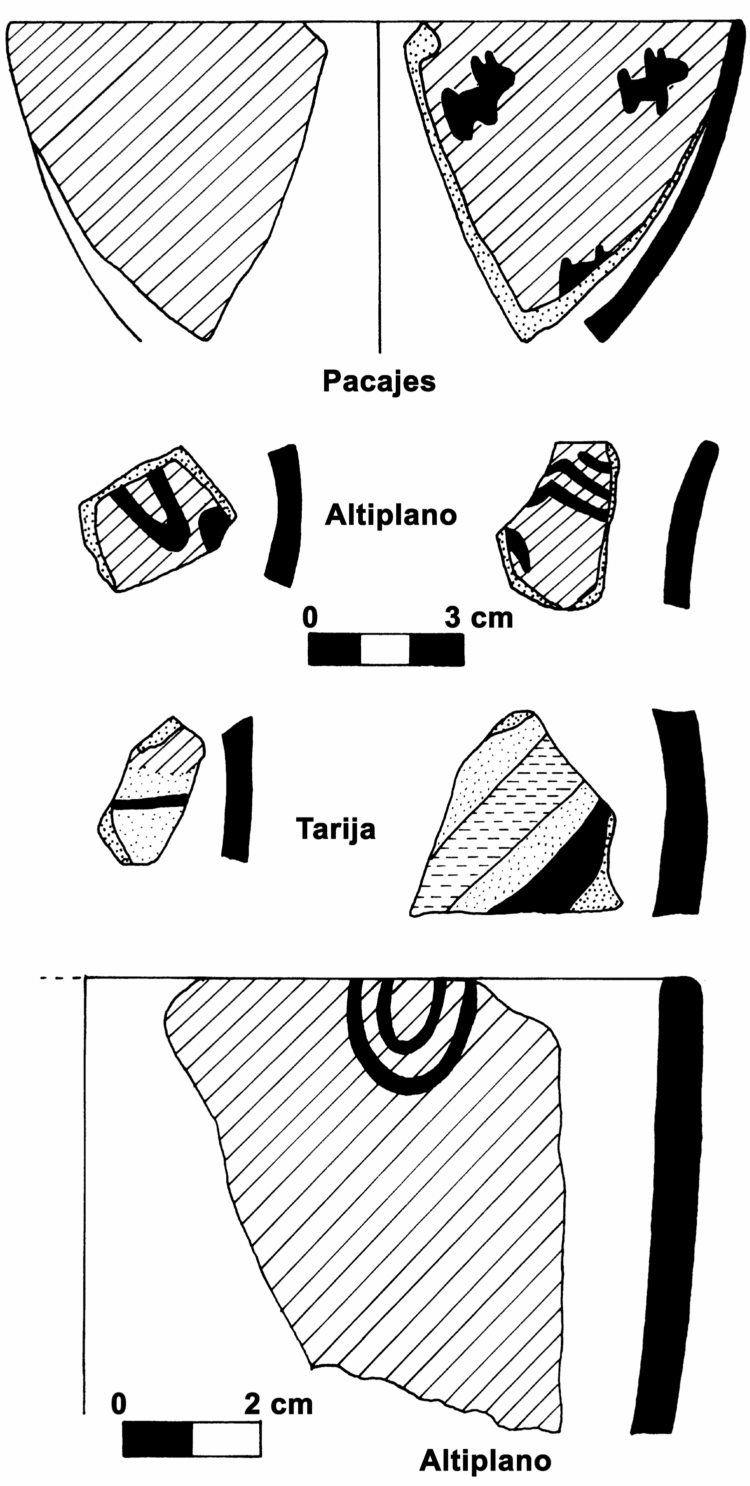


Figure C25. Other foreign styles in Cinti.

APPENDIX D

SITE DESCRIPTION

SITE DESCRIPTION

This section presents a description of registered sites ordered by number, including location (IGM sheet "hoja" number, scale 1:50,000, UTM coordinates), natural setting, modern land use, archaeological remains, classification, and function. Site size is given according to periods when a site was occupied in more than one period. Areas of agricultural fields associated with the sites are not included in site size.

C-1 (Calvario Mokho)
Location: Hoja Muyuquiri 6532 I, (E277558 N7735362)
Natural Setting: 3240 masl, upper valley, Carusla Valley, located on top of a natural mound or elevation near a river, adjacent is a small *calvario* or chapel. Vegetation consists of grasses and xerophytic plants.
Modern Land Use: pasturage.
Archaeological Remains: segments of foundations with single stone lines and concentration of stones in areas of possible structures. Dispersion of materials covers an area of 0.65 ha on the top of the mound. Some mortars were observed on the surface. Ceramic and lithic materials scattered on surface.
Classification: Formative, small village (0.65 ha), ERD small village (0.65 ha).

C-2 (Horno Khasa)
Location: Hoja Muyuquiri 6532 I, (E278995.7, N7736312.8)
Natural Setting: 3460 masl, upper valley, Santa Ana area. A shelter with a cave located at the end of a narrow *quebrada*, in an area of large sandstone rock outcrops with shelters and caves, in the middle of a *queñua* grove. Good visibility of the Carusla basin.
Modern Land Use: None.
Archaeological Remains: The walls and top of the cave are covered by rock art paintings depicting human beings, perhaps "shamans" based on the depicted ornaments, geometric motifs and animals, especially camelids and lizards with three fingers. Colors are bright in white, red, yellow, green, and black. It seems the cave had a long period of use because paintings are elaborated in what appear to be distinct artistic styles. Outside the cave a projectile point was found and probably can be dated to the Archaic Period.
Classification: Preceramic period, rock art site (48 m^2), probably used in several periods.

C-3 (Jatun Khasa I)
Location: Hoja Muyuquiri 6532 I, (E279293.0, N7735819.3)
Natural Setting: 3620 masl, upper valley, rocky ridges on the top of Jatun Khasa Mountain. An open, flat space between the rocks in which a camp site and observatory was located. From this place a complete view of the landscape and the adjacent valleys

is possible and therefore to observe the movements of animals. There is a spring located 30 m north, below the rocky formations.
Modern Land Use: None.
Archaeological Remains: There are remains of lithic production (small projectile points, flakes, and debitage), sherds, and ashes probably corresponding to cooking fires. This camp site was settled for observing and hunting animals.
Classification: Formative, camp site (0.056 ha).

C-4 (Jatun Khasa II)
Location: Hoja Muyuquiri 6532 I, (E279326.82, N7736021.93)
Natural Setting: 3620 masl, upper valley, rocky ridges on the top of Jatun Khasa Mountain. It is located 30 m north of the anterior site.
Modern Land Use: None
Archaeological Remains: It consists of a concentration of sherds in an area protected by big rocks, probably a resting place.
Classification: Formative, off-site (2 m²).

C-5 (Jatun Khasa III)
Location: Hoja Muyuquiri 6532 I, (E279172.82, N7736125.69)
Natural Setting: 3600 mals, upper valley, below rocky crest of the top, and close to an area of springs.
Modern Land Use: Pasturage.
Archaeological Remains: Remains of jars broken by the collapse of stones over the area.
Classification: LRD?, off-site (1.50 m²).

C-6 (Jatun Khasa IV)
Location: Hoja Muyuquiri 6532 I, (E279026.45, N7735507.05)
Natural Setting: 3600 mals, upper valley, it is located in a rocky crest south from Jatun Khasa III, in the limit between the Carusla valley and the Cochaca basin. It is a sector with difficult access because of the presence of cliffs and ridges that surround it. Good visibility of the landscape.
Modern Land Use: None.
Archaeological Remains: Low density of sherds and presence of projectile points and flakes. It seems to have been an area for observing and hunting small mammals such as *viscachas*.
Classification: Formative, hunting area (0.0175 has).

C-7 (Jatun Khasa V)
Location: Hoja Muyuquiri 6532 I, (E278953.34, N7735368.84)
Natural Setting: 3530 masl, upper valley, it is located in a rocky crest, approximately 200 m south of the C-6. There is good landscape visibility; the sector is difficult to access because of the ridges.
Modern Land Use: None.
Archaeological Remains: Low concentration of sherds and lithic materials, it is a hunting area.

Classification: Formative, hunting area (42 m²).

C-8 (Escuela Carusla)
Location: Hoja Muyuquiri 6532 I, (E276882.69, N7735019.67)
Natural Setting: 3220 masl, upper valley, it is a small elevation over which the old *hacienda*, current school and basketball court are located.
Modern Land Use: School.
Archaeological Remains: There is no evidence of structures on surface. The site is badly damaged because of later constructions in the area. Behind the school there is a sector preserved, with concentrations of sherds.
Classification: Formative, small village (0.90 has), ERD, small village (1.78 has), some scattered sherds of colonial-republican data.

C-9 (Manzanal)
Location: Hoja Muyuquiri 6532 I, (E276302.70, N7732857.28)
Natural Setting: 2980 masl, upper valley. It is located in a shelter, in the bottom of a rocky crest that divides de Muyuquiri area from Huankarani. Down on the slope there are remains of prehispanic agricultural terraces.
Modern Land Use: Pasturage and shelter for goats.
Archaeological Remains: Rocky shelter with rock art. Paintings in red, wine red and black colors depict geometric motifs that resemble textile designs. Anthropomorphic figures in groups and holding hands are also common. There are 6 separate panels or areas with motifs. There is no evidence of ceramics or other materials.
Classification: LRD?, rock art site (31.92 m²).

C-10 (Tranquita)
Location: Hoja Muyuquiri 6532 I, (E278214.71, N7734957.94)
Natural Setting: 3350 masl, upper valley. The site is located in the bottom of Jatun Khasa Mountain and in front of C-1, close to a spring. It is a cave associated with a spring.
Modern Land Use: Shelter for goats and spring for herders.
Archaeological Remains: The cave has part of the walls burned; such pattern can be related to human occupation but also to practices of getting honey from beehives. Outside the cave there is a flat area where there are delimiting walls, although they seem to be modern.
Classification: Formative, LRD (0.0144 has).

C-11 (Cueva Cuchito)
Location: Hoja Muyuquiri 6532 I, (E277607.91, N7734945.62)
Natural Setting: 3240 masl, upper valley, this is a slope with water springs and wet areas good for pasturage.
Archaeological Remains: Retaining wall of a low platform that delimit the site. Stones are big and are stacked without mortar. The area is heavily eroded and the vegetation is xerophytic.
Modern Land Use: Area of pasturage and fuel collection.

Archaeological Remains: Circular concentrations of stones (five possible structures) that correspond to small structures show some type of temporal occupation. Circular concentrations measure as a mean 1.12 x 0.80 m, there is also one probable rectangular structure of 3.20 x 3 m. They are located over small elevations close to the seasonal stream. There are sherds in very low density, projectile points and debitage.
Classification: Preceramic, Formative and ERD?, camp site (0.28 has).

C-13 (Juchuy Falsuri)
Location: Hoja Muyuquiri 6532 I, (E277486.92, N7732103.15)
Natural Setting: 3230 masl, upper valley. The site is located on the top of a hill, in a flat area that looks toward Cochaca.
Modern Land Use: This area was used some years ago as a soccer field and there is a modern structure associated with a wall that surrounds the field.
Archaeological Remains: Low concentrations of sherds and concentration of lithic materials near the structure. They are projectile points, preforms, and flakes.
Classification: Preceramic, camps site, colonial? (0.91 has).

C-14 (Rupaskayu)
Location: Hoja Muyuquiri 6532 I, (E277440.50, N7731221.51)
Natural Setting: 3060 masl, upper valley, located north to the Huankarani River, behind the Ichu Loma hill. The site is placed in a slope with a strong gradient; there are some abandoned modern structures. The site is covered by a xerophytic forest that includes cactus and *churqui* trees.
Modern Land Use: homestead.
Archaeological Remains: Presence of structure foundations and a water channel of 40 cm width, delimited by flat, vertical stones. The bedrock was used in paths that cross the site. The ceramic material is dispersed and erosion has dragged it down the slope. On the surface there are some mortars and lithic materials.
Classification: ERD, small village (0.51 has), modern homestead.

C-15 (Jalanta)
Location: Hoja Muyuquiri 6532 I, (E277668.38, N7731865.23)
Natural Setting: 2900 masl, upper valley, located in a medium slope south of the Juchuy Falsuri hill, the area is covered by xerophytic vegetation.
Modern Land Use: Pasturage.
Archaeological Remains: The site presents a habitation sector with structure walls and platforms associated with agricultural terraces that measure 1.5 x 3.0 m. In some cases, terraces are semicircular and lack irrigation channels. Ceramic materials are present in very low density.
Classification: ERD, small village (1.68 has) associated with agricultural fields (2.50 has).

C-16 (Talasa Cochaca)
Location: Hoja Muyuquiri 6532 I, (E278546.70, N7732566.78)
Natural Setting: 3100 masl, upper valley, the site is located to 500 m SE of the Cochaca community, in a low hill that dominates the surrounding landscape, associated

to the west with a prehispanic road that crosses the site from north to south. Modern corrals are placed over foundations of big structures.
Modern Land Use: Corrals for herds.
Archaeological Remains: The site presents the remains of foundations and collapsed structures. Two sectors can be differentiated: a habitational area and an area with big structures either corrals or patios with semicircular walls. Structures are rectangular in shape, with foundations 40 cm wide and measures of 4 x 4 m, although bigger structures are present too. In some areas structures surrounds rectangular patios. To the west there is an area (3.2 ha) of agricultural fields with irrigation channels associated to the site. Here low terraces of 1.50 x 3 m, divided by irrigation channels that run from north to west and south to east.
Classification: Formative, large village (3.12 has), LRD, LH, large village (3.65 has).

C-17 (Jayasamana)
Location: Hoja Muyuquiri 6532 I, (E278602.88, N7731186.46)
Natural Setting: 3080 masl, upper valley, it is located 2 km SE from C-16, near the Palcamayu *quebrada*.
Modern Land Use: Pasturage.
Archaeological Remains: This site presents different functional areas: in the upper part or north, there are concentrations of lithic remains suggesting an area of production of these artifacts, in the central part there are corrals, while to the southeast there is a sector of structures. This site is associated with agricultural terraces located to the west. Ceramic materials are scanty. The agricultural area (0.32 has) presents platforms divided by one line of stones between each terrace. Canals cross the terraces and were built with two lines of stones, they are 20 –30 cm width and irrigated fields to both sides.
Classification: LRD, large village (5.37 ha).

C-18 (Palcamayu)
Location: Hoja Muyuquiri 6532 I, (E278405, N7730723)
Natural Setting: 3100 masl, upper valley, located on the top of the Palcamayu hill in two peaks and a separating flat saddle. Good view of the Cochaca basin and the Tacaquira valley. The site is covered by dense xerophytic vegetation that made it difficult to record the structures.
Modern Land Use: Pasturage.
Archaeological Remains: This is a big site with a dense occupation reflected in residential terraces with remains of structure foundations, patios and burials. Structures are rectangular with variable dimensions, although with a mean measure of 3 x 4 m. Foundations consist of one and two lines of stones.
A prehispanic road crosses the site in the flat part of the site. This road is well worked and paved with stones and has staircases. The site is associated with agricultural fields or terrace systems (1.63 ha) located to the SW near the river.
Classification: Formative, small village (1.3 ha); ERD, large village (7.26 ha).

C-19 (Jalanta sur)
Location: Hoja Muyuquiri 6532 I, (E277619.86, N7731034.04)
Natural Setting: 3060 masl, upper valley, the site is located on the top of a hill.

Modern Land Use: Pasturage and agriculture.
Archaeological Remains: The site is characterized by the presence of five small, circular, dispersed structures similar to those described for C-12. They measure 1 m radius and are associated with lithic artifacts. North of this area is an agricultural area with prehispanic terraces of later period construction, LRD (2.83 has), associated with low densities of ceramic materials.
Classification: Preceramic, camp site (1 has).

C-20
Location: Hoja Muyuquiri 6532 I, (E278679.14, N7732028.74)
Natural Setting: 3100 masl, upper valley, it is located in a low plateau.
Modern Land Use: Agriculture.
Archaeological Remains: The site presents agricultural terraces with concentrations of lithic artifacts in the upper sector. It seems an early occupation was disturbed by the construction of these terraces during the LRD Period. Terraces are separated every 8 m by irrigation channels that run perpendicular to the terraces. Terraces measure 1 m width by 3 m long.
Classification: Formative, hunting area?, LRD, LH, agricultural area (0.8 has).

C-21 (Cochaca este)
Location: Hoja Muyuquiri 6532 I, (E278695.18, N7732926.50)
Natural Setting: 3100 masl, upper valley, the site is located east of C-16 on a rocky formation.
Modern Land Use: agriculture and homestead.
Archaeological Remains: Remains of agricultural terraces 1 m width by 5 m long, separated by stone irrigation channels of 20 cm width. Terraces are delimited by rows of stones; the differences in altitude are minimal.
Classification: LRD, LH, agricultural terraces (4.57 has).

C-22
Location: Hoja Muyuquiri 6532 I, (E279620.27, N7731858.51)
Natural Setting: 3250 masl, upper valley, it is located at the top of a syncline.
Modern Land Use: Pasturage.
Archaeological Remains: Concentration of lithic materials especially flakes.
Classification: Period non defined, lithic working area (0.015 has).

C-23
Location: Hoja Muyuquiri 6532 I, (E279096.63, N7731033.24)
Natural Setting: 3040 masl, upper valley, the site is located in an area of eroded slopes, on the bottom of a rocky hill dividing the Cochaca basin and the synclines to the east.
Modern Land Use: Pasturage.
Archaeological Remains: The site is dispersed and presents in some parts concentrations of stones that probably were part of some type of structure. Ceramic and lithic materials in low densities and scattered.
Classification: Preceramic, Formative, camp site? (0.10 has)

C-24
Location: Hoja Muyuquiri 6532 I, (E278915.53, N7730903.27)
Natural Setting: 3020 masl, upper valley, it is located in an area of eroded slopes, near a prehispanic road.
Modern Land Use: Pasturage.
Archaeological Remains: There are dispersed concentrations of stones over the landscape that were part of small circular structures. These features are associated with projectile points and flakes.
Classification: Preceramic, camp site (0.15 ha).

C-25
Location: Hoja Muyuquiri 6532 I, (E278876.35, N7730174.38)
Natural Setting: 3000 masl, upper valley, it is located in a low slope surrounding by *quebradas*, SE of C-18.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural area with terraces and irrigation channels; preservation is bad. Low density of scattered sherds.
Classification: LRD, LH, Agricultural terraces (0.15 ha).

C-26
Location: Hoja Muyuquiri 6532 I, (E278974.24, N7730071.65)
Natural Setting: 2980 masl, upper valley, it is located on a slope of a small hill, crossing the *quebrada* that separates this area from site C-25.
Modern Land Use: Pasturage.
Archaeological Remains: Remains of agricultural terraces and irrigation channels associated with dispersed sherds.
Classification: LRD, LH, agricultural terraces (0.11 ha).

C-27 (Huaca Cancha)
Location: Hoja Muyuquiri 6532 I, (E280933.40, N7731718.26)
Natural Setting: 3090 masl, upper valley, it is located on eroded terrain crossed by three *quebradas*, south of Huaca Cancha's agricultural area.
Modern Land Use: Pasturage.
Archaeological Remains: Small circular structures (1 m diameter), dispersed in the landscape, associated with concentrations of lithic materials and flakes. Lithic artifacts were being produced in this area. Few sherds are associated with this site.
Classification: Preceramic, ERD?, camp site (0.53 has).

C-28
Location: Hoja Muyuquiri 6532 I, (E279444.08, N7732137.36)
Natural Setting: 3080 masl, upper valley, the site is located in the slope of a syncline, next to C-22.
Modern Land Use: Pasturage, corrals.

Archaeological Remains: Agricultural terraces built with one line of stones, 3 x 1 m. Each 6 m are irrigation channels that run perpendicular to the terraces, with a width of 30 - 40 cm and walls with big rocks. Scattered sherds.
Classification: LRD, LH, agricultural terraces (0.18 ha).

C-29 (Ichu Khasa)
Location: Hoja Muyuquiri 6532 I, (E280027.13, N7732145.81)
Natural Setting: 3065 masl, upper valley, it is located in a slope down to C-27 and crossing the Huaca Cancha river.
Modern Land Use: Agricultural area.
Archaeological Remains: Lining of stones that appear to have formed part of agricultural terraces now destroyed by modern agriculture. There is a terrace wall that crosses the site from north to south. There are scattered sherds and lithics.
Classification: Formative, LRD, LH, agricultural terraces (1.4 ha).

C-30
Location: Hoja Muyuquiri 6532 I, (E280358.03, N7733126.97)
Natural Setting: 3120 masl, upper valley, the site is located on a hill that dominates the area of Huaca Cancha.
Modern Land Use: Pasturage.
Archaeological Remains: Source of quartzite for lithic artifacts. Rocky outcrops are associated with hundreds of flakes that were being obtained here. It is a quarry area.
Classification: Source of quartzite used probably through all the prehispanic sequence (2.0 ha).

C-31
Location: Hoja Muyuquiri 6532 I, (E280692.14, N7733083.87)
Natural Setting: 3100 masl, upper valley, it is located in a small hill in front of C-30, near Huaca Cancha community.
Modern Land Use: Small rural property.
Archaeological Remains: Agricultural area with remains of terraces, irrigation canals, and possibly some structures, but they are not clearly defined. Very low density of sherds and lithic materials.
Classification: LRD, LH, agricultural terraces (1.15 ha).

C-32
Location: Hoja Muyuquiri 6532 I, (E281338.79, N7734064.51)
Natural Setting: 3160 masl, upper valley, the site is located south of the *quebrada* Lajahuayco, at the end of the valley.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces of 5 m long by 2 m wide associated with irrigation channels 50 cm width, oriented from north to south, they run in the middle of the terraces. Terraces are low, with one line of stones.
Classification: LRD, LH, agricultural terraces (0.78 ha).

C-33
Location: Hoja Muyuquiri 6532 I, (E281252.57, E7733978.30)
Natural Setting: 3110 masl, upper valley, it is located near river in front of the hill that divides Huaca Cancha from Chajra Khasa.
Modern Land Use: Agricultural area.
Archaeological Remains: Agricultural terraces, badly preserved associated with dispersed sherds.
Classification: Formative, LRD, LH, agricultural terraces (0.46 ha).

C-34
Location: Hoja Muyuquiri 6532 I, (E278331.84, E7733353.27)
Natural Setting: 3080 masl, upper valley, the site is located on a flat elevation close to the river of Oveja Cancha and near the Cochaca community.
Modern Land Use: Area of transit, there is a path linking Oveja Cancha with Cochaca.
Archaeological Remains: There are structures and corrals grouped in two sectors: north and south, with an intermediate open area with some stone linings. Structures are placed over terraces, and surrounded by patio walls. Structures have one line of stones united by a mud mortar. There are signs of at least one rectangular cist burial (1.20 x .94 m) built with small stones and delimited by long ones. The settlement is crossed by a prehispanic road. Ceramic materials are concentrated over all in the southern part.
Classification: LH, small village (0.68 ha).

C-35 (Antigua)
Location: Hoja Muyuquiri 6532 I, (E277673.61, E7733495.16)
Natural Setting: 3160 masl, upper valley, it is located down slope from the currentl water reservoir and the remains of the hacienda Cochaca.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces with irrigation channels, they measure 3 x 1.80 m and the channels are 20 cm wide. Most of the terraces have retaining walls of one line of stones, although in stepped sectors walls are higher and preserved up to 4 rows of stones. Possibly some structures in the northern part of the site, although the remains are badly preserved and it is difficult to discern their nature. Ceramic materials are dispersed in the area in low densities.
Classification: LRD, LH, agricultural terraces (2.33 ha).

C-36 (Burrusuyunaj)
Location: Hoja Muyuquiri 6532 I, (E278498.53, N7733652.61)
Natural Setting: 3140 masl, upper valley, it is located on a flat area north of C-34 with a good visibility of the landscape; the area is eroded and cut by *quebradas*.
Modern Land Use: Pasturage.
Archaeological Remains: Presence of concentrations of stones that seem to correspond to some sort of small circular structures; there are five of them associated with lithic materials. In the southern part there are some colonial walls associated with vitrified sherds.
Classification: Preceramic, Formative, ERD?, camp site (0.50 ha).

C-37 (Burrusuyunaj II)
Location: Hoja Muyuquiri 6532 I, (E278923.15, N7734304.00)
Natural Setting: 3260 masl, upper valley, it is located north to C-12 in the same flat area.
Modern Land Use: Pasturage.
Archaeological Remains: Surface remains of two rings associated with sherds and flakes. Camp sites in this flat area seem to form part of a hunting landscape rather than discrete concentrations of features or "sites".
Classification: Preceramic, Formative, LRD?, camp site (0.06 ha).

C-38 (Chajra Khasa)
Location: Hoja Muyuquiri 6532 I, (E280012.39, N7734244.16)
Natural Setting: 3220 masl, upper valley, the site is located on an isolated rocky elevation surrounded by two rivers, north of Patapampa hill. It dominates the landscape in its strategic position.
Modern Land Use: Area of fuel gathering.
Archaeological Remains: The site presents three different sectors in which there are compounds or groups of structures and corrals. Sector 1 located in the north part shows broad terraces and corrals, Sector 2 to the west presents smaller structures or dwellings and corrals, and Sector 3 to the south, separated from the rest by an open space, has structures and corrals and, down the hill, agricultural terraces (0.35 has). The main characteristic of this site is the presence of corrals suggesting its function in housing llama caravans. It is close to a system of prehispanic roads that enter the valley from Suquistaca, north of this site. Agricultural terraces measure 3 x 1.50 m; they are delimited by retaining walls of one line of stones, and are crossed by irrigation channels of 20-30 cm width.
Classification: LH, large village (3.26 ha).

C-39 (Talasa Chajra Khasa)
Location: Hoja Muyuquiri 3562 I, (E281111.49, N7734964.54)
Natural Setting: 3200 masl, upper valley, this site is located on the eastern hill slope of the Chajra Khasa basin, close to the river; currently the site is in the middle of a xerophytic grove.
Modern Land Use: Fuel gathering area.
Archaeological Remains: The settlement was built over residential terraces 5 to 10 m width, and retaining walls 50 cm high. Foundations of rectangular structures present one and two lines of stones and mud mortar. Although the vegetation prevents having a clear idea of the layout, the site appears to have been planned because terraces are connected by circulation areas and staircases. Dwellings have their patio located to one side of them, structures measure 3 x 4 m and patios 6 x 8.30 m approximately. The site is surrounded by agricultural terraces with irrigation channels, due to the gradient retaining walls reach until 60 cm high.
Classification: LRD, LH, large village (2.26 has).

C-40
Location: Hoja Muyuquiri 3562 I, (E280995.04, N7734139.47)

Natural Setting: 3240 masl, upper valley, it is located to approximately 500 m south of C-39, on the top of a hill.
Modern Land Use: Pasturage.
Archaeological Remains: The site is characterized by the presence of some structures of a homestead surrounded by agricultural terraces. There are three structures in a terrace 7 m wide, they present rectangular foundations with one line of big stones. Terraces (0.38 ha) are oriented from north to south and measure 18 x 4 m, with one line of stones in the retaining wall.
Classification: LRD, homestead (0.01 has).

C-41 (Escuela Cochaca)
Location: Hoja Muyuquiri 3562 I, (E278977.02, N7733303.57)
Natural Setting: 3090 masl, upper valley, it is located at the edge of a *quebrada*, approximately 200 m north of the Cochaca school, in the bottom of Patapampa hill.
Modern Land Use: Pasturage.
Archaeological Remains: At least one structure or dwelling associated with two levels of terraces, and a corral with a small structure, probably for storage.
Classification: LRD, homestead (0.07 has).

C-42 (Patapampa)
Location: Hoja Muyuquiri 3562 I, (E279861.18, N7733677.17)
Natural Setting: 3100 masl, upper valley, the site is located on the northeast slope of the Patapampa hill. In the northernmost part of the site there is a modern homestead.
Modern Land Use: Pasturage.
Archaeological Remains: Dispersion of lithic artifacts and materials in a flat area. Evidence of lithic artifact production.
Classification: Preceramic, LRD?, Camp site (1.2 has).

C-43
Location: Hoja Muyuquiri 6532 I, (E280019.97, N7733022.25)
Natural Setting: 3060 masl, upper valley, it is located next to a river, on the southern slope of the Patapampa hill; the path to Huaca Cancha crosses the site.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces of one line stones in the retaining walls forming rectangles, separated by irrigation channels. Terraces measure 4.50 x 1.80 m and channels are 20 cm wide. Scattered sherds on the surface.
Classification: LRD, LH, agricultural terraces (2.28 has).

C-44 (Escuela Muyuquiri)
Location: Hoja Muyuquiri 6532 I, (E275789.74, N7732141.81)
Natural Setting: 3125 masl, upper valley, the site is located in a slope in front of the Muyuquiri school, crossing the river, and behind the modern boarding school.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces and irrigation channels badly preserved; remains of retaining walls with stones united by mortar. There are walls with big stones that seem to delimit planting areas.

Classification: LRD, LH, agricultural terraces (5 has).

C-45 (Huankarani)
Location: Hoja Camargo 6532 II, (E277248.19, N7730328.70)
Natural Setting: 3100 masl, upper valley, the site is located on the flat top of the Huankarani hill, where the current soccer field is placed.
Modern Land Use: Pasturage and sport field.
Archaeological Remains: This site forms part of C-48; it is the latest expansion of that site during the LH. Because of the vegetation it is difficult to locate differences in areas or sectors, patios are associated with structures with double line of stones used in wall foundations. To the north, there are platforms and structures smaller than those located to the east and south. In the west and south margins, the site is delimited by a large wall that protects it and runs from C-48 to this area. Below the hill peak, the slopes are covered by agricultural terraces and channels, although most of them were destroyed or reshaped in modern times, some sectors still have intact remains of these fields.
Classification: LH, part of the regional center (6.12 has).

C-46 (Falsuri)
Location: Hoja Camargo 6532 II, (E280523.79, N7729927.92)
Natural Setting: 3120 masl, upper valley, the site is located on the last syncline of the valley, in an eroded slope.
Modern Land Use: Pasturage.
Archaeological Remains: Dispersion of ceramic sherds in a rocky outcrop. It might have been a place of seasonal occupation.
Classification: Formative, LRD?, camp site (0.03 has).

C-47 (Falsuri II)
Location: Hoja Camargo 6532 II, (E280399.45, N7729353.09)
Natural Setting: 3120 masl, upper valley, it is located on a slope near *quebradas*; there are remains of two modern dwellings.
Modern Land Use: Homestead.
Archaeological Remains: Agricultural terraces of one line of stones for terraces walls, with irrigation channels that run transversally to them, associated with disperse sherds.
Classification: Formative, LRD, LH, agricultural terraces (0.10 has).

C-48 (Jatun Talasa Huankarani)
Location: Hoja Camargo 6532 II, (E276296.00, N7730992.72)
Natural Setting: 3100 masl, upper valley, this site is located on the Huankarani hill that dominates the landscape in the upper valley thanks to its central position in the area. The hill is surrounded by two rivers and has some springs that allowed the development of agricultural terraces in its low slopes.
Modern Land Use: The residential area is used as pasturage, while the terraces are used for agriculture. As the site is big, the current community of Huancarani is placed here.
Archaeological Remains: The settlement is located on the hill top; residential terraces were built over the slopes to serve as platforms for structures, open spaces and

circulation areas. There are two big walls that cross the site and delimit it separating areas or sectors, suggesting the existence of some type of social segmentation or social differentiation.

The site was divided into 7 sector for making systematic collections: Sector 1 is located in the west peak of the mountain looking at the Liquemayu valley and to the interior concave area of the same site, Sector 2 corresponds to the flat area that exists between the two peaks and to the east peak of the settlement it is separated from sector 1 through a big wall, Sector 3 is placed southeast from Sector 2 and it is characterized by the presence of well built terraces with retaining walls of at least 2 m high, and a high density of grinding implements on the surface. Structures measure 5 x 3 m as a mean and are associated with patios. Sector 4-5 is located in the north part of the site, facing the Liquemayu River; all these sectors are separated by the rest of the settlement by a big wall placed behind the east peak. Sector 6 is located on the east slope of the mountain and has a lower density of structures than the previous sectors; it is delimited to the west by the big wall and to the east by a prehispanic path. Between this sector and sector 7 there is an open rocky area where the prehispanic road and the big wall cross toward the east. Sector 7 is located behind a small hill in the current Huankarani community, part of the terraces and road have been damaged by agricultural practices, construction of modern houses and the hacienda. C-45 continues next to sector 7 in a flat top of the mountain, it was part of C-48 during the LH.

One of the striking surface features of this site is the density of grinding implements and possibly hoes in all of the settlement. Particularly, Sector 3 displays *batanes* and *manos* of different sizes, flat stones for making flour, and conic stones that might have been used as hoes, suggesting that agricultural activities and food processing were basic activities. Graves consist mainly of cist tombs of circular shape that once had a long stone standing as a marker, today this feature has disappeared as looters have destroyed most of them.

Classification: Formative, small village (2 has), ERD, large village (3.45 ha), LRD, regional center (17 has), LH, regional center (23.12 has).

C-49

Location: Hoja Camargo 6532 II, (E278676.90, N7727648.37)

Natural Setting: 3020 masl, upper valley, it is located on a slope with *quebradas*, near the estancia Potrero.

Modern Land Use: Pasturage.

Archaeological Remains: Agricultural terraces with one line of stones, associated with dispersed sherds.

Classification: LH, Agricultural terraces (0.28 ha).

C-50 (Potrero)

Location: Hoja Camargo 6532 II, (E277892.47, N7727055.66)

Natural Setting: 2960 masl, upper valley, it is located on a flat area between two hill slopes in the Potrero sector.

Modern Land Use: Pasturage.

Archaeological Remains: Dispersion of ceramic sherds and lithics in low densities.

Classification: LRD, camp site (0.40 ha).

C-51
Location: Hoja Camargo 6532 II, (E278171.44, N7728117.20)
Natural Setting: 2960 masl, upper valley, it is located near current agricultural areas.
Modern Land Use: Agriculture.
Archaeological Remains: Presence of destroyed semicircular structures built with big stones. Dispersed sherds in the area.
Classification: LRD, homestead with corrals (0.09 has).

C-52
Location: Hoja Camargo 6532 II, (E278288.91, N7728284.17)
Natural Setting: 2940 masl, upper valley, this site is located south east of site C-51, in an area where two synclines join; there are two current houses and their agricultural fields.
Modern Land Use: homestead and agricultural fields.
Archaeological Remains: Agricultural terraces, 5 x 1.50 to 2 m with one line of stones (10 to 40 cm), connected by irrigation channels of 40 – 50 cm width. There is a flat space in the upper part of the terraces that divides them; here there are scattered lithic and sherds.
Classification: Formative, LRD, LH, agricultural terraces (0.8 has).

C-53 (Santa Rosa)
Location: Hoja Camargo 6532 II, (E277392.85, N7728886.27)
Natural Setting: 2920 masl, upper valley, the site is located in front of C-45, crossing the Liquemayu river, where the hacienda Santa Rosa was placed. It is badly disturbed because the hacienda infrastructure was built over the prehispanic remains.
Modern Land Use: hacienda and homesteads.
Archaeological Remains: There are remains of residential terraces, platforms, and segments of single line stone foundations, but all the layout is obliterated by the last occupation. There are looted cist burials with dimensions 0f 50 x 50 cm built from small stones with flat stones sealing them.
Classification: Formative, small village (2 has), LRD, large village (7.10 has), LH, large village (7.10 has).

C-54 (Tacaquira Este)
Location: Hoja Camargo 6532 II, (E276969.51, N7728091.36)
Natural Setting: 2920 masl, upper valley, this site is located south of C-53 and constituted its agricultural area.
Modern Land Use: Pasturage in the upper part and agricultural area in the lower part.
Archaeological Remains: Agricultural terraces built with small stones, retaining walls 30 cm high, and presence of irrigation channels. One important feature is the presence of promontories of stones or *despiedre* mounds associated with the terraces. Such a feature suggests these fields were being implemented in relatively late times. A prehispanic path, part of a road system, crosses the site in the upper part. There is also evidence of a small structure with a platform, located next to the path for probably carrying products from the site to other places.

Classification: LRD?, LH, agricultural terraces (37.95 ha)

C-55 (Ojo)
Location: Hoja Camargo 6532 II, (E275977.22, N7726840.67)
Natural Setting: 2820 masl, upper valley, this site is located in a small syncline, crossing the river that separates C-54 to the south. Probably both were part of the same agricultural complex.
Modern Land Use: Pasturage.
Archaeological Remains: agricultural terraces crossed by irrigation channels, badly preserved.
Classification: LRD, LH, agricultural terraces (1.79 has).

C-56 (La Marchana)
Location: Hoja Camargo 6532 II, (E276461.40, N7728541.91)
Natural Setting: 2880 masl, upper valley, small hill located northeast of the Tacaquira town. In the lower western part there are some modern houses and the *Calvario* or shrine.
Modern Land Use: Properties and Pasturage.
Archaeological Remains: Agricultural terraces (1.50 x 3 m) with irrigation channels associated with promontories of stones, they cover an area of 0.40 has. In the southern part there exist structures and patios and more concentrations of sherds. There are three levels of terraces, 6 m wide, and a structure (2.8 x 3 m).
Classification: Formative, homestead, LRD, LH, homestead (0.45 has).

C-57 (Tambohuayco)
Location: Hoja Camargo 6532 II, (E275981.25, N7730526.96)
Natural Setting: 3060 masl, upper valley, the site is located south from C-48, crossing the Tacomayu River and in the entrance to the Tacomayu Valley.
Modern Land Use: Pasturage and abandoned homestead.
Archaeological Remains: Residential terraces 40 cm high, with rectangular structures and patios in front of them. Foundations present double line of stones, and measure 40-50 cm width, structures measure 4 x 3 m and 6 x 4 m and the patios 10 x 6 m and 7 x 4 m, each of them enclose 3 to 5 structures. All structures and patios have entrances facing to the north. Walls that divide patios are one stone wide. There are three sectors with structures in the settlement.
Classification: Formative, small village (0.60 has), LRD, LH, small village (1.81 has).

C-58 (Talasa Chaco)
Location: Hoja Camargo 6532 II, (E275943.58, N7725651.07)
Natural Setting: 2820 masl, upper valley, this site is located in the small syncline behind the hacienda Chaco, almost entering to the *cañadón* that links the upper valley with the canyon.
Modern Land Use: None.
Archaeological Remains: This settlement presents structures built over terraces with stone retaining walls. Structures have rectangular foundations with single and double

lines of stones, they measure 5 x 4 m and some 7 x 4 to 5 m, but it is probable that the last are patios. Cist burials of 50 x 50 cm and 60 x 40 cm are located in the floors of structures at the terraces.
Classification: ERD, large village (4.46 has).

C-59 (Cuñuri I)
Location: Hoja Camargo 6532 II, (E276343.86, E7729675.78)
Natural Setting: 3040 masl, upper valley, the site is located in a flat area behind C-57 in the slopes of a mountain, near sources of water.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces of one line of stones, 7-8 x 3-4 m, 20 cm high, and irrigation channels of 50 cm width. The site is badly preserved due to erosion.
Classification: LRD, LH, (9.89 has).

C-60 (Sarcarca)
Location: Hoja Camargo 6532 II, (E275137.67, N7723343.52)
Natural Setting: 2900 masl, *cañadón*, it is located in a small syncline in front of the Sarcarca community.
Modern Land Use: None, eroded area with cliffs.
Archaeological Remains: Structures associated with some agricultural terraces and irrigation channels, low ceramic density.
Classification: ERD, homestead (0.16 has).

C-61(Cuñuri II)
Location: Hoja Camargo 6532 II, (E276427.06, N7728930.21)
Natural Setting: 2980 masl, upper valley, the site is located in a small hill, southeast of C-59, in Chaquijara.
Modern Land Use: None.
Archaeological Remains: Agricultural terraces in the slopes of a small hill, measuring 3 x 1.50 m, with retaining walls of one line of stones, and irrigation channels in the extremes.
Classification: LRD, LH, agricultural terraces (1.05 has).

C-62 (Volcán)
Location: Hoja Camargo 3562 II, (E272423.06, N7719353.55)
Natural Setting: 2520 masl, canyon, this settlement is located behind the hacienda Viña Vieja in two synclines with difficult access because of the eroded to prehispanic paths.
Modern Land Use: Pasturage.
Archaeological Remains: Remains of a multicomponent site, a large village with structures, patios and circulation areas built over terraces. The site is divided in two sectors, or basins separated by a *quebrada* where there are also other structures. In the central part of the first basin there are platforms and bigger structures suggesting the presence of special purpose structures or elite areas. Here terraces width measures 10 to 8 m while in other sectors 6 m. Terraces display big stones in the retaining walls and

structures with one and two lines of stones. Cist burials are common in the structures and patios. The second basin, to the south, presents high terraces (1 m) with well worked stones; it seems this sector was expanded during the LH. The site is damaged due to looting activities.
Classification: ERD, small village (1.67 has), LRD, large village (3 has), LH, large village or local center (7 ha).

C-63
Location: Hoja Camargo 3562 II, (E275660.57, N7728390.71)
Natural Setting: 2980 masl, upper valley, it is located on a flat area at the top of a small slope, northwest of the Tacaquira town.
Modern Land Use: Pasturage.
Archaeological Remains: Agricultural terraces with one line of stones and irrigation channels 40 cm wide, terraces measure 2 x 1 m, and are not higher than 10 cm.
Classification: LRD, LH, agricultural terraces, (0.03 ha).

C-64 (La Colorada)
Location: Hoja Camargo 6532 II, (E271818, N7718653.89)
Natural Setting: 2460 masl, canyon, it is located behind the casa de hacienda, towards the north, on a lower slope.
Modern Land Use: Agricultural area.
Archaeological Remains: Agricultural terraces and irrigation channels eroded and destroyed by modern agriculture.
Classification: LRD, LH agricultural terraces (0.03 ha).

C-65 (Tacaquira I)
Location: Hoja Camargo 6532 II, (E275914.12, N7728088.53)
Natural Setting: 2920 masl, upper valley, this site is located below the current water reservoir. The site is covered by xerophytic vegetation.
Modern Land Use: Pasturage.
Archaeological Remains: The settlement is located in a small slope where there are residential terraces with rectangular structures divided by circulation paths 1 m width. Structures seem to have semicircular patios in their front part, they are built with double line of stones, 50 cm width and measure 4 x 3-4 m and the patios 8 x 5 m, these last have wider walls and one line of stones. Terraces present retaining walls 50 cm high, they have big stones in the extremes as junctures and trabazon and fill of small pebbles in some sectors.
To the west and south of the site there are agricultural terraces of 3-5 x 1.50-2 m with
Structures seem to have semicircular patios in their front part, they are built with double line of stones, 50 cm width and measure 4 x 3-4 m and the patios 8 x 5 m, these last have wider walls and one line of stones. Terraces present retaining walls 50 cm high, they have big stones in the extremes as junctures and trabazon and fill of small pebbles in some sectors.
To the west and south of the site there are agricultural terraces of 3-5 x 1.50-2 m with
irrigation channels (4.84 has).
Classification: Formative, small village (0.70 has), LRD, LH, small village (1.40 has).

C-66 (La Plateada II)
Location: Hoja Camargo 6532 II, (E271072, N7717883.02)
Natural Setting: 2420 masl, canyon, the site is located in a high profile cut by the Chico river, south of the mouth of the Sereno river. Agricultural activities and sedimentation have buried deeply the site three meters down the actual surface.
Modern Land Use: Agricultural area.
Archaeological Remains: Three cultural stratums alternating with natural stratums. The first one presents a matrix of soil with charcoal, ceramic sherds, lithics and bones. The second and third stratums present a matrix of ash and charcoal apparently without artifacts.
Classification: Formative, homestead or village? (size not defined).

C-67 (Ojo)
Location: Hoja Camargo 6532 II, (E275387.53, N7726662.29)
Natural Setting: 2900 masl, upper valley, it is located at the top of a slope where there is a small shrine or chapel.
Modern Land Use: Pasturage.
Archaeological Remains: The site presents rectangular structures with foundations of double lines of stones (50 cm); they measure 3-4 x 4-6 m. Collapsed stones and xerophytic vegetation impede to have a clear idea of the layout. There is evidence of ceramic production in the presence of wasters and burned sherds. The site is associated with agricultural terraces and irrigation channels (1.81 has).
Classification: Formative, ERD, LH, small village (0.77 has) and ceramic production area.

C-68 (Frente Patronato)
Location: Hoja Camargo 6532 II, (E270250.42, N7714853.92)
Natural Setting: 2500 masl, canyon, this site is located on a hill crossing the Patronato river, north west of C-70, once it formed part of the latter site.
Modern Land Use: Pasturage.
Archaeological Remains: The site consists of corrals associated with 11 structures, that show double stone foundations and measure 6.30 x 2.30 and 6.40 x 3.80 m. In some sectors, there are piled stones that according to legend were platforms used for loading llamas.
Classification: LH, caravan housing area (0.44 has).

C-69 (Purón)
Location: Hoja Camargo 6532 II, (E275524.16, N7725074.36)
Natural Setting: 2700 masl, upper valley, located close to the Chaco cemetery in a flat area with lateral slopes.
Modern Land Use: Agricultural area.
Archaeological Remains: Eroded area with concentration of ceramic sherds on surface.
Classification: LRD, homestead (0.02 has).

C-70 (El Patronato)
Location: Hoja Camargo 6532 II, (E270519.92, N7714784.51)
Natural Setting: 2500 masl, canyon, this settlement is located in three synclines, in the first pronounced curve of the Patronato river.
Modern Land Use: Pasturage.
Archaeological Remains: The settlement is large and is placed over three synclines that are crossed first by the Patronato river and after by a *quebrada*. The north part or Sector 1 presents residential terraces with few sherds on surface, associated with a prehispanic road that crosses this sector from east to west running near C-68 and from there towards the canyon. This sector developed in later times. The Sector 2 or central part is located in the major syncline and is linked to Sector 1 by a paved path that goes down the river and then up to the Sector 1. This sector has the higher density of structures in the site and the oldest occupation, presents terraces with structures, circulation paths, and careful built rectangular structures, with walls of 70 cm and cut stones, there are grinding implements on surface. Sector 3 is the *quebrada* where terraces and structures flanking a circulation path were built to connect with Sector 4 to the south, which is the youngest extension of the site.
Classification: LRD, large village (3.17 has), LH, large village or local center (8.91 has).

C-71 (Hacienda Patronato)
Location: Hoja Camargo 65 32 II, (E269875.10, N7714257.19)
Natural Setting: 2440 masl, canyon, this site is located behind the casa de hacienda of El Patronato on a low, flat hill.
Modern Land Use: Agricultural field with remains of colonial structures corresponding to the hacienda.
Archaeological Remains: The site is completely obliterated as all structures were removed for cultivation.
Classification: ERD, small village (1.86 has), LH, large village (3.72 has).

C-72 (Bella Vista)
Location: Hoja Camargo 6532 II, (E269716.54, N7713790.65)
Natural Setting: 2420 masl, canyon, it is placed on a low hill, in the hacienda Bella Vista, next to the Chico river.
Modern Land Use: Pasturage.
Archaeological Remains: The site presents residential terraces, rectangular structures and paths, there exists a concavity or depression in the central part, associated with at least two levels of platforms, that seems to correspond to some sort of public area or patios. Structures present one and two lines of stones. Grinding implements on surface.
Classification: ERD, LRD, LH, large village (2.08 has).

C-73 (Papagayo Bajo)
Location: Hoja Palca Grande 6531 I, (E268850.55, N7711091.03)
Natural Setting: 2400 masl, canyon, the site is located on the top and slopes of an eroded, conical hill next to the Chico River.
Modern Land Use: Pasturage.

Archaeological Remains: Remains of a small settlement with terraces, rectangular structures with double stone foundations and staircases. In the bottom there are some structures associated with a corral. The site is eroded and badly preserved.
Classification: ERD, homestead (0.50 has).

C-74 (Izuma)
Location: Hoja Palca Grande 6531 I, (E268731.61, N7710700.77)
Natural Setting: 2380 masl, canyon, it is located south of C-73, crossing La Estrella River, in a small syncline formation.
Modern Land Use: Pasturage behind small property.
Archaeological Remains: Rectangular structures and low terraces, foundations of one line of stones, features are not clear.
Classification: ERD, LRD, small village (1.57 has).

C-75 (La Capilla)
Location: Hoja Camargo 6532 II, (E269471.93, N7715215.30)
Natural Setting: 2400 masl, canyon, it is located under the remains of La Capilla convent, south of Camargo town and next to *quebrada* de Tota.
Modern Land Use: None.
Archaeological Remains: There are prehispanic ceramics mixed with colonial materials in the area where the remains of a chapel and other structures are placed.
Classification: LH, homestead (0.27 has).

C-76 (El Porvenir)
Location: Hoja Palca Grande 6531 I, (E268268.22, N7709128.30)
Natural Setting: 2420 masl, canyon, the settlement is located in a high syncline behind a modern property.
Modern Land Use: Pasturage.
Archaeological Remains: This settlement presents a sector with residential terraces located on the west slope (Sector 1), where most of the terraces are collapsed and eroded. There is evidence of paths among terraces. The central part or Sector 2 presents elaborate structures associated with patios or public spaces, where there are indications of looted cist burials under the walls. The stone treatment and the dimensions of structures suggest this area was different from the rest of the settlement. Small rectangular structures next to dwellings seem to be storage places. To the north east or Sector 3, there is evidence of residential terraces that were built later in the occupation of the site judging from sedimentation; cultural fill in terraces and almost no presence of ceramic materials on surface. The northernmost part of the site presents a delimiting wall that protects the settlement and is located along the edge of the syncline. Grinding implements are common on surface.
Classification: LRD, large village (3.86 ha), LH, large village or local center (6.70 ha).

C-77 (Huayllahuasi)
Location: Hoja Palca Grande 6531 I, (E268258.59, N7708386.77)
Natural Setting: 2360 masl, canyon, it is located behind the casa de hacienda of Huayllahuasi and next to a *quebrada*.

Modern Land Use: Pasturage, modern property.
Archaeological Remains: Concentration of ceramic sherds associated with segments of one row stone foundations.
Classification: LH, large village (2.43 ha).

C-78 (Callejones)
Location: Hoja Palca Grande 6531 I, (E268107.69, N7707783.10)
Natural Setting: 2360 masl, canyon, this site is located on a small hill behind the Quimbanda Bajo wineyards.
Modern Land Use: None.
Archaeological Remains: Concentration of sherds on the south part of the hill, while in the north part, there are some remains of low terraces associated with Formative sherds.
Classification: Formative, small village (0.60 has), LH, small village (1.19 has).

C-79 (Palca Chica)
Location: Hoja Palca Grande 6531 I, (E268126.53, N7705876.27)
Natural Setting: 2380 masl, canyon, it is located in a syncline of triangular shape in the area where the haciendas Oroza and Velasco are placed.
Modern Land Use: Pasturage.
Archaeological Remains: The slope of the syncline is completely covered by terraces and platforms with structures. However, the site is eroded and badly looted, because of that, it is difficult to recognize architectural layouts. Structures present one or two row stone foundations, and terraces have retaining walls of 0.50 - 1 m high. There are circular cist burials.
Classification: Formative, ERD, homestead (0.47), LRD, LH, small village (0.93 ha).

C-80 (Barrio Obrero)
Location: Hoja Palca Grande 6531 I, (E268011.75, N7706618.73)
Natural Setting: 2360 masl, canyon, the site is located on a flat, elevated area where the chapel, school and San Pedro's workers camp are currently located.
Modern Land Use: Residential neighborhood.
Archaeological Remains: Funerary urns with human ashes and bones buried in a sterile, rocky matrix. Salvage activities recovered five fragmented urns from the streets of the neighborhood. Inhabitants told us that at one time there existed alignments of stones, some times in rectangular shapes delimiting the site where the urns were buried. Urns had flat stones as caps. Other informants commented that during the construction of modern buildings, skeletons were removed from the ground.
Classification: Formative, cemetery (0.10 has).

C-81 (Peña Colorada)
Location: Hoja Palca Grande 6531 I, (E268885.44, N7707284.04)
Natural Setting: 2525 masl, canyon, this site is located on a sandstone rocky outcrop, 2 km east of hacienda San Pedro.
Modern Land Use: Pasturage.

Archaeological Remains: Petroglyphs are carved along the rocky outcrop, predominantly facing to the north; there are 14 different panels that correspond to rocks with different sizes depicting diverse geometrical, anthropomorphic and zoomorphic motives. Some geometric motifs are similar to those represented in local ceramic styles. The site is associated with a prehispanic road that crosses the area next to the pretroglyphs, linking this sector of the canyon with the high valleys of Culpina (for more information see Rivera Casanovas and Michel López 1995a).
Classification: undefined period, probably used throughout the sequence, rock art site (0.6 ha).

C-82 (Peña Colorada II)
Location: Hoja Palca Grande 6531 I, (E268808.73, N7707007.35)
Natural Setting: 2290 masl, canyon, this site is located approximately 400 m east of the hacienda San Pedro, in the southern part of the *quebrada* San Pedro, on a red sandstone outcrop.
Modern Land Use: Pasturage.
Archaeological Remains: Two panels with carved, geometric motives.
Classification: Undefined period, rock art site (0.04 has).

C-83 (Chiqueru Loma)
Location: Hoja Palca Grande 6531 I, (E270301.36, N7708599.25)
Natural Setting: 2680 masl, canyon, it is located in the upper part of the Zacarí *quebrada*, next to a seasonal stream and close to *viscacha* nests.
Modern Land Use: Shelter for goats.
Archaeological Remains: The site is a limestone rock shelter whose walls are covered by paintings damaged by erosion and vandalism by Protestant sects that identify the site with the devil. The few remains left show geometric and zoomorphic motifs in red and gray. Over them there is an overlap of motifs painted with charcoal that represent churches, crosses, animals and Christian phrases. The base of the shelter contained lithic artifacts, some sherds and a partially exposed human burial.
Classification: Formative, shelter, rock art site (0.009 has).

C-84 (Palca Grande I)
Location: Hoja Palca Grande 6531 I, (E266636.23, N7704430.47)
Natural Setting: 2380 masl, canyon, this settlement is located against the canyon wall in the Palca Grande Town, where the water reservoir is placed. It is on a pronounced slope, highly eroded.
Modern Land Use: Pasturage.
Archaeological Remains: Residential terraces built on a slope with a gradient of 45º in the steeper areas. Terraces and structures are highly eroded, and therefore collapsed; large stones were used in some structures and terraces.
Classification: ERD, LRD, LH, small village (1.23 has).

C-85 (Palca Grande II)
Location: Hoja Palca Grande 6531 I, (E266797.55, N7703990.30)

Natural Setting: 2380 masl, canyon, the site is located around 100 m south of C-84, a pipeline has cut the lower part of the settlement, destroying contexts.
Modern Land Use: Pasturage.
Archaeological Remains: Eroded residential terraces and structures, in the lower, flat part of the site, are platforms and rectangular structures associated with cist burials. Foundations with a single and double row of stones, and structures measure 4 x 3, 4 x 4, and 2.60 x 3 m.
Classification: LH, large village (4.18 ha).

C-86 (La Galana)
Location: Hoja Palca Grande 6531 I, (E268325.60, N7699635.88)
Natural Setting: 2320 masl, canyon, it is located on a low hill behind the casa de hacienda La Galana.
Modern Land Use: Pasturage.
Archaeological Remains: Badly preserved structures on the top of the hill, rectangular structures and segments of foundations.
Classification: LH, homestead (0.24 ha).

C-87 (Higuerahuayco)
Location: Hoja Palca Grande 6531 I, (E268968.55, N7699207.43)
Natural Setting: 2360 masl, canyon, this site is located on a high hill with two peaks in the hacienda Higuerahuayco. The site is located in the mouth of a *quebrada* that connects highland valleys with the canyon.
Modern Land Use: Pasturage.
Archaeological Remains: Well preserved settlement with residential terraces, rectangular structures, patios, and small storage structures. The site is organized through a system of paths and public open areas. In the west part, down the hill, an encircling wall is present. Structures measure 4 x 3, 4 x 4 and 6 x 4.60 m.
Classification: LRD, LH, small village (1.88 ha).

C-88 (Hacienda Higuerahuayco)
Location: Hoja Palca Grande 6531 I, (E268546.04, N7698999.33)
Natural Setting: 2320 masl, canyon, it is located on a low hill behind the hacienda and in front of the current cemetery.
Modern Land Use: Agricultural area with vineyards and fruit trees.
Archaeological remains: Disturbed site with scattered sherds on surface.
Classification: LH, small village (1.24 has).

C-89 (Cementerio Cruz Huasa)
Location: Hoja Palca Grande 6531 I, (E266702.79, N7700217.51)
Natural Setting: 2380 masl, canyon, the site is located at the end of the flat area where the cemetery is placed, next to a path that enters into the *quebrada*.
Modern Land Use: Pasturage, trail, and ritual.
Archaeological Remains: Rocks with petroglyphs, the bigger one depicts anthropomorphic motifs, personages sitting down and with arms open, and Christian crosses. The smaller rock shows crosses. It seems there are two periods in these

carvings, a prehispanic represented by the anthropomorphic figures and a colonial represented by the crosses. In the base of the big stone there are remains of current offerings with bottles of beer, alcohol, burned materials and sherds.
Classification: LRD, LH, Colonial, rock art site (0.0025 ha).

C-90 (Cruz Huasa II)
Location: Hoja Palca Grande 6531 I, (E266523.46, N7700258.88)
Natural Setting: 2390 masl, canyon, the site is located in a rock shelter going up in the *quebrada*, 200 m northwest from C-89, associated with a trail that seems to have prehispanic origin.
Modern Land Use: Trail.
Archaeological Remains: Rock shelter associated with a collapsed terrace next to the trail. There are 3 big stones with petroglyphs at the site. Stone 1, next to the shelter presents a zoomorphic personage with tripartite fingers; Stone 2, in front of the shelter depicts anthropomorphic personages, crosses and circles with pivot; Stone 3 shows crosses. The technique used was incision by scraping the rock.
Classification: LRD, LH, shelter and rock art site (0.08 ha).

C-91 (Vivicha)
Location: Hoja Palca Grande 6531 I, (E266854.51, E7700196.82)
Natural Setting: 2380 masl, canyon, this site is located on a low slope southwest of the current cemetery of Cruz Huasa, crossing the *quebrada*.
Modern Land Use: Trail.
Archaeological Remains: Agricultural terraces with one row of stones (30 cm high) in their retaining walls and double rows in the irrigation channels that cross them. Terraces measures 5.40 x 1.80 m, they are eroded.
Classification: LRD, LH, agricultural terraces (0.01 ha).

C-92 (Vivicha II)
Location: Hoja Palca Grande 6531 I, (E266938.17, N7699948.40)
Natural Setting: 2380 masl, canyon, it is located south of Cruz Huasa cemetery on the slopes of a hill delimited by two *quebradas*.
Modern Land Use: Pasturage.
Archaeological Remains: There are big stones and rocky shelters with petroglyphs and paintings associated with a trail that might be prehispanic, and with agricultural terraces (0.17 has). One of the rocks has crosses and 40 m down one of the rocky shelters has an external face with petroglyphs (tripartite motifs) and an internal shelter with a “Malta” cross and serrated motifs. Terraces measures 5 x 2 m and have retaining walls with one row of stones, crossed by irrigation channels.
Classification: LRD, LH, shelter, rock art site (0.02 ha).

C-93
Location: Hoja Palca Grande 6531 I, (E268778.28, N7697469.75)
Natural Setting: 2340 masl, canyon, the site is located in a syncline northeast of C-94.
Modern Land Use: Pasturage.

Archaeological Remains: Rectangular structures located over platforms, corresponding to corrals and dwellings. Corrals (13 x 5, 12 x 12, 7 x 6 m) seem to have being built with one row of big stones while other structures present foundations of double rows of stones. Walls are well preserved, reaching 70 cm high. Almost no ceramic materials were found in the site.
Classification: LRD, LH, small village with corrals (0.8 has).

C-94 (El Rancho)
Location: Hoja Palca Grande 6531 I, (E268642.75, N7697156.42)
Natural Setting: 2340 masl, canyon, it is located in a syncline in front of the hacienda El Rancho, crossing the river.
Modern Land Use: Pasturage.
Archaeological Remains: Residential terraces with rectangular structures that show entrances flanked by two vertical, flat stones. The collapse of structures and terraces prevented us from identifying shapes and layouts, although terraces retaining walls present big stones, while structures have smaller stones and double row stone foundations. 50 m to south east of the main site there is a sector with corrals and some structures that are treated as part of the settlement.
Classification: Formative, large village (2.87 has), ERD, small village (1.03 has), LRD, LH, large village (3.08 ha).

C-95
Location: Hoja Palca Grande 6531 I, (E267553.73, N7698607.35)
Natural Setting: 2340 masl, canyon, this site is located in the mouth of a *quebrada* south of the Rancho Camarguito.
Modern Land Use: None.
Archaeological Remains: There is a sandstone rock with petroglyphs depicting varieties of crosses and other geometrical motifs; crosses are carved over prehispanic motives in some cases.
Classification: LH, Colonial, rock art.

C-96 (El Caserón)
Location: Hoja Villa Abecia 6531 II, (E268500.95, N7691367.78)
Natural Setting: 2320 masl, canyon, the site is located in a syncline behind the casa de hacienda; there are colonial buildings at the bottom of this site that were once part of the hacienda.
Modern Land Use: Pasturage.
Archaeological Remains: Settlement with residential terraces and rectangular structures, terraces in some areas reach 1 m high, the site is seriously damaged due to looting activities. Structures with foundations of double rows of stones and walls with flat stones. The basic layout for households seems to have consisted of a patio separated from the dwellings by a small path, encircled by a wall, then the structures (at least two), an additional wall segment.
Classification: LRD, large village (4 has); LH, large village or local center (9.11 ha).

C-97 (Saladillo)
Location: Hoja Villa Abecia 6531 II, (E268436.40, N7690841.88)
Natural Setting: 2270 masl, canyon, it is located on a small hill south of the Saladillo river and next to the Grande river and the current road.
Modern Land Use: Pasturage.
Archaeological Remains: Small settlement, a couple of dwellings associated with patios and corrals. Structures have double row stone foundations, and corrals have big stones in their walls. The biggest structure measure 6 x 5.40 m and the smallest 3 x 2 m.
Classification: LH, homestead (0.03 has).

C-98 (El Caseron II)
Location: Hoja Villa Abecia 6531 II, (E268631.29, N7690493.17)
Natural Setting: 2280 masl, canyon, this site is located on a low hill south of C-96, crossing a *quebrada*.
Modern Land Use: Pasturage.
Archaeological Remains: Dispersed structures with areas of patios and corrals. Structures measure 4 x 3.50, 4 x 3.30, 3.60 x 3.80 m and are located in front of patios and corrals. For dwellings, wall foundations are double stone rows; six structures are visible as well.

C-99 (Los Sotos)
Location: Hoja Villa Abecia 6531 II, (E267676.63, N7680536.51)
Natural Setting: 2300 masl, canyon, the site is located on a low slope of a *quebrada*.
Modern Land Use: Pasturage with trail.
Archaeological Remains: Eroded agricultural terraces with one line of stones (20 cm), they measure 5 x 4 m.
Classification: LRD, LH, agricultural terraces (0.77 has).

C-100 (Puruva)
Location: Hoja Villa Abecia 6531 II, (E268325.72, N7681225.97)
Natural Setting: 2260 masl, canyon, it is located in a small syncline next to the current road, dominating the join of the Tumusla and Camblaya Rivers.
Modern Land Use: Pasturage.
Archaeological Remains: Terraces associated with corrals, they probably were residential, but there is no evidence of foundations on surface. Semicircular corrals built with one line of big stones, and entrances flanked by big vertical, stones, they measure 7.40 x 10.30 m and 5.50 x 5.70 m.
Classification: LH, Small village with corrals (0.57 has).

C-101 (Villa Abecia I)
Location: Hoja Villa Abecia 6531 II, (E267247.55, N7679148.76)
Natural Setting: 2380 masl, canyon, this site is located west of Villa Abecia town, in the mouth of the *quebrada* Lajuno that leads to Jailia.
Modern Land Use: Agricultural and Pasturage.

Archaeological Remains: Residential terraces with remains of structures and cist burials. Also, there is a large worked stone basin that suggests flour from legume trees were being processed here. The site was looted and destroyed, probably was part of C-102, forming one settlement.
Classification: LH, small village (0.86 has).

C-102 (Villa Abecia II)
Location: Hoja Villa Abecia 6531 II, (E267023.19, N7678683.76)
Natural Setting: 2380 masl, canyon, it is located in the mouth of the *quebrada* Lajuno, next to the modern road and in front of C-101.
Modern Land Use: Pasturage.
Archaeological Remains: Settlement with residential terraces, rectangular structures and a prehispanic road that enters the site. Towards the south, the site is delimited by a wall, which separates it from the *quebrada*. In the central and lower part are wider terraces (15 x 23 and 10 x 10 m). In some sectors, rocky outcrops with hollowed out basins suggest flour processing. The site is looted.
Classification: Formative, small village (0.96 has), LH, large village (2.81 has).

C-103 (Santa Ana)
Location: Hoja Villa Abecia 6531 II, (E267841.63, N7682811.51)
Natural Setting: 2300 masl, canyon, this site is located on an elevation next to the road and close to the hacienda La Cueva.
Modern Land Use: Pasturage.
Archaeological Remains: A big stone in an elevation with petroglyphs depicting geometric and anthropomorphic motifs. It seems this rock was moved from its original place during the installation of a pipeline.
Classification: LRD, rock art site.

C-104 (Villa Abecia, cancha de fútbol)
Location: Hoja Villa Abecia 6531 II, (E268421.81, N7677847.33)
Natural Setting: 2320 masl, canyon, this site is located south of the soccer field and next to the road, where there are outcrops of quartzite, on a small flat elevation.
Modern Land Use: None.
Archaeological Remains: Dispersion of flakes and other lithic materials in low densities. People told us the area was covered by projectile points, however we did not find any, possibly because it is common for them to go and pick up these artifacts.
Classification: Preceramic?, camp site? quarry area?, (0.12 has).

C-105 (Quebrada El Patronato)
Location: Hoja Palca Grande 6532 II, (E271677.00, N7714803.02)
Natural Setting: 2540 masl, canyon, it is located east of the estancia Molino Patronato, next to the river, crossing a vineyard.
Modern Land Use: Agricultural area.
Archaeological Remains: Paintings in a sandstone rock, to 4 m high from the surface, most of them were covered with clay and it is difficult to see the original motives. Motifs

are painted in red and white colors and depict animals, circles and composed geometric motifs that resemble textiles and emblems.
Classification: LRD, LH, rock art.

C-106 (Talasa Camblaya)
Location: Hoja Villa Abecia 6531 II, (E268546.93, N7680905.81)
Natural Setting: 2380 masl, canyon, this settlement is located in the upper part of an abrupt syncline in the corner where the Tumusla River joins the Chico River of Camataquí forming the Camblaya River.
Modern Land Use: Pasturage.
Archaeological Remains: Settlement with residential terraces and some flat areas in the middle slope. Structures are rectangular and placed in terraces over areas with high gradient; erosion is pronounced making difficult to see the layout. Dwellings are located next to the patios, and some had a small storage structure. In the southern part of the settlement, where there is a *quebrada*, there is a big delimiting wall.
Classification: Formative, small village (1 ha), LRD, LH, large village (4.30 has).

C-107 (La Estrella)
Location: Hoja Palca Grande 6531 I, (E270012.76, N7710868.93)
Natural Setting: 2480 masl, canyon, it is located on a broad area of the *quebrada* La Estrella, where it broadens and cultivation areas exist. Toward the east there are some abandoned modern structures.
Modern Land Use: Abandoned agricultural area.
Archaeological Remains: Agricultural terraces with remains of an irrigation channel associated with the river. The area of terraces seems to have been bigger once, but was destroyed by modern agricultural activities.
Classification: LRD, LH, agricultural terraces (0.22 has).

C-108 (Lorohuasi)
Location: Hoja Muyuquiri 6532 I, (E276824, N7731418.31)
Natural Setting: 3020 masl, upper valley, the site is located straddling the Lique *quebrada* and following a path; in front of C-48; there is xerophytic vegetation.
Modern Land Use: None.
Archaeological Remains: Agricultural terraces (1.50 x 5.50 m) divided by irrigation channels; in some areas the terraces reach 1.30 m high because of the gradient (40º).
Classification: LRD, LH, agricultural terraces (0.88 has).

C-109 (Jalakhasa)
Location: Hoja Camargo 6532 II, (E277906.19, N7730493)
Natural Setting: 3000 masl, upper valley, this site is located on the slopes of a conical elevation where there is a small shrine or chapel, northeast of C-45.
Modern Land Use: None.
Archaeological Remains: Agricultural terraces (3.90 x 1.95 m) with irrigation channels of 45 cm width, retaining walls reach 25 cm.
Classification: LRD, LH, agricultural terraces (0.26 has).

C-110
Location: Hoja Villa Abecia 6531 II, (E268597, N7691045.49)
Natural Setting: 2280 masl, canyon, it is located in front of C-96, across the *quebrada* to the south.
Modern Land Use: Pasturage
Archaeological Remains: Small settlement with a dwelling (3 x 2 m), a corral (10 x 6 m), and a circular *pirca* of 2 m diameter.
Classification: LRD, LH, homestead (0.03 has).

C-111 (La Plateada II)
Location: Hoja Camargo 6532 II, (E271108.42, N7718012.58)
Natural Setting: 2420 masl, canyon, the site is located in a profile next to C-66, north of it, crossing the Sereno River.
Modern Land Use: Agricultural area.
Archaeological Remains: It is a profile cut by the river where there is a cultural stratum, looks like fill with ceramics, some 2 m below the current surface.
Classification: Formative, LH, homestead?

C-112 (Pampay Khocha)
Location: Hoja Palca Grande 6531 I, (E268483.73, N7698587.35)
Natural Setting: 2300 masl, canyon; this site is destroyed and the remains are located in the walls and around the hacienda principal buildings.
Modern Land Use: Property.
Archaeological Remains: The site was destroyed by colonial agricultural activities and the construction of the hacienda complex. There are sherds in the adobes of the buildings, and in cultural layers under the surface that occasionally are exposed by modern works. Some Huruquilla vessels were recovered when a house was built near the hacienda.
Classification: LH, small village?

C-113 (Quebrada Caserón)
Location: Hoja Villa Abecia 6531 II, (E270689.79, N7689843.71)
Natural Setting: 2460 masl, canyon, it is located in the limits of the survey area in the high part of the Caserón *quebrada*, in the rocky walls. This site appears to have been reported by Carlos and Lilo Mettfessel.
Modern Land Use: None.
Archaeological Remains: Rock shelter with impressive paintings in the walls to both sides of the *quebrada*. Animals, humans, and geometric motifs are depicted in white, yellow, red and wine red colors. There are different styles from naturalistic to elaborate. Some paintings seem to be emblemic, or represent complicated motifs like shields or even textiles. There is duality in colors with combinations of red and white, or wine and yellow, over all in composed volutes and serrated motifs. This site is associated with an ancient trail that connects the valley with the high valleys to the east,
Classification: LRD, LH, shelter and rock art site (0.006 ha).

Table D1. List of Cinti Valley sites.

Site N.	UTM Coordinates	Elev. (masl)	Area (ha)	Period	Classification
C-1	N7735362.0 E277558.0	3240	0.6500	F-E	Small village
C-2	N7736312.8 E278995.7	3460	0.0048	P-F	Cave/rock art
C-3	N7735819.3 E279293.0	3620	0.0560	F	Camp site
C-4	N7736021.93 E279326.82	3620	0.0002	F	Off site
C-5	N7736125.69 E279172.82	3600	0.0002	L	Off site
C-6	N7735507.05 E279026.45	3600	0.0175	F	Paradero
C-7	N7735368.84 E278953.34	3530	0.0042	F	Paradero
C-8	N7735019.67 E276882.69	3220	1.7850	F-E	Small village
C-9	N7732857.28 E276302.70	2980	0.0032	L	Shelter/Rock art
C-10	N7734957.94 E278214.71	3350	0.0144	F-L	Shelter
C-11	N7734945.62 E277607.91	3240	0.1176	F	Homestead
C-12	N7733822.34 E278621.62	3160	0.2827	P-F	Camp site
C-13	N7732103.15 E277486.92	3230	0.9139	P-F	Camp site
C-14	N7731221.51 E277440.50	3060	0.5100	E	Small village
C-15	N7731865.23 E277668.38	2900	1.6850	E	Small village
C-16	N7732566.78 E278546.70	3100	3.6500	F-L-LH	Large village*
C-17	N7731186.46 E278602.88	3080	5.3750	L-LH	Large village
C-18	N7730282.04 E278245.62	3100	7.2661	F-E	Regional Center
C-19	N7731034.04 E277619.86	3060	1.0000	P	Camp site
C-20	N7732028.74 E278679.14	3100	0.8000	F-L-LH	Agric. terraces
C-21	N7732926.50 E278695.18	3100	4.5774	L-LH	Agric. terraces
C-22	N7731858.51 E279620.27	3250	0.0154	?	Lithic debris
C-23	N7731033.24 E279096.63	3040	0.1025	P-F	Camp site
C-24	N7730903.27 E278915.53	3020	0.1530	P-L	Camp site
C-25	N7730174.38 E278876.35	3000	0.1500	L-LH	Agric. terraces
C-26	N7730071.65 E278974.24	2980	0.1100	L	Agric. terraces
C-27	N7731718.26 E280933.40	3090	0.5355	P-L	Camp site
C-28	N7732137.36 E279444.08	3080	0.1830	L-LH	Agric. terraces
C-29	N7732145.81 E280027.13	3065	1.400	F-L	Agr. terraces
C-30	N7733126.97 E280358.03	3120	20.000	All?	Lithic source
C-31	N7733083.87 E280692.14	3100	1.1520	L-LH	Agric. terraces
C-32	N7734064.51 E281338.79	3160	0.7808	L-LH	Agric. terraces
C-33	N7733978.30 E281252.57	3110	0.4614	F-L-LH	Agric. terraces
C-34	N7733353.27 E278331.84	3080	0.6864	LH	Small village
C-35	N7733495.16 E277673.61	3160	2.3331	L-LH	Agric. terraces
C-36	N7733652.61 E278498.53	3140	0.5082	P-F-L	Camp site
C-37	N7734304.00 E278923.15	3260	0.0676	P-F-L	Camp site
C-38	N7734244.16 E280012.39	3220	3.2670	LH	Large village
C-39	N7734964.54 E281111.49	3200	2.2695	L-LH	Village
C-40	N7734139.47 E280995.04	3240	0.0100	L	Homestead
C-41	N7733303.57 E278977.02	3090	0.0693	L	Homestead
C-42	N7733677.17 E279861.18	3100	1.200	L	Camp site
C-43	N7733022.25 E280019.97	3060	2.2847	L-LH	Agric. terraces
C-44	N7732141.81 E275789.74	3125	4.9898	L-LH	Agric. terraces

Table D1. Continued.

C-45	N7730328.70 E277248.19	3100	6.1200	LH	Regional Center
C-46	N7729927.92 E280523.79	3120	0.0300	F-L	Camp site
C-47	N7729353.09 E280399.45	3120	0.1050	F-L	Agric. terraces
C-48	N7730992.72 E276296.00	3150	17.000	F-E-L-LH	Regional center
C-49	N7727648.37 E278676.90	3020	0.2800	LH	Agric. terraces
C-50	N7727055.66 E277892.47	2960	0.4000	L	Camp site
C-51	N7728117.20 E278171.44	2960	0.0900	L	Corrales
C-52	N7728284.17 E278288.91	2940	0.8000	F-L-LH	Agric. terraces
C-53	N7728886.27 E277392.85	2920	7.1050	F-L-LH	Large village
C-54	N7728091.36 E276969.51	2920		LH	Agric. terraces
C-55	N7726840.67 E275977.22	2820	1.7904	L-LH	Agric. terraces
C-56	N7728541.91 E276461.40	2900	0.4508	F-L-LH	Homestead
C-57	N7730526.96 E275981.25	3060	1.9000	F-L-LH	Small village
C-58	N7725651.07 E275943.58	2820	4.463	E	Large village
C-59	N7729675.78 E276343.86	3040	9.8900	L	Agric. terraces
C-60	N7723343.52 E275137.67	2900	0.1625	E	Homestead
C-61	N7728930.21 E276427.06	2980	1.0500	L-LH	Agric. terraces
C-62	N7719353.55 E272423.06	2520	6.9845	E-L-LH	Local center
C-63	N7728390.71 E275660.57	2980	0.0300	L-LH	Agric. terraces
C-64	N7718653.89 E271818.00	2460	0.0332	L-LH	Agric. terraces
C-65	N7728088.53 E275914.12	2920	1.3993	F-L-LH	Small village
C-66	N7717883.02 E271072.00	2420	?	F	Small village?
C-67	N7726662.29 E275387.53	2900	0.7770	F-E	Small village
C-68	N7714853.92 E270250.42	2500	0.4466	LH	Village-corrales
C-69	N7725074.36 E275524.16	2700	0.0200	L	Homestead
C-70	N7714784.51 E270519.92	2500	8.9100	L-LH	Local center
C-71	N7714257.19 E269875.10	2440	3.7200	E-LH	Large village
C-72	N7713790.65 E269716.54	2420	2.0800	E-L-LH	Large village
C-73	N7711091.03 E268850.55	2400	0.5000	E	Homestead
C-74	N7710700.77 E268731.61	2400	1.5700	E-L	Small village
C-75	N7715215.30 E269471.93	2400	0.2688	LH-C	Homestead
C-76	N7709128.30 E268268.22	2420	6.7000	L-LH	Local Center
C-77	N7708386.77 E268258.59	2360	2.4320	LH	Village
C-78	N7707783.10 E268107.69	2360	1.1926	F-LH	Small village
C-79	N7705876.27 E268126.53	2380	0.93001	F-E-L-LH	Small village
C-80	N7706618.73 E268011.75	2360	0.1000	F	Cemetery
C-81	N7707284.04 E268885.44	2525	0.6000	L-LH?	Rock Art
C-82	N7707007.35 E268808.73	2290	0.0400	L-LH?	Rock art
C-83	N7708599.25 E270301.36	2680	0.0090	F	Shelter/rock art
C-84	N7704430.47 E266636.23	2380	1.2375	E-L-LH	Small village
C-85	N7703990.30 E266797.55	2380	4.1870	LH	Large village
C-86	N7699635.88 E268325.60	2320	0.2400	LH	Homestead
C-87	N7699207.43 E268968.55	2360	1.8727	LH	Small village
C-88	N7698999.33 E268546.04	2320	1.2400	LH	Small village
C-89	N7700217.51 E266702.79	2380	0.0025	L-C	Rock art
C-90	N7700258.88 E266523.46	2400	0.0800	L	Shelter/Rock art

Table D1. Continued.

C-91	N7700196.82 E266854.51	2380	0.0150	L-LH	Agric. terraces
C-92	N7699948.40 E266938.17	2380	0.0250	L	Shelter/rock art
C-93	N7697469.75 E268778.28	2340	0.8000	L	Village-Corrales
C-94	N7697156.42 E268642.75	2340	3.0854	F-E-L-LH	Large village
C-95	N7698607.35 E267553.73	2340	0.0009	L-LH-C	Rock art
C-96	N7691367.78 E268500.95	2320	9.1164	L-LH	Local center
C-97	N7690841.88 E268436.40	2270	0.0375	LH	Homestead
C-98	N7690493.17 E268631.29	2280	0.2409	L-LH	Homstd/corrales
C-99	N7680536.51 E267676.63	2300	0.0777	L-LH	Agric. terraces
C-100	N7681225.97 E268325.72	2260	0.5750	LH	Hamlet/Corral
C-101	N7679148.76 E267247.55	2380	0.8585	LH	Small village
C-102	N7678683.76 E267023.19	2380	2.8133	F-LH	Large village
C-103	N7682811.51 E267841.63	2300	0.0004	L	Rock art
C-104	N7677847.33 E268421.81	2320	0.1200	P?	Lithic debris
C-105	N7714803.02 E271677.00	2540	0.0035	L	Rock art
C-106	N7680905.81 E268546.93	2380	4.3000	F-L-LH	Local center
C-107	N7710868.93 E270012.76	2480	0.2223	L-LH	Agric. terraces
C-108	N7731418.31 E276824.00	3020	0.8840	L-LH	Agric.terraces
C-109	N7730493.00 E277906.19	3000	0.2604	L-LH	Agric. terraces
C-110	N7691045.49 E268597.00	2280	0.0300	L-LH	Homestead
C-111	N7718012.58 E271108.42	2420	?	F-L	Homestead?
C-112	N7698587.35 E268483.73	2300	?	LH	Village?
C-113	N7689843.71 E270689.79	2460	0.0060	L-LH?	Rock art

Table D2. Site size (settlements) by periods for the Cinti Valley.

Site N.	Name	F (ha)	ERD (ha)	LRD (ha)	LH (ha)	Total (ha)
C-1	Calvario Mokho	0.65	0.65			0.65
C-8	Escuela Carusla	0.90	1.78			1.78
C-11	Cueva cuchito	0.11				0.11
C-14	Rupaskayu		0.51			0.51
C-15	Jalanta		1.68			1.68
C-16	Talasa Cochaca	3.12		3.65	3.65	3.65
C-17	Jayasamana			5.37	5.37	5.37
C-18	Talasa Palcamayu	1.3	7.26	7.26		7.26
C-34					0.68	0.68
C-38	Chajra Khasa				3.26	3.26
C-39	Talasa Chajra Khasa			2.27	2.27	2.27
C-40				0.01		0.01
C-41	Escuela Cochaca			0.07		0.07
C-45	Huankarani				6.12	6.12
C-48	Jatun Huankarani	2.00	3.45	17.00	23.12	23.12
C-51				0.09		0.09
C-53	Santa Rosa	2.00		7.10	7.10	7.10
C-56	La Marchana	0.45		0.45	0.45	0.45
C-57	Tambo Huayco	0.60		1.90	1.90	1.90
C-58	Talasa Chaco		4.46			4.46
C-60	Sarcarca		0.16			0.16
C-62	Volcan		1.67	3.00	7.00	7.00
C-65	Tacaquira I	0.70		1.40	1.40	1.40
C-67	Ojo	0.77	0.77		0.77	0.77
C-68	Frente Patronato				0.44	0.44
C-69	Puron			0.02		0.02
C-70	Patronato			3.17	8.91	8.91
C-71	Hacienda Patronato		1.86		3.72	3.72
C-72	Bella Vista		2.08	2.08	2.08	2.08
C-73	Papagayo bajo		0.50			0.50
C-74	Izuma		1.57	1.57		1.57
C-75	La Capilla				0.27	0.27
C-76	El Porvenir			3.86	6.70	6.70
C-77	Huayllahuasi				2.43	2.43
C-78	Callejones	0.60			1.19	1.19
C-79	Palca Chica	0.47	0.47	0.93	0.93	0.93
C-84	Palca Grande I		1.24	1.24	1.24	1.24
C-85	Palca Grande II				4.19	4.19
C-86	La Galana				0.24	0.24

Table D2. Continued.

C-87	Higuerahuayco			1.88	1.88	1.88
C-88	Hda. Higuerahuayco				1.24	1.24
C-93	El Rancho			0.80	0.80	0.80
C-94	Talasa El Rancho	2.87	1.03	3.08	3.08	3.08
C-96	Talasa El Caseron			4.00	9.11	9.11
C-97	Saladillo				0.03	0.03
C-98	El Caseron II			0.24	0.24	0.24
C-100	Puruva				0.57	0.57
C-101	Villa Abecia I				0.86	0.86
C-102	Villa Abecia II	0.96			2.81	2.81
C-106	Talasa Camblaya	1.00		4.30	4.30	4.30
C-110				0.03	0.03	0.03

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