POTTERY PREFERENCES AND COMMUNITY DYNAMICS

IN THE INDUS CIVILIZATION BORDERLANDS

by

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Abstract

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By Katie E. Lindstrom

Under the supervision of Professor Jonathan Mark Kenoyer

At the University of Wisconsin-Madison

Archaeological research presented in this dissertation confronts assumptions about the spatial patterning of Harappan pottery in borderland regions of the Indus Civilization (2600-1900 BC), a geographically expansive ancient state located across Pakistan and northwestern India. Traditional models for the Indus borderland region of Gujarat are based on the supposition that Harappan material culture was introduced by elite merchants and craftspeople from core areas of urbanism in the Indus Valley, represented by the type sites of Mohenjo Daro and Harappa. Whereas Indus settlements often contain monumental perimeter walls, which protected craft industries located inside, the traditional model predicts that Harappan pottery will be found concentrated inside walled areas. However, these are untested hypotheses. Interpretative implications of this model are particularly significant at sites where non-Harappan pottery are also found since the model assumes pottery represent people: the Harappans – who are elite, reside inside perimeter walls, and have ancestral

connections to the Indus Valley, and non-Harappans – who are local non-elite residing outside the wall.

However, I contend that because ethnic, class, and personal identities of borderland communities are complex they cannot be simplified into categories of pottery representing core and periphery. Social dynamics are better accessed through a comparative approach, which identifies types of Harappan pottery that were present and absent from regional assemblages. Applied at Bagasra, a small, walled craft center in Gujarat, this research has identified a set of regional pottery preferences in Harappan ceramics. This study documented the unique occurrence of Harappan pottery types at Bagasra, and their percentage and spatial distribution on both sides of the perimeter wall, where they occur in association with non-Harappan pottery. Thus, this study presents new data that contradicts expectations of the traditional model. I contend we can no longer assume that Harappan pottery was the only pottery utilized by elite residents of Indus settlements, nor that Harappan and non-Harappan pottery will appear in discrete locations segregated by perimeter walls. This research establishes that analyzing contexts for the use of pottery types refines our understanding of the nature of Harappan and non-Harappan interactions through identifying the pottery preferences of unique borderland regions.

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Chapter 1: Introduction

My dissertation tests several hypotheses regarding the patterning of Harappan and non-Harappan pottery at the site of Bagasra, a small, walled craft production center located in the borderlands of the Indus Civilization (2600-1900 BC). The contribution of this research is that it refines our understanding of the nature of Harappan and local cultural interactions in Gujarat by identifying their unique pottery preferences. I approach pottery analysis through a comparative methodology that applies the Harappan pottery typology (Dales and Kenoyer 1986) to identify the types and styles of Harappan pottery that were and were not in use at Bagasra. Moreover, traditional migration-based models argue that the presence of Harappan pottery in the Indus borderlands is evidence of residents' elite status, which was connected to craft manufacture, or their ancestral connections to the Indus Valley. Thus, at sites where Harappan and non-Harappan pottery are found, such as Bagasra, this model would predict that these classes of pottery represent two groups of people: the Harappans – who are elite, reside inside a perimeter wall, and have ancestral connects to the Indus Valley, and non-Harappans – who are local non-elite residing outside the settlement wall. This largely descriptive model is reminiscent of pots equal people interpretations and does not provide a framework for understanding the social and community dynamics of settlements in culturally diverse borderland regions of ancient complex societies. By identifying the percentage and spatial and chronological patterns in the distribution of specific Harappan vessel types, as compared to the overall ceramic assemblage at Bagasra, my research has identified data that refute the

traditional migration-based model. Thus, I now contend that we can no longer assume that Harappan pottery was the only pottery utilized by elite residents of Indus settlements, nor that Harappan and non-Harappan pottery will appear in discrete locations segregated by perimeter walls.

1. Background

In the past, the Indus Civilization was generally thought to have emerged in the Indus and Ghaggar-Hakra River valleys of Pakistan and northwest India and gradually spread into resource-rich borderland regions, such as Gujarat (Hegde et al. 1988, Possehl 1992a, Sonawane 1998-99). By 2600 BC it was a geographically expansive state-level society that drew together diverse preexisting regional cultural traditions through a network of inter-regional economic and social ties (Kenoyer 1995b, 2011, Lahiri 1992, Mughal 1990a, Possehl 1990, 1992b, Ratnagar 1991). The production and trade of goods with social and symbolic value provided the foundation for vast socio-economic, ideological and ultimately political networks (DeMarrais et al. 1996, Kenoyer 1995a, 2000, Schortman et al 2001, Vidale and Miller 2000). Elite merchants, traders, and political leaders in ancient Indus societies are thought to have legitimized power through control of the production and distribution of crafted prestige items, especially valuable stone, shell, faience, and copper/bronze ornaments (Kenoyer 1995a, 2000, Vidale 1989, 2000, Vidale and Miller 2000). Elaborate craft production industries were dependent upon strong local agricultural and pastoral economies that provided a subsistence

foundation to both urban and rural societies as well as an impetus to expand into new resource-rich lands (Kenoyer 1998, Possehl 1992b).

Proponents of traditional models contend that elite traders from the core regions of urbanism (Jansen 1993b, Mughal 1990b, Wheeler 1953) along the Indus River Valley migrated into borderland regions, such as Gujarat, where they established walled cities and towns close to the source of valuable land and raw materials (Rao 1973, Joshi 1972, Possehl 1980, Bisht 1989b, Dhavalikar 1995). By extension, these migration-based models of diffusion are based on the assumption that Harappan material culture, urban ways of life, and craft economies were introduced by elite merchants and craftspeople from outside of Gujarat (Ajithprasad 2006, Bisht 1989a, Joshi 1972, Majumdar 2001, Possehl 1980, 1992a, Rao 1963, 1979, Sonawane 1992).

After their founding, the economies and civic administrations of these craft manufacturing towns were thought to have been maintained by elite leaders who directed the production and exchange of valuable prestige goods from inside monumental perimeter walls (Kenoyer 2008c, 1995b, 1993). These groups or individuals appear to have signaled their control of borderland economies through the use of diagnostic steatite seals, standardized stone weights, and restricted access to Indus script. They also displayed their individual and ancestral connections to core urban centers through the consumption and use of Harappan material culture, including pottery. Thus, in traditional migration-based models, sites of Harappan craft production in the borderland region of Gujarat are indirectly connected to core

urban centers in the Indus and Ghaggar-Hakra River valleys, especially the major Indus cities of Harappa, in the Punjab, and Mohenjo Daro, in Sindh.

The relatively recent discovery of several non-Harappan archaeological traditions (Ajithprasad 2002, 2011, Possehl 1992a, Possehl and Herman 1990, Sonawane and Ajithprasad 1994) in Gujarat before, during, and following the rise of Harappan cities and towns in the area is leading current generations of archaeologists to reconsider the complexity of interactions between regional indigenous communities and "Harappans," who lived in the core regions of urban development. Over the last twenty-five years, extensive archaeological survey, excavation, and research have been directed towards understanding the relationship among sites of the Indus Civilization and these various non-Harappan material cultures and communities. New research projects have established more rigorous scientific programs of archaeological investigation than those of previous generations. Through systematic recovery and recording procedures, as well as extensive detailed documentation, it has become possible to now explore site-specific and regional patterns in the diversity of Harappan and non-Harappan material cultures during the emergence, expansion and transition of the Indus Civilization.

However, this new body of research has not been wholly successful at articulating dynamic models that explain the possible ways in which Harappan and non-Harappan material cultures may, or may not, reflect discrete Harappan and non-Harappan cultures or societies. As such, existing models have not yet tested how these material traditions, especially pottery, are related to social behavior and community dynamics, which is key to understanding the myriad

ways that these “cultures,” or societies, may have influenced each other, or alternatively, the ways that a single community may have adopted both Harappan and non-Harappan material culture.

2. Research Questions

The site of Bagasra is particularly well suited to testing the relationship between material culture and society, as well as testing several expectations established by traditional migration-based models. Bagasra was occupied in four phases dating from 2500-1700 BC, which are distinguished by the rise, florescence, decline, and disappearance of prominent craft industries, including the largest excavated shell bangle workshop in the Indus world (Bhan and Gowda 2003, Bhan et al. 2009). Bagasra was founded after Harappan-style cities and towns had already been established in Gujarat, and therefore cannot be used to test early migration models. However, the site’s location, equidistant from three archaeologically unique geographic regions of Gujarat (India): Saurashtra, North Gujarat, and Kachchh, situate Bagasra within a trade nexus that included Harappan and regional, or non-Harappan, cultural traditions. Saurashtra and North Gujarat were home to several regional, or non-Harappan, archaeological traditions each of which has been characterized by a distinctive pottery assemblage (Rajesh 2011), which differs from Harappan pottery assemblages documented at sites in Kachchh and the Indus Valley. In Saurashtra, local pottery traditions are known by the terms Sorath, or Sorath Harappan (Possehl and Herman 1990), Prabhas, Padri, Micaceous Red Ware, and Black and Red Ware (Ajithprasad 2002, Ajithprasad and Sonawane 2011, Herman and Krishnan 1994,

Shinde and Kar 1992). In North Gujarat, the primary local pottery tradition is known as Anarta (Ajithprasad 2002, Ajithprasad and Sonawane 2011). Located equidistant from Saurashtra, North Gujarat, and Kachchh, Bagasra's material culture and built landscape point to ancestral connections to both pre-existing local heritage, as well as urban Harappan traditions (Sonawane et al. 2003). Moreover, Bagasra is the first excavated site with well-documented stratigraphic evidence for the contemporary use of Harappan, Anarta and Sorath pottery traditions (Bhan et al. 2004, 2005, Sonawane et al. 2003). Thus, Bagasra is an ideal site to test the material limits of the shared preference for Harappan-style ceramics by communities in the borderland regions of the Indus Civilization.

Utilizing Bagasra's rich assemblage of Harappan and non-Harappan pottery, my dissertation tests a related set of hypotheses, which I refer to as the inside/outside the wall model, that stem from the existing body of literature. Extensive excavations across Bagasra have shown that the manufacture of economically valuable marine shell, agate, and faience ornaments was primarily located inside the perimeter wall, where raw materials were also stock piled, and within which inscribed steatite seals have been recovered (Bhan et al. 2004, 2005, Sonawane et al. 2003). Drawn from traditional migration-based models (Dhavalikar 1995), my research tests the hypothesis that Bagasra's craft production economy was established and maintained by elite leaders who directed the production and exchange of valuable prestige goods from inside the monumental perimeter wall. The traditional model also would predict that elite leaders at Bagasra were either migrants from outside the regions, or had strong ancestral connections (in other words, they were descendants of migrants) to the

core regions of Indus urban development. If this statement were supported by the Bagasra pottery data, then I would expect to find evidence that elites displayed their ancestral connections to the Indus Valley through preferences for a wide array of Harappan pottery types including domestic culinary equipment (Bray 2003), trade vessels, and other ceramics. On the other hand, if elite leaders at Bagasra did not have strong and direct ancestral connections to the Indus Valley, I would expect to find a restricted set Harappan pottery types at the site. These potential Harappan pottery types may relate to the site's craft economy and trade connections to other Indus settlements. Thus, Harappan pottery types related to domestic practices, such as cooking and serving food (Bray 2003, Chase 2012) are likely to be absent if elite residents at Bagasra did not express strong ancestral connections to outside the region.

In addition, if Harappan pottery was viewed as a symbol of elite status, as predicted by the traditional model, I would expect to find evidence for its restricted access. This pattern would stand in contrast to spatial patterns in non-Harappan pottery, if it was not viewed as a symbol of elite status. One possible way to restrict access would be through the segregation of space as demarcated by the perimeter wall. For instance, if the use of Harappan pottery symbolized the elite status of the vessel owner, I would expect to find Harappan pottery primarily deposited in association with the major craft industries located inside the perimeter wall. Moreover, if non-elite residents did not have access to Harappan pottery and primarily used non-Harappan pottery, then I would expect to see this reflected in the spatial patterning of non-Harappan pottery outside the perimeter wall, away from the major craft industries. An alternative hypothesis is that Harappan pottery was not viewed as a symbol of elite identity

with restricted access, but was used by most members of the Bagasra community. If this were the case then I would expect to find Harappan pottery distributed across the site and intermingled with non-Harappan pottery in domestic and craft production settings. An alternative explanation for this spatial pattern is that elites and non-elites distinguished themselves by their pottery preferences, but did not live in segregated spaces. If elites and non-elites instead lived in neighboring households on both sides of the wall and discarded their pottery across the site, then we would expect to see Harappan and non-Harappan pottery distributed on both sides of the perimeter wall.

While the majority of my dissertation focuses on this application of the inside/outside the wall model, in Chapter 6 I also test the hypothesis that elites, who signaled their control of the site's economy through the restricted use of inscribed steatite seals, also restricted access to use of the Indus script as graffiti found on pottery. This hypothesis is drawn from new research on steatite seals at Bagasra (Jamison 2010, 2012). In short, this inside/outside the wall model would predict that Harappan pottery, as well as writing on pottery, will be concentrated within Bagasra's perimeter wall. In comparison, non-Harappan pottery will be more abundant in areas outside the perimeter wall.

I am not the first to test expectations drawn from traditional migration-based theories. Brad Chase (2007, 2010a, 2010b) recently articulated a model for Bagasra in which two communities lived at the site: a largely Harappan community living inside the perimeter wall and a local, or non-Harappan, community living outside the walled area. Through his study of meat provisioning, Chase concluded that those living inside the walled perimeter maintained

some food preferences and food preparation practices that distinguished themselves from the group of people who lived outside the settlement's wall. Expanding on this research, Brad Chase and David Meiggs (2012) have recently begun a new research project exploring pastoral land-use through strontium isotope analysis, which will provide insightful new data on patterns of human mobility and social interaction, while further testing expectations regarding animal exploitation inside and outside the wall at Bagasra. Furthermore, renewed excavations at Shikarpur, Bagasra's nearest neighbor (Ajithprasad 2012b, Bhan and Ajithprasad 2008, 2009) are currently documenting Harappan, Anarta and Sorath ceramics in a similar stratigraphic relationship to that known from Bagasra (Sonawane et al. 2003). Therefore, insights gained from recent work at Bagasra (Ajithprasad 2006, Bhan and Gowda 2003, Bhan et al. 2004, 2005, Chase 2007, 2010a, 2010b 2012, Jamison 2010, Lindstrom 2010, Sonawane et al. 2003) are already informing new research agendas at neighboring sites, which merit careful methodological and interpretive consideration (see Chase, Ajithprasad and Rajesh in press).

3. Methods and Results

Comparative approaches help bridge methodological and interpretive gaps between the types of quantitative and qualitative data generated by ceramic analysis and the questions that are of interest to archaeologists. My dissertation outlines one such comparative framework for analyzing Harappan pottery forms recovered from the walled craft production center of Bagasra, Gujarat, and pottery from the major Harappan centers of Mohenjo Daro and Harappa, located in core regions of the Indus Civilization. Extensive excavations at Bagasra have revealed

the presence of Harappan and non-Harappan pottery styles in stratigraphic association, which is unique among sites in Gujarat and is important for analyzing the contemporaneous co-occurrence and spatial patterning of these two classes of vessels and how their relationship may have changed through time. As such, careful stratigraphic documentation of pottery and a well-defined chronology make Bagasra an excellent site to study the interaction and intersection of Harappan and non-Harappan pottery traditions across community space as well as through time.

My comparative approach focuses on distinguishing the specific types and styles of Harappan pottery that were or were not in use at Bagasra, including rare Harappan vessel types. The Harappan pottery typology established at Mohenjo Daro by George Dales and Jonathan M. Kenoyer (1986), and also applied at Harappa, provides the baseline definition and classification of Harappan vessel types analyzed in this study. Thus, throughout this dissertation I refer to the Dales and Kenoyer pottery typology as *the Harappan pottery typology*. In comparison, non-Harappan vessel types are defined by several regional pottery reports (Ajithprasad and Sonawane 2011, Sonawane and Ajithprasad 1994, Possehl and Raval 1989, Rao 1963) that are based on ceramic data drawn from various Anarta and Sorath, or non-Harappan, archaeological sites in Gujarat. An important criterion for their classification as non-Harappan is that the specific vessel form, defined by its unique combination of rim, body and base features, is not found in the Harappan pottery typology.

Using these typologies as a baseline to define Harappan and non-Harappan vessel forms and styles, this study seeks to identify, what I call, "*regional pottery preferences"* in Harappan

ceramics – as opposed to discrete ceramic patterns – in order to emphasize and encapsulate the idea that at the local level people in Gujarat enacted material choices to shape the form, style and function of both Harappan and non-Harappan pottery, which was used by their communities. I also evaluate changes in these pottery preferences by studying vessel frequencies across space and time. Thus, by identifying unique pottery preferences, this comparative method has the potential to reveal the agency of people living at Bagasra over their material culture. This type of agent-based interpretive framework is largely missing from the predominantly descriptive approach used in much of the regional site reports and Harappan pottery studies today.

Based on the research that I have conducted, I suggest that the ceramic data for Bagasra indicate that residents utilized a different set of Harappan pottery types than those who lived at the major urban centers of Mohenjo Daro and Harappa. Further, my research indicates that, while Harappan pottery is very common at Bagasra, many types of Harappan pottery were not used and others were used in very low percentage. These data imply diversity in the adoption and use of Harappan pottery types by communities located outside the Indus Valley and suggest that new interpretations are required to explain these pottery preferences. In addition, vessel specific findings indicate that there were significant changes in the preferences for specific types of Harappan and non-Harappan pottery over time at Bagasra. These findings, while in some ways consistent with the traditional model, suggest that several Harappan pottery forms continued to be used into the site's final period of occupation. In short, the traditional model that Harappan forms and styles of pottery completely disappeared towards

the end of the Indus Civilization is no longer supported and new interpretations are required to explain this important pattern.

Furthermore, spatial analyses of pottery types demonstrate that preferences for Harappan and non-Harappan pottery were largely shared by residents living on both sides of Bagasra's massive perimeter wall, which protected and restricted access to important craft activities and raw materials located inside the perimeter wall. In other words, spatial patterns show that Harappan pottery types were used both inside and outside Bagasra's perimeter wall, thus contradicting traditional migration-based models, which assume a correlation between Harappan material culture and craft manufacturing industries that were concentrated inside the walled area of many Indus settlements.

However, preliminary findings offer compelling evidence that a limited set of the Harappan vessel types used at Bagasra were recovered in greater percentage in craft production contexts located inside Bagasra's perimeter wall, as compared to adjoining habitation areas. Representing both trade and domestic activities, I contend that elite residents at Bagasra who directed craft production and trade from the site tended to use a greater quantity and variety of Harappan vessel types than was accessible to the entire population. This hypothesis is further substantiated by my presentation of new findings of Indus script on both Harappan and non-Harappan pottery types. In short, my research findings do not support several expectations of the inside/outside the wall model, suggesting that this traditional model requires modification.

4. Chapter Organization

I begin this dissertation with Chapter 2, which situates Bagasra within the archaeological landscape of the Indus Civilization. I also develop a set of specific research questions derived from recent models of the Indus Civilization in Gujarat that can be evaluated through a study of the pottery remains from Bagasra. This background Chapter is organized into five parts. In the first section I define the culture tradition framework (Shaffer 1992, Kenoyer 1991, 2008c), which I applied in this dissertation to define the chronological history of the Indus Civilization, and also provide a brief overview of the major social and political forces that shaped the greater Indus world during its emergence, expansion and transformation. In the second section I pay special attention to the design and function of settlement walls in the Indus Civilization. This section provides the context for understanding the possible functions of Bagasra's perimeter wall, which is the defining feature of the inside/outside the wall model (Chase 2007, Dhavalikar 1995) that my dissertation tests. In the third section I explore themes of socio-economic hierarchy and interaction networks in the Indus Civilization, which are reflected in walled craft areas and the production and accumulation of wealth items at Bagasra. Since Bagasra is the first excavated urban-style Harappan town where Anarta and Sorath material culture has been found in stratigraphic relationship with Harappan material culture, in the fourth section I provide a background to these two non-Harappan communities. This background leads into the final section of Chapter 2 where I provide a detailed chronological history of the site of Bagasra.

In Chapter 3 I present my methods of analyzing and interpreting the ceramic assemblage from Bagasra in four sections. This Chapter elucidates my comparative method, which employs a Harappan pottery classification system that has been applied at multiple sites. My comparative methods put into use and expand upon the Harappan pottery typology developed by George Dales and J. Mark Kenoyer (1986) in order to identify vessel types that are common between Bagasra and other Indus settlements. My comparative approach to Harappan pottery classification identifies diagnostic vessel types, evaluates their form and attributes in relationship to other sites, and evaluates changes in both style and percentage through time. Broadly speaking, my research illustrates how a comparative approach to ceramic analysis moves beyond ceramic description in order to problematize pottery data and ceramic classification. In doing so, it develops an interpretive structure for analyzing vessel-specific pottery data to inform archaeological understandings of the social and cultural variables that influence regional pottery preferences and patterns of continuity and change in pottery preferences across time.

The primary data analyzed for this study derive from over 12,500 potsherds selectively sampled from each of the four occupational phases at Bagasra, spanning the estimated dates 2500 to 1700 BC. Chapter 3 begins with a description of the site formation processes and the MS University approach to the excavation of Bagasra and curation of its excavated remains, including variables that influenced the ceramic assemblage that was made available to me for analysis. This section is followed by a discussion of my sampling strategy, which draws upon the strengths of the Bagasra excavation. In the third section, I move on to discuss the method

of classification of Harappan and non-Harappan ceramics that this study employs. The final section presents a detailed overview of the methods used to document the Bagasra pottery assemblage.

In Chapter 4 I present the Harappan pottery types that I documented at Bagasra. This Chapter begins by introducing the reader to the types of pottery found at Harappa and Mohenjo Daro, and discusses which of these types are also present at Bagasra. By way of comparison, this Chapter points out the additional Harappan pottery types that appear to be absent from Bagasra. Detailed chronological and spatial data on Harappan pottery types from Bagasra is presented. Specific vessel types are organized by the vessel form: jars and pots (or jarpots) and bowls and dishes (or bowldishes) are presented separately. Following these vessels specific details are additional pottery data for Harappan decorative features that have been found to overlap between vessel types, including painted motifs and red slip black band decoration. In discussing each vessel type, I focus on identifying patterns in their distribution inside as compared to outside the perimeter wall at Bagasra, and in craft production contexts as compared to habitation deposits. I conclude Chapter 4 with a discussion of two main chronological patterns: Harappan pottery types that show differences in their percentages across time from those that show continuity in use. In this way, the data in this Chapter highlights changes in the use of different types of Harappan vessels across time. Thus, in Chapters 4 I outline the regional preferences for Harappan pottery, which are documented in the ceramic assemblage at Bagasra.

In Chapter 5 I examine the extent to which styles of domestic cooking pots and select types of serving vessels were shared between Bagasra and the major urban centers of Harappa and Mohenjo Daro. This Chapter is divided into two sections: cooking pots and serving vessels. In both sections, I examine the chronological and spatial distribution of select Harappan pottery types compared to regional, or non-Harappan, types. The focal point of this Chapter is an investigation of the potential similarities and differences in the types of pots and bowls used by residents living inside the perimeter wall as compared to those living outside the wall. I also present an analysis of the distribution of Harappan and non-Harappan cooking pot and bowl types in craft contexts and habitation areas inside and outside the wall. The results of this analysis not only demonstrate that the residents at Bagasra used different types of cooking pots and serving bowls than those who lived at the urban centers in the Indus Valley, but also point to variation in the use of certain pottery types by residents inside and outside the wall at Bagasra. By focusing on this new spatial and chronological pottery data, this study specifically aims to contextualize the social practices of selection and use of the Harappan cooking pot, a widespread symbol of Harappan identity, at a single site that lies outside the Indus Valley.

In Chapter 6 I turn to examine the evidence for writing on Harappan and non-Harappan pottery forms at Bagasra. As a tool of elite power and control over the transmission of knowledge, the presence of steatite seals and pottery with Indus script signifies that literate individuals or families at Bagasra used writing to maintain and display their social and economic position to other members of their community. My study is the first in Gujarat to apply a method for distinguishing different types of pottery graffiti that was developed at Harappa. My

study of graffiti also documents and analyzes patterns in the use of Indus script on pottery and thus provides important new regional data on the use of writing in the Indus Civilization borderlands.

I begin Chapter 6 with a brief background on studies of Indus script and I then describe my methodology for distinguishing scriptural from non-scriptural pottery graffiti, which is based on the methods developed by J. Mark Kenoyer and applied in the research on script at Harappa (Kenoyer 2006, 2009a, Kenoyer and Meadow 1997, 2000, 2008, 2010, Meadow and Kenoyer 1994, 1997, 2000, 2001). By differentiating pre-firing graffiti from post-firing graffiti and script from non-linguistic symbols, this analytical technique produced a robust data set on the Indus writing system, as distinct from other notation systems used by regional communities.

In the second section of this Chapter I present the Bagasra graffiti data in four parts: pre-firing potter's marks, pre-firing painted script, post-firing inscribed graffiti, and post-firing incised graffiti. In discussing my results, I focus on the Bagasra data set of scriptural graffiti, or painted and inscribed graffiti, which were documented during each of the four occupation phases and in areas on both sides of the perimeter wall. By distinguishing writing from other forms of non-linguistic symbols found on pottery, I have been able to establish that elites at Bagasra inscribed both Harappan and non-Harappan vessels with Indus script. Furthermore, these Bagasra scriptural graffiti data signify that contexts for the use of writing on pottery changed over time and may have differed from those established for seals and tablets (Jamison 2010, 2012, Kenoyer 2009).

In conclusion, living amidst a culturally diverse landscape on the borderlands of the Indus Civilization, residents of Bagasra became specialists in producing highly standardized Harappan style ornaments of shell and stone, which was traded throughout the Indus Civilization. I believe my research shows that in the process, they crafted their own regional pottery preferences by drawing on a diverse set of local non-Harappan and widespread Harappan pottery styles and vessel forms. Thus, I argue that this comparative methodology, which identifies site-specific variation and regional patterns in the preference for Harappan ceramics, warrants extended application at additional sites in Gujarat as well as other regions of the Indus Civilization.

Chapter 2: Background

1. Introduction

In this dissertation, I test several hypotheses regarding the chronological and spatial patterning of Harappan and non-Harappan pottery at the site of Bagasra, a small, walled craft production center located in the borderlands of the Indus Civilization (2600-1900 BC). The contribution of this research is that it refines our understanding of the nature of Harappan and local cultural interactions in Gujarat by identifying the unique pottery preferences of the Bagasra community, which utilized both Harappan and non-Harappan forms and styles of pottery for most of its occupation. In this study, I approach pottery analysis through a comparative methodology that applies the Harappan pottery typology (Dales and Kenoyer 1986), which was developed at the major Indus cities of Mohenjo Daro and Harappa, to identify the types and styles of Harappan pottery that were and were not in use at Bagasra. A primary goal of this dissertation is to test a related set of hypotheses, which I refer to as the inside/outside the wall model, that stem from the existing body of literature, which I discuss in this chapter. As it relates to pottery data, this inside/outside the wall model predicts that Harappan pottery, as well as writing on pottery, will be concentrated within Bagasra's perimeter wall. In comparison, non-Harappan pottery will be more abundant in areas outside the perimeter wall. The significance of this model lies in the direction it provides to our understanding of the social and cultural identities of elite leaders, who directed the production and exchange of valuable prestige goods from inside Bagasra's monumental perimeter wall.

The goal of this chapter is to provide a background for several trends in archaeological research that led me to pursue this specific line of study. This background situates Bagasra within a social landscape that includes both regional neighbors and broader communities of the Indus Civilization. I believe that a focus on social landscapes better explains the presence of Harappan pottery at Bagasra than other possible approaches, which may privilege environmental, geographic, economic, or culture-historical landscapes. Further, the social landscape sets the stage for evaluating components of the inside/outside the wall model, which derive from traditional migration-based perspectives (Rao 1973, Joshi 1972, Possehl 1980, Bisht 1989a, Dhavalikar 1995). The traditional model predicts that elite, who lived at Bagasra, where they directed craft production and trade, were closely tied to communities in the core regions of the Indus Valley through ancestral and/or social connections. In the final section of this chapter I further develop the set of specific research questions that are evaluated in this study of the pottery remains from Bagasra.

The history of research in Gujarat echoes important trends in the study of the Indus Civilization, producing critical new data that have been used to evaluate models for the development, expansion, and decline of state-level society. Archaeological evidence from Gujarat has shaped our understanding of the Indus Civilization in three ways: 1) Gujarat provides extensive evidence for the existence of *regional Harappan cultures* (Possehl 1980, Possehl and Herman 1990), 2) it provides the strongest evidence for the *co-existence of Harappan and non-Harappan communities* (Sonawane and Ajithprasad 1994) during the period of Indus urban florescence and 3) sites dated towards the close of the Indus Civilization provide

some of the strongest evidence against models for state collapse and instead reveal the presence of important economic and social continuities (Bhan 1989, 1994, Possehl 1980, 1997a, Shaffer 1992). Thus, research in Gujarat expands our understanding of the cultural complexity of this ancient landscape.

Furthermore, because the development of the Indus Civilization in Gujarat is quite different from its origins in the core regions of urbanism located in the Indus Valley, sites in Gujarat provide important evidence to test and refine hypotheses regarding the nature of urbanism, the position of elites and the ways their power and position was symbolized, and links between material culture and society. In the process of urban development and transition to state-level society, many technological and societal changes occur (Childe 1950, Kenoyer 1991a, 1994a, Yoffee 1993). These transitions, including the origins of writing, have been extensively documented in the Indus Valley but are not thoroughly understood in Gujarat.

This chapter begins with an overview of the models used to reconstruct the chronology and major social and economic forces shaping the civilization. I then discuss the three main eras of the Indus Civilization: the Regionalization Era, Integration Era, and Localization Era. Within each era summary are included the major developments and defining features shared across the Indus Civilization while focusing more detail on Gujarat in particular. Gujarat has been the locus of a great deal of archaeological research. Much of this research has been directed at describing and interpreting the presence of several regional cultural traditions, which existed prior to and contemporaneous with Harappan sites. Thus, by discussing research and theoretical trends in the context of popular models that have been developed to explain the

articulation of the Indus Civilization in Gujarat, the background to understanding the world that existed when Bagasra was occupied is provided.

With this background in mind, I then present a phase-by-phase overview of the site of Bagasra and explain a related set of hypotheses, which I refer to as the inside/outside the wall model. By providing specific detail on Bagasra's perimeter wall and evidence for craft production, this section presents information about the site, which is necessary to understand and evaluate the inside/outside model that is being tested in this dissertation. The inside/outside model stems from traditional-migration based literature (Dhavalikar 1995) and has been proposed and tested at Bagasra by Brad Chase (2007, 2010a). In short, the model establishes the expectation that the perimeter wall at Bagasra segregated the settlement into two communities: a largely Harappan community living inside the perimeter wall and a local, or non-Harappan, community living outside the walled area. Key to this model is the interpretation that the wall restricted access to areas inside where highly valued objects were produced. As such, the model would predict that elite Harappan residents of Bagasra lived inside the perimeter wall because they were involved in, and in control of, the production and trade of highly valued marine shell, faience, and semi-precious stone bead industries located within these walls. These individuals signaled their elite status and connection to the core areas of urbanism in the Indus Valley through the consumption and display of highly valued goods. In contrast, non-Harappan residents lived outside the perimeter wall. They were not in control of the major craft industries and did not have access to highly valued goods. Directly relevant to this study, this inside/outside the wall model predicts that Harappan pottery, as well as writing

on pottery, will be concentrated within Bagasra's perimeter wall. In comparison, non-Harappan pottery will be more abundant in areas outside the perimeter wall. As will be demonstrated in the following dissertation, this simplistic model is not supported, and while there is clearly a Harappan component in the ceramic and craft assemblage, there is no strong pattern of distribution inside or outside of the walled area.

2. The Indus Civilization: Chronology and Culture History

With more than 1000 known sites spread across a landscape measuring over 1 million km^2 (Jansen 2002), the Indus Civilization is the most geographically expansive state-level society in the ancient world (Figure 2.1) (Jansen 2002, Kenoyer 1991a, 2008b, Shaffer 1992). Also referred to as the "Greater Indus Valley" (Mughal 1970), it stretches from the Himalaya Mountains in the north to the Arabian Sea in the south. On the west it borders the Baluchistan highlands and stretches east to include the Thar Desert and the western fringes of the Ganges River Valley. The southern coastal areas include several outlets to the Arabian Sea, specifically the deltas of the Indus and Ghaggar-Hakra (now dry) rivers in addition to the Rann of Kachchh. The complexity of this geographic matrix plays a major role in the variety of regional histories witnessed within the Indus Civilization.

The region of Gujarat lies outside the Indus River Valley, and has been considered by some as a borderland, or frontier, of interaction (Chase 2010a, 2012, Fuller 2006, Law 2011, Possehl 1976, 2002a), while others consider it to be a part of the greater Indus valley (Kenoyer 2008b). Gujarat is defined by the modern Indian state of the same name and encompasses

three distinct geographic regions (Chamyal et al. 2003, Mehr 1995): Mainland Gujarat, Kachchh, and the Saurashtra Peninsula (Figure 2.1). Gujarat has been extensively surveyed and contains archaeological sites dating from the Mesolithic period (Ajithprasad 2004, Sonawane 2002a). The primary feature of Mainland Gujarat is a vast flat alluvial plain, which is bordered by the Aravalli and Deccan highlands. The region consists of a series of rivers that originate in the eastern uplands. The Sabarmati River is the most important river in the region, but smaller rivers like the Rupen, Saraswati and Banas were also home to ancient communities (Hegde et al. 1988). Kachchh is a central high plateau surrounded by salt-encrusted flats called the Rann of Kachchh. A group of islands (*bets*) located in the salt flats contain the remnants of archaeological sites. The most prominent of these being the large metropolis of Dholavira, which is located on Khadir bet. The Saurashtra peninsula is marked by a series of flat-topped rocky ridges, which are bounded by varied coastal lowland plains and low ridges and cliffs. Additional details regarding the natural landscape of Gujarat can be found in a recent summary by S.V. Rajesh (2011: 26-46). The site of Bagasra, which is the focus of this research, is located at the juncture of these three geographic zones (Sonawane et al. 2003), and thus lies in an important location for ancient trade routes as well as access to various resource zones.

Figure 2.1: Map of the Indus Civilization with selected sites mentioned in the text

Archaeologists have developed a variety of terminologies to describe the complex chronological histories of the Indus Civilization (Jansen 1993a, Kenoyer 1991a, 2008b, Possehl 1984). This dissertation applies the cultural tradition framework (Willey and Phillips 1958) adapted to the Indus Civilization by Shaffer (1992) and Kenoyer (1991a, 1995b, 2008b). Unlike other chronological systems, this framework incorporates the notions of regionalism and cultural diversity within the conceptual outline of a particular tradition. Key to this revised model of cultural traditions is the recognition that components of material culture change at different rates both within a community as well as between regions (Shaffer 1993, Shaffer and Lichtenstein 1989, 1995). The concepts of regional diversity and differential rates of change in material culture are central themes in my study. Thus, situating the Bagasra pottery data within this framework helps to connect the material patterns from a single site to broader cultural and chronological frameworks.

Shaffer (1992) and Kenoyer's (1991a, 2008b, 2008c) cultural tradition framework employs four analytical archaeological concepts: tradition, era, phase and interaction system. A *cultural tradition* is defined as "persistent configurations of basic technologies and cultural systems within the context of temporal and geographical continuity" (Shaffer 1992: 442). Shaffer (1992: 442) finds the utility of this concept for archaeologists to be its ability to facilitate "stylistic grouping of diverse archaeological assemblages into a single analytic unit" while also providing the parameters, which link culturally and chronologically diverse material components. It follows that the geographical area defined above as the Indus Civilization is referred to as the Indus Tradition (Kenoyer 2008b, 2008c) in this scheme. However, the

terminology “Indus Civilization” is more common across the literature and is therefore preferred in this dissertation.

Traditions are broken down into several large-scale chronological units called *eras*, which are neither fixed in space nor time, but are defined by the nature of regional economies and *interaction systems* (Kenoyer 1995b). Eras do not represent unilinear cultural developments, but instead have the potential to exist contemporaneously. As such, they reflect the potential for features of societies within a cultural tradition to change at different rates. Shaffer (1992) and Kenoyer (1991a, 2008b) have identified four eras within the Indus Civilization (Table 2.1): the Early Food Producing Era, the Regionalization Era, the Integration Era and the Localization Era. The Early Food Producing Era is the period in which economies first began to be based on food production, but precedes the introduction of ceramic technologies (Kenoyer 1991a: 334), and therefore largely falls outside the time period that is the focus of this dissertation. The Regionalization Era is known as a period of intensified regionally focused interaction and regionally distinctive material culture, especially pottery styles. Ancestral patterns of diversity persist into the Integration Era, but are submerged by widespread unifying economic and social forces characteristic of a state-level society. These unifying forces were strong enough to draw together a geographically expansive civilization for over 700 years under a broadly similar economic foundation of craft production and inter-regional trade and exchange, which served as an avenue for the spread of shared material traditions. However, this foundation eventually broke up and regional cultural patterns reemerged during the Localization Era.

Table 2.1: A Simplified Chronology of the Indus Civilization

Era	**Geographic Region**				
	Gujarat	**Sindh**	**Baluchistan**	**Punjab**	**Cholistan**
Early Food Producing Era (7000 - 5500 BC)			Mehrgarh Phase		
Regionalization Era (5500 - 2600 BC)	Anarta Phase Padri Phase Pre-Prabhas Phase Early Harappan Phase	Balakot Phase Amri-Nal Phase	Kot Diji Phase	Ravi/Hakra Phase Kot Diji Phase Sothi Phase	Hakra Kot Diji Phase
Integration Era (2600 - 1900 BC)	Harappan Phase Anarta Phase Prabhas Phase Sorath Phase	Harappan Phase	Harappan Phase	Harappan Phase	
Localization Era (1900 - 1300 BC)	Rangpur Phase Sorath Phase	Jhukar Phase		Punjab Phase	

These broad eras are further subdivided into *phases*, which represent the smallest analytical unit in this scheme. Particularly significant for my dissertation, phase definitions rely primarily on groupings of diagnostic ceramic styles found at one or more sites (Shaffer 1992: 442), which fit well with the literature on Gujarat. Thus, geographically defined regions can

include a single phase, with one main ceramic tradition, or multiple phases that reflect the co-existence of several regional ceramic traditions. The fact that phases may co-exist contemporaneously within a cultural tradition takes into account differential rates of cultural change across a large geographic area like the Indus Civilization. In this way, the concept of phase provides an ideational structure for studying cultural and material diversity within and between regions of the Indus Civilization, which is the focus of this dissertation.

Further, crosscutting both traditions and phases, *interaction systems* refer to "various avenues of social communication existing within and between social groups" (Shaffer 1992: 442). Interaction systems are identified archaeologically by the distribution of raw materials (see Law 2011) in addition to unfinished and finished craft products (Kenoyer 1995b). Thus, the concept of the interaction system lies at the foundation of a wide array of archaeological studies of craft production and trade economies in the Indus Civilization. The concept itself, and the research that builds on the concept, highlights the social connections that existed between people who belong to different cultural traditions, while also identifying the connections between nearby neighbors and people living in different geographic regions of the Indus Civilization.

In sum, by applying the concepts of era, phase and interaction system in combination, the cultural tradition framework provides an interpretive heuristic that can help to explain the differential rates of change in the defining features of society. For instance, Regionalization Era trends in one geographic area may persist while other areas witness changes characteristic of the Integration Era. Thus, the cultural tradition framework provides a chronological as well as

an interpretive structure for comparing patterns in diagnostic material culture between sites and regions of the Indus Civilization.

Table 2.2: A Simplified Chronology of Chalcolithic Gujarat

Era	**Geographic Region**		
	North Gujarat	**Saurashtra**	**Kachchh**
Regionalization Era			
3600-3000 BC	Anarta	Padri	
3000-2500 BC	Early Harappan	Pre-Prabhas	Early Harappan
Integration Era	Anarta	Harappan	Harappan
2500 - 1900 BC	Harappan	Prabhas	
		Sorath	
Localization Era		Sorath	
1900 - 1300 BC		Rangpur	

2a. The Regionalization Era (5500-2600 BC)

The Regionalization Era (5500-2600 BC) is a formative period of increased regional differentiation during which the social and technological foundations of state-level society (Kenoyer 1991a, 1994a, 2011) were established. As the term suggests, at this time the Indus Civilization was organized into several regional social groups (Shaffer and Lichtenstein 1995: 133), or regional interaction systems, which manifest archaeologically through "distinct artifact styles, essentially ceramics, which cluster in time and space" (Shaffer 1992: 442, see also Mughal 1970, 1990a), but which are not fixed (Kenoyer 1991a: 334). As such, the

Regionalization Era is roughly equivalent to the Early Harappan (Mughal 1990a, Possehl 1999, 2002c) and Pre-Harappan (Ajithprasad 2002) periods identified in regional studies by other scholars. The regions often referred to as Early Harappan, especially the Amri-Nal (located in Sindh-Balochistan) and Kot Diji Phase (located in Baluchistan and Punjab), and (contemporary) Sothi Phase (located in Punjab and Haryana) have the earliest evidence of the technological and social preconditions of later Harappan Phase society (Mughal 1970).

Recent archaeological research in Gujarat provides new evidence for the independent establishment of villages and towns in several geographic regions during this period. Among the most significant for this research are the indigenous Chalcolithic farming communities of North Gujarat (Ajithprasad and Madella 2012), which are discussed in more detail below. As evident by the presence of Amrian and Kot-Dijian pottery styles and vessel forms, the early Harappan communities from the southern Indus Valley regularly interacted with the indigenous Chalcolithic communities of North Gujarat (Ajithprasad 2002) from roughly the middle of the 4th millennium BC. While the social and political nature of these interactions is not well understood, early Harappan people may have sought to acquire raw material resources found in Gujarat such as chert, agate-jasper, amazonite and marine shell (Kenoyer 1983, Law 2011).

The preconditions for the emergence of state-level society (Kenoyer 1991a, 1994a) that were established during the Regionalization Era are: 1) a diverse and abundant subsistence and resource base, 2) the establishment of socio-economic interaction systems that link resource areas, 3) the technological expertise and capacity to fulfill the needs of both urban and state-level society, and 4) mechanisms for establishing and reinforcing status differentiation, or social

hierarchies. Increased regional social complexity and the emergence of social hierarchies is reflected through the growth of small Regionalization Era agro-pastoral settlements into villages and large towns, which has been most extensively documented at communities along the Indus plain (Mughal 1990). The elaboration of technologies to include more production stages and a variety of non-local raw materials helped to define emerging social hierarchies through the public display of highly valued ornaments and other crafted wealth items (Kenoyer 1995a, 2000, 2001, Mughal 1990, Vidale and Miller 2000). Thus, a pattern of wealth creation was established during this era, which was based on the control of technology and distribution of finished products rather than the acquisition of raw materials. It is important to consider that societal foundations of state-level society emerged at different points in time and in different locations within the Indus Civilization (Kenoyer 2011). Thus, the direct impact of these developments on the everyday lives of ancient communities must have varied widely. Nonetheless, by the beginning of the Integration Era the impact of these preconditions was felt across an expansive geographic area.

2b. The Integration Era (2600/2500 – 1900 BC)

Features of urban state-level society, which emerged at slightly different times in different regions, mark the beginning of the Integration Era. Recent excavations at Harappa provide evidence for the emergence of an early Indus state around 2800 BC, during the Kot Diji Phase of the Regionalization Era (Kenoyer 2001, Meadow and Kenoyer 2001). Nevertheless, the major phase of Indus state development occurs at the start of the Integration Era, closer to

2600 BC, when the defining features of the Harappan Phase are found distributed throughout the numerous regional cultures, whose foundations were laid during the Regionalization Era. In Gujarat, the Integration Era appears around 2500 BC with the founding of numerous walled urban-style towns in Kachchh and northern Saurashtra. I refer to these towns as "urban-style" because they are very small settlements that generally lack features of Indus cities: for instance, large public buildings, a drainage system, and multiple walled occupation areas. However, their monumental perimeter walls and standardized architecture are suggestive of urban planning. The overarching homogeneity of Harappan material culture and bias towards excavation of large urban sites has masked the continuity of regional cultural traditions within this large state-level society, though they persisted in the various rural and non-urban settlements throughout the era. This pattern is particularly strong in Gujarat.

Differing rationales for defining state-level societies informed a past debate on the nature of political, economic and social authority and integration during this era. On one side of the debate were scholars who argued that the Indus Civilization, while unique from other pristine states, was indeed a state-level society (Allchin and Allchin 1982, Dales 1973, Jacobson 1986, Jansen 1989b, Jarrige 1983, Kenoyer 1994a, Mughal 1970). Scholars who argued that the Indus Civilization was not a state (Fairservis 1989, Possehl 1990, 1998, Shaffer 1982, 1993, Shaffer and Lichtenstein 1989) also cite the ways in which the Indus Civilization diverged from other early states, especially Mesopotamia. Now largely put to rest, this debate illustrates the problems and limitations of traditional trait list approaches to defining early states (Adams 1966, Childe 1950, Mackay 1938, Marshall 1931, Piggott 1950, Service 1975, Wheeler 1953),

which are traced to colonial era archaeology and outdated diffusion models of culture change. The ways in which the Indus Civilization diverges from these models when compared to other early states has further challenged archaeologists to reflect on the ways they theorize social, political and economic integration and authority in ancient states.

Overlaying a web of regional traditions was a relatively homogeneous material culture, which defines the reach of the Indus Civilization. This material culture includes items of domestic use, such as triangular terracotta cakes and black painted red slipped pottery. Ornaments made out of terracotta, marine shell, semi-precious stone, and faience marked personal identity while also signaling internal social hierarchies based on access to highly valued wealth objects (Kenoyer 1995a, 2000). Although elites and civic leaders did not often use their power to construct palaces, nor represent themselves in monumental art, they did signal their economic authority through the use of administrative technologies, especially carved steatite seals bearing the undeciphered Indus script, clay sealings, and standardized cubical chert weights. The distribution of these objects at sites and across the civilization points to shared practices of economic authority through the control of the production and distribution of economically and ideologically important items, rather than through the hoarding of wealth or the direct control of distant resource locales. However, ideological and economic coercion is seen in the spatial organization of cities and the hierarchy of craft and technologies (Kenoyer 1989).

These archaeological data are consistent with a model of relatively autonomous city-states enmeshed within broadly unifying economic and ideological forces (Kenoyer 1994, 1997),

but situated within distinct regional landscapes. Some of the largest cities, like Dholavira (Bisht 1989, 2000) appear to have been more strongly centralized, while others suggest leadership through internally competing groups of elites, like at Harappa (Kenoyer 1995a) and Mohenjo Daro (Jansen 2002). The specialized urban features of Indus settlements vary regionally and in accordance with size of the settlements. Water management is common to the largest cities in the form of wells (Mohenjo Daro) and large water reservoirs (Dholavira, Lothal), as well as a complex drainage system for waste disposal (Mohenjo Daro, Harappa, Dholavira). Common to sites of all size, from small villages like Bagasra, to urban metropolises of Harappa and Mohenjo Daro, is the use of monumental walls with narrow gateways to enclose the major occupation mounds, thus protecting and restricting access to the goods and activities inside. The recovery of seals and weights near gateways at Harappa (Meadow and Kenoyer 1994) and the restriction of craft production to inside the walls at some sites suggest that perimeter walls played a powerful economic role at many Indus settlements.

Within a framework of regionalism that encompasses the whole of the Indus Civilization, sites in Gujarat provide the most comprehensive evidence for the co-existence of Harappan and Non-Harappan communities during the height of the Indus Civilization. This evidence comes in the form of Harappan ornaments appearing in small quantities at many Non-Harappan sites located in north Gujarat and Saurashtra, which are discussed in more detail below. Likewise, Non-Harappan pottery has been recovered within the ceramic assemblages of most Harappan sites located in Kachchh. The mechanisms by which these objects came to be incorporated into the material remains of these sites are not fully understood. Perhaps less understood is the

role and meaning of these objects in the daily lives of inhabitants. The intermingling of Harappan and Non-Harappan material traditions at individual sites challenges and pushes the boundaries of existing models for the integration of Gujarat cultural landscapes into the Indus Civilization.

In Gujarat, over 500 sites have been discovered and they represent at least one regional Harappan culture and numerous non-Harappan cultures. Of these, features resembling the core areas of Indus urban development have been documented at twenty-five sites (Sonawane 1998-99). These sites also display non-typical Harappan ceramic styles. Accepted models posit the emergence of Harappan communities in Gujarat during the expansive urban Harappan phase of the Integration Era (2600-1900 BC) (Dhavalikar 1995, Hegde et al. 1992, Joshi 1972, Possehl 1980, Rao 1973). This assumes that these communities played a minor role in the early formation of state-level society across the region. These sites were positioned along important trade routes and waterways to facilitate exchange of key resources and finished objects valuable to the Harappan economy. While Harappan sites vary in size from 1.4 hectares (Surkotada) to over 60 hectares (Dholavira) (Possehl 1980), they all have evidence for specialized craft production, especially the crafting of marine shell and agate ornaments (Bhan and Gowda 2003, Sonawane 1992). Many have at least one walled sector that enclosed various craft production areas and demarcated social and economic space.

The diversity of communities in Gujarat is the focus of several current research projects (Ajithprasad 2012, Ajithprasad and Madella 2012, Chase et al. 2012, in press). It is now becoming clear that there are continuities in occupation and distinctive material culture of

Gujarat's regional traditions, which indicate these cultures played a significant regional role in the development of urban state-level society. However, the influence of Gujarat on state-level society developments outside of Gujarat is not yet clear. Very little work has been done to identify material culture styles and technologies that originated in Gujarat in the Indus Valley. This type of information is key to better articulating the two-way nature of interactions between urban Harappan settlements in the Indus Valley and local communities in Gujarat. This dissertation research provides an initial step towards addressing several methodological and interpretive gaps by articulating and testing a comparative approach to ceramic analysis. A comparative approach has the potential to extend the implications of traditional pottery analysis by articulating the nature of local preferences for Harappan pottery more precisely.

2c. The Localization Era (1900 - 1700 BC)

In the wake of dramatic environmental changes and shifting economic networks that characterize the Localization Era (1900-1700 BC) (Kenoyer 1991) numerous cities, towns and villages in the greater Indus region were abandoned. Many people appear to have migrated into resource-rich landscapes like Gujarat (Bisht 1989a, Joshi 1972, Majumdar 2001, Possehl 1980, 1992b, Rao 1963, 1979, Sonawane 1992), which shows some of the clearest evidence for continuities in cultural and technological traditions. Despite the apparent influx of new populations into Gujarat, there was an overall decline in the number and size of sites (Possehl 1997a) reflecting increased mobility (Bhan 1989) and a shift away from urban models of community organization. As was the case during the Regionalization Era, local and regional

patterns of material culture, especially pottery, come to again distinguish the main geographic regions, which were once tied together through the unifying forces of a state-level society. The breakdown of the interregional trade and interaction networks, which previously linked important resource areas, meant that people no longer had access to the raw materials necessary for the creation of wealth items. Thus, several technological traditions appear to have disappeared, including the manufacture of steatite seals, standardized stone weights, and stoneware bangles, as well as urban architectural practices and writing (Kenoyer 1998: 173-185). On the other hand, there are important continuities in technological traditions, most notably in semi-precious stone bead manufacture (Bhan et al. 2002, Kenoyer et al. 1991, 1994, Vidale et al. 1993) and shell bangles (Kenoyer 1983), which suggest that the economic base of many communities was maintained through this period of transition. At Bagasra, the shift is reflected in new styles of domestic and public architecture, often built on top of the defunct perimeter wall. New styles of pottery and a lack of evidence for the production, trade, and personal use of Harappan style ornaments indicate that previous social and economic contacts were broken or renegotiated and new relationships were established.

3. Settlement Perimeter Walls

As articulated throughout this dissertation, my research tests a related set of hypotheses, which I refer to as the inside/outside the wall model, that stem from the existing body of literature. As it relates to pottery data, this inside/outside the wall model predicts that Harappan pottery, as well as writing on pottery, will be concentrated within the single

perimeter wall excavated at Bagasra. In comparison, non-Harappan pottery will be more abundant in areas outside the perimeter wall. The significance of this model lies in the direction it provides to our understanding of the social and cultural identities of elite leaders, who directed the production and exchange of valuable prestige goods from inside Bagasra's monumental perimeter wall. Thus, a brief background on city walls and settlement planning in the Indus Civilization will contextualize the construction and function of the perimeter wall at Bagasra.

During the Integration Era, single or multiple monumental walls were built around settlement areas in the large cities, like Harappa (Meadow and Kenoyer 1994, Wheeler 1947), Mohenjo Daro (Jansen and Urban 1984, 1987, 1988, Marshall 1931), Rakhigarhi (Nath 1998) and Dholavira (Bisht 1989b). Walls were also built around small settlements, like Kot Diji (Khan 1965) and probably Amri (Casal 1964, Mallah personal communication). Other regionally prominent settlements, like Chanhu-daro (Mackay 1943) and Balakot (Dales 1979) remained unwalled, or their walls have not yet been located (Kenoyer personal communication).

This section reviews the features of perimeter walls in the Indus Civilization as well as their potential functions. I provide several key examples of walled and unwalled settlements in Gujarat that inform my interpretation of the function of Bagasra's single known monumental perimeter wall and the patterning of pottery across the site. The conclusion points out the diversity of wall construction within Gujarat and draws attention to the common practice of focusing excavations and site interpretations on the walled portions of Indus settlements. For

this reason, my comparative study of areas inside and outside the wall fills a critical gap in the knowledge of walled settlements in this region of the world.

The monumentality of perimeter walls during the Integration Era clearly served to distinguish and protect the structures, objects, and people residing inside from attacks and raids as well as flooding (Kenoyer 2008b, Smith 2003). Thus, walls physically and symbolically distinguish lived-in or protected space from uninhabited and unprotected space. Walls may enclose an entire settlement, which signifies the strength and authority of city dwellers to rural and migrating groups as well as to other urban neighbors with which it competed for resources (Smith 2003: 282). Walls also were constructed to separate space within Indus settlements, such as a higher area from the lower area, as at Dholavira (Bisht 1989b) and Balakot (Dales 1979), or to encircle and distinguish multiple mounds as at Harappa (Meadow and Kenoyer 1994). In this way, monumental walls and other labor-intensive architecture symbolize the concentration of power and inter-elite competition. By visibly restricting structures and activities inside of perimeter walls, elites demonstrate their power and authority to control access to the walled area as well as the craft activities, ritual areas, and services inside (Kenoyer 2000, Vidale 2010). By concentrating populations inside the walled areas, elites also gain control over social connections, and perhaps compel contacts, between individuals or families (Smith 2003). Throughout the period that walls and other forms of monumental architecture were maintained, they served as symbols of community identity, wealth, and the durability of political power in South Asia, as in other parts of the world (Abrams 1998, Kenoyer 2000, Kim 2013, Smith 2003). These patterns of enclosing settlements with walls began during the Indus

Civilization and continue into the Early Historic era (Erdosy 1995, Smith 2003), when warfare also became a factor affecting city planning.

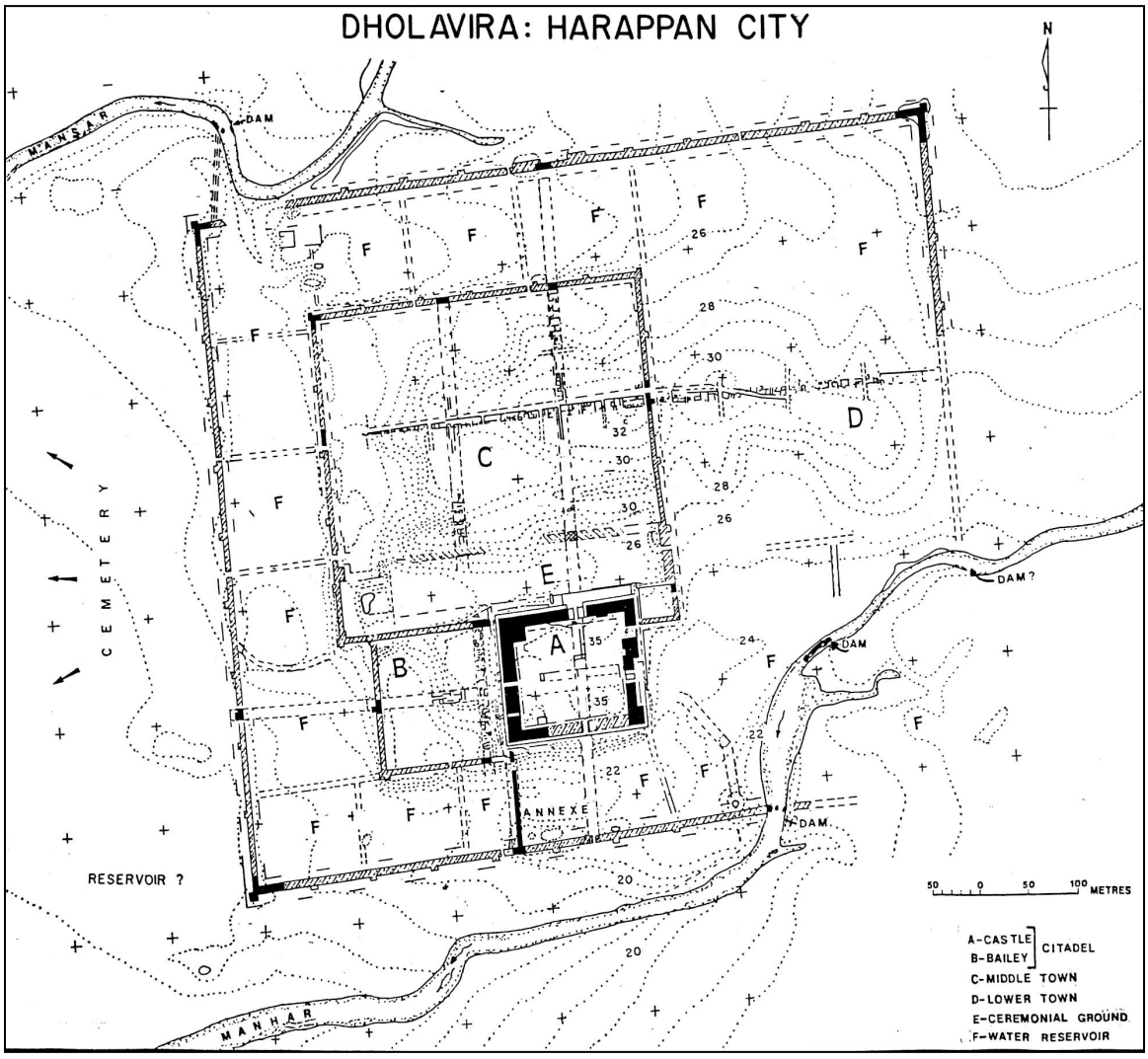
In this dissertation I refer to these architectural features as perimeter walls (Kenoyer 2008c, 1995b, 1993), rather than the more common term fortification walls (Bhan and Ajithprasad 2009, Bhan et al. 2004, 2005, Bisht 1989b, Dhavalikar 1995, Kharakwal et al. 2012, Sonawane et al. 2003) for several reasons. Foremost, the architectural features of these walls are not typical of defensive fortifications (Possehl 2002: 103, Wright 2010: 126) as described in the broader literature (Keeley et al. 2007, Kim 2013, Tracy 2000). There is also no conclusive evidence that any major Indus settlement was attacked or destroyed by warfare (Kenoyer 2008b, however see Cork 2005 for an alternative hypothesis). Rather, it is clear that perimeter walls in the Indus Civilization, as elsewhere, served several functions that changed over time (Keeley et al. 2008, Meadow and Kenoyer 1994, Smith 2003).

Settlements across the Indus Civilization, both large and small, had highly developed systems of city planning that included perimeter walls, well-planned streets organized on a grid, and a complex drainage system. This pattern began during the Regionalization Era (Kenoyer 2008b), but took on an elaborated form during the Integration Era when community labor was used to erect massive city walls with gateways that were commonly built of mudbrick and sometimes faced with fired brick or stone. Gateways were located in or near the corners or in the middle of the wall and provided control over entry into the interior of the walled area. Kenoyer's research indicates that the major streets of larger settlements like Harappa and Mohenjo Daro were between 4.5 and 9 meters wide, which allowed for the two-way movement

of ox carts (Kenoyer 2004). As smaller streets were between 2-3 meters wide, they accommodated only one-way traffic (Kenoyer 2008b). Gateways were generally only 2.5 meters wide (Kenoyer 2008b), thus allowing for one vehicle at a time to enter.

Many sites in the Kachchh region of Gujarat retain evidence of their monumental perimeter walls, and thus share this feature of settlement planning with other cities and towns across the Indus Civilization (Kenoyer 2008b, Possehl 2002, Wright 2010). As the nearest urban metropolis to Bagasra, Dholavira (Bisht 1989a, 1989b, 1991, 1994, 2000, 2005) must have had influence over regional trade and interaction networks in Gujarat, which affected resident craftspeople and community leaders at Bagasra. Located on Khadir Island in the Rann of Kachchh, Dholavira has been measured at over 100 hectares in area (Bisht 1989b), thus making it the largest known site in the region and comparable to Harappa and Mohenjo Daro in size and influence. Accordingly, elites at Dholavira must have controlled key aspects of trade, including control of key water trade routes through the Rann of Kachchh as well as the ancient Ghaggar-Hakra River delta. It is important to note that comprehensive Dholavira excavation reports had not yet been published at the time of this dissertation, and thus further material comparisons with Bagasra were not possible for this study.

Figure 2.2: Multiple Perimeter Walls at Dholavira (image from Bisht 2005: Figure 1)



Dholavira has the most elaborate set of perimeter walls of any other regional site (Figure 2.2). Though a comprehensive excavation report has not yet been published, R. S. Bisht (1989b, 1991, 1994, 2000, 2005), the excavation director, has published several short articles that describe the key features of Dholavira's architecture. J. M. Kenoyer (Kenoyer 2008c) has

also observed and extensively summarized Dholavira's major architectural features. From these reports we know that the mud-brick wall was erected when the site was first founded in the Regionalization Era and stood as a physically imposing feature into the Localization Era (Kenoyer 2008c). During the Integration Era, the settlement grew and additions were made to the wall. Bisht identified these separate walled areas of the city as the so-called citadel, bailey, middle town and lower town (Bisht 1989b, 1991). The outer wall, made entirely of mud-brick, enclosed approximately 47 hectares (771m x 616.8m) (Bisht 1994). The outer wall had large square corner bastion-like features and massive ramparts leading to two major gateways (Figure 2.3). Inside the outer perimeter wall is an interior set of mud-brick walls faced with stone, which contain four minor gateways. This set of walls enclosed the middle town (360m x 250m), which contained a large open ceremonial ground. The citadel (300m x 300m), rises about 13 m above the lower town and is the highest part of the settlement. The walls surrounding the citadel have five extant gateways. A small so-called bailey, west of the citadel, can be accessed by another set of gateways. Outside these walls a series of large stone-lined reservoirs totaling an area of about 10 hectares (Bisht 2005) were excavated into the natural bedrock. The massive reservoirs are lined with dressed stone and have staircases leading down. Several scholars have suggested that these reservoirs may have been filled with seasonal rainwater (Bisht 1998-99, 2005, Kenoyer 2008). Habitation areas and a cemetery lie outside the city's outermost perimeter wall.

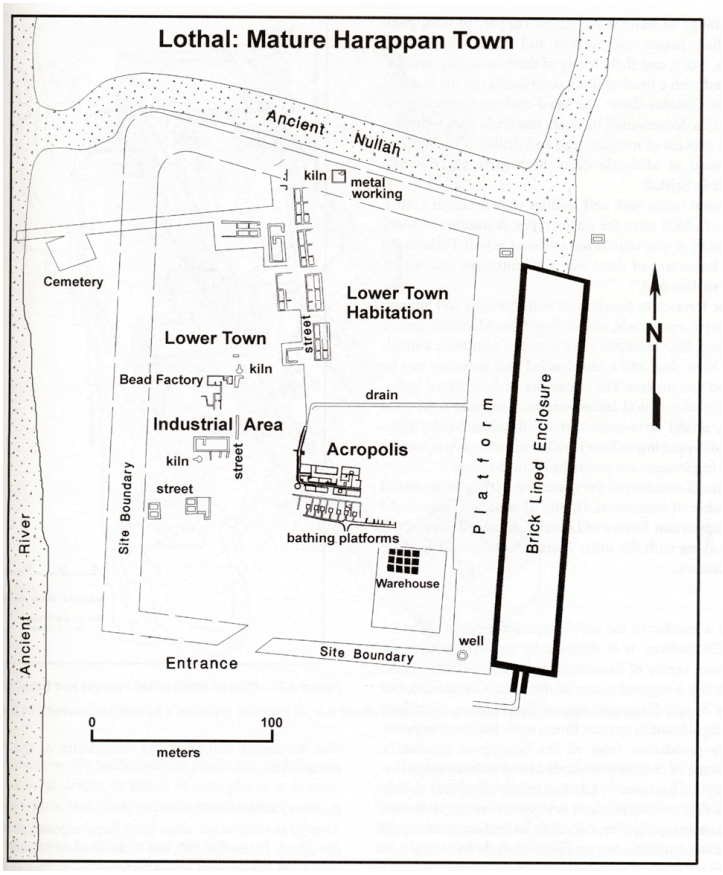
Figure 2.3: Dholavira's Eastern Gateway (Photo by Katie Lindstrom, 2007)

The evidence of water management (Bisht 1994, 2005), the monumentality of the site's architecture, and the overall layout of Dholavira are unique, thus suggesting that the socio-economic and political organization of the site was different from other Harappan cities (Kenoyer 2008b). A review of the literature shows a critical shift away (Possehl 2002e: 103, Vidale 2010: 63) from the colonial era paradigm (Piggott 1950, Wheeler 1953) according to which Indus elites ruled fortified cities from a single high citadel, which was located at the site center and was surrounded by walls. Nonetheless, Dholavira provides the most compelling

architectural evidence for some form of centralized leadership, perhaps a king or queen, who ruled the region from a monumental walled city.

Many other Integration Era towns in Gujarat were surrounded by massive stone, mud and baked-brick perimeter walls including Kanmer (Kharakwal et al. 2012), Kuntasi (Dhavalikar et al. 1996), Lothal (Rao 1979, 1985), Shikarpur (Bhan and Ajithprasad 2008, 2009), and Surkotada (Joshi 1972), which better compare to the size and nature of the settlement at Bagasra. At most of these regional sites, excavations have identified a single perimeter wall. However, most of these projects did not conduct extensive trenching to test for other perimeter walls outside the settlement center. The very recent discovery of a second outer perimeter wall at Shikarpur (Figure 2.5, Ajithprasad 2012) indicate that additional, yet unidentified, perimeter walls may have been present at sites in Gujarat, including Bagasra.

Figure 2.4: Mudbrick Perimeter Walls and Platform at Lothal (image from Possehl 2002e, Figure: 3.2, after Rao 1973)

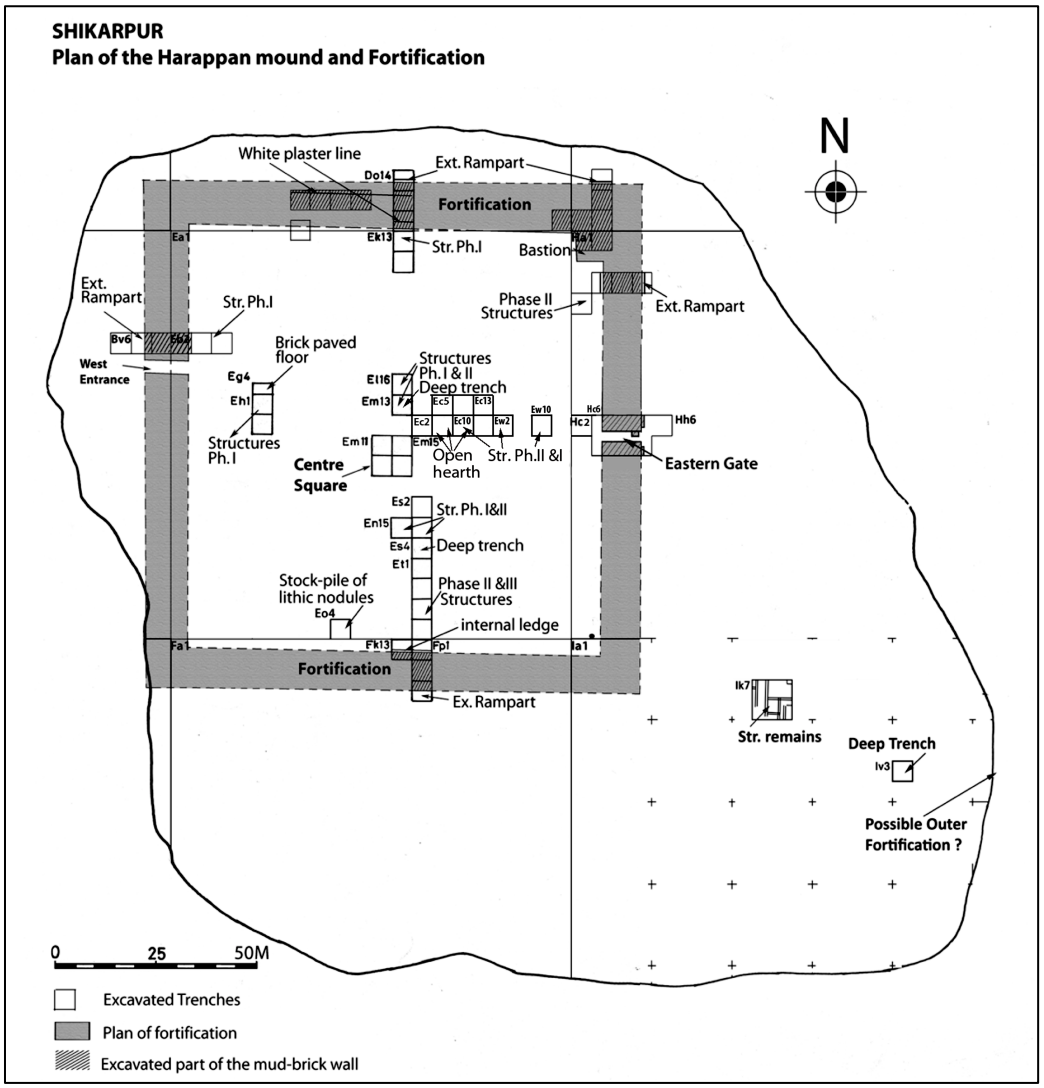


Chase, Ajithprasad and their colleagues have begun a new project to directly compare the material culture at Bagasra and Shikarpur (Ajithprasad 2012, Chase et al 2010a, 2010b). This project is providing new data that will inform our understanding of Bagasra's position in the regional economy, while on-going excavations add to knowledge of wall construction in Gujarat (Bhan and Ajithprasad 2009). The analytical approach taken by Chase and Ajithprasad offers a new framework for investigating material culture diversity and is providing new data that

suggest key differences in the frequency of specific Harappan artifacts, especially shell bangles, terracotta objects (bangles, beads, cart frames and wheels, figurines, and terracotta cakes) and semi-precious stone beads. These differences are indicative of variance in the social activities and economic orientations of Bagasra and Shikarpur, which is significant since these sites are just 20km apart and are located on opposite shores of the narrowest point of the Gulf of Kachchh. Thus, Bagasra and Shikarpur have been referred to as "nearest neighbors," (Bhan and Ajithprasad 2008, Chase et al. in press). Further, the presence of Harappan, Anarta and Sorath pottery types at Shikarpur invites future comparison with Bagasra, where the same pottery types occur.

While Bagasra and Shikarpur show differences in Harappan material culture, similarities may exist in perimeter wall construction. Shikarpur is roughly 4 hectares in size, compared to Bagasra's 2 hectares, and the sites were occupied contemporaneously (Ajithprasad 2012). Shikarpur has both an inner and outer perimeter wall (Figure 2.5) and evidence indicates that its inner perimeter wall was constructed around 2500 BC. Currently excavations suggest the site was not occupied prior to the construction of the perimeter wall, whereas Bagasra was founded before its single known perimeter wall was erected. If this pattern persists upon future excavation, it is a significant difference in the occupational histories of these two settlements.

Figure 2.5: Shikarpur Site Plan, Excavated Trenches and Two Perimeter Walls
(Image courtesy of P. Ajithprasad and The Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda based on 2008-2011 excavations)



However, there appear to be many similarities in the way the walls were built and maintained. Renewed excavations by the Department of Archaeology and Ancient History at Maharaja Sayajirao since 2008 (Ajithprasad 2012, Bhan and Ajithprasad 2008, 2009) have

unearthed a tapering 10.5 meter thick mud-brick wall enclosing 103.5m x 103.3m of the site center. The preserved remains of this inner perimeter wall still stand 6.3m high and are made from multi-colored bricks. Several additions were made to the wall, including the early addition of a rampart-like support, which increased the wall thickness over time. Remains of whitish clay plaster facing preserved on sections of the existing wall are so far unique in the region. Two gateways have been excavated in the eastern and western walls, and there are suggestions of a third gateway on the north. The eastern gateway measures 2.3 to 1.7m wide and appears to have been intentionally narrowed over time.

The habitation at Shikarpur extended to areas outside the inner perimeter wall where stone and mud-brick structures have been unearthed. Details regarding the second outer perimeter wall are forthcoming. However, the discovery of a second wall at Shikarpur opens up the question of whether Bagasra was surrounded by an outer wall as well. With this evidence it is now possible to extend comparisons between Shikarpur and Bagasra, which have been focused on studying variation in the frequency of material culture between sites (Chase et al. in press, 2012), to include the analytical approach I take in this dissertation and study the patterning of specific Harappan, Anarta and Sorath pottery types found inside as compared to outside the perimeter walls at both settlements.

In contrast to the above examples, several craft manufacturing towns in Gujarat, such as Nageshwar (Bhan and Kenoyer 1980-81, Hedge et al. 1992, Sonawane 2004) and Nagwada (Hedge et al. 1988, 1990), which have been extensively excavated, do not appear to have perimeter walls based on the extent of the previous excavations. As regional marine shell

manufacturing centers, Nageshwar and Nagwada compare well with Bagasra. Though future excavations may reveal perimeter walls at these sites, the current lack of evidence for perimeter walls at some craft centers provisionally suggests that power *over crafts* may have been less important than power accrued *through the crafting of trade goods*. For instance, Nageshwar (Figure 2.6) situated on the southwestern tip of the Gulf of Kachchh, is described as major manufacturing center for the production of shell bangles and ladles (Bhan and Gowda 2003), yet lacks an perimeter wall.

A major portion of the site was destroyed prior to excavation (Hegde et al. 1992, Sonawane 2004), however four excavation trenches in different areas of the site (Figure 2.6) did not expose an perimeter wall. Further, no structural remains of craft workshops were recovered. However, vast quantities of manufacturing waste from locally available marine shell (*Turbinella pyrum* and *Chicoreus ramosus*) were found, which Bhan (Bhan and Gowda: 73) describes as the largest amount of marine shell manufacturing waste of any site in the Indus Civilization. Furthermore, Bhan (Bhan and Gowda 2003, Hedge et al. 1992) has inferred from the shell remains that craftspeople from Nageshwar traded marine shell raw materials to inland sites like Nagwada, a small settlement in North Gujarat with a predominance of Anarta pottery (Ajithprasad 2002). At Nagwada, there is dispersed evidence for marine shell working and semi-precious stone bead manufacture during Period 1B, yet no evidence for formal craft workshops was unearthed (Bhan and Gowda 2003, Hedge et al. 1988, 1990). I find both Nageshwar and Nagwada interesting exceptions that challenge our interpretations of the necessity and functioning of perimeter walls. As two regionally prominent craft centers responsible for

importing and transforming marine shell into valuable personal ornaments, these sites demonstrate that activities did not take place inside structures or clearly defined workshops, nor did a settlement wall protect them.

Figure 2.6: Nageshwar Site Plan, Excavation Trenches and Craft Activity Areas (image from Hegde et al. 1992: Figure B.1, Sonawane 2004: Figure 5)

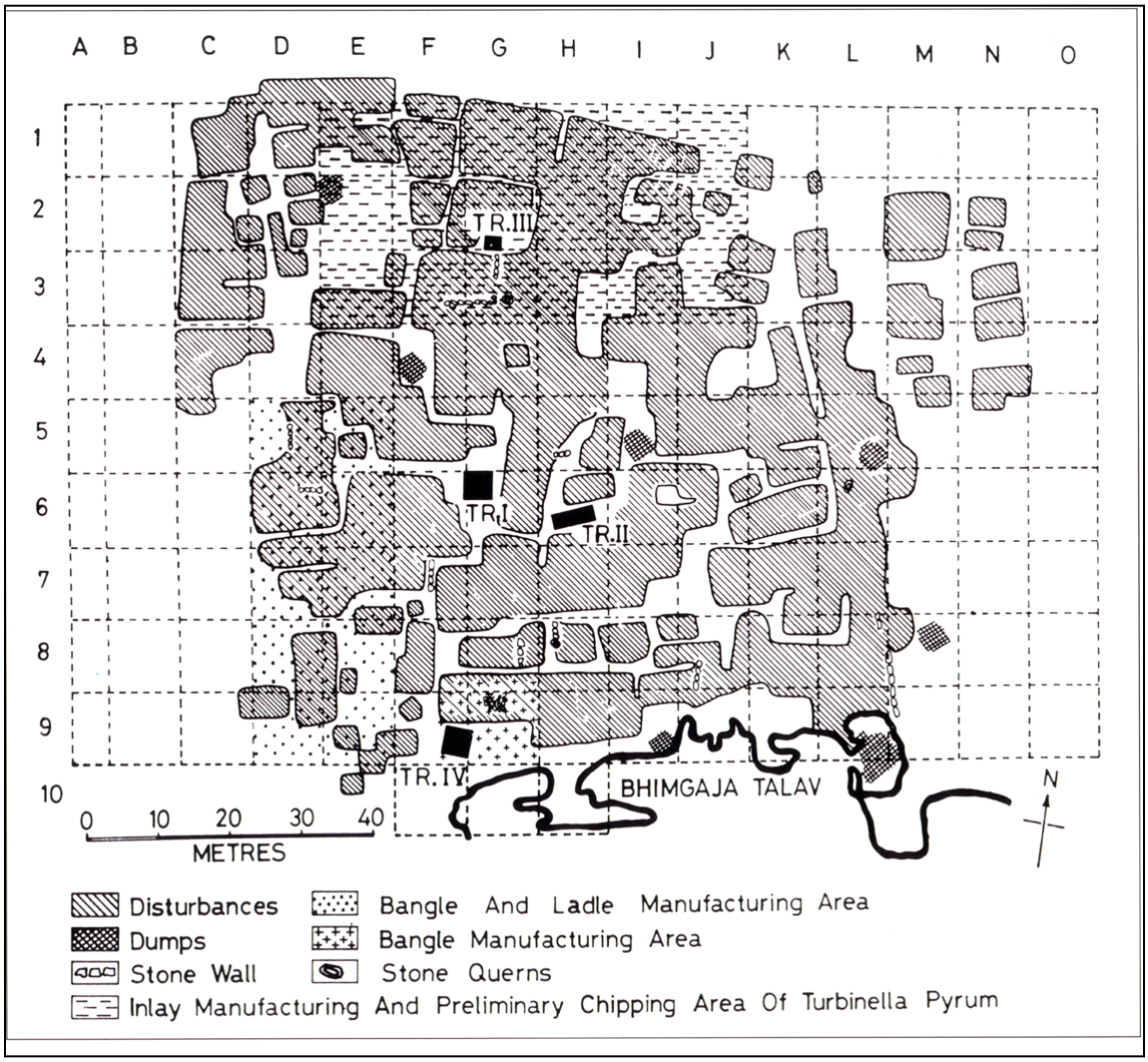
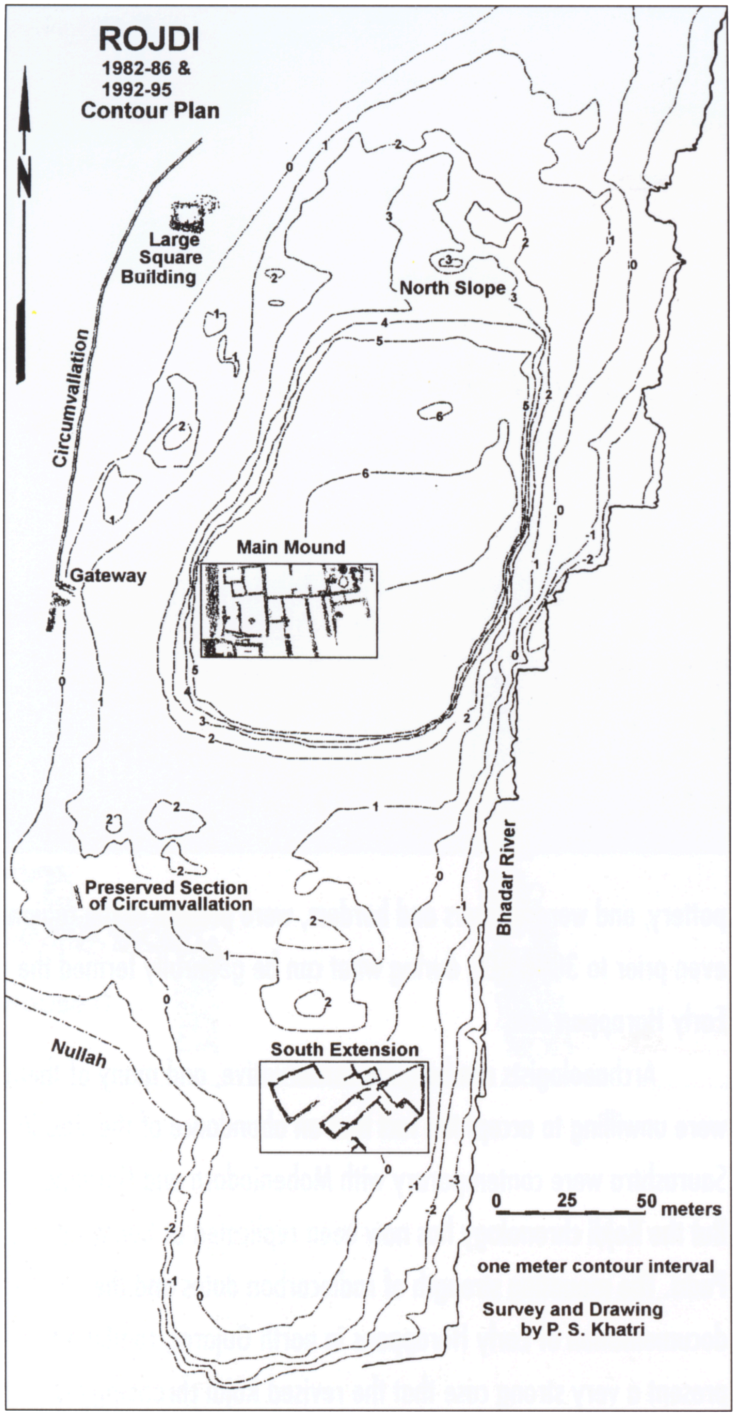


Figure 2.7: Rojdi Site Plan, Excavation Areas and Perimeter Wall (Circumvallation) (image from Possehl 2004, Figure 2)



Perimeter walls are not unique to craft manufacturing centers and were erected at sites in the interior of Saurashtra, which are associated with more rural lifeways and Sorath pottery traditions. In these settings, perimeter walls may have served to pen domesticated animals, an interpretation that is supported by ethnographic analogy with modern pastoral communities of Gujarat (Bhan 2004). In central Saurashtra the site of Rojdi, a site associated with the Sorath tradition, has remains of both an inner stone perimeter wall and an outer perimeter wall that surrounds the 7.5 hectare site (Possehl 2004). The outer wall has one preserved gateway and internal supportive bastion-like architectural features, which the excavators argue served to stabilize the wall and are not defensive bastions (Possehl 2004: 86).

The construction and maintenance of perimeter walls demonstrates the power and authority of elite leaders to amass building materials and mobilize and manage labor directed towards a single community goal and thus defines an area of social investment (Smith 2003). The most compelling evidence for the functioning of city walls in the Indus Civilization comes from renewed excavations at Harappa (Meadow and Kenoyer 1994), which provide comprehensive information demonstrating that competing groups of elites living in Indus cities occupied contemporary walled mounded areas, or "juxtaposed segregated urban blocks" (Vidale 2010: 63-64), rather than single walled mounds or citadels. The monumental perimeter walls, which were erected around cities and towns in Gujarat, thus reflect the power and authority of local elite community leaders. Nonetheless, current excavation reports and site interpretations tend to focus on the walled portions of Indus settlements. For this reason, my

comparative study of areas inside and outside the wall fills a critical gap in knowledge of walled settlements in this region of the world.

Adding to this, the diversity in wall construction in Gujarat suggests a greater variety in the functions that they may have served. The walled compounds and monumental reservoirs at the urban metropolis of Dholavira are unique demonstrations of concentrated power, like that of a king or queen. At the same time, smaller non-urban towns of Gujarat were imbued with an urban-style of architecture, which reflects the cultural connections between residents of towns in the borderlands of the Indus Civilization to the urban ways of life found in the major Indus cities. However, the possibility that several prominent craft manufacturing towns lacked perimeter walls provisionally suggests that power *over crafts* may have been less important than the power accrued *through the crafting of trade goods*. This aside, the widespread building practice of enclosing settlement with walls cross the Indus Civilization is compelling evidence that these ancient people viewed living at a settlement with perimeter walls as an important cultural symbol, which reinforced concepts of urban identity among interacting groups of artisans, merchants and traders.

4. Socio-economic Hierarchies and Interaction Networks of the Indus Civilization

For the last twenty years, fluctuations in urbanism and state-level society in South Asia have been studied through the analysis of specialized technologies, long-distance exchange, and socio-economic interaction networks (Kenoyer 1991, 1995a, Vidale 1989, 2000, Vidale and Miller 2000). During the Regionalization Era (5500-2600 BC) (Kenoyer 1991, Shaffer 1992)

regional social, technological, and economic developments coalesced, setting the stage for the emergence of urban state-level society during the Integration Era (2600-1900 BC). Thus, the Integration Era is characterized by a complex hierarchical social system. This hierarchy was maintained and legitimized through control of the production and distribution of shared styles of prestige goods as well as the social, economic, and ideological institutions they represent. While Harappan style stoneware bangles, semiprecious stone beads, and faience ornaments were valued as wealth items, similar ornaments were manufactured out of more mundane and locally available materials such as clay (Kenoyer 2000). This hierarchy of materials is evidence of a shared social and ideological system among different classes of people and across the different geographic regions that comprise the Indus Civilization.

The desire for goods with social and ideological value stimulated the development and expansion of trade networks. Research tracing the movement of raw materials (Kenoyer 1995a, Law 2011) as well as specific forms of pottery (Méry and Blackman 1996) has shown that during the Integration Era Harappan trade networks linked diverse communities living in varied environments. These interaction networks were not only conduits for the exchange of raw materials, partially finished goods, and finished objects, but also resulted in the amalgamation of diverse communities in urban centers and the sharing of technologies, and economic, social, and ideological forms. The presence of a range of Harappan style wealth items and urban forms linked the elites at individual sites to broader Harappan social and ideological institutions. Thus, localized and long-distance exchange were both essential in the maintenance and legitimization of social hierarchies within Harappan communities. This is

particularly evident through the breakdown of trade and interaction networks during the Localization Era (1900-1300 BC). When Harappan style goods were no longer in demand, and the power base of Harappan elites had been disrupted, the social hierarchy reinforcing the Harappan elite leaders also broke down. In this changing social environment new economic and political alliances formed, and regional cultural styles became dominant over previous Harappan styles.

While inter-regional trade and exchange of prestige items linked communities across a vast geographic area, it is important to remember that the creation and maintenance of socio-economic hierarchies happened locally, through the daily activities of a community. The location of craft manufacturing workshops inside gated perimeter walls, the presence of steatite seals with Harappan script, and a standardized system of weights all indicate the *local* control of the production and exchange of highly valued objects. In other words, there is currently no evidence to suggest that people living in one settlement, for instance the major cities of Dholavira, Harappa and Mohenjo Daro, controlled the manufacture or wealth items at neighboring villages and towns. Rather, it appears that people at each site administered the production of crafts in their community, as well as their trade and exchange with others. Production of these specialized crafts may have been standardized and controlled through decentralized local and long distance kin networks versus direct state control (Kenoyer 1995a). For instance, in Gujarat, the centralized production of specialized shell objects at Nageshwar and other Harappan sites in the area (Deshpande-Mukherjee 1998) points to socio-economic integration within the broader Harappan civilization. On the other hand, the presence of small

scale specialized marine shell working at Nagwada, where the pottery assemblage is dominated by Anarta ceramics, and the Harappan town of Kuntasi point to different procedures for producing the same objects. Shell production at Kuntasi shows evidence of dispersed household centered production of the same shell objects, however craft persons used a wider range of marine shell species (Deshpande-Mukherjee 1998, Vidale 2000). This brief comparison of shell production at Nageshwar, Nagwada, and Kuntasi is meant to illustrate that socio-ritual goods used to legitimize elite status and integrate communities into the Indus state were remarkably standardized (Deshpande-Mukherjee 1998, Kenoyer 1984), yet were potentially produced through different patterns of craft organization. Clearly the nature of interaction between individual communities and other Harappan cities and town varied and cannot be inferred by the presence of Harappan artifacts alone.

In addition to ceramics, the types of Harappan artifacts recovered from the sites in Gujarat where non-Harappan pottery dominates the ceramic assemblage imply very complex long-distance as well as local interaction networks, which include communities that were less typically Harappan. For instance, Harappan sealings, agate weights, Rohri chert blades, gold disc beads, etched carnelian and other stone beads, marine shell ornaments, and copper celts are documented at Nagwada, where Anarta ceramics dominate an assemblage that includes Harappan pottery (Ajithprasad 2002). On the other hand, copper rods, steatite and other stone and shell beads are also found at Loteshwar, which has almost no Harappan pottery (Ajithprasad 2002).

The local production and use of these crafts points to selection of wealth items at the level of the site, but affected by both economic and ideological processes (Kenoyer 2000). "Indus craftspeople and merchants controlled a selected range of activities, while the interaction between the Indus community and the local society stimulated the development of regional industries, more or less affected by emulation and technological transfer, but only marginally integrated in the Indus trade" (Vidale 2000: 107). While it is clear that some settlements were integrated into the Harappan civilization through the socio-ritual need for these materials (Kenoyer 1995a), we must also focus on understanding the economic and ideological history of local materials in order to reach a finer-grained analysis of the role of the indigenous, non-Harappan, communities of Gujarat in regional craft production, socio-economic hierarchies and inter-regional interaction during the Indus Civilization.

A Note on the Integration of Gujarat

Gujarat contains resource locations for ornament-quality raw materials like chert, agate-jasper, amazonite and marine shell (Bhan 2002, Bhan and Gowda 2003, Insoll and Bhan 2001, Kenoyer 1983, Law 2011, Sonawane 1992). Ornaments made from these materials were crafted into items of wealth and prestige at cities and towns in the Kachchh and northern Saurashtra during the Integration Era. Until recently, archaeological evidence suggested that the material hallmarks of the Indus Civilization did not appear in Gujarat until state-level society (or the advent of the Integration Era) had already taken hold in the Indus Valley (Rao 1973, Joshi 1972, Possehl 1980). Based on this early information, migration-based colonial models emerged,

which argued that Harappan material culture and social, economic, and political forms (i.e. the Indus Civilization) were introduced into Gujarat by migrants or colonists from outside the region, particularly the southern Indus Valley. For instance, some scholars (Rao 1973, Joshi 1972, Possehl 1980, Bisht 1989b, Dhavalikar 1995) have argued for a rapid emergence of settled agricultural communities in Gujarat resulting from the migration of Harappans from the Indus Valley in order to exploit the area's resources including pasture land (Dhavalikar and Possehl 1992, Majumdar 2001), agricultural land (Hegde et. al. 1988), and other resources such as marine shell, tin, copper, ivory, agates (Majumdar 2001, Possehl 1992, Sonawane 1992), and salt (Shinde and Kar 1992) which were not sufficiently available in the Indus Valley.

This diffusion model is now out of date with current archaeological evidence, which supports an inference that interactions between early Harappan communities of the Indus Valley and indigenous Chalcolithic communities of Gujarat began before the Indus state had formed, during in the Regionalization Era. These recent studies showcase the diversity of archaeological cultures in Gujarat and other regions during the 4th and 3rd Millennium BC (Bhan and Kenoyer 1984, Hegde and Sonawane 1986, Majumdar 2001, Possehl 1992a, Kenoyer 2011, Law 2011), including indigenous Microlithic and Chalcolithic cultures (Bhan 1994, Mahida 1995, Shinde 2002, Sonawane and Ajithprasad 1994). Closer attention to chronological control has also made it possible to separate Pre-Harappan and Early Harappan phases and to discuss transformations of Non-Harappan and Harappan cultures through time (Ajithprasad 2002, Dhavalikar and Possehl 1992a, Hegde et. al. 1988, Shinde 1998). Thus, the future of archaeology in Gujarat must problematize the role of Gujarat in the development of Indus state-level

society. Specifically, research must focus on better understanding the role of communities living in Gujarat in the creation of Harappan socio-economic hierarchies and inter-regional trade and exchange. Since many of the raw materials needed to produce Harappan wealth items came from Gujarat and were manufactured there, this line of questioning has the potential to yield informative results.

A Note on Trade between the Indus Civilization and Eastern Arabia

Material and textural evidence indicate that communities of the Indus Civilization (ancient Meluhha) had some type of interaction with settlements in Mesopotamia, eastern Arabia (ancient Dilmun and Magan), the Iranian Plateau, and Central Asia (Chakrabarti 1990, Kenoyer 2008a, 2012, Kenoyer, Price and Burton 2013, Laursen 2010, Possehl 1997, 2002, Potts 1993a, 1993b, 2005, Ratnagar 1981, 2001, 2003, Reade 2001). The nature of relations was complex and must have varied for each region under consideration, but probably modes of contact include direct and indirect trade and exchange of raw materials and finished objects (Kenoyer 2008a). The best line of evidence for the nature and timing of these interactions comes through detailed studies of craft technologies (Kenoyer 2008a, Law 2011). Moreover, new research by Dennys Frenez (personal communication) is furthering this line of inquiry through a detailed study of the types of Indus goods found in Middle Asia (Mesopotamia, eastern Arabia, Iranian Plateau, and Central Asia). From Frenez's ongoing research we are learning that over 1,300 Indus and Indus-related objects are found at 89 sites in Middle Asia (Frenez personal communication). Finished objects include various Indus style ornaments, like

the well-known Indus long-carnelian beads found in the royal cemetery at Ur (Kenoyer 2008, Woolley 1934), as well as stone statues and perishable goods. From material remains and textual evidence we know that raw materials like marine shell, ivory and wood were brought from the Indus Valley. Black slipped jars, steatite seals that bear the Indus script, and weights found in Middle Asia signal the potential for direct trade that was centrally administered (Kenoyer 2008). Frenez points out that these seals, pottery, and weights were not objects of trade themselves, but are associated with trade. Further, craft studies of many of these items suggest that some were produced into the Indus Valley, while others were manufactured locally at sites in Mesopotamia and eastern Arabia, further complicating the reconstruction of relations between the Indus Valley and Middle Asia.

Interesting new and unpublished research by Steffen Terp Laursen in Bahrain (Laursen personal communication) has identified the presence of Sorath pottery, which is associated with the Saurashtra region of Gujarat. This pottery evidence points to a unique connection between specific settlements in Gujarat and sites in eastern Arabia along the Persian Gulf, known as ancient Dilmun, which had not previously been recognized. We do not yet clearly understand the nature of interaction between the various communities of Gujarat and regions across the Arabian Sea, but this pottery evidence, as well as the fact that important resources, like carnelian, agates and marine shell (Kenoyer 1983, Law 2011) came from areas of Gujarat, suggest that Gujarat was linked to sites across the Arabian Sea. While further investigation is not a focus of this dissertation, expanding this line of inquiry has the potential to yield

important results, which will inform our understanding of the relations between craft producing towns in Gujarat, like Bagasra, and far off cities in Mesopotamia, Central Asia, Oman and Iran.

5. Regional Non-Harappan Traditions of Gujarat

5a. The Anarta Tradition of North Gujarat

The non-Harappan Anarta communities of North Gujarat reflect a shared archaeological heritage (Ajithprasad 2002, 2011 Sonawane and Ajithprasad 1994) stretching back to 3700/3600 BC (Ajithprasad 2004). In keeping with the cultural tradition framework (Kenoyer 1991, Shaffer 1992) applied in this dissertation, I contend that it is not yet clear whether Anarta archaeological sites should be considered a *phase* of the Indus Cultural Tradition, or a separate cultural tradition. What is clear is that the Anarta pottery represents an indigenous Chalcolithic community present in Gujarat from at least 3600 BC. Therefore, Anarta could be considered a phase, like the Kot Dijian phase along the Indus River Valley, and thus represent a regional cultural pattern during the Regionalization Era of the Indus Civilization. On the other hand, the continuity of Anarta pottery into the Integration Era in relatively the same form, suggests that perhaps the Anarta represents a different cultural tradition from the Indus tradition. That said, the co-occurrence of Anarta pottery and Harappan pottery at sites in Gujarat during the Integration Era is compelling evidence in support of the hypothesis that a single community utilized both types of ceramics. However, in this dissertation I choose to follow the standard of archaeologists who specialize in the Anarta, and thus refer to it as the Anarta tradition

(Ajithprasad and Sonawane 2011) [note: their use of "tradition" does not reference the cultural tradition framework of Shaffer and Kenoyer]

The Anarta tradition is primarily defined by regional pottery traditions shared between sites along the Rupen River in north Gujarat (Hegde and Sonawane 1986), especially the sites of Nagwada (Hegde et al. 1988, 1990, Majumdar 1999) and Loteshwar (Ajithprasad and Sonawane 2011, Sonawane and Ajithprasad 1994, Mahida 1995, Rajesh 2011). These Chalcolithic communities practiced a rural subsistence economy based on farming and domesticated animals (Ajithprasad and Sonawane 2011). As compared to Harappan well-planned mudbrick architecture, inhabitants lived in flimsy structures and dug large storage pits. Their technological base included copper production and either hand-made pottery or pottery turned on a slow wheel (Ajithprasad and Sonawane 2011). I discuss the Anarta pottery tradition itself in more detail in Chapter 3.

In addition to Nagwada and Loteshwar, Anarta pottery is also known from the North Gujarat sites of Datrana, Moti Pipli, Santhli, and Vaharvo Timbo (Ajithprasad and Madella 2012) where it dates to the Regionalization Era, or Pre-Harappan period in Gujarat. Outside this area, Anarta pottery has been identified in the region of Kachchh, at the sites of Bagasra (Bhan et al. 2004, 2005, Sonawane et al. 2003), Shikarpur (Bhan and Ajithprasad 2008, 2009), and Surkotada (Joshi 1990), where it occurs in Integration Era deposits (2500-1900 BC). Anarta style pottery is also documented at Lothal (Ajithprasad 2002). From all these sites we can see that the relationship between Anarta and Harappan material traditions is complex and changed over time. Specific investigations into the nature of interaction between Anarta and early Harappan

communities, prior to the Integration Era, thus provide vital information for understanding the role of Gujarat in the rise and prominence of the Indus Civilization, South Asia's first state level society.

The North Gujarat Archaeological Project (NoGAP), a new research collaboration between Spanish and Indian archaeologists, is applying an interdisciplinary approach to renewed investigations in North Gujarat (Madella et al. 2010). Part of the project's goals are aimed at reconstructing the ancient natural and social landscape and further understanding the spread of technology in the region. One aspect of their initial results shows that indigenous communities of North Gujarat were practicing farming prior to the advent of Harappan interactions. These new data significantly change traditional views (Bisht 1989a, Dhavalikar 1995, Dhavalikar and Possehl 1992, Hegde and Sonawane 1986, Hegde et al. 1988, Joshi 1972, Possehl 1980, Rao 1973), which have argued in favor of diffusionist perspectives wherein domestic plants and animals were introduced into Gujarat around 2500 BC by migrating Harappan populations from the southern Indus. A second contribution of NoGAP collaboration focuses more specifically on the timing and spread of technology. In several recent conference presentations, P. Ajithprasad (Ajithprasad 2012, Ajithprasad and Madella 2012) has presented new data, along with reinterpretations of previously excavated collections, to argue that early Harappan communities introduced fast wheel technology for producing pottery, as well as the crested ridge technology for producing lithic blades, to the indigenous Chalcolithic communities of North Gujarat. Consequently, the results of the NoGap project offer significant new information and reinterpretations of the nature of interaction networks and formative contacts

between indigenous Chalcolithic communities in Gujarat and people from the Indus River Valley.

Prior to the work of the NoGAP team, interaction among communities in North Gujarat, Kachchh, and settlements of the Indus Civilization was thought to vary in nature and scale and had been primarily analyzed by comparing ceramic assemblages. For instance, the widespread distribution of certain decorative motifs, painting patterns, and ceramic vessel shapes were interpreted as evidence of long-standing connections between North Gujarat, Kachchh, and the southern Indus Valley (Ajithprasad 2002, Ajithprasad and Sonawane 2011). While at the same time the presence of Harappan pottery at Nagwada and its virtual absence at Loteshwar was taken as evidence for variation in contact (Sonawane and Ajithprasad 1994). More recent research by Ajithprasad and Sonawane (2011) has helped to clarify the nature of variation in the frequency of Anarta pottery at different sites. Of 100 known sites in North Gujarat, they identified 62 settlements with Anarta pottery. However, the relative abundance of Anarta and Harappan pottery varies considerably across time and space, ranging from 100% to less than 10% of the known ceramic assemblage, with most sites containing between 20% and 60% Anarta pottery (Ajithprasad and Sonawane 2011: Figure 30).

As a specific example, at Nagwada (Sonawane and Ajithprasad 1994) we find evidence for local emulation of Harappan style pottery forms including dish-on-stand, perforated jars, and beakers. Yet over 80% of the assemblage belongs to the Anarta tradition (Ajithprasad 2002). Period 1A at Nagwada, is represented mainly by burials (Hedge et al. 1988) containing pottery similar to that reported from Early Harappan levels at Amri, Kot Diji and Balakot

(Ajithprasad 2002, Majumdar 1999), which is evidence of the connections between North Gujarat and southern Sindh prior to the Integration Era. During period 1B, which has a single radiocarbon date of approximately 2200 BC (Bhan 1989), Anarta ceramics dominate the assemblage (Ajithprasad 2002) and some Harappan material culture was recovered including a geometric steatite seal and an inscribed clay sealing bearing the Harappan script (Hedge et al. 1990).

Nagwada is an example of a small agricultural community with evidence for agate, amazonite, carnelian, and lapis lazuli bead manufacture and a small quantity of marine shell working including bangles inscribed with the chevron motif, beads, and inlay pieces (Bhan and Gowda 2003, Sonawane 1992, Vidale 2000). There is dispersed evidence for the working of shell remnants left over from other shell manufacturing processes, which took place at sites nearby like Nageshwar and Bagasra (Bhan and Gowda 2003). Craftspeople at Nagwada appear to have close material connections to the region and produced marine shell bangles, rings and other small ornaments for local markets, rather than long-distance trade (Bhan and Gowda 2003: 77). Harappan sealings, agate weights, etched carnelian beads, Rohri chert blades, marine shell objects, gold disc beads, semiprecious stone beads, and copper celts have also been recovered from the site (Ajithprasad 2002). Complex exchange networks brought these objects to Nagwada, which likely included interaction with sites along the Indus Valley or outside of the Indus Valley as well as more localized interactions with other communities living in Gujarat.

In sum, around 3600 BC, or during the Regionalization Era, indigenous Chalcolithic communities in North Gujarat known as the Anarta tradition began farming, raising

domesticated animals, and manufacturing crafts out of clay, marine shell, copper and semi-precious stone. Interactions between these communities and the southern Indus Valley began during this early phase, but did not become regular until the 3rd millennium BC, or the Integration Era. It now seems clear that Harappan communities did not introduce the indigenous communities of Gujarat to farming practices and settled living. Rather, agricultural lifeways are rooted in local traditions. Furthermore, the establishment of the walled Harappan cities and towns in Gujarat did not result in the disappearance of the Anarta tradition. Rather, this pottery tradition continued to exist throughout most of the Integration Era. Since Anarta pottery is a prominent component of the ceramic assemblage at Bagasra, this dissertation provides important new pottery data that will further inform our understanding of the extent to which Anarta and Harappan pottery were used at a single site during the Integration Era.

5b. The Sorath Tradition of Saurashtra

The Sorath tradition of Saurashtra is perhaps the most widely distributed regional tradition of Gujarat and is often referred to as the Sorath Harappan tradition (Ajithprasad 2008, Ajithprasad and Sonawane 2011, Dhavalikar et al. 1996, Shinde 1998, Sonawane 1998-99), a reference that originated with the work of Gregg Possehl (Possehl 1992a, 1997, 2007, Possehl and Herman 1990, Possehl and Raval 1989). While questions still remain concerning the chronological relationship of Sorath style ceramics to classic Harappan phases of occupation (Herman 1997b), there is evidence (Rao 1963, Sonawane et al. 2003) to suggest that so-called

Sorath type material assemblages are an indigenous cultural development, which grew out of the Regionalization Era, or pre-Harappan, Padri (Shinde 1998) tradition in Saurashtra.

In order to avoid confusion between the label Sorath Harappan (Possehl 1992a) and the term Harappan that is referenced in the Harappan pottery typology (Dales and Kenoyer 1986), in this dissertation I refer to the Sorath tradition as non-Harappan. This language preference is meant to distinguish Sorath pottery, which is present at Bagasra, from the pottery defined by the Harappan pottery and based on collections from Mohenjo Daro and Harappa, two sites located outside Gujarat in core areas of Indus urban development.

The term Sorath was first introduced during the work of Greg Possehl at the site of Rojdi (Possehl 1992a, Possehl and Herman 1990, Possehl and Raval 1989), which is located in central Saurashtra. In his writings he never specifically defined the term but generally used it to describe ceramics and associated material culture to demonstrate that the socio-economic systems at some sites in Saurashtra (the ancient term is Sorath) differed from the Indus cultural tradition, while also sharing several features.

Possehl (1992a) generally described Sorath sites as small communities composed of agriculturalists and pastoralists with little evidence for craft activity or surplus production of ornaments and other wealth items. These sites are generally less internally differentiated than Harappan sites and show a distinctive subsistence adaptation that emphasized millet cultivation and a complex agro-pastoralism (Possehl and Herman 1990). The material assemblage of Sorath sites was fairly restricted and lacks evidence for the extensive use of writing, seal technology, and the production of technologically elaborate wealth ornaments. Rojdi pottery

production, by which diverse vessel forms were crafted through a limited number of techniques, differs from the production of ceramics at Mohenjo-Daro, which employ a variety of manufacturing techniques. Sorath ceramics lack Harappan style black painted decorations, decorative motifs and diagnostic Harappan vessel forms (Herman 1989, Possehl and Herman 1990). The Sorath assemblage at Rojdi lacks many types of Harappan style ceramics. Herman's analysis of the Rojdi ceramic assemblage (Herman 1989) identified at most 27 Harappan pottery types and sub-types (Herman 1997a). Within these identified Harappan types, many differences were recorded. Herman (1989, 1997a) reports that the Harappan vessels at Rojdi that most closely resemble the type from Mohenjo Daro (Dales and Kenoyer 1986) are perforated jars (type 16), small globular jar pots (type 14), and some rare bowls (type 41 and 42). Moreover, two of the most common Rojdi vessel forms, convex-sided bowl and "the Saurashra lamp" (Herman 1997a: 94) are absent from the Harappan pottery typology. Thus, while the pottery assemblage has some overlapping vessel forms and styles with pottery from the core of the Indus Civilization, there are many notable differences.

This tradition has its foundation in local indigenous Pre-Harappan traditions (Shinde 1998, Possehl 2007), which differs from the Harappan sites in Gujarat such as Dholavira, Desalpur, Lothal, Nageshwar, and Surkotada that appear after 2500 BC (Possehl 1992b, Possehl and Herman 1990). However, Sorath settlements, including Rojdi, interacted with Harappan settlements locally or farther away. At Rojdi, Sorath-Harappan interaction is signaled by the recovery of three cubical weights, one example of the use of the Indus script on a Sorath potsherd, etched carnelian beads and copper tools (Possehl 1992, Possehl and Raval 1989).

According to Possehl (1992a), communities of the Sorath tradition lacked a sophisticated craft production industry and did not manufacture their own wealth items, but instead forged economic relationships with urban Harappan communities to acquire these goods.

6. Bagasra

The Harappan settlement of Bagasra (Figure 2.8), also known in the literature as Gola Dhoro (Bhan et al. 2004, 2005, Chase 2010), which is the local name for the ancient mound, is a two hectare archaeological site located approximately one kilometer from the southeastern coast of the Gulf of Kachchh in Rajkot district, Gujarat, India. Today, the ancient mound rises 7.5 meters above the surrounding plain and measures 160 x 120 meters (Bhan et al. 2005, Sonawane et al. 2003). The site's location is equidistant from three unique geographic regions: Saurashtra, North Gujarat, and Kachchh, which means that it was nested in a diverse natural and cultural landscape of agro-pastoral and hunter-gatherer communities (Ajithprasad 2002, Dhavalikar and Possehl 1992, Meadow and Patel 2003, Sonawane and Ajithprasad 1994). As such, the site's material culture and built landscape point to ancestral connections to both pre-existing local heritage and Harappan traditions. Thus, it is an ideal site to test the material limits of the shared preference for Harappan-style ceramics by communities in the borderland regions of the Indus Civilization.

Our knowledge of the site comes from extensive excavations conducted by the Department of Archaeology and Ancient History at Maharaja Sayajirao University of Baroda

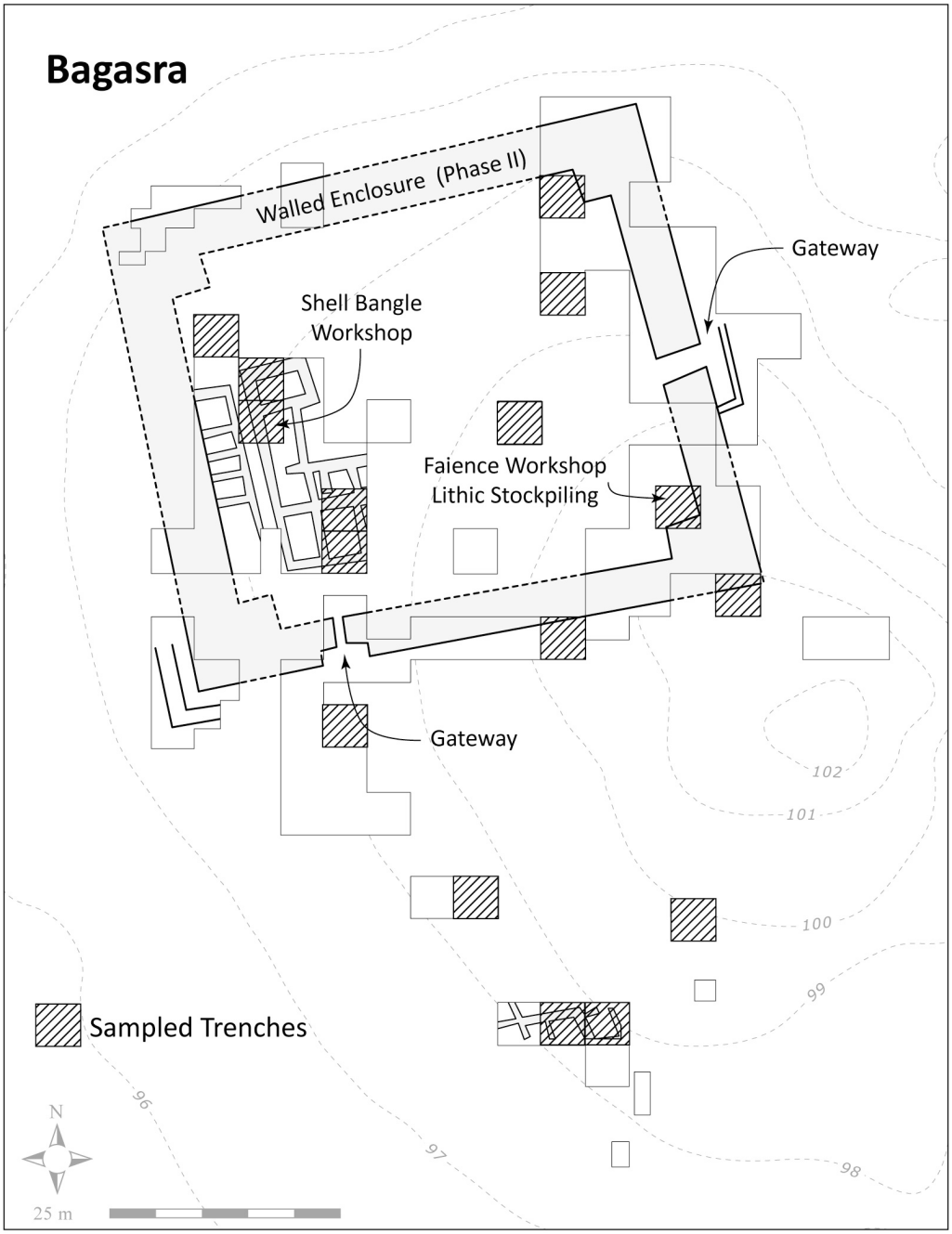
from 1996 to 2005 (Bhan et al. 2004, 2005, 2009; Sonawane et al. 2003). The excavations established a four phase occupational history (Table 2.3) for the site, which dates (2500-1700 BC) from the Integration Era (2600-1900 BC) to the Localization Era (1900-1300 BC) of the Indus Civilization (Kenoyer 1991, Shaffer 1992). A dearth of radiocarbon dates and a close reliance on ceramic cross dating with other regional sites (Sonawane et al 2003: 48-49) have limited a more precise and direct dating of the site into smaller increments of time.

Table 2.3: A Proposed Chronology for the site of Bagasra (adapted from Sonawane et al. 2003)

Developmental Sequence	**Era**	**Bagasra Radiocarbon Dates**
Phase I (2500-2450BC)	Integration Era	2550-2540 cal BC, 2490-2300 cal BC (Beta 217982)
Phase II (2450-2200 BC)	Integration Era	2480-2280 cal BC (Beta 217983)
Phase III (2200-1900BC)	Integration Era	2490-2290 cal BC (Beta 217984)
Phase IV (1900-1700BC)	Localization Era	2430-2140 cal BC (Beta 217985)

The information in this section derives from new and on-going research, unpublished yearly excavation reports that were submitted to the Archaeological Survey of India, as well as my own personal conversations with the excavators since I began this research in 2006. While a comprehensive excavation report awaits publication, existing reports provide detailed descriptions of the material culture, settlement layout and architecture, as well as the craft activities, which mark the site as a regional urban-style economic center linked to the vast

Figure 2.8: Map of Bagasra with excavated and sampled trenches
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)



trading economy of the Indus Civilization. Other research projects referencing Bagasra have targeted specific material and technological aspects of the excavated remains: distinct pottery forms (Ajithprasad 2006, Ajithprasad et al. 1999, Lindstrom 2010), marine shell working (Bhan and Gowda 2003, Deshpande-Mukherjee 1999), faunal remains (Chase 2007, 2010a, 2012), and steatite seals (Jamison 2010, 2012). Very recently, Chase and Meiggs (2012) began a new research project exploring the pastoral land-use through strontium isotope analysis, which is providing insightful new data on the patterns of human mobility and social interaction. A steatite micro-bead, a single steatite seal, a lead lump and a silver ring are also included in Randall Law's (Law 2011) geological provenience study of rock and mineral resources.

6a. Models of Society at Bagasra

This dissertation draws on and reframes the culture-history of Bagasra, which has been established by the site's excavators, within a problem-oriented research framework. When the MSU archaeological team excavated Bagasra they sought to articulate the stratigraphic relationship between Sorath, Harappan and Anarta material culture in order to evaluate the site's "role in the movement of people and materials between Saurashtra, Kachchh, and North Gujarat" (Sonawane et al. 2003: 21). To accomplish this goal, the excavators constructed a full cultural chronology from unearthed deposits that represent contexts of initial occupation through to the site's abandonment. Primarily defined by stages of perimeter wall construction and broad changes in groups of diagnostic pottery types, rather than changes in individual

vessels, their four-phase chronology for Bagasra establishes the presence/absence and relative proportions of Harappan, Anarta and Sorath ceramics during each phase. In sum, according to the MSU pottery chronology, Harappan and Anarta ceramics co-occur from the site's foundation, when Anarta types dominate the assemblage. Both types continue to be found together during Phase II of their chronology, when Harappan forms increase significantly in proportion and become the dominant ceramic class. During Phase III, Harappan ceramics continue to dominate and Anarta ceramics make up a very small proportion. Sorath ceramics are the most common ceramic class during Phase III of their chronology and eventually become the sole type of ceramic recovered in Phase IV deposits.

The complexity of the Bagasra ceramic assemblage calls for comparative and problem-based research approaches, which I apply in this dissertation. What is unique about the Bagasra pottery assemblage is the quantity of the preserved evidence for the changing distribution of these three distinct pottery traditions through time. Previously, evidence existed for the co-occurrence of Harappan and Sorath pottery (Rangpur and Lothal, see Rao 1963, 1979, 1985) or Harappan and Anarta pottery (Ajithprasad and Sonawane 2011), but Bagasra is the first excavated site with well-documented stratigraphic evidence for the contemporary use of all three pottery traditions: Harappan, Sorath, and Anarta (Sonawane et al. 2003: 48). Since the Bagasra excavation, the MSU archaeological team has begun excavations at the neighboring site of Shikarpur, located just 22km away, where Harappan, Anarta and Sorath ceramics are also being documented in a similar stratigraphic relationship (Ajithprasad 2012, Bhan and Ajithprasad 2009). Therefore, the insights gained from recent

work at Bagasra (Ajithprasad 2006, Ajithprasad et al. 1999, Bhan and Gowda 2003, Bhan et al. 2004, 2005, 2009, Chase 2007, 2010a, 2010b, 2012, Chase and Meiggs 2012, Chase et al. 2012, Jamison 2010, 2012, Lindstrom 2010, Sonawane et al. 2003) are already informing new research agendas at neighboring sites, which merit careful methodological and interpretive consideration (for instance, see Bhan and Ajithprasad 2008, 2009, Chase, Ajithprasad and Rajesh in press, Chase et al. 2012).

My work builds on the findings of the MSU pottery chronology for Bagasra to offer new ceramic data that account for chronological variation in individual vessel types, rather than broad pottery classes. My research also adds a new spatial dimension to the work started by the MSU excavation team by investigating the distribution of pottery types deposited inside the perimeter wall, as compared to those found outside the wall. I apply these two lines of new pottery evidence, chronological and spatial, to test existing models for the site. By situating my set data within these models, I offer a further refinement to our understanding of the relationship between Harappan style material culture and society at Bagasra.

Initially put forth in his dissertation study of the faunal remains from Bagasra, Brad Chase's (2007) work presents a testable model for Bagasra that necessitates evaluation against Bagasra's ceramic assemblage. He takes an important step in evaluating traditional migrationist views of the integration of Gujarat, which are deeply rooted in the culture-historical approaches of South Asian archaeology today (Johansen 2003). Applying the Bagasra faunal data to M.K. Dhavalikar's (1995) world-systems based theory for Harappan Gujarat,

Chase tested the expectation that the residents of Bagasra's perimeter wall were somehow distinct from those who lived outside the wall. Specifically, he tested two expectations:

> 1. The residents of the walled sectors of these sites claimed ancestry in the core areas of urban emergence and thus maintained kin as well as economic relations with individuals in these areas, i.e., they were ethnically distinct from the local inhabitants of the region who presumably lived outside the walls.
> 2. The residents of the walled sectors or Harappan Phase sites in Gujarat were not farmers, but rather were merchants and traders provisioned with subsistence goods produced by the local inhabitants of the region, who presumably lived outside of the walls. (Chase 2007: 30).

Dhavalikar's reasoning is couched in analogies to colonial periods of Indian history and 16th century European capitalist economies and is also driven by a world-systems perspective as conceived by Immanuel Wallerstein (1974). From this theoretical basis, Dhavalikar describes the establishment of Harappan sites in Gujarat as an expansion of Harappan economies, based in the core of the Indus Valley, into the resource-rich, but underdeveloped, peripheral zones. Chase's testable expectations derive from Dhavalikar's specific argument that Harappan people would have therefore lived within the walled, or fortified, area of sites like Bagasra, whereas local people were restricted to living in areas outside the settlement wall (Dhavalikar 1995: 55). Through his study of meat provisioning, Chase (2007, 2010a) concluded that those living inside the perimeter wall did, in fact, maintain some food preferences and food preparation practices that distinguished themselves from the group of people who lived outside the settlement's wall. This hypothesis has direct implications for predicted chronological and spatial patterning of objects that may symbolize the authority of Harappan merchants and traders as well as Harappan and non-Harappan pottery, which deserves testing. In sum, Chase's work (Chase

2007, 2010a) articulates a model for Bagasra where two communities lived at the site: a largely Harappan community living inside the perimeter wall and a local, or non-Harappan, community living outside the walled area.

The work of the MSU archaeological team (directed by V. H. Sonawane, Kuldeep Bhan, K. Krishnan and P. Ajithprasad) articulates a pottery chronology for the site that predicts that Harappan pottery will be found only during periods of flourishing trade economy, which is reflected in the intensity of craft production and large amounts of Harappan style ornaments and other material culture during Phases II and III at Bagasra (Bhan and Gowda 2003, Bhan et al. 2004, 2005, 2009; Sonawane et al. 2003). In other words, their chronology indicates that Harappan pottery is not present at Bagasra during the site's final phase, which lacks the traditional defining features of economic prosperity and Harappan affiliation.

Thus, this dissertation will test a set of related hypotheses, which I refer to as the inside/outside the wall model, and evaluate whether the Bagasra pottery data supports or refutes these hypotheses. Extensive excavations across Bagasra have shown that distinctive Harappan-style craft production of economically valuable marine shell, agate, and faience ornaments was primarily located inside the perimeter wall, along with the stock piling of raw materials, and in association with inscribed steatite seals that are diagnostic of Harappan elites (Bhan et al. 2004, 2005, Sonawane et al. 2003). In short, this inside/outside the wall model predicts that if Harappan elites from the core regions of the Indus were directly associated with craft production, we should expect to see higher concentrations of Harappan pottery, as well as writing on pottery, within Bagasra's perimeter wall. In contrast, non-Harappan pottery should

be more abundant in areas outside the perimeter wall. The inside/outside the wall model predicts the following testable hypotheses:

1) Elite leaders at Bagasra were either migrants from outside the region, or had strong ancestral connections (in other words, they were descendants of migrants) to the core regions of Indus urban development.

If this statement is supported by the Bagasra pottery data, then I would expect to find evidence that elites displayed their ancestral connections to the Indus Valley through preferences for a wide array of Harappan pottery types including domestic culinary equipment (Bray 2003), trade vessels, and other ceramics. On the other hand, if elite leaders at Bagasra did not have strong and direct ancestral connections to the Indus Valley, I would expect to find a restricted set of Harappan pottery types at the site. These potential Harappan pottery types may relate to the site's craft economy and trade connections to other Indus settlements. Thus, Harappan pottery types related to domestic practices, such as cooking and serving food (Bray 2003, Chase 2012) are likely to be absent if elite residents at Bagasra did not have strong ancestral connections to outside the region. Moreover, if elite did not have ancestral connections to the Indus Valley, I may also find elite forms of non-Harappan pottery within the ceramic assemblage, such as the Reserved Slip Ware. Though rare across the Indus Civilization, Reserved Slip Ware is a fine ware pottery with a black and pale bichrome decoration that was produced through a very sophisticated manufacturing process (Krishnan et al. 2005) and is made from clay found in nearby Kachchh.

2) In addition, if Harappan pottery was viewed as a symbol of elite status, as predicted by the traditional model, I would expect to find evidence for its restricted access. This pattern would stand in contrast to spatial patterns in non-Harappan pottery, if it was not viewed as a symbol of elite status.

3) Elites, who signaled their control of the site's economy through the restricted use of inscribed steatite seals, also restricted access to use of the Indus script as graffiti found on pottery.

One possible way to restrict access would be through the segregation of space demarcated by the perimeter wall. For instance, if the use of Harappan pottery symbolized the elite status of the vessel owner, I would expect to find Harappan pottery primarily deposited in association with the major craft industries located inside the perimeter wall. Moreover, if non-elite residents did not have access to Harappan pottery and primarily used non-Harappan pottery, then I would expect to see this reflected in the spatial patterning of non-Harappan pottery outside the perimeter wall, away from the major craft industries. An alternative hypothesis is that Harappan pottery was not viewed as a symbol of elite identity with restricted access, but was used by most members of the Bagasra community. If this is the case then I would expect to find Harappan pottery distributed across the site and intermingled with non-Harappan pottery in domestic and craft production settings. An alternative explanation for this spatial pattern is that elites and non-elites distinguished themselves by their pottery preferences, but did not live in segregated spaces. If elites and non-elites instead lived in neighboring households on both sides of the wall and discarded their pottery across the site, then we would expect to see Harappan and non-Harappan pottery distributed on both sides of the perimeter wall.

What follows is a phase-by-phase summary of Bagasra's history. The features of Bagasra's built and material landscape, including a diverse assemblage of Harappan and local pottery styles, indicate that Bagasra residents were connected to multiple overlapping long-distance and local trade and social networks, which changed during the course of the site's occupation. In preparing this synthesis, I emphasize the material evidence that can be used to test the above expectations. Social and economic interaction networks, which connected Bagasra residents to nearby and distant neighbors, can be established from the source location of raw materials (local or distant) used in manufacturing as well as ornaments brought to Bagasra as finished goods. In particular, I draw on the presence and distribution of craft activities, both inside and outside the wall. I also highlight the material evidence, namely steatite seals, clay sealings, cubical stone weights and the use of writing, which might suggest that individuals or groups living at Bagasra exercised some type of civic and economic authority over aspects of craft production. As objects that symbolized authority, the location of seals, sealings, weights and writing, either inside or outside of the perimeter wall, suggests the presence of residents who had some measure of power or control over aspects of the community's economy. If these artifacts of administration are found to be concentrated inside the perimeter wall, where most craft activities occurred, then I would argue in support of Chase's hypothesis and my expectations included above. This patterning would suggest that two groups might have lived at Bagasra. Those residing inside the walled area were in control of key aspects of the settlement's craft economy and distinguished themselves from the people who lived outside of the wall. On the other hand, if these artifacts of administration are found

in association with craft contexts inside as well as outside the wall, or if they are dispersed across the site, I would argue that the perimeter wall did not serve to segregate two distinct groups of people. Since specialized craft production had ceased by Phase IV, and the collapsed perimeter wall no longer served as a physical boundary to areas inside the wall, this period falls outside the time period being considered in my evaluation of the above expectations. However, Phase IV pottery preferences are used to test whether the community at Bagasra continued to use certain types of Harappan pottery into the Localization Era. In Chapters 4, 5 and 6, I explore the implications of my recorded pottery data for further testing the above expectations.

6b. Phase I (2500-2450BC, Integration Era)

Bagasra, like most urban-style Harappan towns in Gujarat, was settled towards the beginning of the Integration Era after many cities and towns of the Indus Civilization had already been established along the Indus Valley. From Bagasra's initial occupation, the material culture and lifeways point to a social and economic landscape that already included writing and a variety of other sophisticated technological traditions to suit an urban society. Thus, while Bagasra was a rather small agro-pastoral village (Chase 2010a: 7, 260) when it was founded, it already had the markings of a community linked to urban state-level society. What is unique about Gujarat during this time is the rich array of archaeological evidence for indigenous pastoral and agricultural communities occupying north Gujarat, Kachchh, and Saurashtra prior to the advent of Indus traditions in the region (Ajithprasad and Madella 2012, Ajithprasad and

Sonawane 2011). The influence and cultural diversity of neighboring environs is reflected at Bagasra from the site's founding.

The geographic extent of the initial occupation of Bagasra is unclear because most excavations were not deep enough to expose Phase I deposits. Phase I is known from ten trenches, including three deep 'marker' trenches in the western and southern portions of the site (Er13, Eq2, Eo10) where the deposit measures up to 1.75 meters deep (Sonawane et al. 2003). Excavations in these trenches point to early habitation on top of natural soils that were leveled and perhaps fire-cleared for building foundations (Sonawane et al 2003: 30). No "pre-Harappan" period (Ajithprasad 2002) is documented at Bagasra. Pottery chronologies and one radiocarbon date (Beta 217982) with a 2σ calibration of 2550-2540 BC and 2490-2300 BC are used to date Phase I from 2500 to 2450 BC (MSU Dept of Archaeology n.d.).

At its foundation, towards the beginning of the Integration Era, Bagasra was distinctly Harappan in character, as evidenced by the presence of diagnostic Harappan pottery, triangular terracotta cakes, and clay toy-cart frames and wheels along with shell bangles and stone beads made from agate and carnelian (Sonawane et al. 2003). The clay, marine shell, and semi-precious stones used to craft these items all have sources in Gujarat (Insoll and Bhan 2001, Kenoyer 1983, 1998, Law 2011), so it is possible that they were manufactured close to Bagasra. Nonetheless, their presence indicates that Bagasra's earliest residents valued personal objects that symbolized Harappan identity (Kenoyer 1995a).

Items made from raw materials that were obtained from distant resource locales (Kenoyer 1998, Law 2011) co-occur with locally produced goods. Imported raw materials, along

with finished and semi-finished goods, are strong evidence that Bagasra residents participated in the long-distance trading economy, for which the Indus Civilization is renowned, from the very beginning of the site's occupation (Ajithprasad 2006, Sonawane et al. 2003). Specific artifacts recovered from Phase I that are likely to have been procured from afar include a single cubical agate weight, beads of lapis lazuli, copper implements, and Rohri-type chert blades (Sonawane et al. 2003, MSU Dept of Archaeology n.d.).

There is no clear evidence for centralized craft production in workshop settings at this time, and the perimeter wall did not exist. Instead, small-scale crafting appears to have occurred in several dispersed contexts. Excavated remains suggest that residents may have worked copper/bronze and marine shell (Sonawane et. al. 2003) during this early period, thus bringing the technological knowledge of manufacturing specific crafts with them when they settled.

Buildings constructed out of finely made mud-bricks with the 1:2:4 ratio, standard across the Indus Civilization (Kenoyer 1998), were excavated in association with layered ashy floors, some of which may have been plastered. One well-made structure (Sonawane et al 2003: 35) located in trench Eo10 (Figure 2.9) retains evidence of several courses of mud-bricks with fine clay mortar and fragments of wall plaster. Rammed floors enhanced their durability. Buried in the floor, a large pot was unearthed in association with grinding stones and other domestic artifacts. In contrast to such well-planned mud-brick houses, several additional structures were constructed of rubble, pointing to the combination of formal and informal building at the site.

Figure 2.9: Bagasra Phase I and Phase II Structures Outside the Perimeter Wall
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

Domestic animals were integral to the residents' cuisine during Phase I (Chase 2007, 2010). Detailed faunal analysis (Chase 2007, 2010a) shows that the bones of cattle and buffalo are almost twice as frequent as the bones of sheep and goat. From these data Chase argues that beef, or the meat of large domesticates, was the most common meat consumed at this time. Furthermore, the largely adult age profiles of cattle and buffalo suggest that the animals were used for secondary products, like milk products and as traction animals. On the other

hand, sheep and goat appear to have been raised mostly for meat. Even though Bagasra is close to the coast, fish and crab are quite rare as are pigs and wild hoofed animals, like deer, gazelle, antelope, and nilgai. Situating Bagasra within a regional context, Chase (2012) argues that Bagasra's heavy reliance on the meat of large domestic animals is a cuisine preference that the Bagasra residents shared with other communities in Gujarat (Thomas et al. 1997) and throughout the Indus Civilization (Meadow 1989, Meadow and Patel 2003).

While residents show an affiliation with Harappan ideology and economies during Phase I, they were also closely tied to pre-existing non-Harappan cultural traditions. The recovery of regional styles of pottery, classified as Anarta in the literature and found in abundance at the sites of Loteshwar and Nagwada in North Gujarat (Ajithprasad 2002, Sonawane and Ajithprasad 1994), attest to the social or ancestral connection of Bagasra residents with the communities of North Gujarat. While Anarta pottery predominates over Harappan pottery types during Phase I, the excavators did not find a "pre-Harappan" (see Ajithprasad 2002) stratigraphic layer with Anarta pottery types alone (Ajithprasad 2006). Further, a distinctive class of bichrome bowls and large pots, which are not widely distributed outside Bagasra and neighboring environs, points to the agency of Bagasra residents in managing and manipulating their own material culture.

The interactions that brought Harappan material culture to Bagasra around 2500 BC are not well understood. Ajithprasad (2006) offers a preliminary picture of the early history of Bagasra as a location where a community with cultural connections to North Gujarat, reflected by the predominance of Anarta ceramics, met with incoming Harappan traders who brought

with them black slipped jars and their contents, in addition to other Harappan material culture. Sites in Gujarat, like Surkotada, show evidence of both Harappan and Anarta pottery at a slightly earlier date. Since no black slipped jar sherds have been documented at Surkotada (Joshi 1990), Ajithprasad rules out the possibility that its nearest neighbors settled Bagasra. However, new and on-going excavations at Shikarpur (Bhan and Ajithprasad 2008, 2009) are already showing connections between Bagasra and other neighboring sites, which may shed light on the origins of Harappan lifeways in this region of Gujarat. Adding to this picture, I suggest that Harappan traders arriving in Gujarat from other Indus regions carried with them the technological knowledge of Harappan material culture, as well as an appreciation for its economic and social value. Traders from the southern Indus Valley, in particular, left evidence of a long history of migration back and forth across the southern Indus Valley into the plains of north Gujarat since the fourth millennium BC. While these early migrants may have carried some of the Harappan pottery, weights, and ornaments that were recovered during excavation, the quantity and array of Harappan items at Bagasra is large enough to suggest production closer to the site. Whether Bagasra's early residents were migrants, a local population who adopted Harappan lifeways, or a mixture of the two, as Ajithprasad (2006) argues, the people living at Bagasra during Phase I were already specialized craftspeople and traders with connections to important Harappan cities and towns, both near and far.

6c. Phase II (2450-2200BC, Integration Era)

Bagasra's florescence occurred during Phase II when the settlement became more closely connected to long-distance trade and interaction networks, which were continually expanding during the Integration Era (2600-1700 BC). At Bagasra, this trend is reflected in the construction of a monumental perimeter wall and the rise of several prominent craft industries. Craft industries mark the onset of urban living (Sonawane et al. 2003: 30) and are accompanied by a major reorientation of public space (Chase 2010a) and elaboration of the material accessories of urban life. At this time marine shell, semi-precious stone, and faience workshops were producing popular Harappan style ornaments. This crafting brought Bagasra craftspeople and traders into direct and indirect contact with local and long-distance customers who lived in cities and towns that comprise the Indus Civilization.

During Phase II Bagasra grew to its maximum known extent of 1.92 hectares. The excavators' site chronology dates Phase II from 2450 BC to 2200 BC (MSU Dept of Archaeology n.d.) based on stages of building construction, pottery chronologies, and one radiocarbon date (Beta 217983) with a 2σ calibration of 2480-2280 BC. Phase II deposits are documented across the site and reach depths of over 5 meters in some locations (i.e., trench Eq2).

The MSU archaeological team distinguished Phase II (2450-2200BC) from Phase I by the construction of a massive 7.5-meter thick wall, which is referred to as a fortification in the literature (Ajithprasad 2006, Bhan et al. 2004, 2005, Sonawane et al. 2003), and is common to Harappan sites in the region. This central wall enclosed (Figure 2.8) approximately one hectare (65 x 57 meters), or one half of the site's known area. Extensive trenching was not conducted

to test for the presence of a second outer perimeter wall. Discussed in detail in the above section, I refer to this feature as a perimeter wall (Kenoyer 2008c, 1995b, 1993), rather than a fortification wall, because its architectural features are not typical of defensive walls and because it likely served several functions. The monumentality of the wall clearly indicates that it protected the structures, objects, and people contained inside. The width and height of the wall must have also been a deterrent to unpermitted entry. Excavations uncovered extensive occupations both inside and outside the wall, therefore the perimeter wall clearly separated the site into walled and unwalled space. Such a physically imposing barrier makes a statement, both symbolic and ideological, about the power of those who erected it as well as the value of what was inside. Thus, the perimeter wall at Bagasra served several functions, which are not mutually exclusive, and which changed over time.

The target of extensive excavations (Sonawane et al. 2003, MSU Dept of Archaeology n.d.), the perimeter wall was constructed with rectangular dressed sandstone slab as a foundation and a mud-brick superstructure with mud and clay mortar. It was built using mud-bricks of various color, fabric and size, but all following the standard Harappan ratio (1:2:4) (Sonawane et. al. 2003: 37-38), the same ratio used to construct the numerous houses and buildings dated to this phase. The wall was at times plastered with fine calcareous clay. It tapers on both the interior and exterior side, resulting in a trapezoidal cross section, with the base measuring 7.75 meters and tapering to approximately 5.2 meters at the top (Sonawane et al. 2003: 37). Simple internal bastion-like architectural features were excavated at three of the four corners of the perimeter wall. The location of these “bastions” (Sonawane et al. 2003: 37)

on the interior of the wall suggests that they did not serve as defensive bastions, but rather as architectural support to the massive wall. Two gateways were also uncovered; one on the southern and another on the eastern perimeter wall. Excavated in 2005, the eastern gateway (Figure 2.10) is preserved as a gap in the wall, which measures from 2.2 to 1.8 meters wide and is lined with mud-brick and stone bracing. Just outside this opening is a "porch" area, marked by several postholes, suggesting that the original gateway may have resembled a baffled bent-axis gateway (Keeley et al. 2007: 63). Excavated in 2004 and 2005, the southern entrance (Figure 2.11) is preserved as a large gap filled with erosion debris, cutting through the perimeter wall. Remains of a drain underlying the entrance are unclear (Figure 2.8), but are common to other urban-style settlements of the Indus Civilization (Meadow and Kenoyer 1994). The excavators describe this as a stone-lined and paved entrance with a small exterior cubicle, possibly with steps, and a landing space on either (MSU Dept of Archaeology n.d.). The entrance is wider on the outer side (4.5 m) and narrows towards the interior (1.05m). [This type of narrowing gateway has also been documented at Surkotada (Joshi 1990).] It is interesting to note that the location of these two gateways on the eastern and southern perimeter wall provides the closest exit to the occupation outside the wall, which has been preserved in the south and southeastern portions of the site.

Figure 2.10: Eastern Gateway of the Perimeter Wall at Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

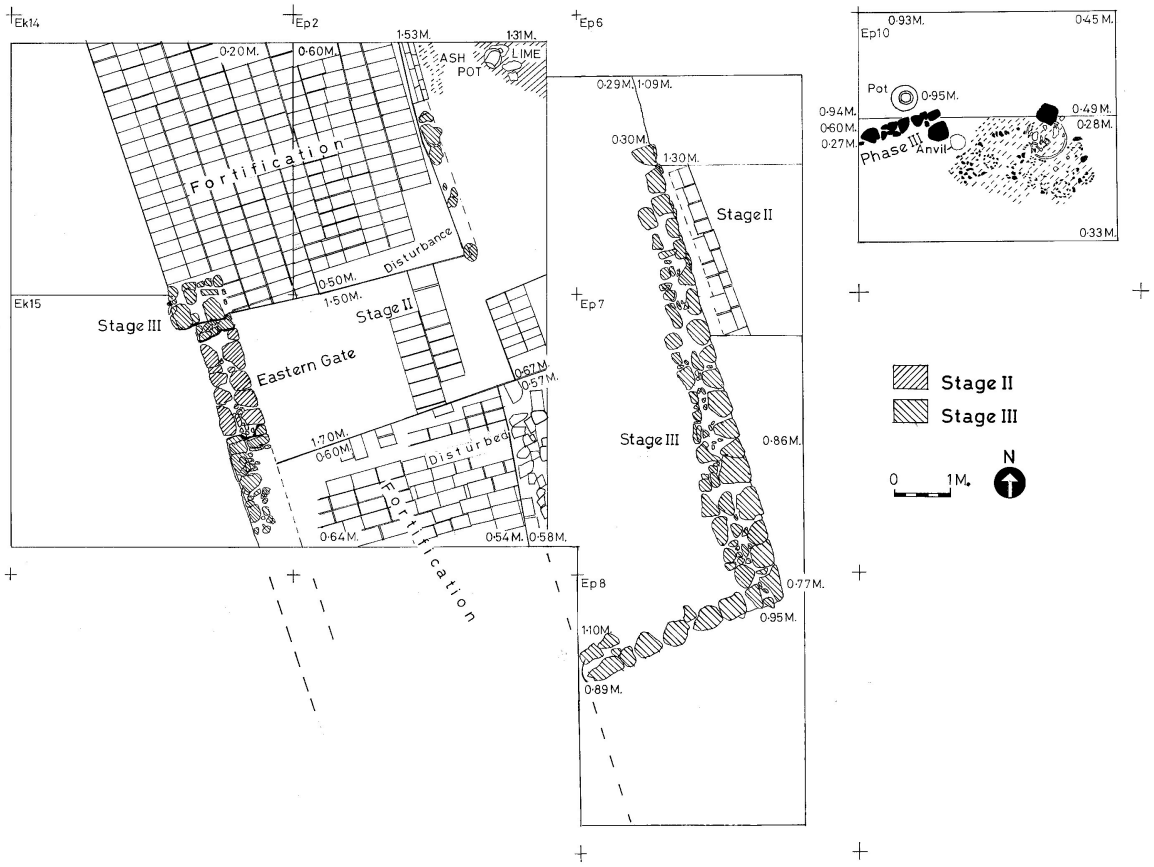
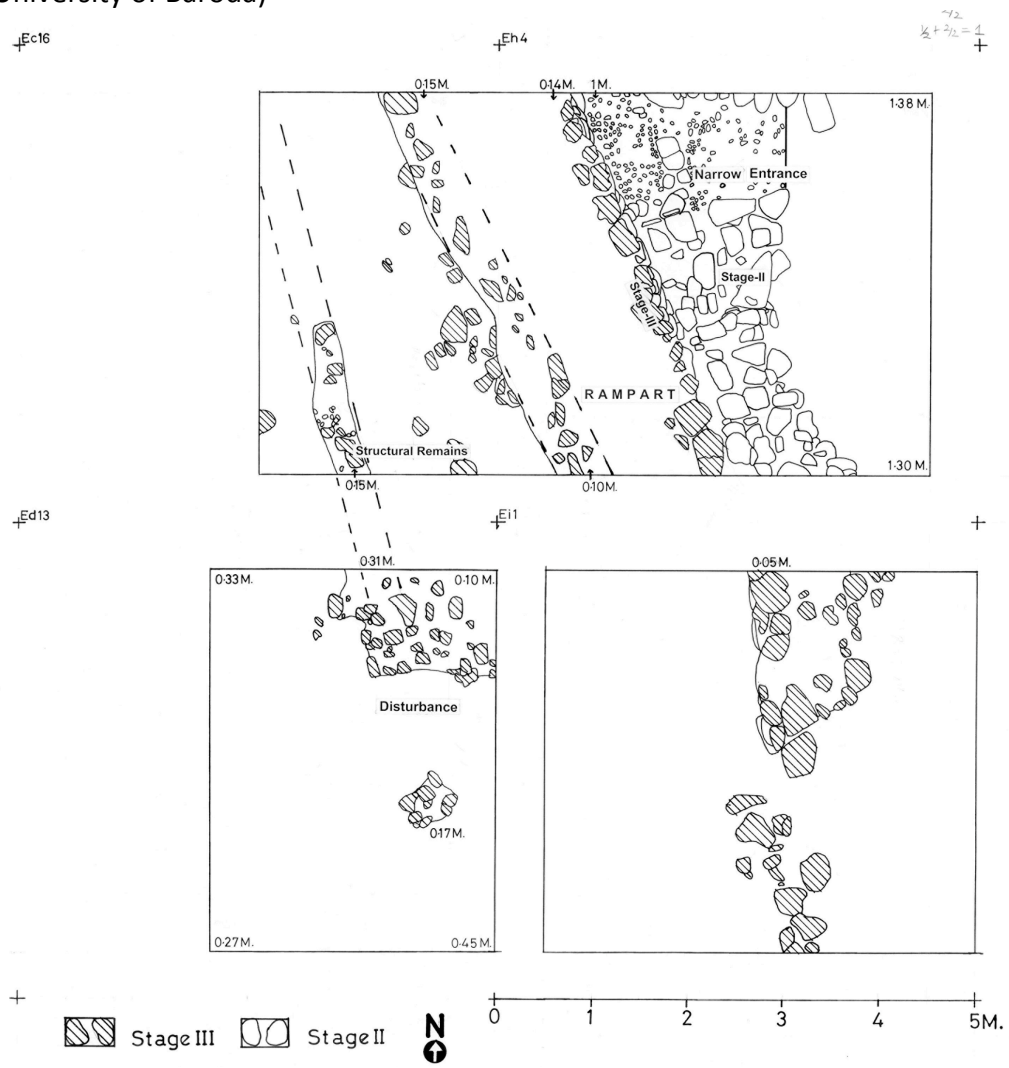


Figure 2.11: Southern Gateway of the Perimeter Wall at Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



Wall foundation remains show evidence of three successive building stages, all dated to Phase II, which increased the height of the wall, today preserved to a height of 5 meters on the eastern side of the mound. During Stage 1, the foundation trench of the wall was cut into the Phase I deposit down to a depth of 0.5 to 1 meter. Over time, the wall was damaged and

rebuilt during Stage 2, while also increasing its height and interior thickness. For this task, a new foundation trench was laid on the western side to extend the width of the wall. Thus, during Stage 2 the sandstone wall foundation contains five courses of stone and measures 1 meter in height. During Stage 3, the final stage of wall rebuilding, several additional courses of mud-bricks were added to the top of the Stage 2 wall, resulting in an increase in the height of the wall. In addition, the wall was reinforced with a stone bracing on both the interior (width: 0.7m) and exterior (width: 1.2m). Over time, changes were made to the two gateways as well. During Stages 2 and 3, the southern gateway was filled in and rebuilt to accommodate the increasing height of the wall. The platform and steps leading to the entrance were increased in height. On the eastern gateway, during Stage 3, an elevated 4.0 meter thick mud-brick and stone embankment was constructed, which functioned as a pathway to the gate. Described as a "rampart" in the excavation reports, this 9.0 meter long embankment extended towards the south at a 5-degree slope. Describing the path one would take to enter the perimeter wall via this gateway, the excavators state, "one has to climb up the sloping approach road from the south to reach up to the gate and take a 90 degrees turn towards west to get into the gate passage" (MSU Dept of Archaeology n.d.). Thus, as the height of the wall increased, both entrances were also increasingly elevated above the level of the surrounding land.

Inside this wall excavators unearthed a concentrated shell workshop where marine shell bangles were produced on a massive scale compared to other Harappan settlements at the time (Bhan and Gowda 2003) (Figure 2.12). The most remarkable features of this workshop are

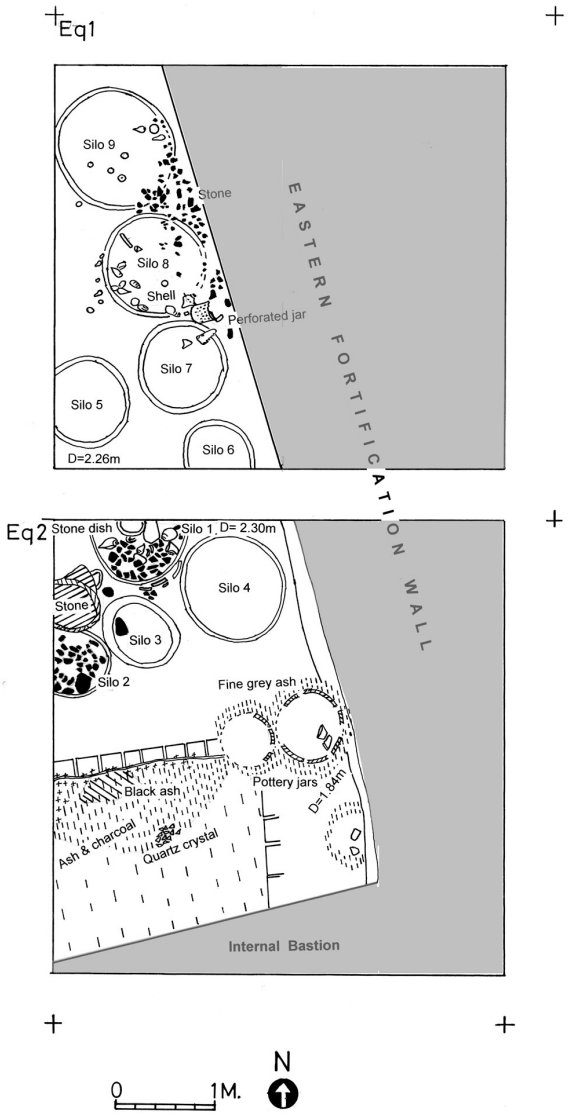
Figure 2.12: The Shell Workshop Located Inside the Perimeter Wall at Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

the two huge stockpiles of unused *Turbinella pyrum* surrounding a shell cutting area. Inside the workshop sawn shell circlets, columellas and apex portions of T. pyrum were recovered. In his studies of this shell industry, Kuldeep Bhan (Bhan and Gowda 2003) has noted that one of the marine shell stockpiles consisted of under-sized or worm-eaten shell, which is evidence that shell was being separated by quality. By comparing the marine shell industries of regional settlements in Gujarat, Bhan (Bhan and Gowda 2003) provides evidence that the shell cutting craftspeople at Bagasra did not harvest marine shell themselves, but were dependent on other neighboring coastal sites, such as Nageshwar (Bhan 1992, Hedge et al. 1992), which thus explains the presence of poor quality and unusable shell raw materials at Bagasra.

A faience processing area and five clay-lined storage pits were also found inside the perimeter wall (trench Eq2) (Figure 2.13) (MSU Dept of Archaeology n.d., Sonawane et al. 2003). Two of these pits contained unmodified and rare semi-precious stones, commonly used to manufacture beads, as well as marine gastropod shells and shell circlets. The site's excavators have identified the semi-precious stones as jasper, or ferruginous chert, and moss agate. Faience preparation vessels, crushed quartz crystals, grinding stones, vitrified sagars, faience beads at different stages of production and improperly fired faience beads are evidence that a workshop once existed, which was responsible for all stages of production of faience bangles and beads (Sonawane et al. 2003). The storage of rare stones suggests "some sort of infrastructure set-up for controlling the procurement of raw material and the production of beads at the site" (Sonawane et al. 2003: 44). Further, the storage of valuable unworked stone inside a faience processing area suggests to me the coordination, or interdependence, of craft

activities, which is also a feature of craft production at urban crafting centers, like Harappa (Kenoyer and Miller 2007).

Figure 2.13: Faience Processing and Lithic Stockpile Area Inside the Perimeter Wall at Bagasra (Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



While the technologies of faience production and shell bangle manufacture were restricted to workshops inside the perimeter wall, excavations also unearthed areas of bead and ceramic manufacture outside the wall. In a small stone bead workshop (trench Eh3) just outside the southern gateway, the excavators documented large amounts of bead working debitage, a handful of bead rough-outs and broken stone beads in banded agate, jasper, carnelian and chert. Worn-out and broken ernestite and chert drill fragments were found along with this bead making debris, which together indicate that the production of stone beads took place in this location (Sonawane et al. 2003). In addition to this workshop, the excavators recorded ephemeral evidence for small-scale stone bead production throughout the site. The remains of ceramic kiln foundations, a mud platform, burnt clay, and deformed and over-fired pottery were also identified in the southeastern part of the site, outside the wall (trenches Eo15 and Eo16), suggesting the local production of ceramics at the site.

Located in unwalled areas in the southern half of the site, I contend that these small bead and ceramic workshops would have been visible to all residents and visitors to Bagasra, which contrasts with marine shell and faience industries and the stockpiling of rare semi-precious stones that were removed from public view and protected by the physically imposing boundary wall. The segregation of certain crafts inside a monumental wall might signal that individuals with positional power regulated them. However, Kenoyer (1989: 183) reminds us that "(t)here is not *a simple and direct* correlation between segregation of craft specialization and socio-economic stratification or centralized control." Applied to Bagasra, this statement

reinforces the need for additional evidence for control of marine shell and faience industries located inside the perimeter wall.

Both seals and weights are considered symbols of economic authority. Their presence at Bagasra supports arguments for the centralized administration, or control, of the production and possibly distribution of certain craft activities (Jamison 2010, Kenoyer 1995b, 1998). Seven steatite unicorn seals bearing Harappan script and several clay sealings bearing inscribed seal impressions as well as several cubical chert weights (Sonawane et. al. 2003) were discovered during excavations. Of the unicorn seals, six date to Phase II; five of these seals were found inside the wall and one was found outside the wall. As part of his dissertation research, Gregg Jamison is further documenting the technology of these steatite seals (Jamison 2012). He concludes that two of the unicorn seals from Bagasra (BSR 6719, BSR 2037) were crafted in a style that he also documented at Mohenjo Daro and Lothal, and thus may have all been produced by the same workshop. In addition, two of the unicorn seals are stylistically unique (BSR 8288, BSR 7197), suggesting a regional carving style and manufacture. A unique seal (BSR 7368) with a central hollow compartment, rare in the Indus Valley, is also stylistically unique. Thus, the carving technology and style of the steatite seals from Bagasra demonstrates that people living here maintained their own stylistic traditions of carving while also being linked to other urban Harappan centers.

Coinciding with the Phase II site expansion, wall construction, and flourishing craft industries the MSU archaeological team also documented a dramatic increase in the quantity of Harappan material culture (Ajithprasad 2006, Sonawane et al. 2003), which is distributed across

the site. Harappan material culture likely to have been produced at Bagasra includes all four categories of crafts defined by Kenoyer (Kenoyer 1991, 1992): simple technologies made out of locally available as well as non-local raw materials in addition to complex technologies applied to local as well as non-local raw materials. Simple technologies documented at Bagasra include the construction of buildings using standardized mudbricks and stone, simple lapidary using chipping and grinding technologies, as well as the crafting of a wide variety of ceramics. At Bagasra, Harappan style clay objects recovered from excavation include pottery, terracotta beads, spindle whorls, tops, triangular cakes, bull and other animal figurines, toy-cart frames and toy-cart wheels.

Complex technologies, as noted above, include stone bead, faience, and marine shell manufacture. Bagasra craft workshops transformed primarily locally available agates and carnelian into beads and shell into bangles, beads, and other small ornaments (MSU Dept of Archaeology n.d., Sonawane et al. 2003). The complete stone beads from the site include several styles made from regionally available agate, carnelian, and steatite (Law 2011) as well as lapis lazuli, and amazonite, which have distant resource locales and were likely brought to the site as finished goods (Law 2011, Kenoyer 1998). Other goods likely to have been imported include several gold beads, cubical chert weights, and Rohri-type chert blades. Copper objects include copper rods, a large spearhead, several chisels, fishhooks, copper pins and spirals. Provenience studies of specialized ceramic vessels, like black slipped jars, have not yet been conducted and stylistic and morphological features suggest they may have been produced at Bagasra or elsewhere (Ajithprasad 2006). Preliminary evaluations suggest to me that Bagasra

craft industries focused on locally available stones (agate, carnelian, and jasper), and not exotic raw materials. However, additional analysis of the bead making debitage, quantification of complete beads, and sourcing of stone and ceramics from the site will help to further distinguish the objects that were made at Bagasra, from those imported in finished form.

The faunal remains from Phase II contexts indicate continuity in the pastoral economy of the site that was established in Phase I (Chase 2007, 2010a, 2012). However during this phase there is some marine and faunal evidence to suggest differences between areas inside and outside the perimeter wall in terms of the types and quantities of animal resources consumed, as well as the way that preferred animals were butchered. Chase's work showed that the quantity of recovered faunal remains indicate that the settlement, both inside and outside the wall, was relatively self-sufficient in terms of animal products. Cattle and buffalo continued to account for the majority of the faunal remains and the various parts of these animals are distributed homogeneously across areas inside and outside of the wall. The distribution pattern for sheep and goat remains, on the other hand, are not as homogeneously distributed. Instead, a slightly higher proportion of bone fragments from the head (crania and mandibles) and axial portions (vertebrae and pelvis) are found outside the perimeter wall. Inside the wall, limb bone fragments from sheep and goat are slightly more common as are remains of pigs. While the statistical difference indicates that choice cuts occurred in relatively low volume, Chase posits that residents inside the wall had greater access to these choice cuts of sheep and goat meat (legs of lamb), as well as pig meat, than residents outside the wall. In addition, Chase notes that areas inside the wall contain significantly more fish remains, compared to areas outside

the wall where crab remains are more common. This data is suggestive of slight differences in food preferences and cooking habits in the walled and unwalled areas at Bagasra. Adding to this picture, recent isotope studies by Chase and Meiggs (2012) are beginning to show that Bagasra residents were not migrating pastoralists, but obtained most of their sheep/goat and some of their cattle from areas relatively close to the settlement, with a few individual cattIe coming from areas a bit farther away. In Chapters 4 and 5 I explicitly test Chase's hypotheses drawn from the Bagasra faunal data, which argue that differences in the remains of meat found inside and outside the perimeter wall are evidence that two groups of people lived at the site, who differentiated themselves based on food preferences and food preparation practices (Chase 2007, 2010a). While pottery analysis provides crucial data to address cooking practices, a comprehensive assessment of cuisine at Bagasra (Chase 2012) must also reference botanical remains from the site, which have not yet been studied.

The pottery recovered from Phase II also suggests that Bagasra residents' affiliation with Harappan ideology and economies was expressed in a wider range and quantity of material culture than during Phase I. In annual excavation reports, the MSU excavation directors argued that Harappan pottery forms increased significantly in proportion to the total curated ceramic assemblage and became the dominant ceramic class in Phase II. However, they also note the recovery of Anarta pottery side by side with Harappan vessels attests to the persistence of social and/or ancestral connections of Bagasra residents to the indigenous Chalcolithic communities of North Gujarat. Further, a few potsherds of black and red ware and other Sorath pottery forms suggest early contact with communities to the south in Saurashtra. Thus,

the nature of the preserved ceramic evidence suggests that during this period Bagasra residents were connected to several indigenous Chalcolithic communities. Nonetheless, it is unclear whether the elite leaders at the site who controlled and managed craft production had ancestral connections to these local cultures or if their ancestral connections lie outside of the region. While the exact nature of these interwoven interaction networks is just beginning to be understood, the intensity of craft production at this small town suggests that Bagasra played a vital role in the local economy.

In sum, Phase II was a period of flourishing craft production at Bagasra, which linked people living at the site to a complex interaction network of cities and towns both near and far. The perimeter wall, erected early in the site's occupation, was a physically imposing feature of the community. It both protected and separated the important industries of marine shell working and faience manufacture. Semi-precious stone, used to make beads, was stored inside the wall and evidence of bead manufacture is found dispersed throughout the site.

6d. Phase III (2200-1900 BC, Integration Era)

During much of Phase III Bagasra residents appear to have lived a life similar to their Phase II ancestors. However, sometime during Phase III the craft and trade economy of the community began to shift and by the end of Phase III Bagasra was no longer a center for craft production. The continued utilization of diagnostic Harappan artifacts coupled with a decline in structural building projects and the failure to maintain shared communal spaces points to this conclusion.

The excavators date Phase III deposits based on their stratigraphic position below Phase II deposits, distinctive building episodes, and a shift in the relative proportions of Harappan and non-Harappan ceramics as Sorath ceramics come to dominate the assemblage (Sonawane et al. 2003: 31). Phase III deposits are documented across the site. They average 1.2 meters thick, but reach 2 meters in some locations. Drawing from these lines of material evidence, and one radiocarbon date (Beta 217984) with a 2σ calibration of 2490-2290 BC, the excavators date Phase III from 2200 BC to 1900 BC (MSU Dept of Archaeology n.d.), which situates it fully within the Integration Era. However, Chase (2007: 36) has noted that the overall character of Phase III deposits is more suggestive of the Localization Era. Clarification of the dating of Phase III deposits can only be reached through submission of additional radiocarbon dates.

The perimeter wall continued to stand as an imposing feature of Bagasra's built environment, and a mound ("rampart") was built to reinforce its southwestern corner. The wall and other standing buildings were used and maintained, but no major new building projects have been identified that date to Phase III. Inhabitants continued to occupy space both inside as well as outside the perimeter wall. This period has been characterized as one of "general disarray in construction, waste disposal and space management" (Sonawane et al. 2003: 32). Sometime before the end of Phase III most of the buildings, as well as the perimeter wall, appear to have collapsed. Subsequent Phase IV deposits found directly on top of Phase III remains appear to post-date the collapse of earlier buildings (Sonawane et al. 2003: 49).

No craft workshops have been identified that date to Phase III. Instead, deep deposits of debris accumulated inside the wall, which contains craft manufacturing debris suggesting that dispersed craft manufacture took place.

Reflections by the site's excavators suggest continuities in the material culture between Phase III and the previous phase in terms of the array of Harappan artifacts found across the site. However, the overall quantity of Harappan goods noticeably decreased. In addition to Harappan pottery, other excavated Harappan artifacts include beads of carnelian, lapis lazuli, steatite, and faience, shell bangles, terracotta cart frames, triangular terracotta cakes, and long Rohri-type chert blades (Sonawane et al. 2003). A single steatite seal, dating to an early Phase III layer, has been reported (Jamison 2012). A medium sized, squat copper pot was found alongside the interior edge of the southern periphery wall (trench El15), which contained a copper axe, or celt, and five copper/bronze bangles. Few objects were recovered that are indicative of the control or administration of the craft economy. A few clay sealings were recovered, including one with six Harappan characters above a unicorn with a standard (trench Ek5). Two cubical weight preforms and a truncated spherical weight are also reported (Sonawane et al. 2003: 33, 47).

Excavation reports declare Harappan pottery to be a prominent feature of the Phase III ceramic assemblage. However, the Phase III pottery assemblage is distinguished from the Phase II assemblage by the dominance of Sorath pottery over other defined pottery traditions. Cross-dating by reference to ceramic sequences at Rangpur (Rao 1963) and Rojdi (Possehl and Raval 1989) define Phase III Sorath pottery at Bagasra as equivalent to Rangpur-IIA and IIB and

Rojdi-A and B (Sonawane et. Al. 2003: 27). Sorath ceramics of this period at Bagasra differ from the styles found in Phase IV, which is significant for situating Bagasra within regional ceramic sequences. Excavation reports and preliminary studies (Ajithprasad et al. 1999, MSU Dept of Archaeology n.d., Sonawane et al. 2003) suggest that Anarta pottery, present from the site's initial occupation, continued to the end of Phase III but in very small quantities compared to earlier phases. Other regional ceramics also were recovered in association with Sorath and Harappan pottery. Those reported (Sonawane et al. 2003) include Micaceous Red Ware, which appears at the site for the first time and is associated with the site of Lothal, as well as a few sherds of black and red ware and probable Prabhas Ware - common to Saurashtra.

Despite the changes in the craft economy of the site, the subsistence base and social fabric of the community appear to have remained stable. Support for this comes from the faunal remains, which suggest a general continuity in manner of procurement and consumption of domestic animals (Chase 2007). In contrast to Phase II, patterns of meat processing appear to be the shared by those inside as well as outside the wall.

In sum, Phase III represents a decline in economic activity at the site. There is no evidence to suggest that people moved away. In fact, areas inside and outside the wall continued to be occupied as before, though no new structures were built and deep trash deposits accumulated, suggestive of a breakdown in civic authority. Taken together, these patterns suggest a shift in the networks that Bagasra residents were tied to. New economic relationships were negotiated as the previous networks based on the trade of Harappan goods

broke apart. These new relations are reflected most clearly in increase of regional Sorath pottery forms.

6e. Phase IV (1900-1700 BC, Localization Era)

Bagasra's final inhabitants experienced a very different economic and social landscape than earlier occupants. It is possible that the mound was abandoned for a short period of time following Phase III, which is not visible in the stratigraphy of the site (Sonawane et al. 2003: 49). What is clearer is that Bagasra residents no longer experienced a thriving urban-style town that attracted a variety of wealth items and supported building and maintenance projects.

The MSU chronology for Bagasra proposes that Phase IV dates from roughly 1900 - 1700 BC, which places it at the beginning of the Localization Era (1900-1300 BC). This dating is derived from diagnostic Sorath pottery types coupled with an absence of Harappan material culture. However, a single radiocarbon date (Beta 217985) with a 2σ calibration of 2430-2140 BC (MSU Dept of Archaeology n.d.) is suggestive of an earlier date within the Integration Era. As with Phase III dating, more radiocarbon dates are required to resolve this apparent contradiction.

Phase IV occupation is confined to a small area in the southeastern portion of the site, on top of and outside the dilapidated perimeter wall. The excavators note that there is no identifiable stratigraphic break between Phase III and IV deposits. In fact, Phase IV deposits are often found overlying the collapsed debris of Phase III structures, including on top of the perimeter wall itself. Remains of the monumental wall, which was probably still standing, must

have continued to be an imposing feature of the settlement. In light of the physical prominence of the wall, it is significant that residents chose to not live inside. Instead of the well-planned building complexes characteristic of earlier phases, residents now constructed small circular rubble stone structures outside the wall and dug a series of large deep pits nearby. While the site's final ancient occupants did reuse stone and mudbricks from earlier structures (i.e., trench Es3/4), excavated features suggest that Phase III buildings had already collapsed prior to this recycling behavior (Sonawane et al. 2003: 49).

There is no evidence for any craft production during this time and both long distance and trade networks based on the exchange of semiprecious stone, marine shell, and other raw materials appear to have broken down. The almost total lack of Harappan ornaments, such as semi-precious stone beads as well as objects made out of faience and marine shell indicate that the Phase IV inhabitants no longer produce these goods, even on a small scale, but it also suggests to me that residents no longer had access to, or an interest in, obtaining goods made out of locally available raw materials. The recovery of copper implements, including copper rods, a chisel and a small knife, as well as a wide array of well-made pottery are suggestive of new economic orientations, which are not well understood.

The Phase IV faunal remains suggest that residents now consumed more wild resources, though domestic sheep, goat, and cattle were also slaughtered. Chase (2007) interprets the homogeneous distribution of faunal remains across the site as indicative of the local processing and consumption of meat.

Excavation reports declare Harappan pottery to be absent from the Phase IV ceramic assemblage. Instead, Sorath pottery resembling Rangpur-IIC pottery (Rao 1963) and Rojdi-C (Possehl and Raval 1989) pottery predominates characterizations of the assemblage. Sorath ceramics of this period at Bagasra differ from the styles found in Phase III, which has significant implications for situating Bagasra within regional ceramic sequences. Other than a few sherds of black and red ware, no other ceramic traditions are noted in published overviews of the site (Sonawane et al. 2003).

It is unclear whether Phase IV residents of Bagasra were descendants of earlier inhabitants, who continued to live at the site, or if the site was briefly abandoned and reoccupied by a new group of people. Either way, it is clear that the site's final occupants built different types of structures and relied on a different set of daily goods than during earlier periods. Sites close to Bagasra, which are potentially contemporaneous, have been interpreted as pastoral camps occupied on a seasonal basis (Bhan 1992, 1994, 2004, Mehta 1982, 1984, Mehta, Momin and Shah 1980, Sonawane and Mehta 1985).

7. Conclusion

Bagasra's preserved heritage makes it a unique site at which to conduct archaeological research. First, the scale of production of bangles at Bagasra's shell cutting workshop is unprecedented among excavated Indus Civilization sites (Bhan and Gowda 2003, Bhan and Kenoyer 1984, Kenoyer 1983). Second, Bagasra is the only site to date with well-excavated archaeological evidence of the contemporary use of Harappan and local, or non-Harappan,

ceramic styles (Sonawane et al. 2003: 48). While the level of preservation at Bagasra may be unique, the diversity of its ceramic assemblage and types of Harappan material culture at the site are typical of many other sites in the region. Consequently, ceramic studies at Bagasra can be used to test models of the relationship between Harappan and non-Harappan material culture in both space and time, at a site that was of central importance to the Indus craft economy. Further, these new ceramic data from Bagasra have the potential to fill a crucial gap in our understanding of Indus interaction networks. By further identifying the extent of preferences for specific types of pottery, this study offers significant new data aimed at detailing the specific nature of shared versus localized material culture during the Integration Era. Previously evaluated against models of craft economy derived from centers of Indus urbanism far away, comparative pottery analysis can reveal agency exercised by the people of Bagasra in the selection of material symbols of their own identity. Enhanced understandings of Bagasra pottery preferences can in turn be used to model overlapping social and economic affiliations at the small craft production centers dotted along the Indus Civilization borderlands.

Chapter 3: Methods of Analyzing and Interpreting the Ceramic Assemblage

1. Introduction

Bagasra's diverse repertoire of Harappan and non-Harappan ceramics make it well-suited for addressing the series of pottery-related questions outlined in this study because these types are found in contemporaneous deposits at the site and also show evidence of change over time in both style and percentage. At two hectares in size, the site was small enough for archaeologists to be able to collect broad samples from different activity areas as well as from all four-occupation phases. Ten seasons of excavation by one of the most active archaeological teams working in India provide a rich array of pottery and other material culture that was recovered in such a manner that it has been possible to accurately associate pottery with distinct and well dated archaeological chronologies for the region.

In this methods chapter I present the data collection and analysis of the Bagasra ceramic assemblage as an interpretative process, in order to establish an initial connection between my laboratory methods and the research questions and larger interpretive goals set forth in this dissertation. The main point I wish to make is that traditional approaches to pottery classification in South Asia view Harappan and non-Harappan pottery typologies as fixed and discrete material culture traditions that reflect distinct cultural groups in the past. Since these pottery traditions are found to co-occur in both time and space at Bagasra, I argue that this framework needs to be enhanced in order to account for the co-existence of these pottery types at certain sites. Instead, I approach typological classification itself as an interpretive

process and argue that a comparative approach to analyzing pottery within and between Indus Civilization sites brings forth types of data that stimulate new perspectives on regional pottery preferences and the question of cultural identification in the Indus Civilization borderlands.

Of particular importance for this project is the problematic conflation of stratigraphic sequences with cultural sequences (Sonawane et al. 2003: 24), and pottery with people, both vestiges of culture-historical archaeological frameworks that are pervasive in South Asian archaeology today (Johansen 2003). In Gujarat, traditional culture-historical methods succeed at establishing complex cultural chronologies, which are largely built from detailed regional pottery chronologies. Yet, these traditional methods have limited potential to provide satisfying answers to questions of cultural process, which are key to understanding the contemporary use of Harappan and non-Harappan pottery at sites in Gujarat.

The terms “Harappan” and “non-Harappan” have their origins in approaches to pottery classification that apply Harappan and non-Harappan pottery typologies as fixed tools to identify and define distinct material culture traditions. These material culture patterns are also widely interpreted as reflections of discrete cultural communities. For this reason when Harappan and non-Harappan pottery are found at the same or neighboring sites, archaeologists often frame their research questions around understanding the nature of the interaction between Harappan and non-Harappan people. Thus, existing approaches to the Harappan/non-Harappan question have fallen into the trap of equating pottery with people, resulting in the failure of these terms to engender social interpretations that account for the coexistence of different types of pottery at sites of ancient Indus communities, such as Bagasra.

With this in mind, this chapter delineates the ways in which an approach that compares pottery between sites moves beyond ceramic description in order to problematize pottery data and ceramic classification. In doing so, it develops an interpretive structure for analyzing vessel-specific pottery data to inform archaeological understandings of the social and cultural variables that influence regional pottery preferences and patterns of continuity and change in pottery preferences across time.

This chapter describes the site formation processes and the MS University excavations at Bagasra. This chapter proposes three areas of investigation related to this study that have been most impacted by the preservation and excavation of the site. These findings are summarized as: 1) aspects of Bagasra's excavation that influence the study of change through time in pottery preferences, 2) aspects of Bagasra's excavation that influence the study of the spatial distribution of pottery types, and 3) aspects of the curation of Bagasra's pottery that influence this and future pottery studies. Relevant information regarding the formation of Bagasra as an archaeological site, as well as the MS University excavation approach, excavation techniques and curation procedures are included within each of these three discussions when they bear upon the assemblage of pottery remains. In each section, I put forth both the limitations and potential of pottery studies at Bagasra. Woven through this discussion is my reflection on what I understand to be the choices made by the excavators about how and where to excavate, as well as their research questions that inform the curation and interpretation of the material remains from the site. These choices delineate not only the

contexts available for analysis, but also define what is known about the site and refract it through a culture-historical lens of descriptive interpretation.

This chapter also elucidates my comparative method, which employs a Harappan pottery classification system that can be applied at multiple sites. My comparative methods put into use and expand upon *the Harappan pottery typology* developed by George Dales and J. Mark Kenoyer (1986) in order to identify vessel types that are common between Bagasra and other Indus settlements. Dales and Kenoyer developed and refined the typology at Balakot (Dales 1979, see also Franke-Vogt 1997, 2005), Mohenjo Daro (Dales and Kenoyer 1986), and Harappa (Dales and Kenoyer 1993, see also Jenkins 1994a, 2005). The latter two urban centers have long served as type-sites for defining archaeological signatures of "Harappan" material culture (Jansen 1993b, 1994, Mughal 1990b, Wheeler 1953). It follows that a typology developed at these formative sites offers a testable standard for defining "Harappan" (as opposed to "non-Harappan") pottery types at other Indus settlements. The utility of the Harappan pottery typology is also recognized in the work of other Indus scholars who have applied the typology at both small and large sites in different regions (Franke-Vogt 1997, 2005, Hegde et al. 1992, Herman 1997a, Jenkins 1994a, 1994b, 2000, 2005, Possehl and Herman 1990, Uesugi 2011a, Uesugi and Meena 2012). Thus, the Harappan pottery typology has been applied and refined through diverse applications at Indus Civilization sites of different size, in different regions, and of slightly differing time periods, providing a rich array of comparative ceramic data.

My comparative approach to Harappan pottery classification identifies diagnostic vessel types, evaluates their form and attributes in relationship to other sites, and evaluates changes in both style and percentage through time. As outlined, a comparative method of applying the Harappan pottery typology is a robust method for collecting and analyzing pottery data because it can be tailored to identify pottery types and styles that are shared between sites, while at the same time identifying unique regional pottery preferences. This method draws meaning from pottery data that is directed at answering the pottery-specific research questions and broader goals of this study. Thus, this study draws on the potential of the Bagasra pottery assemblage to address questions of pressing archaeological significance. Outlined in this way, a comparative approach avoids pitfalls brought about by several limitations of the data, which result from archaeological preservation as well as the choices made during excavation of Bagasra and curation of its antiquities.

The primary data analyzed for this study derive from over 12,500 potsherds selectively sampled from each of the four occupational phases at Bagasra, spanning the estimated dates 2500 to 1700 BC. Section 2 of this chapter assesses the variables that influenced the ceramic assemblage, which Kuldeep Bhan, P. Ajithprasad, and K. Krishnan at Maharaja Sayajirao University of Baroda made available to me for analysis. This section is followed by a discussion of my sampling strategy, which draws upon the strengths of the Bagasra excavation. In the fourth section, I move on to discuss the method of classification of Harappan and non-Harappan ceramics that this study employs. Section 5 presents a detailed overview of the methods I used to document the Bagasra pottery assemblage. I employed a hierarchical

recording system in order to document the largest sample of pottery possible, while also maintaining standards of detail that facilitate meaningful comparison. Documentation involved tabulation of the entire corpus of sampled pottery, while detailed attribute data were collected on a subset of the total sample. Included in this section is a detailed discussion of the attributes selected for analysis, along with the variation of documented attribute states. This chapter sets the stage for the more detailed data chapters that follow.

2. The Excavation of Bagasra

The nature of the material remains from past societies, which are preserved for archaeological study, are ultimately dictated by a variety of natural and human processes that affect an archaeological site while it is being formed, as well as during excavation, recording and curation. As such, natural and human activities necessarily influence the preservation, content and condition of the pottery assemblage from Bagasra available for this study. In recognition of this fact, it is necessary to briefly describe processes that impact the formation of Bagasra as an archaeological site, along with the goals and methods employed during excavation and subsequent modes of artifact curation.

Bagasra was excavated from 1996 to 2005 by archaeologists from the Department of Archaeology and Ancient History at Maharaja Sayajirao University of Baroda (Bhan et al. 2004, 2005; Sonawane et al. 2003). The way in which Bagasra was excavated plays a vital role in what is known about the site, as summarized in Chapter 2, and dictates, to some degree, the boundaries of this project and of future research. I have identified three aspects of the MS

University excavation approach, which have had the most impact on this pottery study: 1) aspects of Bagasra's excavation that effect the study of change through time in pottery preferences, 2) aspects of Bagasra's excavation that impact the analytical precision of the spatial distribution of pottery types, and 3) aspects of the curation of Bagasra's pottery that define the corpus of pottery available for analysis.

Since Bagasra is a small 2 hectare settlement, the MS University excavation team was able to unearth an extensive array of archaeological material (including pottery) spanning the entire occupation and representing various parts of the site, both inside and outside of the perimeter wall. Central to this study, several pervasive excavation strategies and techniques present challenges to fine-grained analysis of variation in pottery types, and thus pottery preferences, across space and time. Nevertheless, this dissertation capitalizes on several prominent excavation standards that serve to strengthen comparative analysis of pottery from different areas of the site and throughout its entire occupation. The MS University excavation teams' systematic excavation and pottery curation procedures, as well as unpublished annual excavation reports, accompanying section drawings and illustrations of diagnostic material culture provide a wealth of supporting evidence. Drawing on this evidence, my analysis provides a comprehensive, though necessarily partial, picture of the pottery preferences at a single site across space and time, which is difficult to achieve at larger sites or those with less extensive excavation.

2a. Change through time: the potential of Bagasra pottery data

The MS University excavation strategy prioritized wide horizontal exposure of Phase II (2450-2200 BC) and Phase III (2200-1900 BC) architectural remains, which resulted in a greater exposed area and thus a greater amount of material culture dating to these phases than to Phase I (2500-2450 BC) and Phase IV (1900-1700 BC). Most important for this dissertation, this excavation strategy resulted in varying amounts of pottery from each of the four phases. Since this study of change through time in pottery preferences relies on comparable samples from each of the phases, the interpretations put forward in this dissertation regarding specific vessel patterning across the entire four-phase sequence should be considered preliminary. Additional excavations in specific areas of the site would be needed to develop more precise comparative samples. However, the very fact that a wide array of deposits was excavated from each phase allows for broad evaluation of continuity and change in individual vessel types across each of the four phases. Combined in this new way, vessel-specific patterns are used to develop a model of complex and evolving pottery preferences at Bagasra.

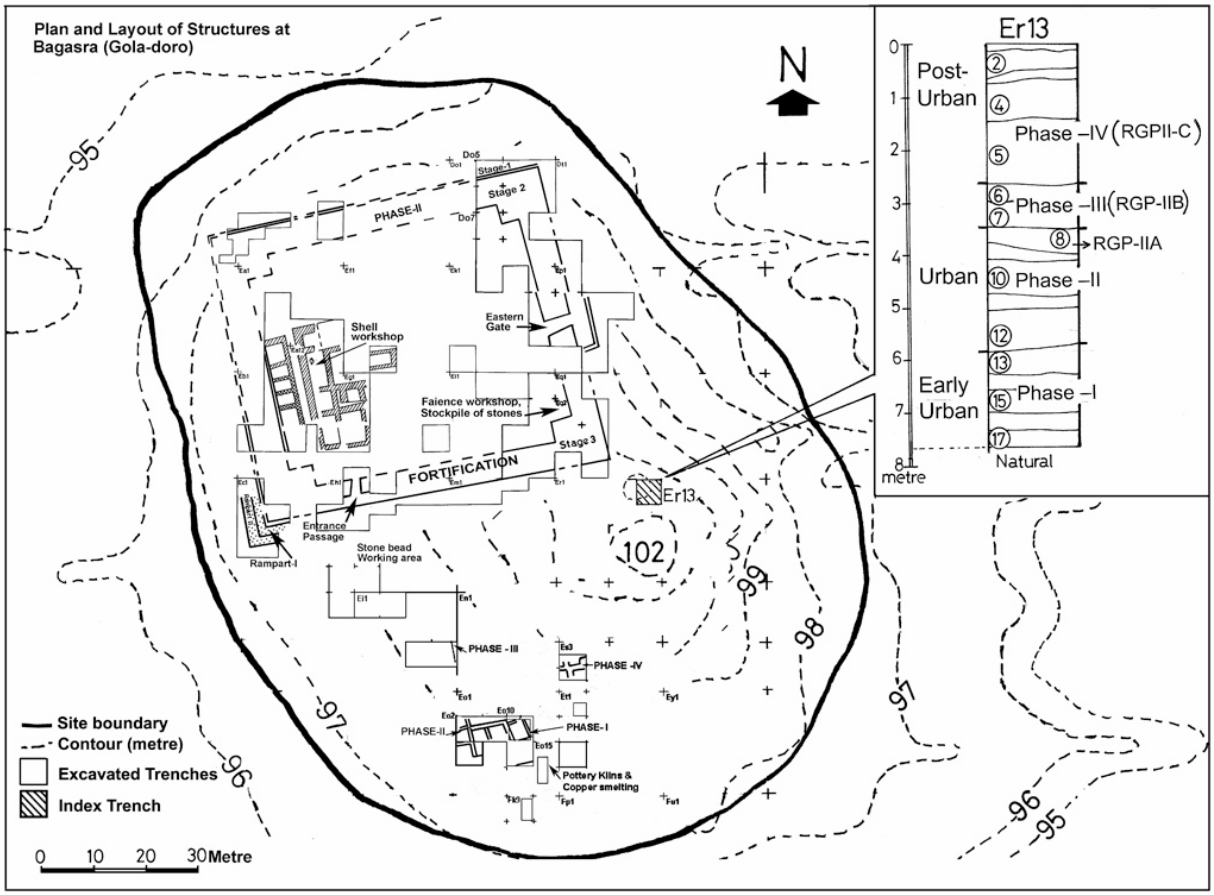
The MS University research strategy focused excavations on first establishing a full occupational chronology of the site and then wide horizontal exposure of those areas of the site and occupation levels with the greatest density of architectural features. Drawing on the results of their previous excavations in the region (i.e. Hegde et al. 1988, 1990, 1992), the MS University research team, lead by V. H. Sonawane, P. Ajithprasad, Kuldeep Bhan, and K. Krishnan, concentrated their excavations on the mounded portion of the site (Figure 3.1), where they expected to find the highest architectural density and the deepest cultural deposits.

Efforts to establish the stratigraphic sequence concentrated on several deep "marker" trenches located both inside (Eq2) and outside the perimeter wall (Er13, Figure 3.1) on the highest portion of the mound in the eastern portion of the site. Two additional trenches in the northern (Do5) and southern sections (Eo10) of the mound were also excavated to natural soil, thus establishing the stratigraphic sequence in four separate trenches. These excavations unearthed 7.75 meters of continuous habitation deposits representing the full chronological occupation of the site, from the "Urban Harappan" through "Post-urban" periods (Sonawane et al. 2003: 24).

Once the four-phase site chronology had been established, the excavators focused their attention on wide horizontal exposure of the major architectural components of the site, especially the perimeter wall (which the excavators refer to as a "fortification wall," Bhan et al. 2004, 2005; Sonawane et al. 2003), and other intact building foundations, as well as craft production areas. Because archaeological deposits from Phases II and III contain a relatively high degree of intact building foundations, well-preserved features of several craft workshops, and show evidence of several stages of building and rebuilding the perimeter wall, a notably greater area was excavated dating to these phases. In keeping with the focus on architecture, the excavators chose not to remove in situ architectural remains, thus many trenches were not excavated beneath Phase II deposits, which further reduced the exposure Phase I deposits. So, while excavations established the time depth of occupation at Bagasra, they provide only a glimpse into the activities dating to the earliest and final periods. Most of what we know about the site, as described in Chapter 2, relates to activities and patterning of material culture dating

from Phase II and III. This results in a bias towards craft production as the main economic activity at the site, with less attention paid to economic strategies and resources that supported the community throughout its entire occupation.

Figure 3.1: Bagasra Site Plan and Stratigraphic Profile of Marker Trench Er13
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



In recognition of the limitations of an uneven sample, I frame my hypotheses regarding change in pottery preferences throughout the entire four-phase occupation of the site as preliminary. Since a large sample of Phase II and Phase III pottery was available for study, I necessarily place emphasis on pottery preferences and associated behavior that dates to Phase II and III. Thus, my research questions and principle expectations, as outlined in Chapter 2, focus on identifying pottery patterns inside and outside the perimeter wall. In this way my dissertation draws on the potential of the Bagasra assemblage to answer questions regarding Phase II and Phase III pottery preferences, while limiting the potential pitfalls from overextending interpretations of change though the entire occupation sequence.

2b. Spatial Distribution: the potential of Bagasra pottery data

The MS University excavation methods, including the plan and layout of excavation trenches, largely derive from the excavation techniques established in India through the Archaeological Survey of India by R.E.M. Wheeler, during his tenure as the Director General from 1944-1948 (Chakrabarti 1988: 173-188). This approach results in the excavation of course-grained stratigraphic units, which prevents precise contextual analysis of the pottery remains from Bagasra. The Wheeler method promotes the excavation of archaeological deposits in *layers,* visible in section drawings, that often contain several stratigraphic layers and activity *features,* or episodes of human activity and site formation processes. The lumping of these otherwise discrete aspects of stratigraphy, dated to the same Phase, mixes together pottery from potentially different contexts, such as primary context floors and secondary

context erosion features. As a consequence, the potential of mixing limits my ability to broadly evaluate the specific contexts of use or discard of individual pottery types. The course-grained definition of layers also prevents assessment of pottery use behavior in smaller units of time within phases, except in the rare contexts where pottery was recovered in situ. Thus, by necessity, but also in response to previously proposed hypotheses regarding the division of space at the site, this study focuses on comparing contexts inside Bagasra's perimeter wall with those outside the wall, which was a prominent feature of the community's built environment during Phases II and III. Further details regarding perimeter walls in the Indus Civilization, and the walls at Bagasra, are provided in Chapter 2.

The MS University excavation approach is as follows: excavation units were laid out in a grid of nine 100 x 100 meter units, designated by the letters "A" through "I," starting from the northwest corner of the known site (Figure 3.2a). Each of these lettered units were subdivided into twenty-five square 20 x 20 meter units lettered in lower case from "a" through "y" (Figure 3.2b). These 20 x 20 meter units were further divided into sixteen 5 x 5 meter units (numbered 1 through 16) (Figure 3.2c), which were the main excavation units, or *trenches*, within the larger grid. A 0.5 meter baulk was left unexcavated between most of the trenches, thus many of the trenches available for analysis actually measure 4 x 4 meters. Trenches were labeled using a series of letters and numbers of the trench within the larger grid, for instance Er13 (see Figure 3.1). Within each trench, major stratigraphic units are referred to as *layers*, which are the smallest unit of collection that can be used for analysis. Layers are assigned a sequential

number (1 being the surface layer) and are distinguished from trenches by circling the number, for instance Eo10 ④.

Figure 3.2: Schematic of Grid Plan for Excavating Trenches

a)

A	D	G
B	E	H
C	F	I

b)

a	f	k	p	u
b	g	l	q	v
c	h	m	r	w
d	i	n	s	x
e	j	o	t	y

c)

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

While *layers* are determined by the stratigraphy of the site, they are nonetheless relatively coarse in their resolution because this method of excavation does not separate certain *features*, like hearths, floors and the *stratigraphic contexts* that enclose them, from one another. Thus, the materials found beneath, inside and on top of a floor or hearth were likely to have been excavated together, assigned the same layer, and separate features later identified during final section drawing. In addition, a single excavated layer may cross-cut an architectural feature, like a structural wall, as is the case for trench Eo10 layer 7 (Figure 3.3, (sampled for this study) as well as for trench Et3 layer 4 (Figure 3.4, not sampled for this study). Such lumping of deposits mixes pottery found inside a structure from that found outside. It follows that pottery bagged together as coming from a single stratigraphic layer may thus contain mixed material from several features or contexts. While curated potsherds from the excavation were individually labeled with trench, layer and occasionally depth information, the label is not sufficient to identify the precise three-dimensional location or trench quadrant from which pottery was removed within an excavated layer. As an exception, the contents of large pits (for instance the large pit in Eo10, Figure 3.3), which were prominent features during Phase IV, were generally excavated separately from the stratigraphic layers that enclose them. While materials recovered from pits are often mixed from several phases or areas of the site, their separation ensures that pottery and other artifacts recovered from the surrounding layers are from “secure” non-pit contexts. Nonetheless, these aspects of the Bagasra excavation and artifact curation strategy limit fine-grained contextual analysis of the distribution of specific pottery types at Bagasra.

Figure 3.3: Section Drawing of Trench Eo10 at Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

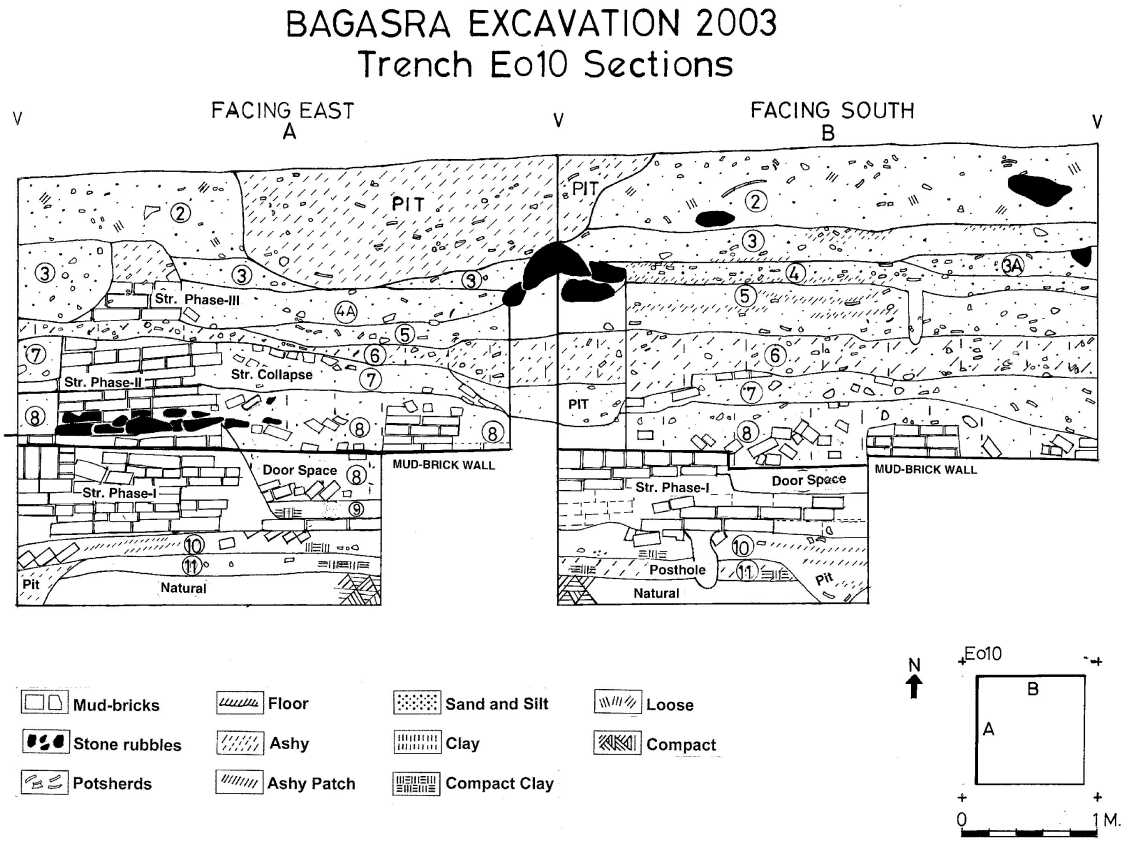
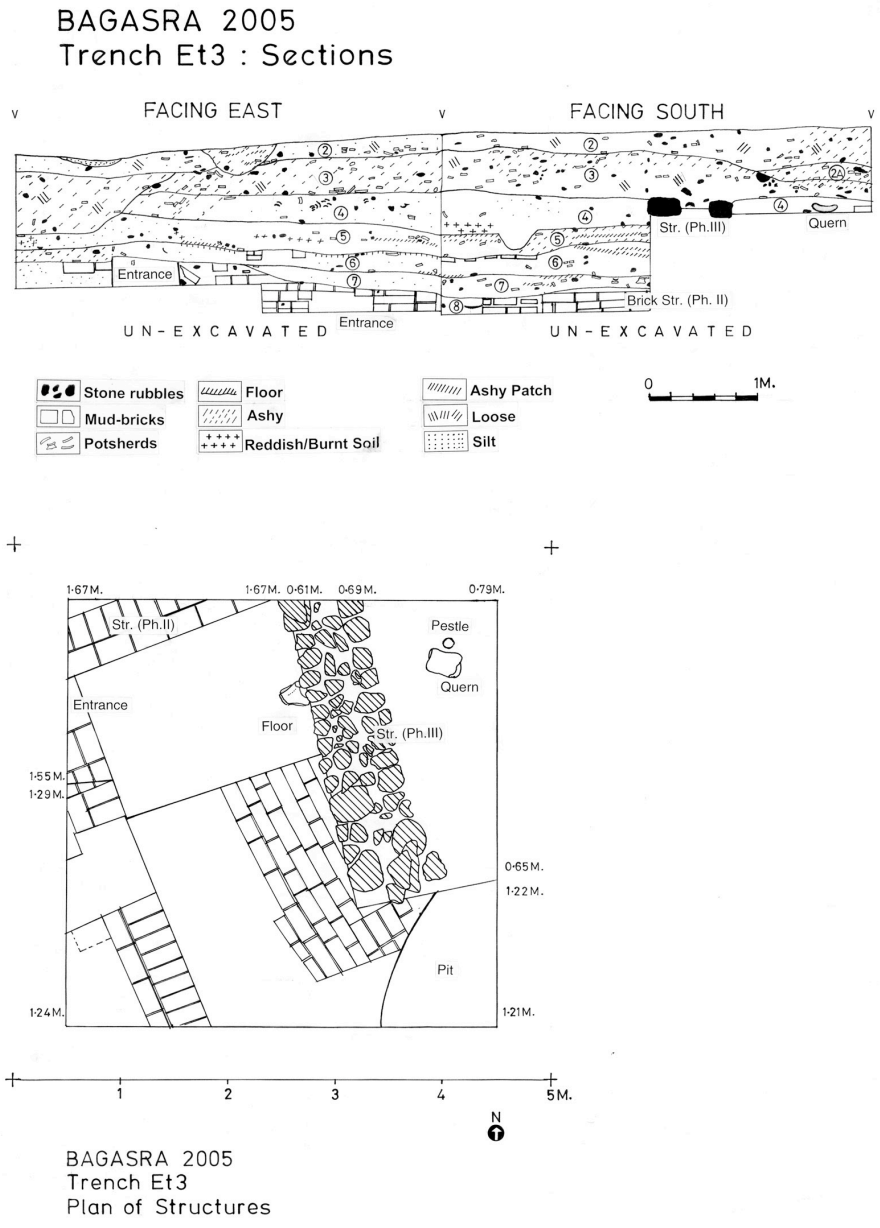


Figure 3.4: Section Drawing of Trench Et3 at Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



Therefore, by necessity, this study assesses the spatial distribution of individual pottery types on a relatively coarse spatial scale, relying on the site's perimeter wall as an imposing and permanent feature dividing the approximately 2 hectare site into two areas of roughly equal size, a northern and a southern half. Discussed in detail in Chapter 2, the wall was built early in Phase II (or around 2450 BC) and served as an imposing architectural feature at this small settlement from that time forward. The massive wall was targeted for extensive horizontal excavations, which exposed sections of four adjoining walls along with three corner bastion-like architectural features and two gateways.

In addition to being a focal point of research and excavation by MS University archaeologists, the perimeter wall has been used as the main analytical unit in Brad Chase's dissertation study of the Bagasra faunal remains (Chase 2007, 2010a). Based on the Bagasra faunal data set, Chase concludes that residents of the perimeter wall "maintained food preferences and preparation practices that distinguished them from both the earlier occupants of the site as well as their neighbors outside the walls" (Chase 2010a: 13). An analytical approach that compares the types and percentage of pottery inside the wall with that found outside the wall provides a valuable data set to further the research goals set forth by MS University and other researchers working at Bagasra. Detailed analysis of the distribution of Harappan and Non-Harappan pottery at Bagasra provides an additional line of evidence for testing hypotheses regarding the social function of city walls and also related to questions of community composition and cultural identity.

2c. Curated ceramics: the potential of Bagasra pottery data

The MS University pottery curation strategy focused on collection of all diagnostic pottery excavated from Bagasra. As a consequence, non-diagnostic plain and red-slipped body sherds were left undocumented and discarded at the site. Since my dissertation research began after the excavation of Bagasra had concluded, I have been unable to account for potential biases introduced into the pottery sample by collection, sorting and curation strategies adopted in the field. With this in mind, my main research questions, which are outlined in Chapter 2, intentionally draw on diagnostic pottery data that was systematically collected from the site in order to identify the types of Harappan vessels found at Bagasra.

In keeping with common archaeological practice in India, the Bagasra excavation project directors did not screen the excavated deposits. Rather, potsherds and other artifacts were removed from the excavated soil by hand in an area close to the trench. Pottery was then taken to the open air pottery yard, where it was washed with water, labeled and stored along with faunal remains in separate grid squares for each stratigraphic unit (see Chase 2007: for treatment of faunal remains from the site). Certain types of pottery, such as black slipped jars and sherds with "graffiti," or inscribed Indus script, were immediately identified in the field, recorded in the antiquities register and stored with other antiquities from the site. At the end of the field season pottery was sorted into diagnostic and non-diagnostic categories, and all non-diagnostics were discarded at the site. Diagnostic pottery was stored in cotton bags, which were labeled with the trench, layer and excavation season, as well as the number of bags from each stratigraphic unit. Back at the university, faculty selected a set of diagnostic potsherds to

be drawn and some of these drawings appear in publications and unpublished annual excavation reports submitted to the Archaeological Survey of India, which were made available for my research. All drawn pottery is stored in cabinets in the drawing room and each pottery sherd is labeled with the drawing number.

The MS University pottery curation procedure (Ajithprasad personal communication) was to collect and store all rim and base sherds, but to only collect and store those body sherds with diagnostic vessel features. Diagnostic features include painted bands and designs, incising, surface treatments like burnishing, as well as formal features like shoulder ridging and carination. All non-diagnostic potsherds, or those lacking features used to identify the general vessel form or specific vessel type, were discarded at the site and were not counted, weighed or recorded before discard. Plain and single-slipped vessels are generally regarded as the most common form of pottery, but body sherds from these vessels were discarded in the field if they did not show diagnostic features. This curation procedure was applied consistently throughout site during all ten seasons of excavation. This means that all rim sherds and base sherds were available for study, as were many body sherds, but plain and single-slipped body sherds were not available.

The MS University pottery curation strategy has two ramifications for this dissertation. First, since the overall volume or weight or excavated pottery is not known, I am unable to compare site formation processes across the site, as they pertain to volume of cultural material. Second, since non-diagnostic body sherds were systematically discarded in the field, this study is unable to provide comparative frequency data on vessel types with predominantly non-

diagnostic features, especially plain and red-slipped vessels. Further, vessels with a large surface area that is either plain or red-slipped are underrepresented by weight within the overall ceramic volume. Since all rim and base sherds were saved for analysis, vessel counts will be representative, although the discarding of body sherds results in the under representation of the percentage of certain vessel types, like large plain storage jars, within the overall assemblage.

This practice of discarding non-diagnostic pottery, without recording the excavated volume, limits the ability to compare site formation processes in different areas of a site. Further, discarding also limits the research potential for certain vessel forms, and opens up recorded data to questions of representation. However, it does not diminish the significance of the spatial and chronological data gleaned from quantitative and qualitative attribute analysis of diagnostic vessel types, precisely because potsherds with preserved diagnostic features are routinely saved at Bagasra. Frequency data for diagnostic vessel classes, while an accurate representation of the quantity of vessels present from any given context, may be overrepresented for vessel types with a greater variety of diagnostic features, which warrant saving, while plain and single-slipped vessels are likely to be underrepresented in the curated assemblage. In other words, reliable patterns can be identified from a potentially biased sample if the limitations of the data are considered when framing research goals and objectives.

3. Sampling Strategy

The assemblage of pottery fragments documented and included in this study totals 12,509 diagnostic potsherds (Table 3.1) weighing approximately 340.6 kg from separate 113 *layers*, or *collection units* (Table 3.3, Appendix A). The goal of my sampling strategy was to obtain a large, comparative sample of pottery from each of the four occupation phases at Bagasra. As a result, selected layers come from 15 separate trenches (Figure 3.5) that I grouped into separate phase-defined units of analysis to facilitate phase-by-phase comparison in each trench (Table 3.1). Discussed in more detail in section 2b, collection units defined in this study are generally referred to as *layers* by the excavators of the site. However, since these layers may contain several sub-layers, features, or episodes of activity, they should be distinguished from *stratigraphic layers* and *contexts*, which are very precisely defined. In keeping with the research questions put forth in this dissertation and to avoid pitfalls that result from the lack of fine-grained stratigraphic, or context based excavation of the site, this study groups pottery into phase-defined assemblages, which are the most precise analytical units.

Collection units were selected according to the following sampling criteria: 1) trenches with a clearly defined layers that have been securely dated by the excavators,[1] 2) layers contain little to no mixing[2] of material from different phases.[3] When possible, I selected trenches with deposits that span several phases of occupation. In addition, I selected trenches from different

[1] P. Ajithprasad provided me with a list of the phases for each layer.
[2] The excavators define "mixed contexts" and those with material dating to multiple phases, and not the mixing of separate features dating to one phase.
[3] Brad Chase followed a similar selection strategy in his analysis of the Bagasra faunal remains.

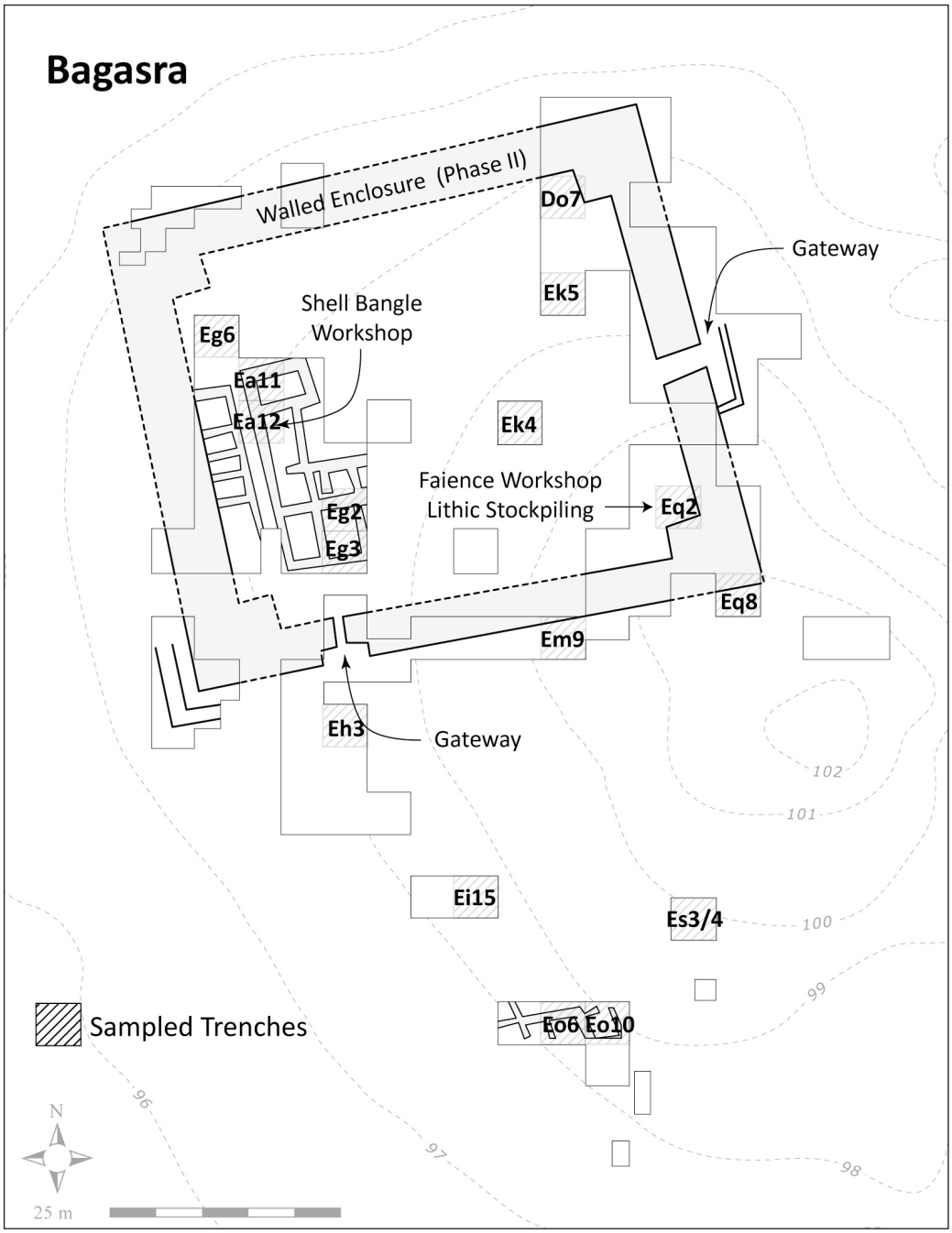
Table 3.1: Counts of Studied Pottery by Trench and Phase

Trench	Phase 1	Phase 2 Inside	Phase 2 Outside	Phase 3 Inside	Phase 3 Outside	Phase 4
Ea12		518				
Eo6	108		685		267	
Eo10	244		866		418	
Eg3		16		282		
Eg2	62	391		54		
Ek4		187		959		
Ea11		238				
Ea6	2	143				
Eq2	175	1028				
Es3/4						559
Eh3			187		988	
Ei15			247		265	
Ek5				2527		
Em9						1005
Eq8						88
Totals	**591**	**2521**	**1985**	**3822**	**1938**	**1652**

Total Count: 12,509

areas that date to the same phase. Documenting a large and comparative sample of pottery from both inside and outside the Phase II through Phase III perimeter wall was the highest priority so that I would have enough data to address to test research expectations outlined in Chapter 2, which relate to the spatial patterning of Harappan and non-Harappan pottery types inside and outside the wall. For each sampled layer, the entire assemblage of curated pottery was documented. Every attempt was made to locate and document individual potsherds removed from selected collection units for research by other scholars, or potsherds that had

Figure 3.5: Map of Bagasra with Sampled Trenches Numbered
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)



been selected for technical drawing and were subsequently kept in the MS University pottery drawing room.

In addition to the sample included in this study (Table 3.1), I also chose to omit the first trench that I analyzed (Trench Do7, 450 potsherds, 9.27kg, see Figure 3.5) during my year of field research in 2007. This is because there are uncertainties in dating the layers in this trench. It was one of the first excavated and the project directors subsequently changed the stratigraphic phase-wise chronology for the site (MSU Dept of Archaeology n.d.). Further, seven layers (172 potsherds, 4.04kg), which were documented for this study, have been omitted from analysis because they cannot be reliably attributed to a single occupational phase or they have been disturbed (Table 3.2). These layers contain a large proportion of pottery and other artifacts that have been chronologically associated with separate phases and were accordingly defined as mixed layers by the excavators. Unlike the random movement of individual potsherds down through the soil and into older contexts, omitted contexts contain features or other evidence of site formation processes, which resulted in a large proportion of potsherds intruding into earlier or later layers. The total omitted sample consists of 622 potsherds (13.31kg), and is thus a relatively small component of the overall ceramic assemblage studied for this dissertation.

Very little pottery from the site is derived from primary contexts, which might be directly associated with the use of ceramics by the ancient community. Large pots were occasionally buried in the floors of structures and recovered in situ during excavation (MSU Dept of Archaeology n.d.). Rather, most of the pottery was excavated from secondary deposits.

Detailed in Table 3.3 and illustrated in Figure 3.6, the most common deposits at the site are remains of craft production, habitation features, and structures. An attempt was made to sample from a variety of deposits including standing structures, collapsed structures, and habitation layers containing floors, hearths, and occupational debris. As discussed above, most habitation features, like floors and hearths, were not excavated separately from the soil that enclosed them, but can be identified in unpublished annual excavation reports, section and plan drawings created by the MS University technical staff. This study draws from these documents in order to evaluate and define the type of deposits represented by the layers selected for this study. Further, the total number of layers that I sampled from each context type compare with the Brad Chase's study of the faunal remains from Bagasra (Chase 2007: 67). Appendix A provides an extensive list of the layer details for each collection. Table 3.2 and Table 3.3 below provide a summary of the contexts analyzed in this study. As illustrated in Figure 3.6, due to Bagasra's relatively small site size, I was able to draw sizable samples from each of the site's four phases and representing the main habitation and activity areas of the settlement, both inside and outside the perimeter wall. In the following sections I provide sample details for each of the four occupational phases at Bagasra.

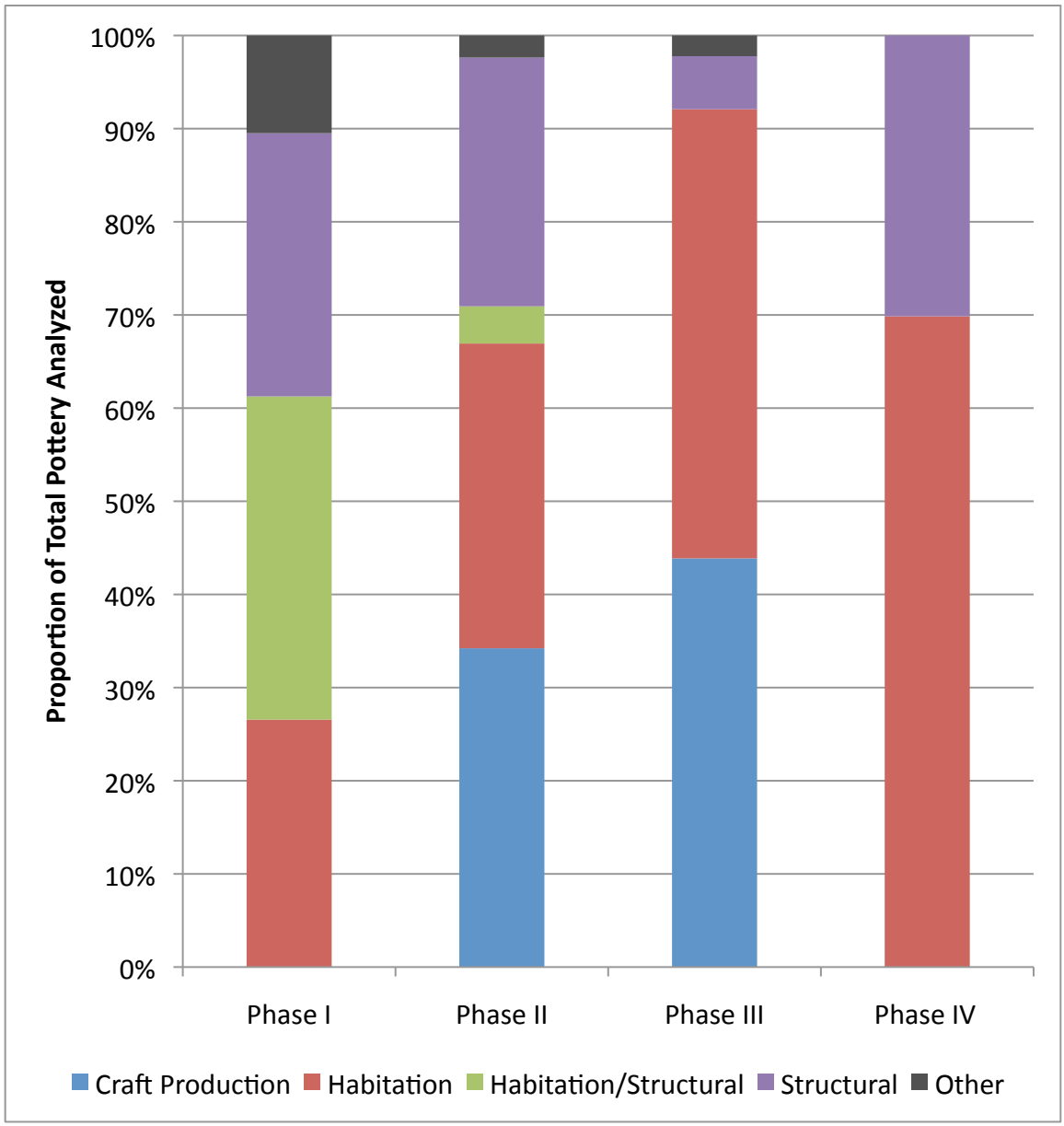
Table 3.2: Summary Table of Context Definitions

Context Type	Context Identification	Include	Description
Craft Production	craft production workshop	include	structures, features, and/or artifacts associated with craft production
Craft Production	shell workshop	include	structures, features, and/or artifacts associated with the shell workshop
Craft Production	craft production debris	include	trash from craft production
Habitation	habitation-floor(s)	include	layer includes floor(s), may be plastered, always includes occupational debris surrounding floor(s)
Habitation	habitation-hearth	include	layer includes hearth(s), always includes occupational debris surrounding hearth(s)
Habitation	occupational debris/fill/trash	include	the reason I call it occupation debris and not habitation debris, is that it is most often not clear how the layer is associated with dwellings
Structural	structural foundation	include	either stone or mudbrick foundation wall(s)
Structural	perimeter wall	include	deposit abuts perimeter wall, or includes deposits inside or on top of the wall
Structural	structural debris/fill	include	includes structural collapse, intentional and unintentional fill
Other	pit	include	large pit features, whose contents were excavated separately, usually Phase IV
Other	trash	include	general trash, not enough information to precisely identify
Disturbed	disturbed	omit	described as disturbed on section drawing
Robber's Trench	robbers trench	omit	modern digging and disturbance
Surface	surface	omit	disturbed top soil, generally not included in sections, pottery generally not saved

Table 3.3: Pottery Counts by Context Type

Phase	Location		Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
I	All	Pottery	0	157	205	167	62	591 (17.36kg)
		Layers	0	8	3	2	4	17
II	Inside	Pottery	1355	547	180	439	0	2521 (78.91kg)
		Layers	30	13	3	7	0	53
	Outside	Pottery	187	927	0	764	107	1985 (59.78kg)
		Layers	3	5	0	2	1	11
	Total	Pottery	1542	1474	180	1203	107	4507 (142.34kg)
		Layers	33	18	3	9	1	64
III	Inside	Pottery	2527	1209	0	0	86	3822 (104.53kg)
		Layers	6	11	0	0	1	18
	Outside	Pottery	0	1568	0	328	42	1938 (50.56kg)
		Layers	0	6	0	2	1	9
	Total	Pottery	2527	2777	0	328	128	5760 (155.09kg)
		Layers	6	17	0	2	2	27
IV	All	Pottery	0	1154	0	498	0	1652 (29.81kg)
		Layers	0	4	0	1	0	5
	TOTAL	Pottery						12,509 (340.95kg)
		Layers						113

Figure 3.6: Comparison of Total Pottery Analyzed By Phase and Context

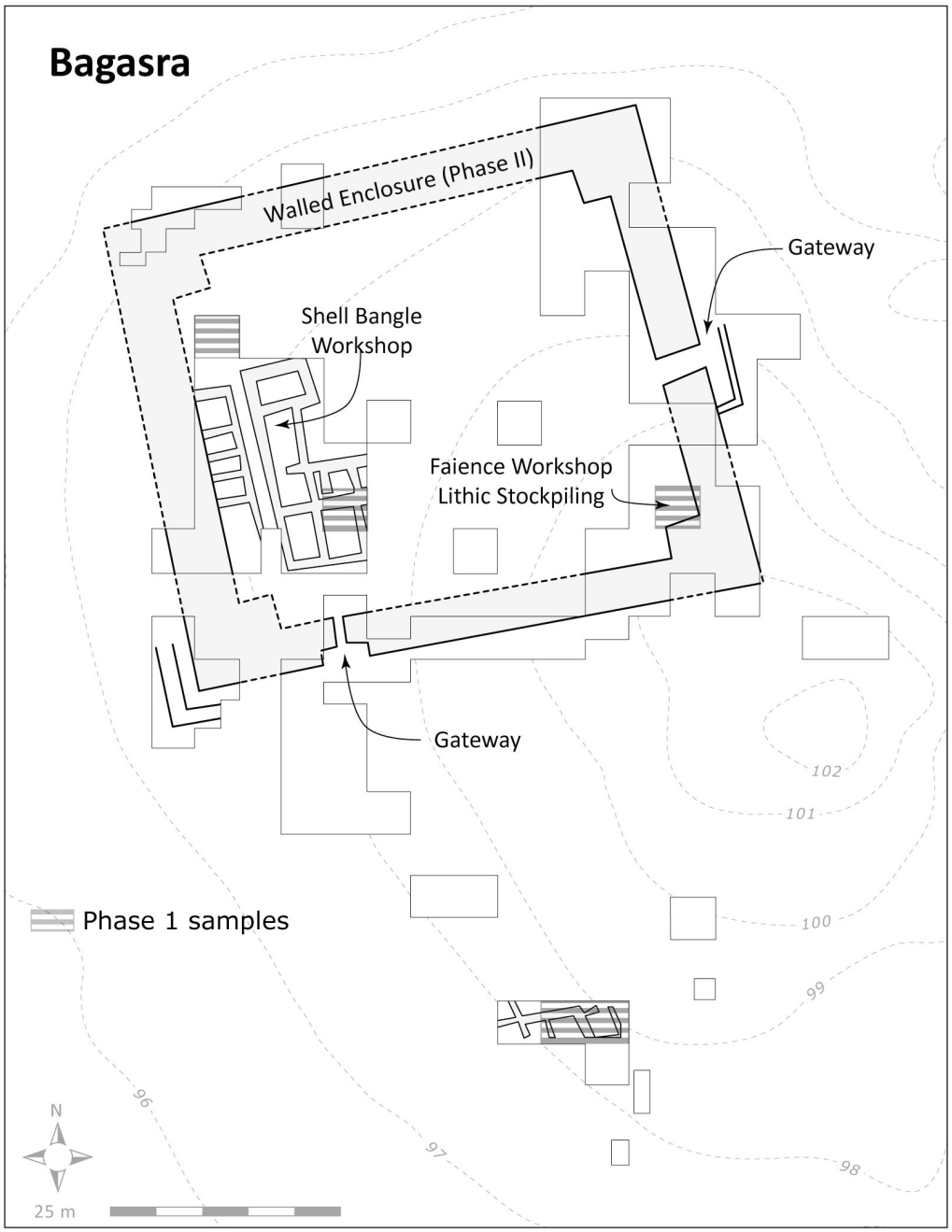


3a. Phase I

As illustrated in Table 3.3, the Phase I (2500-2450 BC) sample consists of 591 potsherds weighing 17.36 kg from 17 separate layers. Concentrated in the southern half of the site, the samples come from five trenches (Eo6, Eo10, Eq2, Ea6, and Eg2) located in the south, east and west (Figure 3.7). While the total sample of pottery dating to Phase I comprises 4.72% of the total pottery count (12,509 potsherds) included in this study, it represents five of the ten total trenches with excavated Phase I deposits. However, since the Phase I sample is rather small, I approach comparison with later phases with caution and argue that hypothesis, which include the initial occupation, are preliminary and deserve further testing.

The excavators date Phase I deposits on the basis of their stratigraphic position below Phase II layers, including the construction of the perimeter wall. Habitation deposits and structural remains are rather distinctive during this roughly 50-year period (2500 −2450 BC) period. A thick ashy band, found in several trenches, has led the excavators to suggest that the early inhabitants cleared the site with fire (Sonawane et al. 2003: 30). Mudbricks, used in building construction, are of a dark grey color with the standard Harappan ratio of 1:2:4 and are commonly associated with ashy plastered floors (Sonawane et al. 2003: 30). The excavators also rely on regional ceramic sequences (Possehl and Raval 1989, Rao 1963) in assigning rough chronological dates to the occupation phases at Bagasra. In publications (Sonawane et al. 2003) and unpublished excavation reports written prior to this study, the Phase I pottery assemblage has been characterized as a mixture of classic Harappan, Anarta, and a class of local

Figure 3.7: Map of Bagasra with Sampled Phase I Trenches
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)



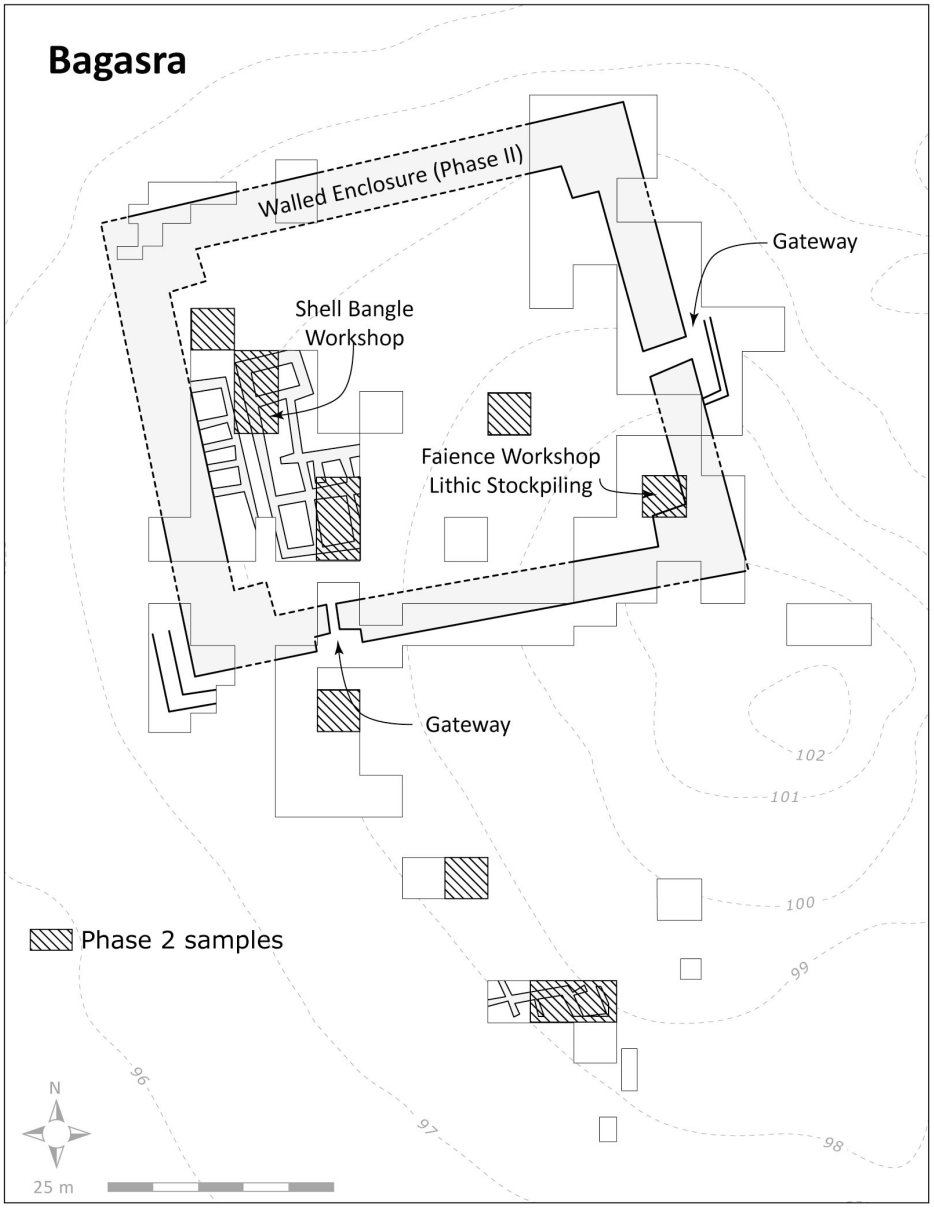
ceramics specific to Bagasra. Anarta ceramics, predominantly associated with sites to the northeast of Bagasra, are identified in these reports as the majority ceramic class.

While the perimeter wall had not yet been constructed in Phase I, my sample represents locations both inside and outside of the future walled perimeter. Summarized in Table 3.3 above, sampled Phase I contexts represent various habitation and structural deposits associated with the earliest occupation at the site. Sampled layers include a series of floors and habitation debris associated with early structures, as well as a thick deposit of ash and charcoal, that is suggestive of fire-clearing activities. Since there is no concentrated evidence for craft manufacturing during this time, the sample does not include layers clearly associated with craft production.

3b. Phase II

The Phase II (2450-2200 BC) sample consists of 4506 potsherds weighing 142.34kg from 64 separate layers located in eleven trenches (Ea6, Ea11, Ea12, Eg2, Eg3, Ek4, Eq2, Eh3, Ei15, Eo6, Eo10) from the south, eastern and western parts of the site (Figure 3.8). Collecting a large and comparable sample from Phase II and III, both inside and outside perimeter wall, was given the highest priority during data collection. At 36.02% of the total sample count (12,509 potsherds), the Phase II assemblage consists of 2521 potsherds (55.95%) (78.91 kg) from seven trenches location inside the perimeter wall and 1985 potsherds (44.05%) (59.78kg) from four trenches outside the wall (Table 3.3).

Figure 3.8: Map of Bagasra with Sampled Phase II Trenches
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)

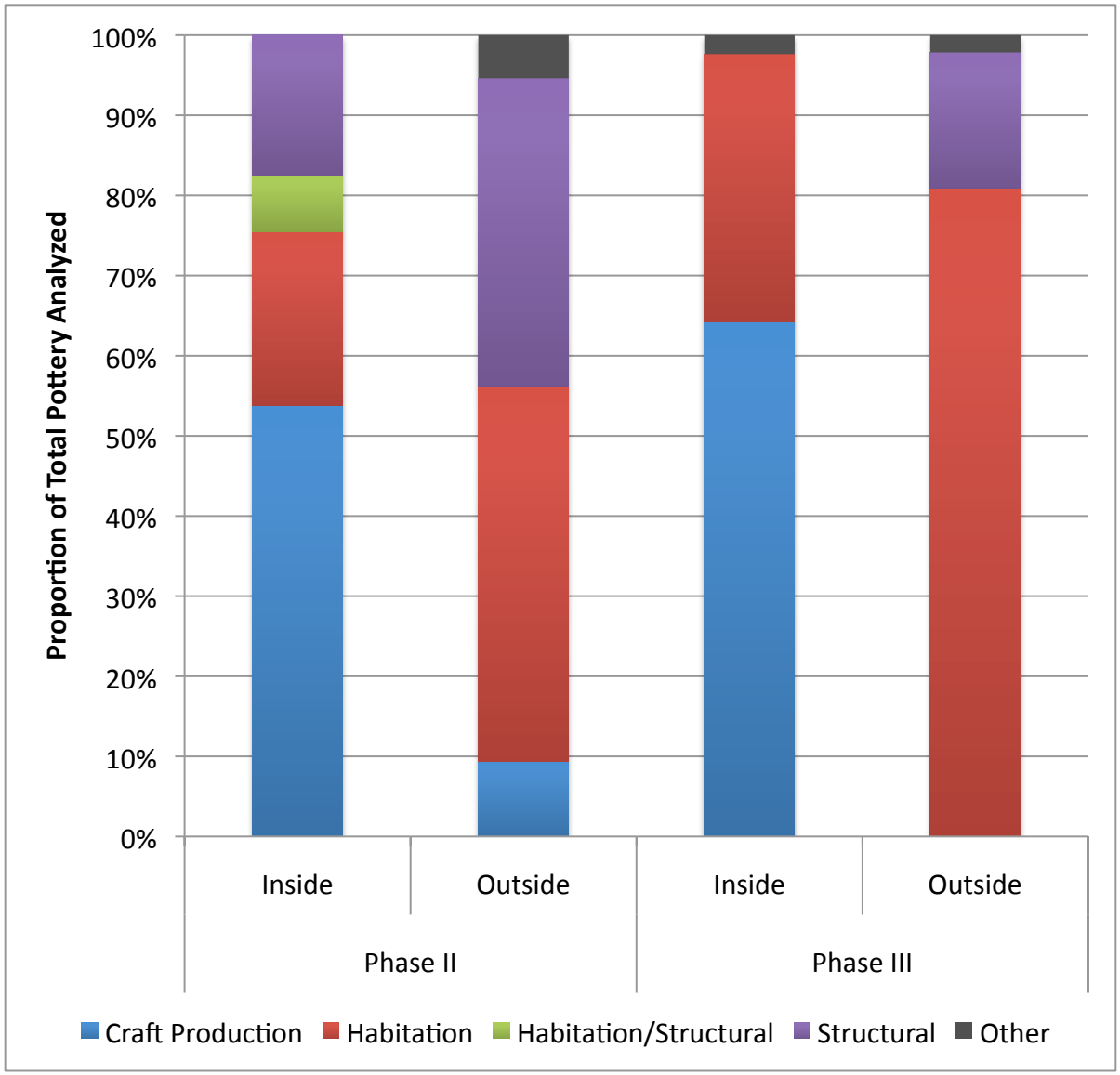


The construction of a monumental perimeter wall, extensive mudbrick and stone structural remains, and extensive evidence for craft production are outstanding features of Phase II. Used to date deposits, these features also indicate that Phase II was a period in which the community flourished through craft production, economic connections, and civic building programs. Thick habitation deposits of up to 5 meters (Sonawane et al. 2003: 30) contain a variety of features associated with domestic and communal activities. Ceramic assessments made in the field, and outlined in excavation reports, characterize Phase II pottery as a mixture of Harappan, Anarta, and other non-specific local pottery. There is a noticeable increase in the proportion of Harappan pottery with a concomitant decrease in the proportion of Anarta pottery. Isolated sherds of Sorath style pottery are found in the upper layers (Sonawane et al. 2003: 27), but become much more common during Phase III.

A wide variety of Phase II deposits indicative of habitation and craft production activities were sampled from across the settlement, both inside and outside of the perimeter wall (Figure 3.9). This includes the most prominent craft production contexts at the site, which are concentrated in specific locations inside the perimeter wall; shell working, sampled in trenches Ea6, Ea11, Ea12, Eg2, and Eg3 located in the western portion, and faience production, sampled in trench Eq2 abutting the southeastern corner of the wall. Outside of the perimeter wall, trench Eh3 is included in the sample because it shows abundant evidence for semi-precious stone bead production. An extensive array of habitation and structural deposits located both inside and outside the wall are also included in the sample, reflecting a period of economic prosperity and occupational density at Bagasra. Since this study focuses on comparing pottery

inside and outside the perimeter wall, Figure 3.9 provides a comparison of pottery analyzed from Phase III as well.

Figure 3.9: Comparison of Phase II and Phase III Pottery by Context

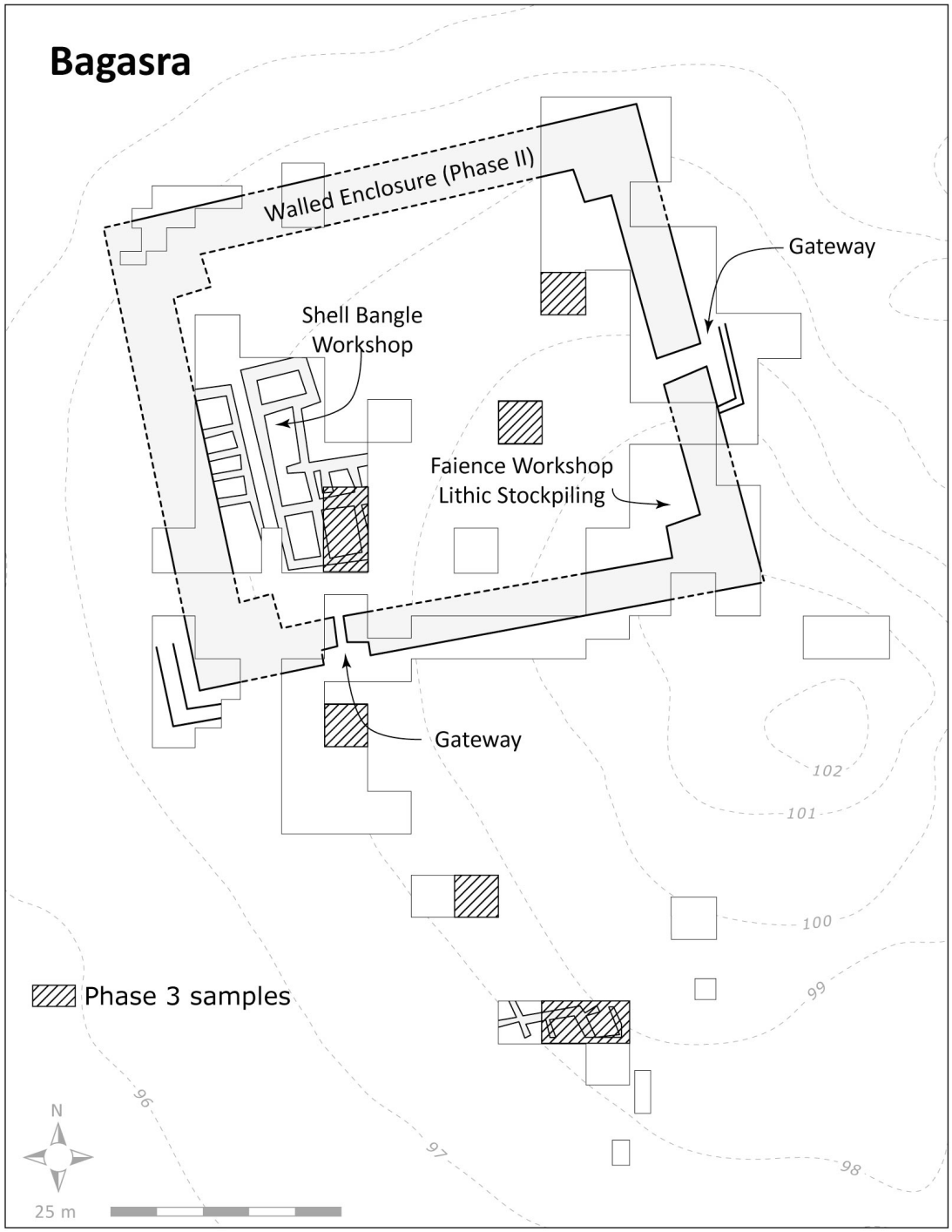


3c. Phase III

Approximately 46.05% of the total sample included in this study (12,509 potsherds) derives from Phase III (2200-1900 BC) deposits. Consisting of 5706 pottery sherds weighing 155.09kg from 27 separate layers located in the central and south part of the site (Figure 3.10). Four trenches inside the perimeter wall (Eg2, Eg3 Ek4, Ek5) and four trenches located outside the wall (Eh3, Eo6, Eo10, Ei15) were sampled.

Phase III closely resembles Phase II in terms of the array of Harappan artifacts found across the site, but is considered the "terminal stage of the Urban Harappan occupation" (Sonawane et al. 2003: 31). The excavators date Phase III deposits based on their stratigraphic position and sequence of structural construction, which differs from Phase II in the attention paid building projects as well as the management of craft activities (Ajithprasad 2006, Sonawane et al. 2003). The Phase III deposit averages 1.2 meters thick, but reaches 2 meters in some places. The upper half is loose and ashy and lacks remains of floors, which are common in earlier periods. Some lower layers contain remnants of rammed plastered floors that are composed of clay with kankar nodules with brickbats, which differ from the ashy and rammed clay floors of Phase II. Craft production continued during Phase III, but seems to have slowed down. Existing buildings and the perimeter wall were maintained, but no major building projects were initiated. The Phase III pottery assemblage, also drawn upon in dating deposits, is distinguished from Phase II deposits by the noticeably greater proportion of Sorath pottery, as compared to Harappan and Anarta pottery. Cross-dating by reference to ceramic sequences

Figure 3.10: Map of Bagasra with Sampled Phase III Trenches
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)



at Rangpur (Rao 1963) and Rojdi (Possehl and Raval 1989) places Phase III at Bagasra as equivalent to Rangpur-IIA and IIB and Rojdi-A and B (Sonawane et al. 2003: 27). Anarta and local pottery are also present, but in much smaller quantities than earlier periods.

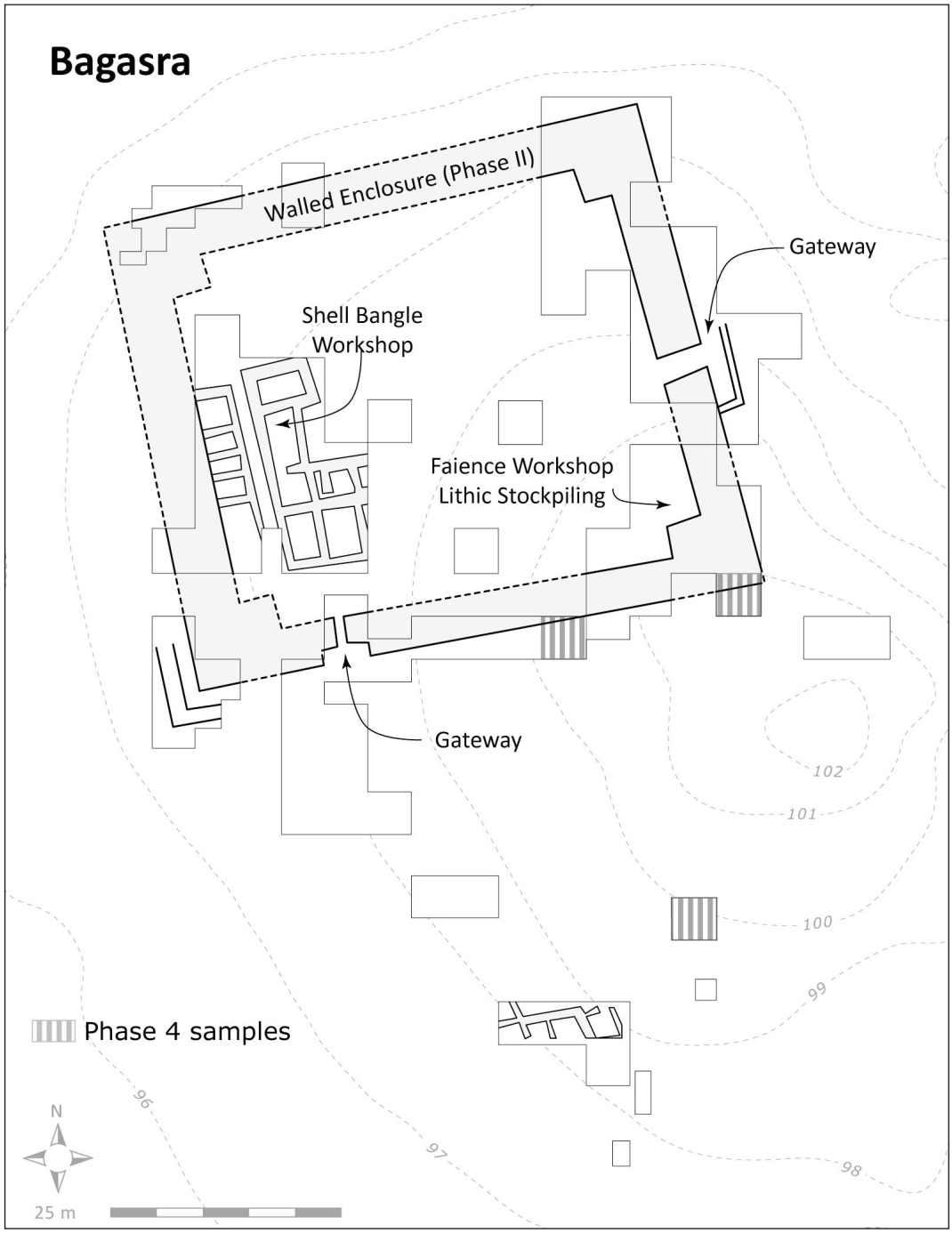
Since this study set an initial goal to compare pottery from Phase II and Phase III, inside and outside the perimeter wall, attention was paid to collecting comparable sample sizes (see Table 3.3 and Figure 3.9). In the end, the occupation and depositional history of the site made it difficult to collect comparable samples from inside the wall. In general, Phase II areas of craft production inside the wall (trenches Ea6, Ea11, Ea12, Eg2, and Eg3) contain a rather small quantity of pottery. Cited in unpublished excavation reports, the upper levels of these trenches have eroded, leaving little evidence of Phase III activities. On the other hand, trenches (Ek4, Ek5) from the central portion of the walled area contain deep posits of Phase III occupational debris, which account for a majority of the total sample. While pottery from Phase III deposits located inside the wall total 3822 sherds (104.53 kg) and come from 18 layers located in four trenches, Phase II pottery from seven trenches and 53 layers inside the wall total just 2521 sherds, or 78.91 kg. Phase III pottery samples from outside the wall total 1938 potsherds (50.56 kg) from 9 layers located in four trenches, which similar to the Phase II sample distribution (n=1985). Diffuse craft production areas inside the perimeter wall and habitation deposits across the site make up the majority of the Phase III pottery sample included in this study. While no new building projects were undertaken during Phase III, existing buildings were maintained, therefore a small portion of structural deposits are recorded.

3d. Phase IV

The Phase IV (1900-1700 BC) sample included in this study consists of 1652 potsherds weighing 29.81 kg, which is 13.21% of the total sample (12,509 potsherds). Concentrated in the southern half of the site, the locus of Phase IV occupation, the samples come from three trenches: two trenches (Em9 and Eq8) located in the center of the mound and along the southern side of the perimeter wall, and one trench (Es3/4), located about 35-40 meters to the south.

Concentrated in the southern half of the site, Phase IV deposits are found overlying Phase III occupation without a stratigraphic break (Sonawane et al. 2003: 33), however Phase IV deposits are unique from earlier occupation phases in the design of structures, occupational activities, and artifacts. Rubble stone structures were built by reusing materials found at the site and were placed in ad hoc locations, which differs from the well-constructed and laid out stone and mudbrick architecture of earlier phases. Occupation debris accumulated on top of and outside the southern side of the perimeter wall. Large pits were dug into the mound in several places, including on top of the remnant perimeter wall. Excavations inside the wall indicate that Phase IV occupants did not reside inside this space. There is no evidence for formal craft production, further differentiating Phase IV from earlier occupation phases. Evaluation of the pottery during excavation indicated an assemblage of mainly Sorath types, which resemble Rangpur-IIC (Rao 1963) and Rojdi-C (Possehl and Raval 1989) pottery.

Figure 3.11: Map of Bagasra with Sampled Phase IV Trenches
(Modification of a map courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda and Brad Chase, Albion College)



These preliminary studies further suggest that no Harappan pottery types occur during Phase IV, as are other Harappan artifacts like steatite seals, cubical chert weights, as well as shell, faience and semi-precious stone ornaments. For this reason, and because of extensive pit digging during this time, deposits at the site that contain Harappan pottery types are interpreted by the excavators to be a mixed Phase III-IV contexts.

While the Phase IV sample is not as large as the total sample from Phases II and III, it is comparable to the samples from outside the wall dated to earlier periods. Further, sampled deposits come largely from habitation and structural contexts, rather than trash dumps or pits, strengthening the comparison of pottery related to these features of occupation during the different periods at the site. The sample also reflects the lack of excavated evidence for craft production in the final occupation phase.

4. Pottery Classification and Ceramic Interpretation

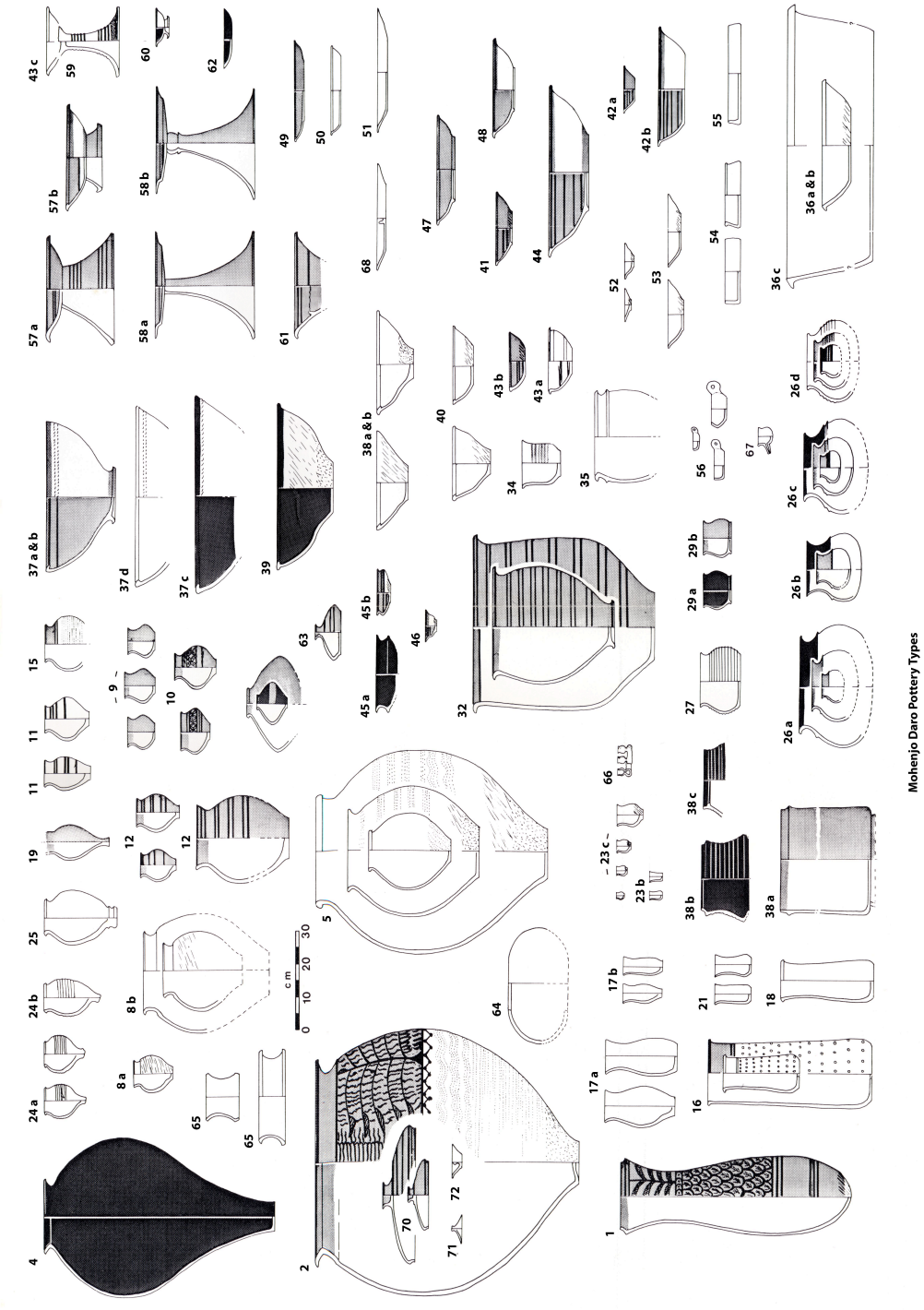
4a. The Harappan Pottery Typology

The suite of Harappan pottery defined (Figure 3.12) by George Dales and J. Mark Kenoyer includes vessels used for household meal preparation, serving of food and beverages, as well as large and small storage containers. Harappan pottery comes in both plain and highly decorated varieties and a wide range of vessel forms manufactured from the same medium sandy to fine red ware clay fabric. While some platters, shallow bowls, and small pots were manufactured by hand (Kenoyer 1998: 151), most Harappan pottery was formed with slow or fast wheel technology. In fact, fast wheel technology began to be effectively used to mass-

produce popular vessel forms and disposable drinking cups to suit the needs of growing populations at Indus cities. Many of these rapidly produced vessels were left undecorated and untrimmed and show marks of being string cut on the base. Other vessels were finely slipped, usually with a highly polished red slip, and painted parallel horizontal black bands or intricate black geometric and natural motifs, which were arranged in panels from the rim to the lower vessel body. Many of these design motifs, such as the pipal leaf, the fish-scale pattern and intersecting-circle motifs have roots in Regionalization Era cultures along the Indus Valley (Kenoyer 1998: 153). Although many design motifs are known to have changed through time (Jenkins 1994a, Quivron 1994, 2000), the basic vessel shapes show a remarkable degree of standardization and continuity through time (Kenoyer 1998: 154). Furthermore, the pottery found at Harappa and Mohenjo Daro suggests that each household had a similar set of pottery for regular domestic use (Kenoyer 1998: 154).

The Harappan pottery typology (Figure 3.12), developed by George Dales and J. Mark Kenoyer, groups vessels into types, defined by a combination of attribute states, and varieties, which are based on minor stylistic differences in attribute states (Dales and Kenoyer 1986: 18-21). Initially developed during their excavations at Balakot (coastal Sindh) in the late 1970s (Dales 1979), the Dales and Kenoyer pottery typology has since been widely utilized at other Indus sites. While the Balakot pottery study remains unpublished (Kenoyer personal communication), their subsequent excavations at Mohenjo Daro resulted in the publication, "Excavations at Mohenjo Daro, Pakistan: The Pottery" (Dales and Kenoyer 1986). This volume is arguably the most detailed and standardized classification of Harappan pottery to date.

Figure 3.12: The Harappan Pottery Typology Established by George Dales and Jonathan Mark Kenoyer for Mohenjo Daro (Image from Dales and Kenoyer 1986)



The typology has proven effective in recording and classifying pottery at large sites with long-term excavations. This is evident through its development at Mohenjo-Daro, one of earliest excavated (Mackay 1938, Marshall 1931) and most prominent Indus urban centers, located in the southern Indus region in the modern province of Sindh, Pakistan, and its further expansion at Harappa, in central Punjab (Dales 1991, Dales and Kenoyer 1993, Jenkins 1994a), where it has been used since 1986. The pottery typology is also highly transferable to other sites, both large and small, which has led to its widespread use and popularity in Indus pottery studies (Franke-Vogt 1997, 2005, Hegde et al. 1992, Herman 1997a, Jenkins 1994a, 1994b, 2000, 2005, Possehl and Herman 1990, Uesugi 2011a, Uesugi and Meena 2012). For these reasons, I refer to the Dales and Kenoyer pottery typology as "the Harappan pottery typology" in this dissertation study.

The Harappan pottery typology groups vessels into types, which are defined by a conglomerate of major attribute states, and varieties, which are defined by regular differences in attribute states identified in the Balakot, Mohenjo Daro and Harappa assemblages. Harappan pottery types show a high degree of standardization, which suggests that ancient potters had a mental template in mind when they crafted many types of pottery (Dales and Kenoyer 1986: 19). The following attributes show the highest degree of standardization within pottery types: "vessel form, profile, and dimensions; the association of specific rims, bases, and surface treatments with specific vessel forms; and the use of base molds that set the pattern for the size and form of the finished vessels" (Dales and Kenoyer 1986: 19).

While a combination of attributes defines each Harappan vessel type, once established many vessel types are practically identified by reference to one or two unique and diagnostic attribute states. For instance, black slipped jar potsherds can be identified by their unique rim type and/or slip color (Dales and Kenoyer 1986: 83-84, Méry 1996, Méry and Blackman 2000, 2005, Ajithprasad 2006). The Harappan cooking pot can be identified by its unique shoulder ridging, commonly preserved on rim and body sherds (Dales and Kenoyer 1986: 132-140, Lindstrom 2010). Thus, a benefit of this classification system is that types can often be quickly identified without detailed or time consuming analysis, precisely because these "discovered types" reflect categories that are intuitively identified by archaeologists (Dales and Kenoyer 1986: 18-19). In the absence of vessel type-specific markers, several attribute states shared among several Harappan vessel types are shown to be useful in distinguishing Harappan from non-Harappan pottery. Perhaps the most popular of these unique Harappan attribute is the distinctive Harappan black design motifs painted over a red slip, which are common to a wide number of Harappan vessel types. Changes in black painted motifs have also been used to define regional pottery chronologies (Jenkins 1994a, Quivron 1994, 2000).

Since the publication of the Mohenjo Daro pottery volume in 1986, the Harappan pottery typology has become increasingly popular as archaeologists working in different regions apply this recording and classification system to new sites of the Indus Civilization. The Harappan pottery typology has been drawn upon during post-excavation ceramic analysis at several sites Gujarat (India), including Rojdi (Possehl and Herman 1990), Nageshwar (Hegde et

al. 1992), and more recently at Farmana (Uesugi 2011), located in Haryana, India and Kanmer (Uesugi and Meena 2012), located fairly close to Bagasra in Kachchh, Gujarat.

These studies provide a rich array of comparative material and serve as valuable test cases for the typology's suitability in separate zones of Indus culture. The development of the typology at the two most prominent centers and type-sites of Indus urbanism, Mohenjo Daro and Harappa, as well as its application at a small craft production center such as Balakot, and at sites in different regions, makes it a powerful resource for comparative ceramic analysis at Bagasra. The adoption of this recording and classification method by other archaeologists working in Harappan regions in India provides a diverse sample of pottery data that can be compared to Bagasra.

4b. Non-Harappan Pottery Typologies

Several classes of non-Harappan pottery are defined in Gujarat, each with their own regional history connecting them to pre-Harappan Chalcolithic communities (Ajithprasad 2002, 11, Ajithprasad and Sonawane 2011, Sonawane and Ajithprasad 1994, Rajesh 2011). This dissertation focuses on the two regional pottery traditions that are most common at Bagasra, the Anarta tradition and Sorath tradition. The regional history of the sites that defined these pottery traditions was described in detail in Chapter 2.

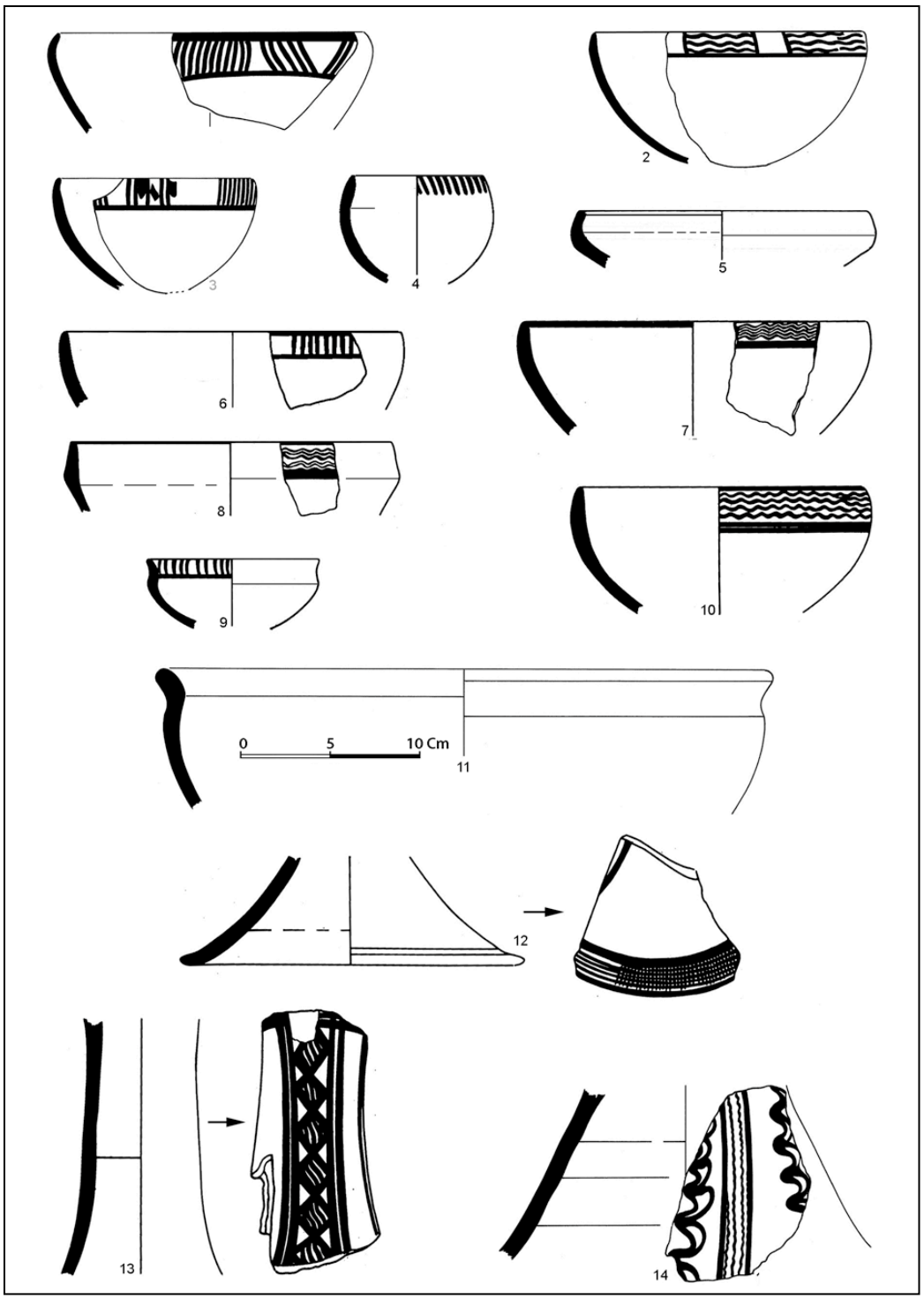
There is no standardized typology of Anarta or Sorath pottery traditions, despite several decades of investigation. Rather, these ceramic traditions are instead defined by comparison to the type-sites where they were first identified.

As detailed in Chapter 2, the Anarta pottery tradition was originally documented at sites in the Rupen Estuary in north Gujarat (Hegde and Sonawane 1986). More specifically, this tradition is defined by the non-Harappan ceramics recovered from Nagwada (Hegde et al. 1988, 1990, Majumdar 1999) and Loteshwar (Ajithprasad and Sonawane 2011, Sonawane and Ajithprasad 1994, Mahida 1995, Rajesh 2011). Found at sites dating to the Regionalization Era and Integration Era (Ajithprasad 2002, 2011, Ajithprasad and Sonawane 2011), chronological variations in Anarta pottery have not yet been established.

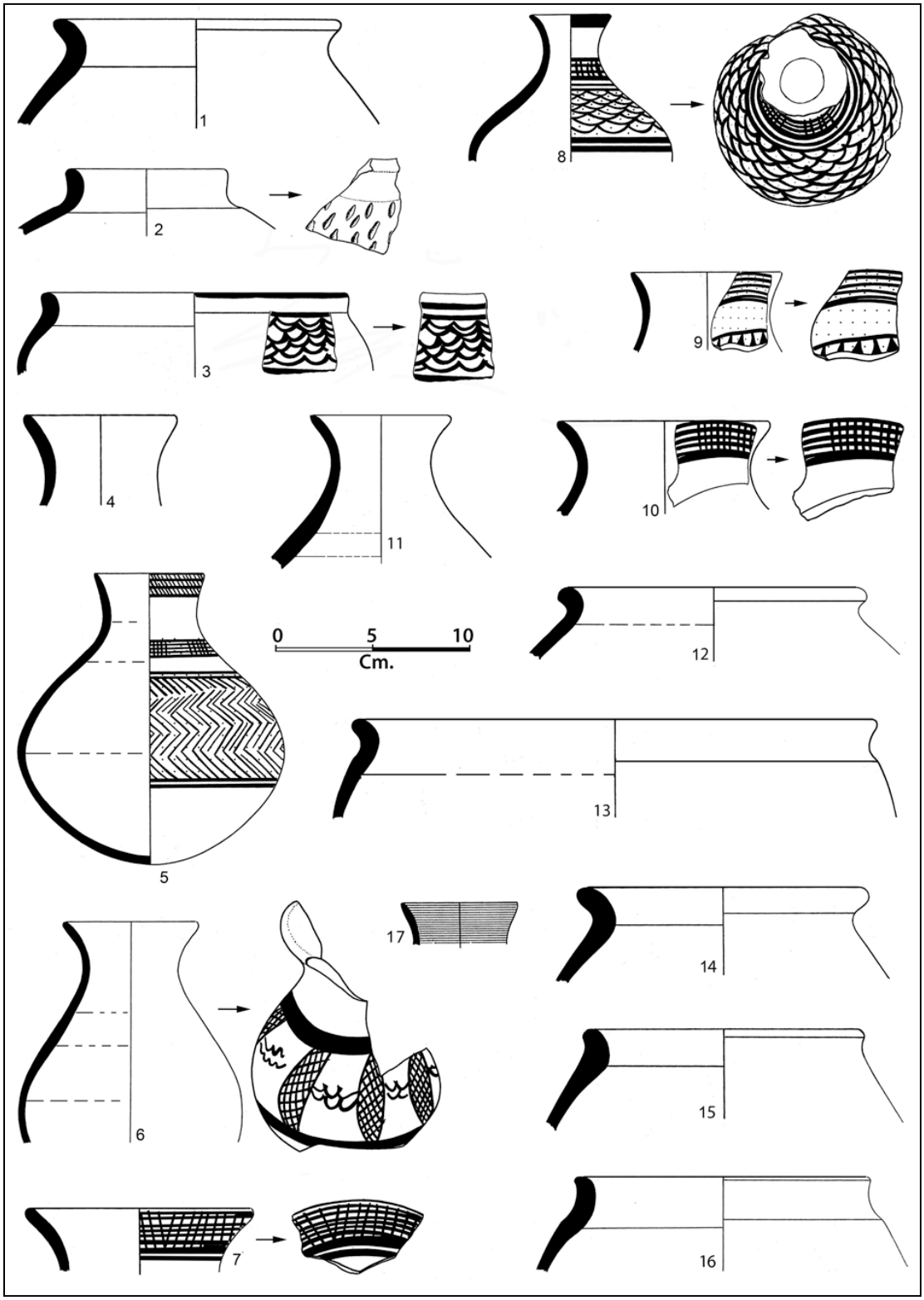
The Anarta pottery tradition is characterized by several wares that resemble each other in shape, decoration, and form (Ajithprasad 2011, Ajithprasad and Sonawane 2011, Mahida 1995, Majumdar 1999, Rajesh 2011, Sonawane and Ajithprasad 1994). Anarta pottery includes several different ware categories with gritty red ware being the most abundant type. The vessels are hand-made or turned on a slow wheel. Depicted in Figure 3.13, popular Anarta vessel forms include straight or convex-sided bowls with incurved rims, large bowls/basins with a thick externally projecting rim, and jarpots with a constricted neck, globular body and an externally projecting rim. They are commonly decorated with black or red pigment on a white background. An abundant regional fine red ware and occasionally burnished red ware and burnished black/grey ware are also characteristic of the assemblage.

Figure 3.13: Examples of Anarta Pottery from Nagwada and Loteshwar (Images from Ajithprasad and Sonawane 2011)

Anarta Pottery from Nagwada (Ajithprasad and Sonawane 2011: Figure 5)



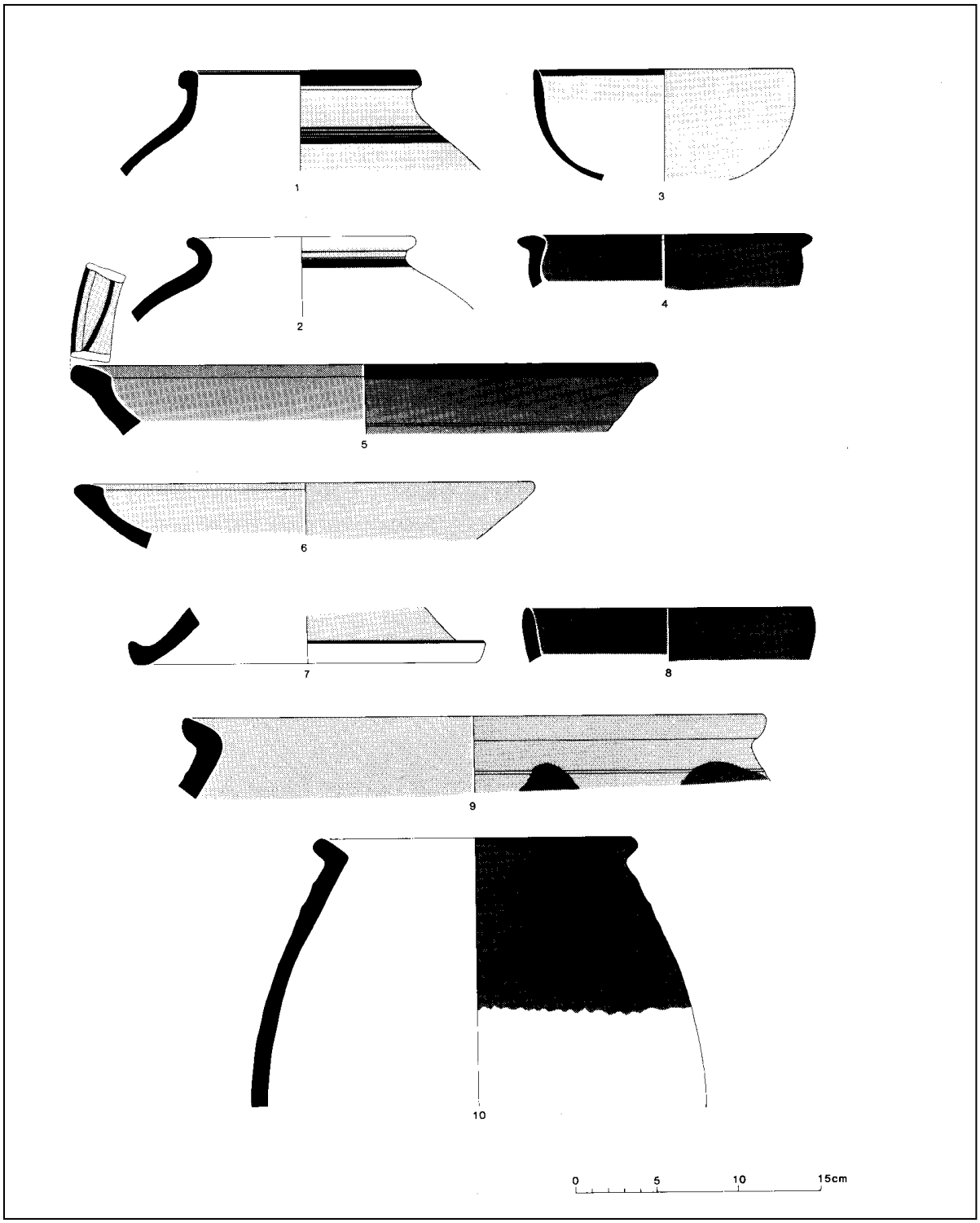
Anarta Pottery from Loteshwar (Ajithprasad and Sonawane 2011: Figure 18)



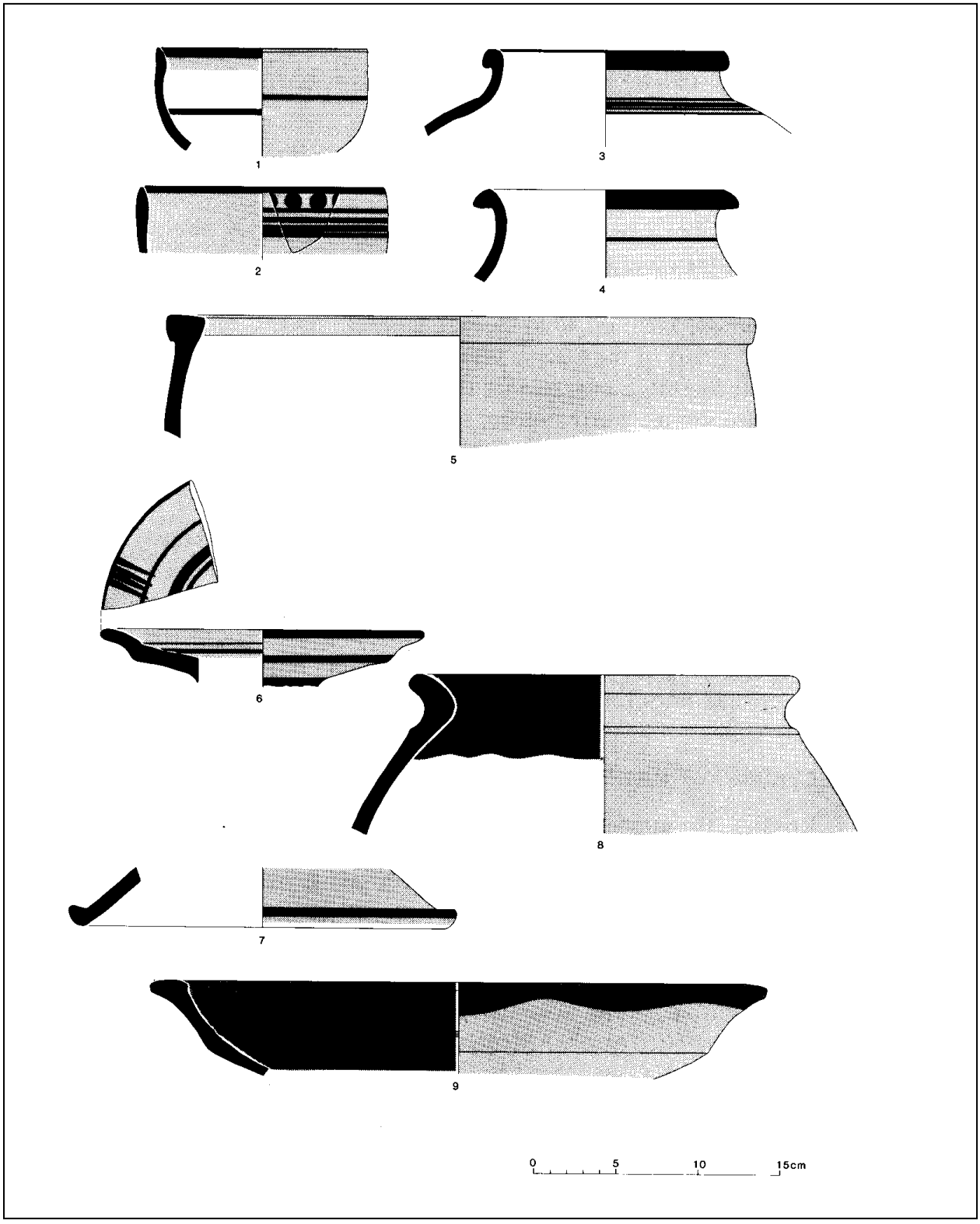
As detailed in Chapter 2, The Sorath pottery tradition was originally documented at the site of Rojdi, which is located in central Saurashtra (Possehl and Herman 1990, Possehl and Raval 1989). Sorath ceramics from Rojdi show an overall continuity in form and style through time, but have been broken down into three ceramic phases, Rojdi A, B, and C based on fabric, form, decoration, changes in the vessel manufacture, and statistical evaluation of the ceramic assemblage (Herman 1989, Possehl and Herman 1990). The Rojdi assemblage, examples of which are shown in Figure 3.14, consists of wheel thrown fine red, buff, and grey wares as well as a wide variety of coarse wares such as black-and-red ware, coarse red ware, coarse grey ware, and coarse buff or "chunky ware." Fine Ware vessel forms include bowl, small to medium sized pots, jars, basins, dishes, and dish-on-stand. Decoration is limited to painted horizontal bands and complex painted designs are rare. Black-and-red ware is the most common coarse ware and occurs as pots or jars. Decoration of coarse wares is limited to burnishing of the upper part of the vessel and raised corrugated bands on the shoulder.

Anarta pottery from Nagwada and Loteshwar and Sorath pottery from Rojdi are used identify these different pottery traditions at other sites in Gujarat. From this research, Bagasra has become the first archaeological site in Gujarat where Anarta and Sorath pottery traditions have been identified in stratigraphic relationship. Previously, these traditions were thought to have distinct and separate regional distributions. Thus, pottery studies at Bagasra have the potential to add significant new information that can be used to assess the contemporaneity of non-Harappan potteries as well as the social use of different pottery traditions across space and time.

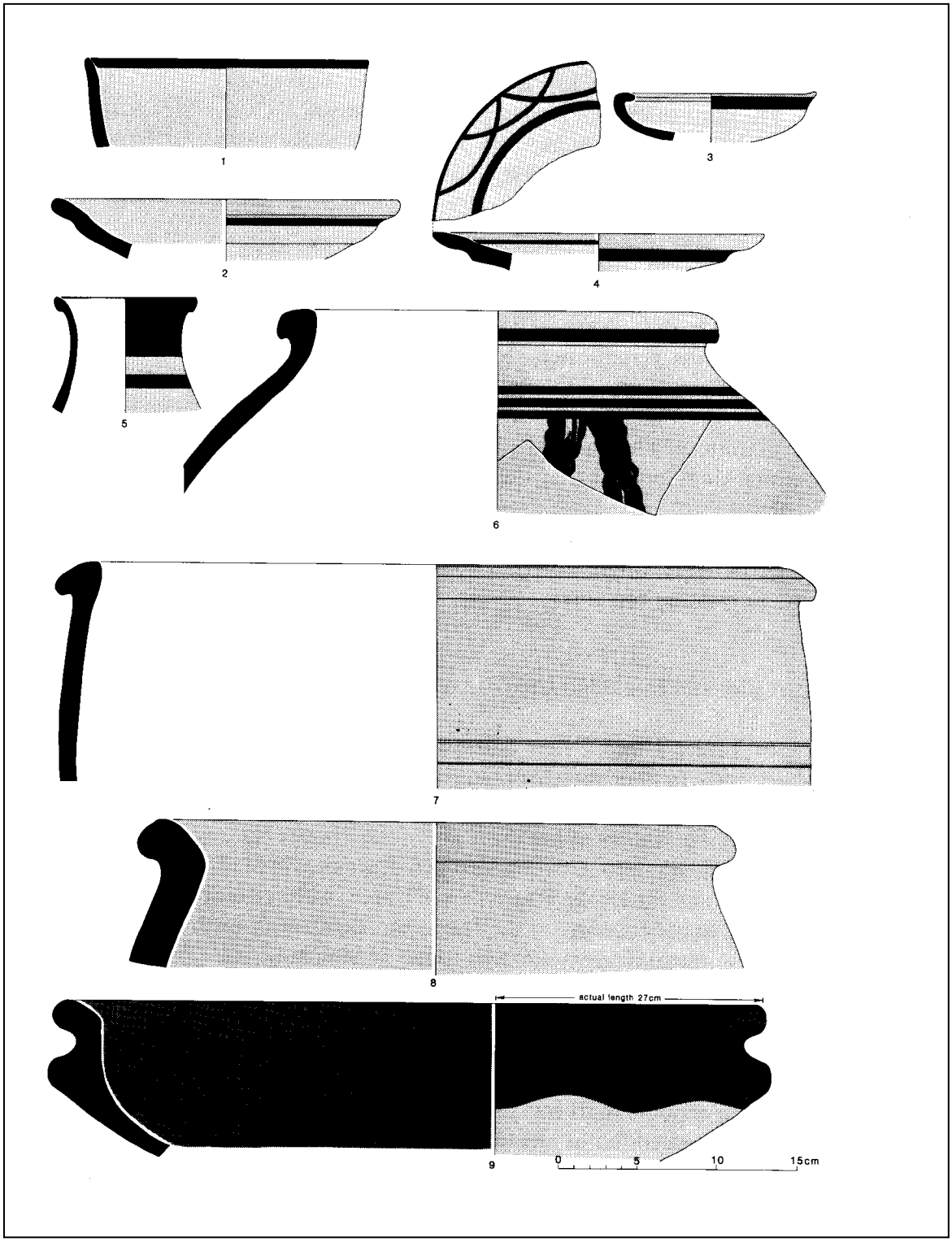
Figure 3.14: Examples of Sorath Pottery from Rojdi (images from Possehl and Herman 1990)
Representative Pottery from Rojdi Phase A (Possehl and Herman 1990: Figure 3)



Representative Pottery from Rojdi Phase B (Possehl and Herman 1990: Figure 4)



Representative Pottery from Rojdi Phase C (Possehl and Herman 1990: Figure 5)



5. Pottery Documentation Method

Having now introduced the Harappan pottery typology, in this section I move on to discuss my method of documenting the Bagasra pottery assemblage. Most important to this discussion is the hierarchical pottery recording system that I employed, along with the recorded variables and their implications for typological classification.

My pottery documentation procedure is non-destructive and involves morphological and typological identification along with quantitative measurements of complete, or reconstructable, vessels and potsherds alongside qualitative assessment of vessel decorative motifs and other stylistic features. In order to sample a large assemblage of pottery as outlined in my sampling methods above, I implemented a hierarchical recording strategy, wherein I tabulated all pottery included in this study and did further detailed recording on a select sample. A hierarchical recording strategy allowed me to document a large sample of pottery, while also collecting specific details necessary to address the series of research questions outlined for this dissertation. Appendix B shows an example of these recording sheets and the codes that were developed for his study.

My tabulation strategy was modified from the Harappa Archaeological Research Project (HARP) pottery tabulation system, which I learned from Professor J. Mark Kenoyer during a 2007 field season at Harappa, Pakistan. The HARP recording system is a paper-based recording system that requires very few tools. A vessel type summary chart that consists of a scaled-down drawing of each pottery type assists in recalling vessel types numbers during data collection.

The HARP tabulation system was selected because it facilitates documentation of large amounts of pottery in a relatively short time and is easily modified, while also providing a sufficient level of detail to distinguish diagnostic pottery types and styles. Potsherds from each collection unit are counted together on a single tab sheet. The ceramics are first separated into rims, base, and body sherds and each category is counted and weighed. Potsherds were then grouped and counted according to vessel type. Potsherds that do not retain enough features to be clearly identified to vessel type were recorded using the main criteria of fabric color, texture, and surface decoration. Within each vessel type or ware/texture/decoration category, pottery was further grouped and counted according to the following attributes: 1) rim, body, or base sherd, 2) vessel form (jar, jar/pot, pot, bowl, bowl/dish, dish, other), 3) size category (small, medium, large). Since the HARP tabulation system is easily modifiable, I added new fabric attribute states and several new vessel form attribute states (i.e. lamp, stud-handled bowl) to better suit the diversity of pottery at Bagasra. In addition, I recorded the rim or base type number, or a small sketch, alongside the main vessel form criteria to aid in more detailed comparison of vessel types. The major attributes documented through detailed recording, such as slip, decoration, fabric color and texture, were also recorded through tabulation, although in less detail.

My system of detailed pottery recording is an expansion of variables recorded on the tabulation sheet. In this way the two procedures collect the same information, but additional level of detail is documented with detailed recording. Numbered recording codes (Appendix B) were created as shorthand to document variation in attribute states within each attribute

category. Detailed pottery recording includes all of the attributes documented in the tabulation system, but records each potsherd individually, which allows for an additional level of detail to be collected. For instance, when recording surface features such as slip or decoration, interior and exterior surfaces were recorded for separately. Ceramic ware color was recorded using a coding system based on Munsell color chart (Appendix B). Ware texture was recorded along with the types of inclusions and an estimate of their percentage. Potsherds are examined with a 10X hand lens when fine-grained temper was difficult to identify with the naked eye. Rim and base forms were identified using the Harappan pottery typology rim (Dales and Kenoyer 1986: 32-37) and base (Dales and Kenoyer 1986: 38-41) classifications, which I expanded as new rim and base forms were encountered. In addition, my detailed recording system collected metric details including vessel form measurements, such as rim and base diameters, and measurements of sherd thickness. Evidence of manufacturing technique was also recorded when preserved. Potsherds with "graffiti" were documented in additional detail (see Chapter 6), as were Harappan cooking pots (see Chapter 5, Lindstrom 2010).

Photography and drawings were taken of selected sherds to further document variables that are not easily captured in tabulation and detailed recording. Potsherds were photographed if they represented unique or rare pottery types. Further, all decorated pottery sherds, sherds with "graffiti," and Harappan cooking pots were photographed. Photos were also taken of a sample of each classified pottery type or style, in order to provide photo documentation of each vessel type. The MSU technical staff drew a relatively large sample of pottery at the end of each field season. The entire collection of available "MSU drawn" pottery

was recorded for this research in order to identify the type of vessel according to the Harappan pottery typology and also integrate these diagnostic sherds into my analysis.

The Mohenjo Daro pottery volume, supplemented by the HARP pottery type reference manual, was the main references that I used to identify Harappan pottery types. Pottery types, as defined by the Harappan pottery typology (Dales and Kenoyer 1986), are defined by the regular, yet distinct, combination of attribute states. For this reason, selection of attributes for study is vital to identification of pottery types. The following attributes show the highest degree of standardization within pottery types: "vessel form, profile, and dimensions; the association of specific rims, bases, and surface treatments with specific vessel forms; and the use of base molds that set the pattern for the size and form of the finished vessels" (Dales and Kenoyer 1986: 19). Therefore, these attributes were selection for detailed documented.

Vessel form is the main attribute defining pottery types in the Harappan pottery typology (Dales and Kenoyer 1986: 20). General body form is used to define vessel form; rim and base types were not included. Following the Harappan pottery typology, the attributes of internal height, maximum body diameter, and throat diameter, in addition to balance (the vertical position of the maximum body diameter) distinguish the general body categories: jar, pot, bowl and dish (Dales and Kenoyer 1986: 20). Jar/pot is used when the potsherd does not retain enough measurable features to distinguish it as a jar or a pot, and likewise for bowl/dish. By focusing on overall body form, the Harappan pottery typology places emphasis on the functional aspects of ceramics (shape, size, and accessibility of vessel contents).

This approach also provides measurable criteria for vessel type identification, which enhances the replicability and reliability of type identifications. However, since a majority of the potsherds from Bagasra are too fragmentary to collect many of these measurements, practical documentation of vessel form often relies on reference to published complete examples, rather direct assessment of each potsherd. This results in a relatively high percentage of the documented assemblage falling under the jar/pot and bowl/dish categories, since the boundaries of these vessel forms require precise metric identification.

Vessel profile refers to features that are distinctive to vessel form and also includes shape and decorative features that are separate from vessel form, such as ridging, a ledge, and carination. The number of these features, for instance single or multiple ridges, may distinguish vessel type varieties, and was therefore also recorded. Since these attribute states have unique stylistic features that are not captured in the recording alone, potsherds with these features are also photographed and/or drawn.

Rim and base types were treated as secondary vessel form attributes in the Harappan pottery typology (Dales and Kenoyer 1986: 20). However, the typology recognizes that occasionally rim forms are important attributes in determining vessel capacity and internal height. Bases, on the other hand, are not relevant to the vessel form. Rims and bases have their own classification systems built on profile. This study applied the rim and base classifications defined in the Mohenjo Daro pottery volume (Dales and Kenoyer 1986), and expanded it to include new rim and base types documented at Bagasra. The Bagasra rim classification represents a significant expansion of the Harappan rim classification. The Bagasra base

classification, on the other hand, closely resembles the Harappan base classification, with the addition of several pedestal base types.

Filemaker Pro, a cross-platform relational database software program that is accessible to non-computer programmers, facilitated my pottery documentation and analysis. The Harappa Archaeological Research Project (HARP) is an early innovator of project-specific Filemaker Pro database applications in large-scale archaeological research. Drawing from their model, I developed a new type of Filemaker Pro database to suit the specific needs of a multi-site comparative ceramic research project. My Filemaker Pro database allowed for detailed documentation of individual pottery sherds, as well as broad analysis by vessel class (Harappan or non-Harappan), vessel form (jar, pot, bowl, dish) and specific vessel type (for instance, perforated jar). With this database, it is possible to restrict analysis to a single site or compare pottery between sites. Data can be entered by hand or imported from existing Excel files. My pottery database stores photographs, pottery drawings and other related documents. Once the data had been entered, I was able to quickly assess the frequency of individual vessel types and also identify spatial and chronological patterns by performing finds for desired combinations of variables and then sorting the data to reveal patterns. The database can be easily modified and expanded in keeping with this and future project goals and the nature of the data being collected.

6. Conclusion

In this chapter I have presented important background information on the excavated pottery assemblage from Bagasra along with my approach to studying this assemblage. I described in detail the nature of the samples that I chose to include in this study, and presented the documentation methods that I followed in order to extract useful data from the pottery remains, which can address the set of testable expectations outlined in Chapter 2. The next three chapters present analyses of these data as they relate to the chronological and spatial patterning of specific types of Harappan pottery types that were used at Bagasra (Chapter 4), how this set of Harappan pottery ties into the broader pottery preferences of the community (Chapter 5), and which types of vessel were commonly inscribed with Harappan script (Chapter 6).

Chapter 4: Chronological and Spatial Patterns of Harappan Pottery at Bagasra

1. Introduction

In this chapter I present the percentage, chronological, and spatial analyses of Harappan pottery types present at Bagasra. This chapter begins with a brief overview of the presence and absence of Harappan pottery types at Bagasra. These data are framed in comparison to the urban type-sites of Mohenjo Daro and Harappa, two sites whose assemblages define the Harappan pottery typology. Described in detail in Chapter 3, the Harappan pottery typology was developed by George Dales and J. Mark Kenoyer (1986) and provides a baseline for defining and identifying Harappan pottery types. This chapter contributes to refining our understanding of the nature of Harappan and local cultural interactions in Gujarat by presenting pottery data from a site that has both Harappan and non-Harappan pottery, but at which the Harappan pottery typology had not been previously applied. These pottery data identify aspects of the unique pottery preferences of the community who lived at Bagasra and are a starting point for more rigorous scientific studies of regional pottery preferences in Gujarat.

This chapter begins with an overview of the types of Harappan pottery that were and were not identified in this new research at Bagasra. These types, whether rare, abundant, or absent, define the community's preferences for Harappan pottery. In this chapter, I present new data on the patterning of individual Harappan vessel types. These new data emphasize the spatial and chronological pottery distributions of individual vessel types, which is an approach

that has not yet been applied in Gujarat to analyze a wide range of vessels. Spatial assessments include the percentage of specific Harappan pottery types inside and outside the perimeter wall. Spatial assessments also include the count and percentage of pottery types in three main types of archaeological contexts: craft production, habitation and structural. While this chapter presents chronological patterns in the distribution of Harappan pottery types, it focuses on the distribution of Harappan pottery types on either side of Bagasra's perimeter wall, which was a standing feature of the site during Phase II and Phase III.

My research represents a systematic evaluation and presentation of the quantity and spatial distribution of many different types of Harappan pottery in Gujarat and is the first study to carefully link this type of evaluation to the pottery typologies of the sites of Mohenjo Daro and Harappa. While the count and percentage of individual Harappan pottery types is generally low, my findings clearly show that Harappan pottery is found on both sides of the perimeter wall at Bagasra. Thus, this study presents new data that contradicts expectations of the traditional model. I contend here that we can no longer assume that Harappan pottery was the only pottery utilized by elite residents of Indus settlements, nor that Harappan and non-Harappan pottery will appear in discrete locations segregated by perimeter walls.

The Harappan pottery typology groups vessels into types, defined by a conglomerate of major attribute states, and varieties, defined by regular differences in attribute states identified in the Balakot, Mohenjo Daro and Harappa ceramic assemblages (Dales 1979, 1991, Dales and Kenoyer 1986, 1993). Vessel types are primarily defined by body form (jar, pot, bowl, dish), while the rim, base, and surface treatments are evaluated as secondary attributes. Using this

method, Dales and Kenoyer (1986: 466) identified 75 main types of Harappan vessels (Figure 3.12). Of these types, 16 contain two or more varieties, which are distinguished by minor differences in vessel form, rim type, base form, decoration, size, and other diagnostic attributes.

A comparison of Harappan pottery types that were and were not present at Bagasra reveals that preferred Harappan vessel types fall in all vessel form categories: jars, pots, bowls and dishes. This pottery sample further suggests that Bagasra residents utilized a specific set of very distinctive Harappan vessel types: black slipped jar (type 4), tall slender decorated jar (type 1), cooking pot (type 26), perforated jar (type 16), hollow pedestalled bowls and dishes (type 57, 58), bottles (type 63) and miniature vessels (type 22, not depicted). Discussed in detail in the following chapter sections, these vessel types' diagnostic attributes distinguish them from non-Harappan types. These distinctive Harappan forms were used at the same time as a wide range of non-Harappan pottery, which are not the focus of this dissertation. Additional distinctive Harappan vessel types, such as the ring stand (type 65), have been reported in small quantities from other areas of the site (MSU Dept of Archaeology n.d.), but were not present in this studied assemblage.

Not discussed in this chapter are those Harappan pottery types likely to be present at Bagasra, but which lack a diagnostic set of preserved attributes that can be used to distinguish them from non-Harappan pottery types. Several variables of the assemblage limit my ability to accurately type the entire pottery assemblage: 1) overlap in vessel attributes states between types, 2) overlap in rim and base forms between types, and 3) insufficient preservation of

diagnostic vessel attributes. Therefore, this chapter focuses on the pottery that was reliably assigned to specific Harappan pottery types based on a conglomerate of preserved attributes states. By necessity, these data and the interpretations I draw from them are therefore preliminary and represent a sample of the Harappan pottery types possibly used by the ancient residents of Bagasra.

This study makes several contributions to pottery studies in the Indus Civilization, which can be considered steps towards filling gaps in published research. First, this chapter presents the percentage of the respective vessel types from each of the four phases at Bagasra in relation to the entire sampled assemblage, including both Harappan and non-Harappan forms. For many of the identified vessels, this is the first presentation of their percentage distribution during a single phase, as well as throughout a site's entire occupation. A phase-by-phase comparison of vessel percentages reveals important continuities and changes in the relative quantity of specific varieties of pottery used by the Bagasra community across time. I contend that these new data reflect changes in pottery preferences during important periods of social and economic transition, while certain cultural habits, like cooking practices, appear to have remained the same across time.

Each specific vessel type description focuses on the comparison of attribute states documented at Bagasra to those from Mohenjo Daro and Harappa, which define the original Harappan pottery typology. Outlined in Chapter 3, studied attributes include rim and base form, clay fabric and texture, surface treatment and decoration, and manufacturing technology. The goal of this approach is to identify both the similarities and differences in Harappan vessel

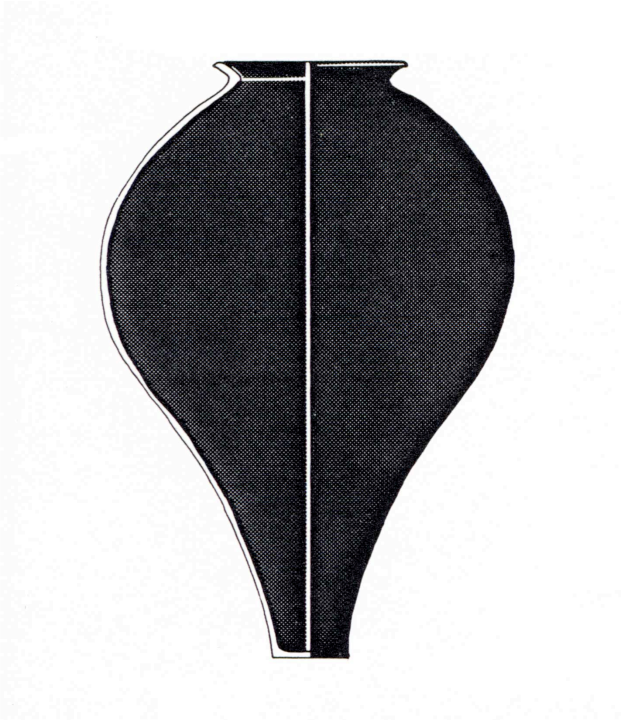
types. Following the guidelines set forth in the Harappan pottery typology (Dales and Kenoyer 1986), patterned differences are used to distinguish varieties within a main vessel type, while also identifying regionally distinctive attributes of Harappan pottery in Gujarat. Attributes that demonstrate patterned differences between Bagasra and Mohenjo Daro can be considered as formal and stylistic options over which Bagasra residents exercised technological and aesthetic choices regarding the pottery manufactured for use by residents or frequent visitors to the settlement.

Within each vessel type section, the individual spatial patterns of each vessel type are discussed. This stage of my analyses focused on identifying the main shared vessel types along with those vessel attributes that show differences between Bagasra and Mohenjo Daro. While contextual data are briefly presented and evaluated, I regard my conclusions of the distribution of pottery types by context as preliminary and in need of further study through targeted excavation. It was not possible to conduct more detailed spatial and chronological analysis of specific attribute states and the regular combination of attribute states, which define new varieties within a vessel type. However, my research indicates, for the first time, that detailed pottery attribute studies have the potential to yield crucial new data that can be directed at answering questions regarding the regional similarities and differences in Harappan and non-Harappan pottery.

2. Harappan Jars and Pots

2a. Black Slipped Jar: Large Jar with Small Molded Base and Dark Color Slip Coating Entire Interior and Exterior
Vessel type 4 (Mohenjo Daro), 2 (Harappa)

Figure 4.1: Black Slipped Jar
(illustration from Dales and Kenoyer 1986: Figure 102)



The black slipped jar is a large tall bulbous jar with a constricted throat and long slender base that is covered on the entire interior and exterior with black slip. It is a very distinctive vessel form that is rare, but highly standardized in manufacture, form and decoration across the Indus Civilization. Its standardization, relatively low abundance, specific locales of production in the Indus basin, specific locations of recovery in the greater Indus Valley, and common occurrence at Bronze Age sites in the Oman Peninsula strongly suggest that the black slipped jar

was intended as a storage vessel for specific commodities, which was traded over long-distances (Méry and Blackman 2005).

Black slipped jars have been reported from very few Indus Civilization sites: Mohenjo Daro, Harappa, Nausharo, Chanhu Daro, Balakot, Miri Qalat, Sutkagen Dor and Sotka Koh in Pakistan and (Méry and Blackman 2005), Dholavira and Bagasra in Gujarat, India (Ajithprasad 2006, Méry and Blackman 2005) and perhaps at select sites in the Ghaggar Plain of India (Ajithprasad 2006). In addition, a comparatively large quantity of black slipped jar pottery sherds (Ajithprasad personal communication) is currently being documented through new excavations at Shikarpur, Bagasra's nearest neighbor (Bhan and Ajithprasad 2008, 2009). However, black slipped jars are conspicuously rare or absent from several prominent craft production centers; Lothal (Rao 1979, 1985), Surkotada (Joshi 1990) and Nageshwar (Hegde et al. 1992) among the most prominent in Gujarat (Ajithprasad 2006). In contrast, existing evidence from the Oman Peninsula (Edens 1993, Méry 1996) indicates that there are more archaeological sites with black slipped jars in the United Arab Emitates and the Sultanate of Oman than there are in India or Pakistan (Méry and Blackman 2000: Figure 1). Moreover, of the set of Harappan pottery recovered from the Oman Peninsula, black slipped jars are the most frequent, whereas they are relatively rare within the larger set of Harappan pottery used in the greater Indus Valley (Méry and Blackman 2005). This combination of evidence implies that the recovery of black slipped jar pottery sherds from an archaeological site is significant evidence that individuals or group inhabitants were connected to the long-distance, and perhaps international, trade networks through which these vessels and their contents

circulated.

Petrographic and Instrumental Neutron Activation Analysis conducted by Sophie Méry and James Blackman (Méry and Blackman 2000, 2005) indicates that black slipped jars found in Pakistan and the Oman Peninsula pottery sherds from Harappa (Punjab) are distinctive from the other samples, which came from Nausharo (Baluchistan), Mohenjo Daro (Sindh) and Miri Qalat (Makran). Their research identifies two potential zones for the production of black slipped jars: (1) the "Harappa" production zone along the Ravi River, where the site of Harappa is located, and (2) the "Mohenjo Daro" production zone along the Indus River, where the other sites are found. Moreover, the compositional analysis of some black slipped jar samples suggests additional production zones, which have not yet been located (Méry and Blackman 2000: Table 2).

The black slipped jar is defined in the Harappan pottery typology (Dales and Kenoyer 1986: 83-84) and in several publications by Sophie Méry and James Blackman (Méry 1996; Méry and Blackman 2000; Méry and Blackman 2005). Within the Harappan pottery typology, it is defined as type 4 at Mohenjo Daro (Dales and Kenoyer 1986: Figure 102, Table 10-A) and type 2 at Harappa (HARP pottery type reference manual). This large 30 to 40 liter capacity storage jar has tall bulbous body profile (typically 70 cm in height) with high center of gravity, a constricted neck not larger than 15cm in diameter and elongated narrow base, which makes it unstable for standing on its own. No complete vessels were recovered from Bagasra, however black slipped jar pottery sherds from the site show similar features. At Bagasra (Ajithprasad 2006), vessels have a constricted neck with throat diameters between 13-15.5cm. Based on external rim

diameter, Ajithprasad (2006) further documented three sizes of black slipped jars at Bagasra. A majority of the assemblage ranges from 21-22cm in rim diameter, with a few reported examples of smaller (17-19cm) and larger (24-25cm) rim diameters. Base diameters from Bagasra range from 9-10cm.

Table 4.1: Black Slipped Jar – External Rim Diameter (data reported in Ajithprasad 2006, Table 3)

Rim Diameter
n = 12
Mean = 21.4
Median = (data not available)
Max. = 25.0cm
Min. = 17.0 cm

Black slipped jars were manufactured in two to three pieces and then joined prior to decorating and firing. The base portion was molded and then finished on a slow wheel and the rim, shoulder and body portions were manufactured on a fast wheel (Dales and Kenoyer 1986: 83-84). The vessel has a short neck and thick beaked rim (rim types 3C). The narrow base was either contiguous and flat or concave on the bottom (base types 2D, 3A, 3B).

As defined by the Harappan pottery typology and documented at Bagasra, black slipped jars were manufactured from a fine dense ceramic paste that contains visible mica inclusions and occasionally quartz sandy grains in varying quantities (Ajithprasad 2006, Méry and Blackman 2005). These large jars were uniquely decorated with a thick black or dark purplish-brown slip on the entire interior and exterior surfaces. At Bagasra, the exterior slip color

ranged from black to dark chocolate brown (5YR 2/1, 5YR 3/1, 5YR 4/1, 10YR 2/1, 10YR 3/1, 10YR 3/2, 10R 3/1) and the interior slip varied from black to various shades of red (2.5YR 4/4, 2.5YR 5/4, 5YR 3/1, 5YR 4/1, 5YR 6/4, 10YR 2/1, 10YR 3/2, 10R 5/3, 10R 6/4) (Ajithprasad 2006). Though rare, specimens from Mohenjo Daro also indicate that the exterior base portion was occasionally unslipped (Dales and Kenoyer 1986: 84). This patterning of complete interior slipping is an uncommon feature of Harappan vessels, which makes black slipped jar pottery sherds distinctive among assemblages.

Functionally, the interior slip reduced the porosity of the vessel for storing liquids such as wine, oils, liquor, clarified butter, pickled vegetables or fruit, honey, or indigo (Dales and Kenoyer 1986: 84, Kenoyer 1998: 97). At Bagasra, Ajithprasad (2006) noted that the interior of black slipped jar pottery sherds from Bagasra were covered in a thicker slip than the exterior, which is further evidence that the thick slip waterproofed the vessel interior. Nonetheless, organic residue analysis has not yet yielded conclusive results (Méry and Blackman 2005).

Prior to this dissertation study, P. Ajithprasad (2006) had conducted a comprehensive study of the chronological and spatial distribution of black slipped jars from Bagasra. The following analysis summarizes Ajithprasad's black slipped jar data and includes a small sample of additional black slipped jar potsherds that were identified during this dissertation study. These additional pottery sherds do not differ from the data gathered by Ajithprasad nor do they modify his interpretations regarding the chronological and spatial patterning of black slipped jars at Bagasra. My contribution to studies of black slipped jars instead comes through inclusion of this important trade vessel within a broader comparative ceramic study, including

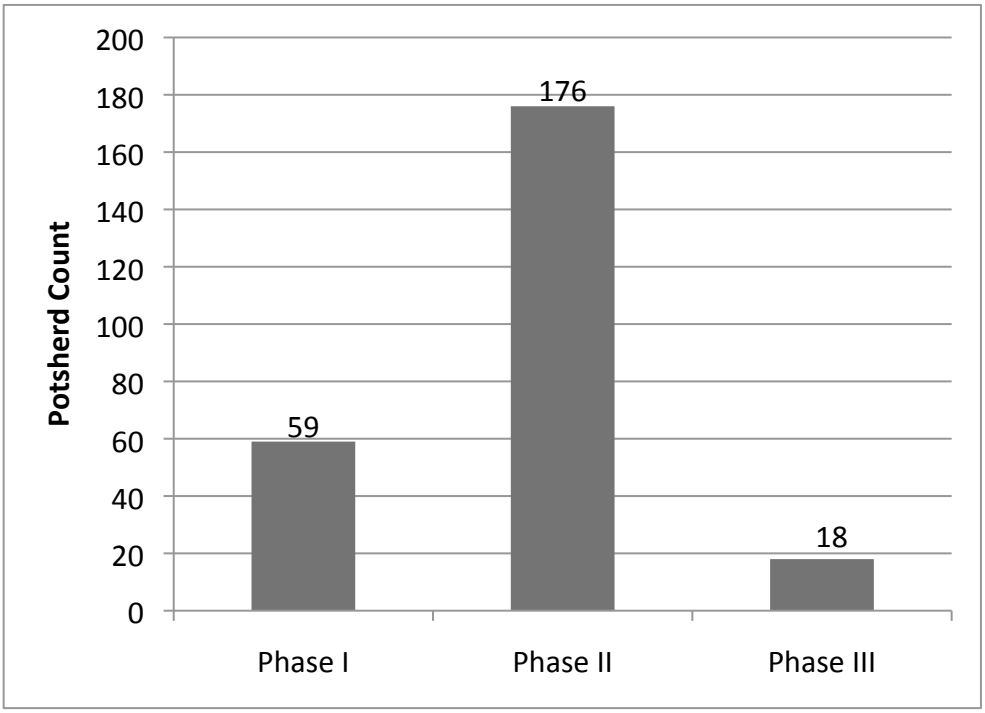
previously unpublished frequency data that helps us to understand the prevalence of black slipped jars at small craft production centers, such as Bagasra.

The black slipped jar is documented during Phase I, Phase II and Phase III at Bagasra (Table 4.2, Figure 4.2). No potsherds from this Harappan vessel type were recorded in Phase IV contexts. The assemblage of Black Slipped Jars collected and analyzed by P. Ajithprasad (2006) total 210 potsherds (Table 4.2), which "constitute just 0.31% of the total ceramic assemblage from Phases I, II, and III" (Ajithprasad 2006: 11). With the addition of 43 sherds provided by this study, the data indicate that this vessel occurred in greatest percentage during Phase II, which accounts for 69.57% of the total recovered assemblage, or 176 of the 253 total pottery sherds. Illustrated in Figure 4.2, these data suggest that Black Slipped Jars (BSJ) were relatively common during Phase I (23.32% of the total BSJ), increased significantly during Phase II (69.57% of BSJ), and declined in abundance during Phase III (7.11% of BSJ).

Table 4.2: Phase-by-Phase Count of Black Slipped Jars at Bagasra

Phase	Black Slipped Jar (from Ajithprasad 2006)	Black Slipped Jar (new data)	Total
Phase I (2500-2450 BC)	45	14	59
Phase II (2450-2200 BC)	152	24	176
Phase III (2200-1900 BC)	13	5	18
Phase IV (1900-1700 BC)	0	0	0
Totals	210	43	253

Figure 4.2: Count and Chronological Distribution of Black Slipped Jars at Bagasra



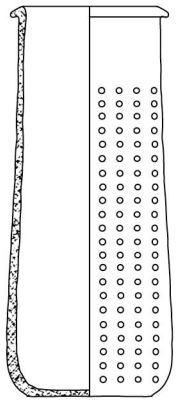
This documented assemblage of Black Slipped Jars came from diverse contexts inside and outside the perimeter wall. In summarizing their spatial distribution, Ajithprasad notes several important trends in the spatial distribution of Black Slipped Jars at Bagasra. First, during Phase I, this unique storage jar appears to be concentrated in the southern part of the mound. Second, during Phase II Ajithprasad (2006: 16) observes that "there is not much variation or any identifiable pattern in the spatial distribution of black slipped jars in this phase. They are found distributed more or less evenly within the fortified area and outside." The occurrence of black slipped jar pottery sherds in Phase III contexts is rare and Ajithprasad (2006: 21) notes for one black slipped jar potsherd, "This badly abraded rim with graffiti on it appears like a poor

shadow of the earlier well-made vessels," which suggests that "(a)s trade declined, the black slipped jar, which was primarily involved in overseas trade, also became redundant. That, to some extent explains the scarcity of black slipped jars in the Phase-III at Bagasra" (Ajithrasad 2006: 21).

In sum, the presence of black slipped jars at Bagasra is significant when put in the context of the regional distribution of this unique Harappan vessel type. Black slipped jars are rare or absent from many sites in Gujarat, including Lothal (Rao 1979, 1985), Surkotada (Joshi 1990) and Nageshwar (Hegde et al. 1992). On the other hand, black slipped jar pottery sherds are commonly recovered from some of the major urban settlements of the Indus Civilization, such as Dholavira, Harappa, and Mohenjo Daro (Méry and Blackman 2005). While black slipped jars were manufactured in the Indus Valley (Méry and Blackman 2005), they are reported at a greater number of archaeological sites and in greater frequency in the Oman Peninsula (Edens 1993, Méry 1996, Méry and Blackman 2000: Figure 1, Méry and Blackman 2005), where they date from approximately 2500-2300 BC (Méry 1996). Set within this broader context, the quantity and temporal concentration of black slipped jars during Phase I and II (2500-2200 BC) at Bagasra suggests that the settlement played an important role in the vast trade networks that linked communities in the Oman Peninsula to sites across the greater Indus Valley.

2b. Perforated Jar: Tall Straight-Sided Jar with Perforations and a Flat Base
Vessel type 16 (Mohenjo Daro), 88 (Harappa)

Figure 4.3: Perforated Jar
(illustration redrawn from Dales and Kenoyer 1986: Figure 102)



Harappan Perforated Jar (MD 16, H 88)
(Redrawn from Dales and Kenoyer 1986)

Perforated vessels are common at sites in the Indus Civilization, where they regularly occur as small to medium-sized jars with tall, straight sides, which are defined in the Harappan pottery typology (Dales and Kenoyer 1986: 107-109). At Mohenjo Daro perforated jar is type 16 (Dales and Kenoyer 1986: Figure 102, Table 10-A) and at Harappa it is type 88 (HARP pottery type reference manual). Although rare, other vessel shapes were also manufactured with perforated sides, including bowls, globular pots, and miniature jars, which are illustrated in reports from Mohenjo Daro (Mackay 1938, Marshall 1931). Perforated jars are common at Integration Era sites in Gujarat, however, they seem to not be present in the Rojdi ceramic assemblage (Possehl and Raval 1989).

The distinguishing feature of perforated vessels across South Asia is that the entire body surface exhibits small round holes. Extending from the neck to the base, these holes, which are all roughly the same size, occur in evenly spaced parallel rows. Dales and Kenoyer (1986: 107) propose that the holes were formed by pushing a round tool through the leather-hard vessel body from the exterior. The interior surfaces of tall cylindrical jars, unique to the Indus Civilization, are typically unsmoothed, resulting in a ring of extra clay accumulation along the interior edges of the perforation (Kenoyer personal communication). Specimens from Bagasra preserve this type of extraneous clay accumulation on the interior, which confirm that the same technique was applied and suggests the prevalence of perforated jars among the assemblage of perforated potsherds at the site.

Perforated vessels are not unique to the Indus Civilization. Vessels with perforated bodies are also reported from Neolithic South India and the Late Jorwe Period in the northern Deccan, c. 1200 BC (Fuller 2005: 768-769). Most suggested functions relate to food preparation: a curd strainer, steam cooking vessel, or specialized container for preparing various regional dishes, but arguments that they were incense holders have also been put forward (Fuller 2005, Kenoyer 1998). Perforated jars may have been used for beer making (Kenoyer 1998) and Arunima Kashyap (personal communication with Kenoyer 2012) has found evidence of barley starches that indicate they were used for something related to these grains, which could be brewing (Kenoyer personal communication). Reviewing ceramic assemblages in Neolithic South India, Fuller (2005: 768) suggests that different perforated vessel forms served separate functions and exhibit regional variation in the style and use. For instance, at Watgal a

perforated vessel with a spouted lip for pouring was recovered, which differs from lipless varieties found at other sites in South India during the same time period.

Residue analysis is one possible approach to help determine the function of perforated jars in the Indus Civilization. Gas chromatography and isotopic analysis of organic residues inside perforated vessel potsherds from 6th millennium BC sites in northern Europe (Salque et al. 2013) have been successful at distinguishing dairy fats from adipose fats in archaeological pottery. The authors of this study concluded that Linear pottery perforated bowls and sieves were used for to process milk, which suggests a function related to cheese making since butter making would not require such a technology. Preliminary studies (Bourgeois and Gouin 1995) of perforated jars from sites in the Indus Valley indicate the presence of fatty acids characteristic of dairy products. As of yet, there is insufficient evidence from the Indus Valley to ascribe more specific associations related to the processing of animal products for food. While the function of perforated jars in the Indus Civilization is not precisely known, the widespread distribution and continuity of use into later periods suggest that they served a central function in many South Asian societies and perhaps reflect shared culinary practices across the region.

Documented variability of perforated vessels within South India suggests that variability may have existed in either the contexts of use or the form and function of perforated vessels during the Indus Civilization, which deserves further testing. At Harappa, perforated jars are recovered from both city trash deposits and the cemetery, where they were deposited as personal burial offerings (Jenkins 2000, Kenoyer 1998, Wheeler 1947). In contrast, at Farmana, while perforated jars are found within the settlement, they are absent from the 56 burials

excavated in the cemetery (Uesugi 2011). Regional differences in perforated vessels are not well understood and have not been the study of specific investigation, but differences are apparent when comparing excavation reports.

The production of Harappan perforated jars appears to be standardized across the Indus Valley. These jars were wheel made and the bases were string-cut. Rim and base types documented at Bagasra are similar to the types documented in the Harappan pottery typology. At Bagasra rim types fall within the categories 2C, 2D, 3A and 3D and base forms 2A, 2B and 4L. At Mohenjo Daro (Dales and Kenoyer 1986: 107), as at Bagasra, perforated vessels are made from a variety of fine, medium and coarse sandy red and yellow-brown fabrics with large white inclusions and occasionally large pebbles. The Harappan pottery typology (Dales and Kenoyer 1986: 107-109) documents that perforated jars were made in small, medium, and large-sized jars with tall, straight sides. In the sample of perforated jars documented at Mohenjo Daro, medium (mean ERD 10.7, base 7.05cm) to large-sized (mean ERD 19.7) vessels were much more common (92.5%, n=136) than small-sized (mean ERD 5.18cm, base 3.51cm) vessels. In comparison, the sample (n=10) of perforated jar rim sherds analyzed for this study include 9 rim sherds that fall within the large-size category and one sherd that is small/medium in size. Base diameters were also that of large perforated vessels.

Table 4.3: Perforated Jars at Bagasra - External Rim and Base Diameter

Rim
n = 9
Mean = 24.5 cm
Median = 25.0 cm
Max. = 30.0 cm
Min. = 18.0 cm

Base
n = 4
Mean = 10.5 cm
Median = 10.5 cm
Max. = 11-13.0 cm
Min = 9.0 cm

Artifact Number	External Rim Diameter (cm)	External Base Diameter (cm)
MSU Drawn-384	7.0	
21-1	18.0	
44-5	21.0	
18-70	21.0	
Lot17	23.0	
19-60	24-26.0	
44-16	26-27.0	
Lot208	26-27.0	
23-1	30.0	
23-2	30.0	
228-304		9.0
67-308		10.0
219-302		11-13.0
38-301		11.0

Formal attribute analysis assists in identifying potential regional differences in size and style of perforated jars. Unfortunately, the fragmentary nature of the Bagasra assemblage limits classification of most recovered potsherds into precise size categories, and thus limits this dimension of fine-grained comparative analysis with the Mohenjo Daro assemblage. However, comparative attribute analysis does reveal a relatively high percentage of decorated perforated potsherds at Bagasra as compared to Mohenjo Daro, which suggests that perforated jars found at Bagasra were more highly decorated.

As at Mohenjo Daro, perforated jars at Bagasra exhibit both decorated and undecorated forms. However, the Bagasra sample exhibits a high relative proportion of perforated jars that were decorated with red slip and black horizontal bands. The results of my analyses indicate that approximately 60% (230 sherds) of perforated vessels in the sampled assemblage are undecorated while nearly 40% (156 sherds) of perforated vessels preserve either red slip or red slip with horizontal black painted bands. The percentage of decorated perforated vessels is not documented in the Mohenjo Daro sample, but Dales and Kenoyer (1986: 107) state that the proportion is very small.

Table 4.4: Count and Relative Percentage of Decorated and Undecorated Perforated Jars from Bagasra

	Plain Perforated Jars	**Perforated Jars with Red Slip/ Red Slip Black Band**	**Total Count of Perforated Jars**	**Total Diagnostic Ceramic Count**
Phase I (2500-2450 BC)	5 (29.41%)	12 (70.59%)	17 (2.88%)	591
Phase II (2450-2200 BC)	81 (60.45%)	53 (39.55%)	134 (2.97%)	4506
Phase III (2200-1900 BC)	122 (60.40%)	80 (39.60%)	202 (3.51%)	5760
Phase IV (1900-1700 BC)	22 (66.67%)	11 (33.33%)	33 (2.00%)	1652
Total Counts	**230 (59.59%)**	**156 (40.41%)**	**386 (3.09%)**	**12509**

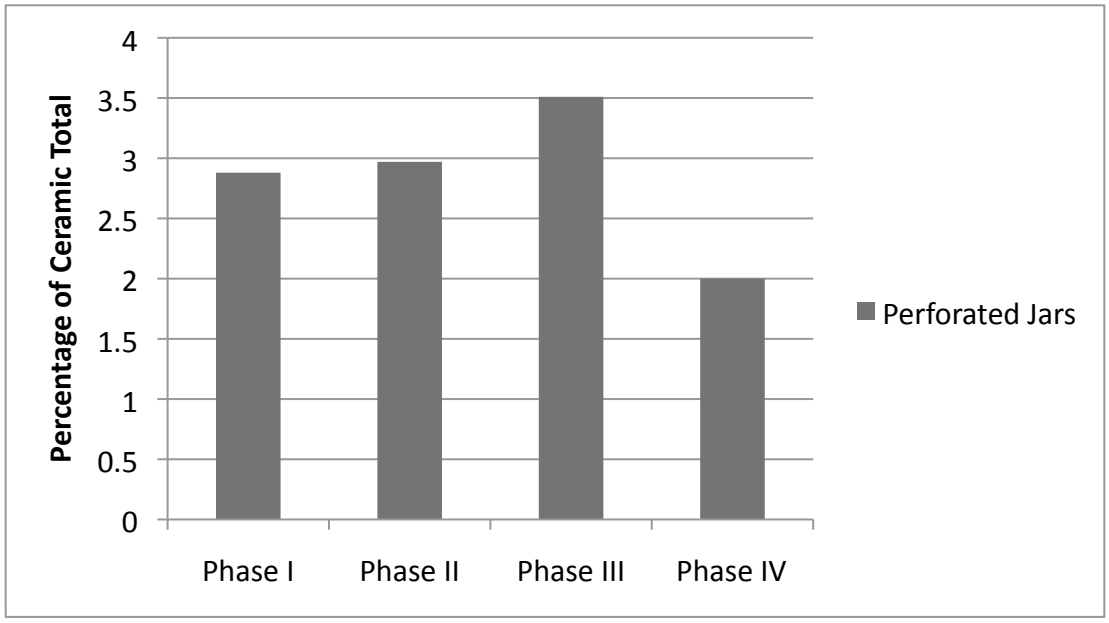
From within this Bagasra sample of decorated perforated vessel potsherds, rim sherds comprise only 5.8% (9 sherds) of the recovered sherds, while body sherds comprise 93.6% (146 sherds). Only one decorated base sherd was recovered. These findings of rim, body and base

sherds suggest that the decorative preference at Bagasra was to paint the jars with red bands from rim to base (Figure 4.4) or to completely cover the vessel in red slip. Slips came in various shades of red at Bagasra, but most often appeared as shades red1 and red5 (see Appendix B). In addition to red slip, black horizontal bands were also occasionally painted on perforated jars. The addition of black bands to other types of red slipped jars, pots, bowls and dishes was a common decorative preference at Bagasra, as at Mohenjo Daro (Dales and Kenoyer 1986). In contrast, at Mohenjo Daro perforated jars were rarely decorated. Known decorated examples were only partially covered in red slip, which extended from the upper most part of the jar, above the top row of perforations, and extending over the rim. A set of incised parallel horizontal black bands or a single narrow black painted band is sometimes found on the upper body at the point where the perforations end. Such comparative data suggest that residents of Bagasra had a greater preference for decorated perforated vessels than those who lived at Mohenjo Daro.

The comprehensive ceramic analyses undertaken for this dissertation identified perforated jars in deposits dating to all four phases at Bagasra. Summarized in Table 4.4 and illustrated in Figure 4.5, the relative abundance of perforated vessels ranged from a minimum of 2.00% (n=33) of the Phase IV ceramic assemblage to a maximum of 3.51% (n=202) of the Phase III assemblage. In comparison to other Harappan vessel types documented in this study, the relatively high percentage of perforated jars at Bagasra suggests that it was a rather common type at the site. These potsherds are commonly recovered from excavation units and

Figure 4.4: Nearly Complete Perforated Jar with Red and Black Band Decoration
(Image courtesy of Department of Archaeology and Ancient History, MS University of Baroda)

Figure 4.5: Percentage of Perforated Jars during each Phase at Bagasra



are a well-recognized component of the ceramic assemblage from the site (Sonawane et al. 2003). Though previous research (Sonawane et al. 2003) indicated that perforated vessels were absent from Phase IV deposits at Bagasra, these new data suggest that perforated vessels continued to be used until the end of Bagasra's occupation. Considering the architectural and material evidence for considerable economic and social change between Bagasra Phase III and Phase IV (Sonawane et al. 2003), scholars have suggested that Harappan ceramic traditions entirely disappeared. Instead, it appears that Bagasra residents might have retained certain Harappan vessel forms during periods of economic transition.

The sample of perforated jars from Bagasra were documented in a range of depositional contexts. Listed in Table 4.5, these include craft production areas, habitation areas and other structural deposits. While this vessel type was documented in contexts on both sides of the perimeter wall, Figure 4.6 below illustrates that patterns in these data suggest that perforated jars occur in higher frequency inside the wall. (Frequency was determined as a percentage of the total count of perforated jar pottery sherds from each phase - in other words, the total count of perforated jar potsherds inside and outside the wall). More specifically, these data suggest that within the wall perforated jars were more than twice as common in craft production deposits than they were in habitation contexts.

Figure 4.6: Percentage of Perforated Jars in Craft Production and Habitation contexts on either side of the Perimeter Wall

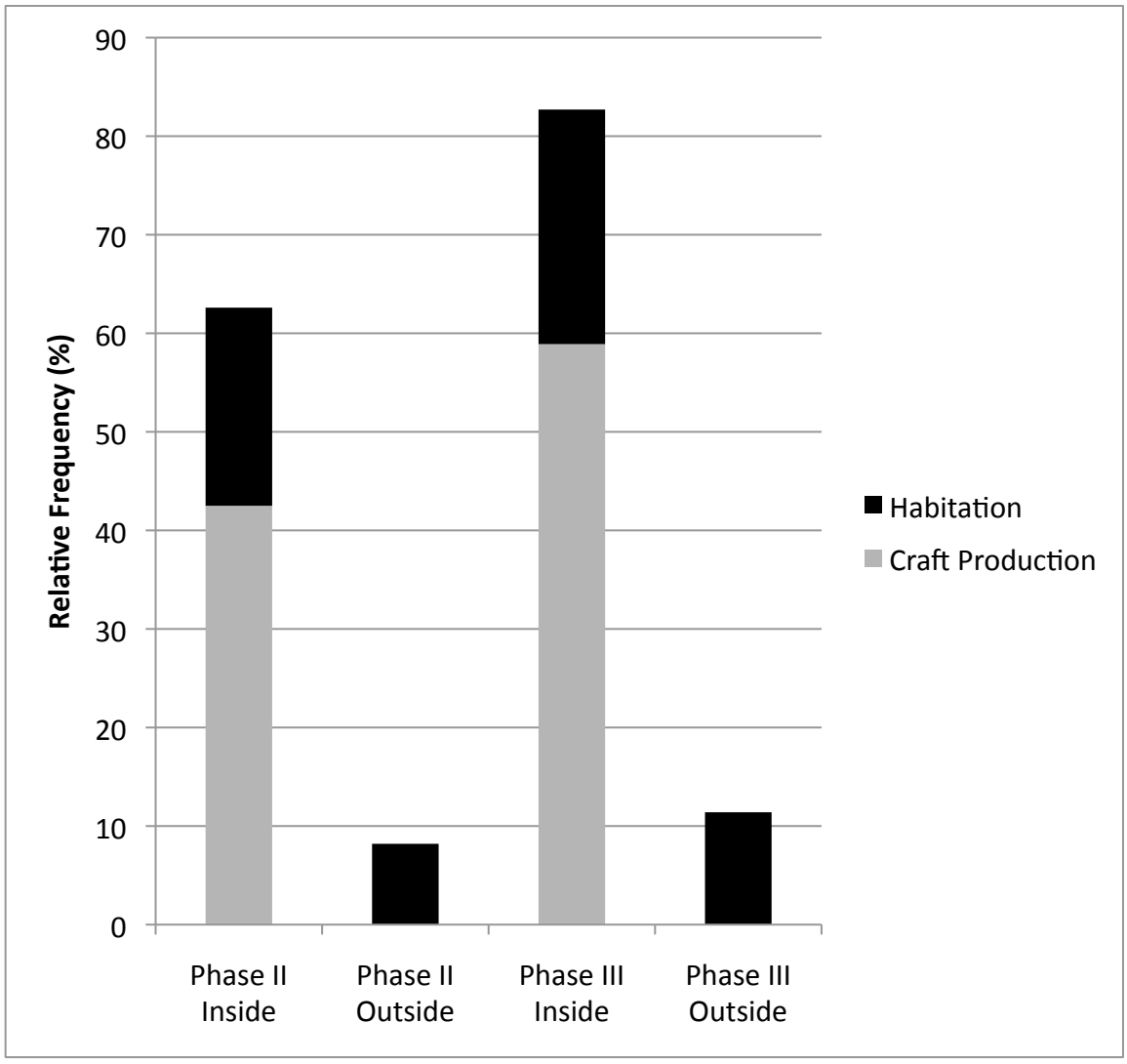
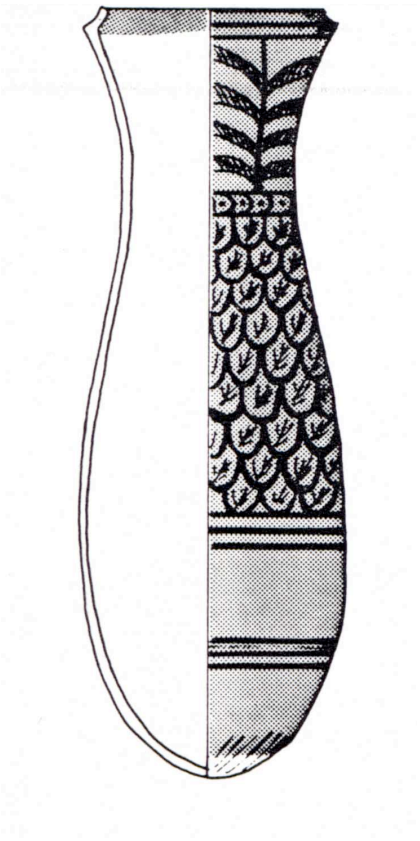


Table 4.5: Counts of Perforated Jar Pottery Sherds by Phase and Context Type

Phase	Location	Vessel Type	Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
Phase I			0	3	5	7	2	17
		Total Pottery	0	157	205	167	62	591
Phase II	Inside		57	27	4	15	0	103
		Total Pottery	1355	547	180	439	0	2521
	Outside		0	11	0	16	4	31
		Total Pottery	187	927	0	764	107	1985
Phase III	Inside		119	48	0	0	8	175
		Total Pottery	2527	1209	0	0	86	3822
	Outside		0	23	0	2	2	27
		Total Pottery	0	1568	0	328	42	1938
Phase IV			0	24	0	9	0	33
		Total Pottery	0	1154	0	498	0	1652
Totals			176	136	9	49	16	386
		Total Pottery	4069	5562	385	2196	297	12509

2c. Tall Decorated Jar: Tall Slender Jar with Rounded Base and Painted Decoration
Vessel type 1 (Mohenjo Daro), 1 (Harappa)

Figure 4.7: Tall Decorated Jar
(illustration from Dales and Kenoyer 1986: Figure 102)



This tall S-profile jar with red slip and black painted designs is one of the most distinctive vessel forms in the Harappan pottery typology – both as a complete vessel and pottery sherds. Its tall, slender body, low profile and rounded base make it unstable for standing on its own. The vessel was thin-walled and fragile, therefore it was probably set into a ring stand or a depression in the floor (Dales and Kenoyer 1986: 77) to protect it from breaking and avoid spilling the contents. The tall, decorated jar is defined in the Harappan pottery typology (Dales

and Kenoyer 1986: 74-77) as type 1 at both Mohenjo Daro (Dales and Kenoyer 1986: Figure 102, Table 10-A) and Harappa (HARP pottery type reference manual).

The jar has a distinctive S-profile with a slightly flared neck and distinctive ledged rim, which accommodated a lid. As defined in the Harappan pottery typology and documented at Bagasra (Table 4.6), rims fall within the category 7A and 7B, which have an external concaved ledge. At Bagasra, this rim type is almost exclusively associated with this type of tall decorated jar. Contiguous rounded bases are category 1 in the base typology. At Harappa, flat bases type 2 and 4 were also documented (HARP pottery type reference manual). No bases have been recovered from Bagasra, though ring stands are present.

The Harappan pottery typology documents the ratio of internal body diameter to internal height at 1:2.67, which classifies it as a jar (Dales and Kenoyer 1986: 74-77). This tall decorated jar is found in three size categories: small (10cm), medium (26.8cm) and large (44.5cm) based on differences in rim diameter, however the height of vessels in each size category varied. A short squat variety was documented at Harappa, where stratigraphic evidence suggests that shorter forms date earlier than tall forms (HARP pottery type reference manual). Eight rim sherds were documented at Bagasra, which fall within the medium size category, based on external rim diameter measurements, as indicated below:

Table 4.6: Rim Diameter of Tall Slender Decorated Jar at Bagasra

Rim
n = 8
Mean = 24.5cm
Median = 21.25cm
Max. = 32.0cm
Min. = 16.0cm

Artifact Number	External Rim Diameter (cm)	Rim Type	Included in Sample
MSU Drawn-60	16.0	7B1a	No
MSU Drawn-61	19.0	7B1a	No
MSU Drawn-383	19.0	7B1c	No
MSU Drawn-67	20.0	7B1a	Yes
MSU Drawn-59	21-24.0	7B1a	No
MSU Drawn-171	24-25.0	7A1a	Yes
MSU Drawn-369	27-28.0	7A1a	Yes
MSU Drawn-276	32.0	7B1b	Yes

This tall decorated jar was skillfully manufactured from three or four separate clay pieces, as reported by Dales and Kenoyer (1986: 74-75). The rim and neck were constructed on a fast-wheel as one unit as was the body, which was made in one or two clay sections or building stages. Base construction appears to have been a complicated process, which involved either a mold or a fast-wheel. Mold-made rounded bases were trimmed to form finalize the shape whereas wheel-thrown round bases were shaped with a paddle and anvil. Chatter marks on the base exterior suggest further trimming on a fast wheel to finish the base form (see Dales and Kenoyer 1986: 239, Figure 1).

The vessel has relatively thin walls and was made from fine to medium sandy fabric with tiny mica and tiny to medium white inclusions at both Mohenjo Daro (Dales and Kenoyer 1986: 74) and Bagasra, where it is documented in common red and yellow brown wares. The exterior

surface of these tall decorated jars is almost completely covered in red slip and complicated black painted designs in diagnostic Harappan motifs. Red slip was applied over the rim and is documented on the upper interior throat. The slip was skillfully applied and is exceptionally smooth and glossy compared to other vessel forms. At Bagasra, the red slip largely falls in the red1 category (see Appendix B), which is a common slip color on pottery from the site. These tall jars were decorated with black bands and a variety of complicated black painted motifs, which were arranged in horizontal panels (for examples see Dales and Kenoyer 1986: Fig.1, Fig.2, Mackay 1938, Marshall 1931, Quivron 2000).

The comprehensive ceramic analysis undertaken for this dissertation documented only 11 potsherds (Table 4.7) representing, or potentially representing, the tall slender decorated jar defined as Jar 1 in the Harappan pottery typology. Moreover, only 5 of the 11 potsherds were recovered from contexts that were sampled for this study. The remaining 6 potsherds were identified in excavation reports and pottery drawings. Based on these data, it appears that this vessel form was present at Bagasra during Phase II and Phase III, and was not a component of Phase I and Phase IV ceramic assemblages. While the sample size is extremely small, these data provide strong evidence that these distinctive decorated jars were recovered in contexts located inside the perimeter wall. The single potsherd (MSU Drawn-276) recovered from outside the wall came from a trench (Em9) that includes the perimeter wall and debris laying against the exterior of the wall, which likely was trash deposit that originated inside the wall.

Table 4.7: Phase by Phase Count and Percentage of Tall Decorated Jars at Bagasra Compared to Total Ceramics (Sampled Trenches only)

Phase	Count	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	0	591
Phase II (2450-2200 BC)	0	4506
Phase III (2200-1900 BC)	5 (0.09%)	5760
Phase IV (1900-1700 BC)	0	1652
Totals	5	12509

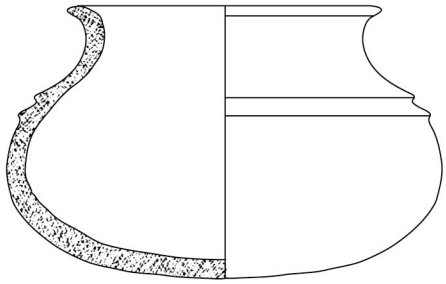
Table 4.8: Count of Tall Decorated Jars Inside and Outside the Perimeter Wall at Bagasra, (Sampled and Non-Sampled Trenches)

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Tall Decorated Jars (Jar 1)
Phase II	Jar 1	2	1 (Wall)	3
	Possible Jar 1	0	0	0
Phase II Total		2521	1985	
Phase III	Jar 1	4	0	4
	Possible Jar 1	2	0	2
Phase III Total		3822	1938	

2d. The Harappan Cooking Pot: Globular Ridged Pot with a Rounded Bottom and Applied Coating

Vessel type 26 (Mohenjo Daro), 69 (Harappa)

Figure 4.8: The Harappan Cooking Pot



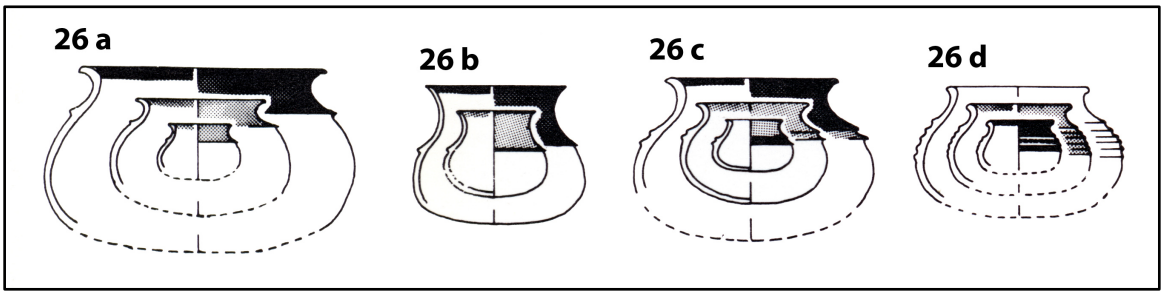
Harappan Cooking Pot (MD 26, H 69)
(Redrawn from Dales and Kenoyer 1986)

The Harappan cooking pot (Figure 4.8) is a very specific type of squat globular pot with distinctive shoulder ridging that is defined in the Harappan pottery typology (Dales and Kenoyer 1986: 132-144) as type 26 at Mohenjo Daro (Dales and Kenoyer 1986: Figure 102, Table 10-A) and type 69 at Harappa (HARP pottery type reference manual). It is the only cooking pot style identified at Mohenjo Daro (Dales and Kenoyer 1986) and Harappa (Kenoyer 1998, Wright 1991, 1993). Since other cooking pot forms have not been extensively reported, it is thus referred to as the main cooking pot form utilized by communities within the Indus Civilization (Kenoyer 1998). The vessel form likely evolved from Regionalization Era (Kenoyer 1991, Shaffer 1992), or Early Harappan Phase, Amrian and Kot Dijian forms (Kenoyer 1998, Mughal 1970), which existed prior to advent of the Indus Civilization around 2600 BC. Its evolution over time has not yet been studied but the ancient Harappan cooking pot form closely resembles the

traditional “handi” used throughout much of South Asia today (Kenoyer 1998), indicating its longevity as a symbol of group identity in South Asia.

As defined by the Harappan pottery typology and illustrated in Figure 4.9, the Harappan cooking pot (Dales and Kenoyer 1986: 132-144) contains four major variants, or sub-types, based on quantifiable and stylistic attribute analysis. These four varieties share many features reflecting a high level of standardization in this vessel type as a whole. The variants show slight differences in ware texture, body profile features, such as the length of the neck and center of gravity, and decorative differences, including the presence or absence of black bands.

Figure 4.9: Harappan Cooking Pot Varieties Defined in the Harappan Pottery Typology (illustrations from Dales and Kenoyer 1986: Figure 102)



This distinctive vessel type has a squat globular shape and rounded base and distinctive shoulder ridging. This wheel-made vessel might have been built in two pieces and joined, followed by paddle and anvil shaping of the lower body into a rounded form (Dales and Kenoyer 1986: 132) with a low center of gravity that makes it optimal for use on hearths without tipping over (Kenoyer 1998: 156). The recovery of only three fragmentary rim sherds

prevents quantification of orifice diameter, vessel size or volume. However, in the sample from Bagasra are rim types 3C4a, a wide externally projecting rim, and rim type 1D2d, a simple everted rim. Vessel diameters of these three rims are 15cm, 21cm and 26cm, while at Harappa and Mohenjo Daro a wider variety of rims types and vessel sizes are documented.

At Mohenjo Daro and Harappa it was made from a fine to fine-sandy red ware clay, typical of many vessels at these sites. Similarly, Harappan cooking pots recorded at Bagasra were produced in a fine to medium sandy wares that contained tiny mica and tiny black and white inclusions. At Bagasra the fabric colors range from "Harappan red" (Dales and Kenoyer 1986: 64) to red and yellow brown (Appendix B). Other types of vessels at Bagasra were made out of the same or similar fabric, which suggests that Harappan cooking pots recovered here may have been made locally. However, compositional analysis needs to be done to distinguish imported vessels from those that were locally produced.

The rim and upper body were often decorated with black or red slip and one or two decorative shoulder ridges. The red slip likely served a decorative function since the mid to lower body, below the ridged portion, remained unslipped. Red-slipped rims were sometimes decorated with a black band on the external rim edge and on the ridge. The red slip color documented on Harappan cooking pots from Bagasra is extremely uniform in color and falls in the Munsell red (10R 5/6) to weak red (10R 5/4) color categories.

The lower body and base were not slipped and were instead covered with a thick, coarse, sandy coating that contained pebbles, grog or large white inclusions (Dales and Kenoyer 1986, Kenoyer 1998). Ethnographic and experimental observations indicate that this sandy

slurry protects the vessel from cracking through repeated heating (Kenoyer 1998, Rye and Evans 1976, Schiffer et al. 1994) and supports its function as a cooking vessel. Many of the specimens recorded in the Dales and Kenoyer Mohenjo Daro study were blackened on the exterior, which further support arguments for their use in a cooking fire. Of the Bagasra sample of Harappan cooking pots, one sherd retains evidence of blackening (pottery number: BSR 33-500, Phase I), suggestive of use in a cooking fire.

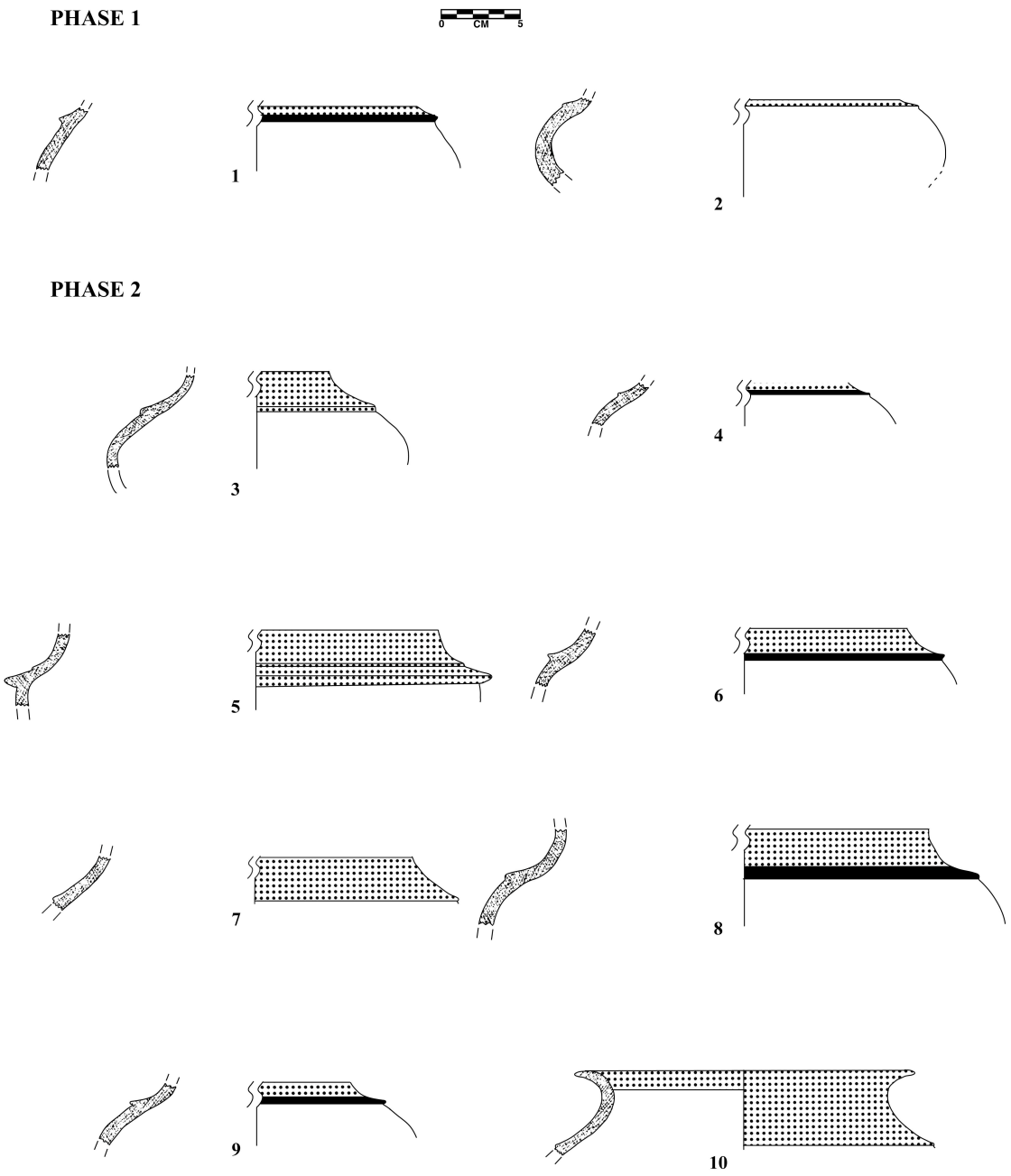
Inferences regarding actual vessel use, versus intended function, of Harappan cooking pot forms at Bagasra are currently inconclusive. Similarities and differences in the function of Harappan cooking pots in separate regional settings need to be further evaluated. It is possible that the Harappan style cooking pots recovered from Bagasra were not used as cooking pots since they do not regularly display evidence of soot marks or charring, which is a common feature of sherds recovered from both Harappa and Mohenjo-Daro (Kenoyer 1998). Charring and soot marks are direct evidence that a vessel was used in a cooking fire (Kobayashi 1994) and can be preserved on archaeological ceramics (Beck et al. 2002, Joyner 2007). Since only one sherd at Bagasra preserves evidence of external charring and no lower body and base portions with sandy slurry application were recovered from the site, no inferences regarding cooking use can be reliably drawn from this sample. While the sample is too small to say conclusively whether or not they were used for cooking, the low percentage, lack of soot marks or charring and sandy slurry application suggest that these vessels may have been used for a function other than cooking at Bagasra. In light of this evidence the possibility that they were

considered special display vessels, indicating the owner's social or economic connection to vast Harappan trading networks, should be considered.

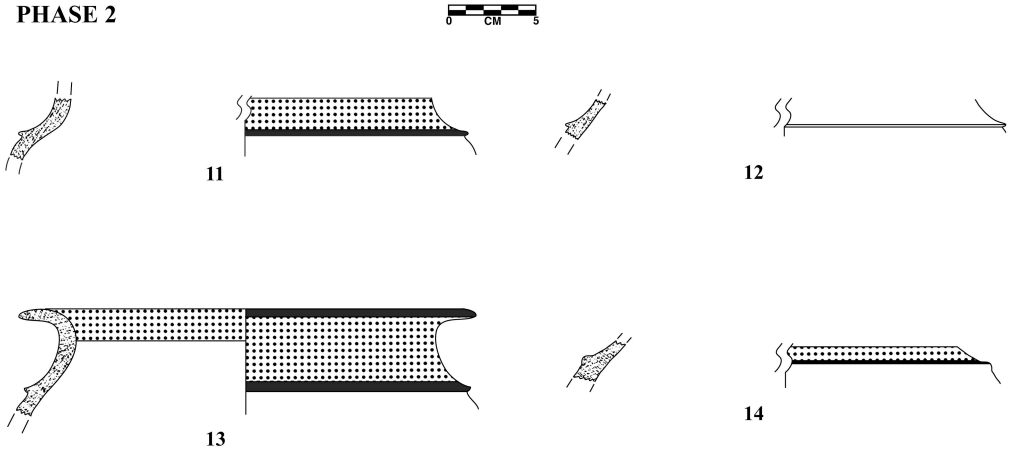
The total sample of Harappan cooking pot sherds from Bagasra, represented in Table 4.9 consists of 2 pottery sherds from Phase I, 12 sherds from Phase II, and 5 sherds from Phase III. None were recovered from Phase IV contexts. Style, ware color, texture and surface decorations indicate that these 19 sherds came from separate vessels and thus represent 19 separate pots.

The small number of recovered Harappan cooking pots is not large enough to draw statistically significant inferences regarding change in percentage through time. This sample does suggest, however, that this distinctive cooking vessel was present from Bagasra's foundation, around 2500 BC (Phase I). The cooking pots continued to turn up in low numbers in deposits dating to the subsequent two phases (Phase II and III), which are noted for the growth and decline of community craft production industries. The Harappan cooking pot was not recovered from excavated deposits dating to the final phase of occupation (1900 to 1700 BC) when Bagasra was no longer a crafting center and regular interactions with distant Harappan towns appears to have ceased.

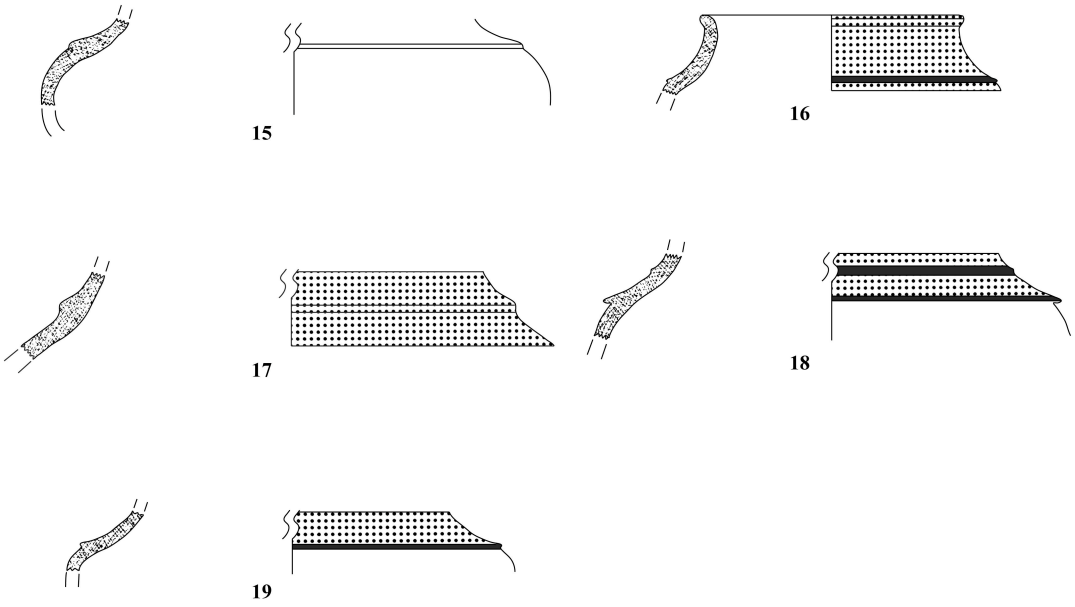
Figure 4.10: The Harappan Cooking Pot at Bagasra



PHASE 2



PHASE 3



Analyses of the contexts in which these vessels were found suggest some spatial patterning that needs to be tested at other sites. The two Phase I examples were located in separate trenches that during Phase II would be separated by the perimeter wall. The largest number of Harappan cooking pot sherds were documented in Phase II deposits. This Phase II increase is reflective of the general increase in the abundance of other Harappan material culture including Harappan style pottery (Sonawane et al. 2003). During this period of intensified craft manufacturing, 4 sherds were recorded inside the perimeter wall. Outside the perimeter wall 8 sherds were recovered, indicating a slightly higher percentage of this vessel class in deposits outside the wall. When compared to other periods, the highest number of vessels are dated to Phase II and occur outside the perimeter wall.

By far the largest number of sherds, 7 out of 19 total documented, were recovered from a single trench (Eo10) outside and relatively distant from the perimeter wall that segregated the main shell workshop from general view. Of this Eo10 sample, 6 sherds were recovered from a single layer (layer 7) of Phase II structural collapse. Each of these potsherds is distinct and arguably from separate vessels. This assemblage includes the 2 of the 3 cooking pot rim sherds recorded at Bagasra, which compare to Mohenjo Daro short-necked variety 26a. An additional body sherd recovered from this trench was found in a trash deposit dated to Phase 3 (Eo10, layer 3).

The data from Phase III indicate that during this period of decline in craft activities and civic authority there was also a decline in the percentage of Harappan cooking pots. Only 1 Harappan cooking potsherd was recorded outside the wall while 4 potsherds were recovered

from Phase III deposits inside the wall. No Harappan cooking pots were recovered from Phase IV contexts, despite comparable sampling.

This documented assemblage of Harappan cooking pots from Bagasra can be divided into two stylistic categories based on preserved ridge features: single ridge and double ridged vessels. These fragmentary rim and body sherds resemble Mohenjo Daro type 26 variants 26a, 26b and 26c. Mohenjo Daro type 26 variant 26d, with multiple ridges and grooves, is not documented at Bagasra. Lacking a rim, 14 of the 17 single-ridged body sherds cannot be specifically classified. The 3 rim sherds in the Bagasra collection are single ridged vessels with a short neck similar in form to Mohenjo-Daro type 26a. Double-ridged vessels are similar to Mohenjo Daro type 26c. These Bagasra findings include 2 sherds classified as double-ridged Harappan cooking pots dating to Phase II and III.

Table 4.9: Phase-by-Phase Count and Percentage of Harappan Cooking Pots at Bagasra Compared to Total Ceramics

Phase	Harappan Cooking Pots	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	2 (0.4%)	507
Phase II (2450-2200 BC)	12 (0.3%)	4379
Phase III (2200-1900 BC)	5 (0.09%)	5559
Phase IV (1900-1700 BC)	0 (0%)	1637
Totals	19 (0.16%)	12082

Table 4.10: Count of Harappan Cooking Pots Inside and Outside the Perimeter Wall at Bagasra

Phase		Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Cooking Pots
Phase II	Harappan Cooking Pot	4	8	12
Phase II Total		2521	1985	
Phase III	Harappan Cooking Pot	4	1	5
Phase III Total		3822	1938	

Both stylistic sub-types are documented with both red slip (6 of 19 sherds) and red slip black band (11 of 19 sherds) and were found in all three phases. Two sherds did not preserve any trace of surface decoration. Of the Mohenjo Daro cooking pot types, only variety 26b was documented with black banding at the ridge, which perhaps indicates that these body sherds at Bagasra were from long-necked 26b variety cooking pots. However, 2 of the 3 documented rim sherds discussed above have short necks and thus resemble variant 26a. These findings suggest that the four varieties of type 26 cooking pots documented at Mohenjo Daro were perhaps not adopted with the same combination of stylistic attributes at Bagasra. However, The recorded assemblage does not show any clear pattern of stylistic change through time based on diagnostic surface features of ridging, slip and black band decoration. The same is true at Mohenjo Daro, where Harappan cooking pot varieties show a remarkable degree of continuity in form and style through time (Dales and Kenoyer 1986). Overall, the Harappan cooking pots at Bagasra remain stylistically very similar to forms documented at other sites of the Indus Civilization, including Mohenjo Daro and Harappa.

The low number of recovered Harappan cooking pots at Bagasra clearly demonstrate that this type of cooking vessel was rare in this community, and thus was not the common cooking vessel for daily meal preparation for the majority of inhabitants. It could have either been rarely used by most members of the community or regularly used by only a few people who lived at Bagasra. Either way, the lack of vessels draws attention to the cultural complexity of the Bagasra community, which is only beginning to be understood.

2e. Miscellaneous Jars and Pots with Harappan Black Painted Decoration

Harappan jars and pots at Mohenjo Daro, Harappa and other Indus sites were commonly decorated with red slip and distinctive geometric and natural motifs in black paint (Kenoyer 1998, Quivron 2000). While found in relatively low percentage, the presence of Harappan black painted pottery at Bagasra is quite distinctive amongst the diverse pottery assemblage. While much of the assemblage is too fragmentary to discuss patterns in the design motifs, important chronological and spatial patterns can be discerned.

These Bagasra findings indicate that Harappan black painted pottery was present from the site's foundation (Table 4.11), when it accounts for 2.54% of the total Phase I analyzed assemblage. There is a gradual decrease over time in the abundance of black painted pottery, and by Phase III it is relatively rare (0.5%). The recovery of black painted pottery in Phase IV deposits is unexpected. However, when put in the context of this study's documentation of select Harappan pottery types continuing into the Phase IV at Bagasra, this pattern is less surprising. It may either suggest a pattern of continuity in design motifs, either through

borrowing or imitation on new vessel forms, or the mixing of Phase IV and earlier deposits, as suggested by the site excavators (Sonawane et al. 2003, MSU Dept of Archaeology n.d.).

Table 4.11: Phase-by-Phase Count and Percentage of JarPots with Red Slip and Black Painted Designs at Bagasra Compared to Total Ceramics

Phase	Count	Percentage	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	15	2.54%	591
Phase II (2450-2200 BC)	64	1.42%	4506
Phase III (2200-1900 BC)	29	0.5%	5760
Phase IV (1900-1700 BC)	16	0.97%	1652
Totals	124	0.99%	12509

Table 4.12: Count of JarPots with Red Slip and Black Painted Designs Inside and Outside the Perimeter Wall at Bagasra

Phase		Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Cooking Pots
Phase II	Red Slip Black Design JarPots	37	27	64
Phase II Total		2521	1985	
Phase III	Red Slip Black Design JarPots	17	12	29
Phase III Total		3822	1938	

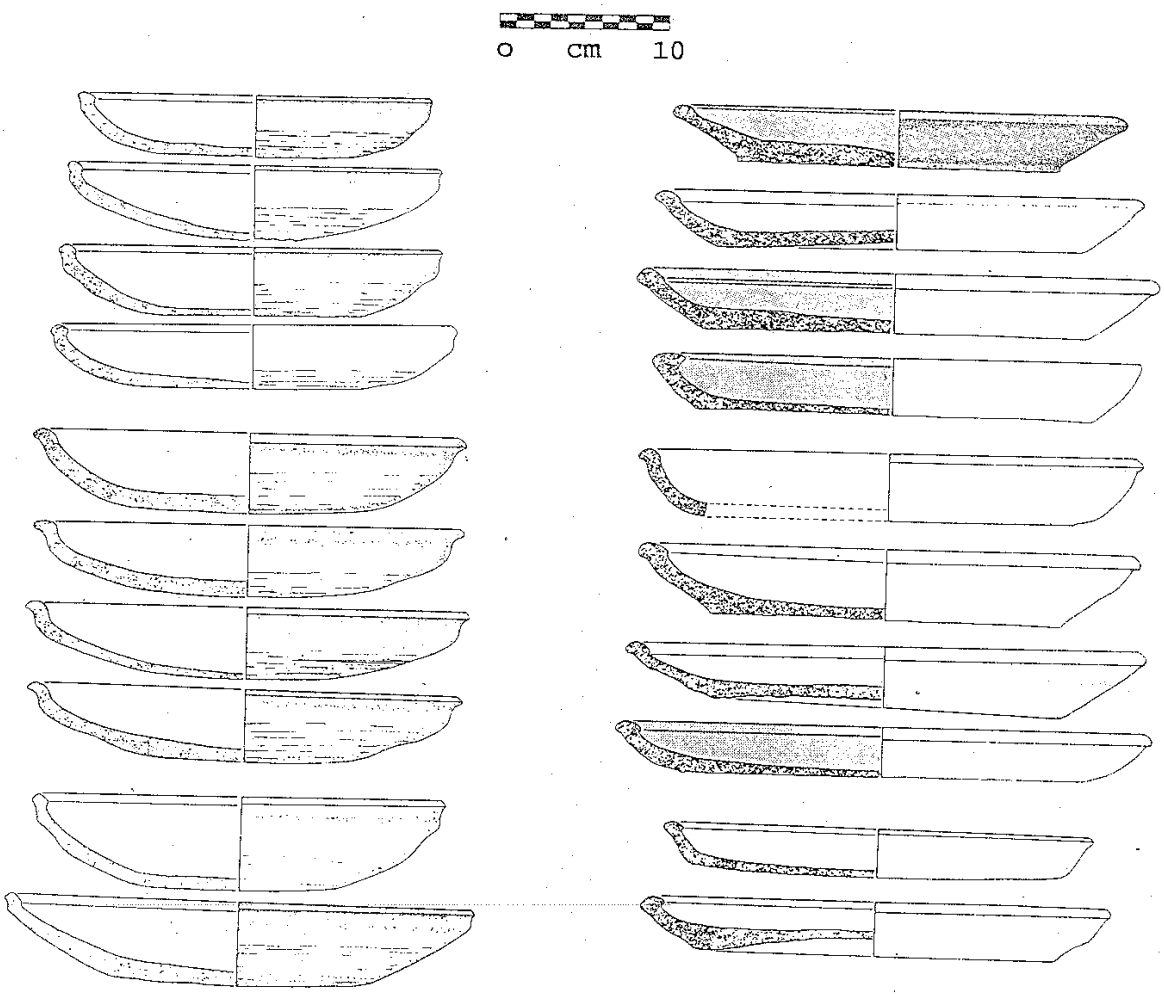
3. Harappan Bowls and Dishes

3a. Harappan Bowls and Dishes
Medium to Large Bowl/Dish with Flared Sides and a Pressed Base: Vessel type 40, 49, 50 (Mohenjo Daro), 55 (Harappa)
Medium to Large Bowl/Dish with Flared Sides and a Ring Base: Vessel type 47, 48 (Mohenjo Daro), 56 (Harappa)
Medium to Large Bowl with Convex Sides and a Molded Base: Vessel type 38, 39 (Mohenjo Daro), 45, 47 (Harappa)
Large Deep Bowl with Cord Impressions: Vessel type 37 (Mohenjo Daro), 44 (Harappa)

Documented at Bagasra are several types of bowls and dishes that are defined in the Harappan pottery typology. The identified set of bowls and dishes detailed in this section have overlapping rim and upper body profile features, which can limit precise vessel identification if the pottery sherds are rather small. Therefore, this section discusses these four vessel forms together.

Among this set of bowls and dishes, one type appears to be the most common at Bagasra. Referred to as type 55 in this study (Figure 4.11), this form comes in both bowl and dish varieties. At Mohenjo Daro it is called by several different types: 40, 49 and 50 (Dales and Kenoyer 1986: 179-180, 199-201, Figure 102, Table 10-A). These three forms are grouped as type 55 at Harappa (HARP pottery type reference manual). The vessel is described as a large bowl or dish with a pressed contiguous base (base type category 2 and 4, with base 2A, 2D and 4A as the most common), a complex internally projecting (rim type category 5) or bilaterally projecting rim (rim type category 8) and convex or flared sides. Dish forms have a broad flat

Figure 4.11: BowlDish 55 - *Medium to Large Bowl/Dish with Flared Sides and a Pressed Base: Vessel type 40, 49, 50 (Mohenjo Daro), 55 (Harappa)*
(illustration from HARP Pottery Reference Manual)



base and bowls have a narrow base. Bowl type 56 closely resembles these forms, but has a ring base (base type category 6). Bowl 56 is identified as type 47 and 48 at Mohenjo Daro (Dales and Kenoyer 1986: 193-195, Figure 102, Table 10-A) and type 56 at Harappa (HARP pottery type reference manual).

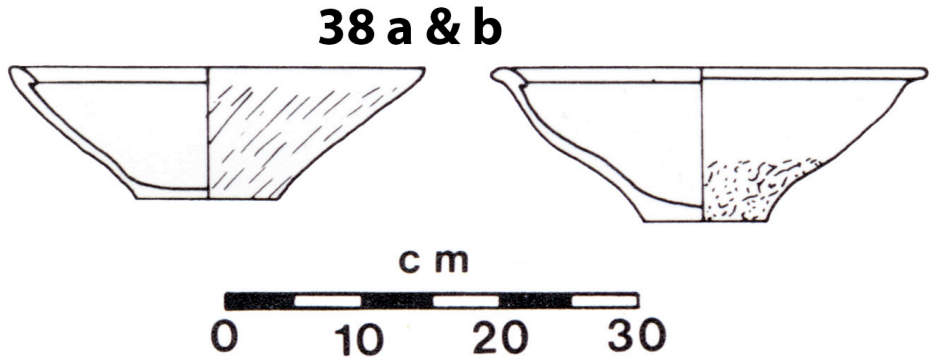
As a bowl or dish, the vessel comes in both plain (Mohenjo Daro types 40 and 50) and red slipped, or red slip black band decoration (Mohenjo Daro types 47, 48, 49). Most examples from Bagasra are red slipped on the interior and extending over the rim; many are completely slipped. Red slipped black band varieties are also common at Bagasra. At Mohenjo Daro and Bagasra, this form comes in a fine to medium sandy reddish-yellow clay fabric with mica and tiny white inclusions. Type 50 at Mohenjo Daro is also documented in coarser fabrics. The form is wheel thrown and the lower body and base are carved and smoothed (Dales and Kenoyer 1986: 199).

The Mohenjo Daro type 49 samples range in size from an external rim diameter of 36.5 cm to 22.0 cm, and an average ERD of 29.1 cm (n=11). As a dish, the external height averages 2.7 cm (n=8) with a base diameter from 25.0 to 16.5cm (average 18.8 cm, n=6) (Dales and Kenoyer 1986: 1999).

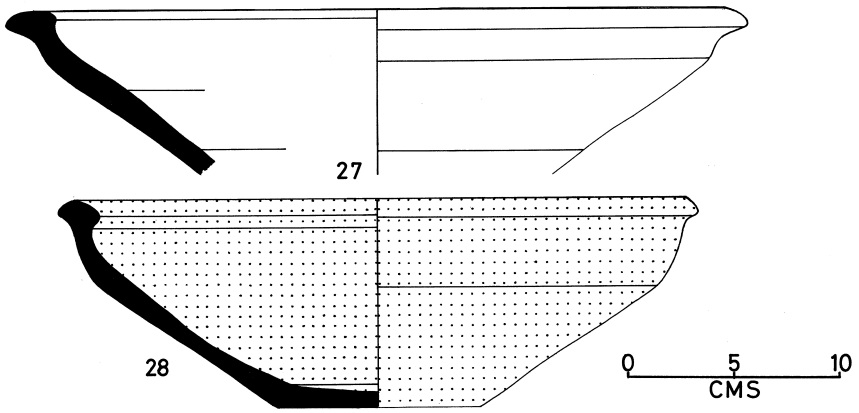
Two types of deep open bowls share rim and base features with the shallower bowls and dishes mentioned above. Deep open bowls are commonly referred to as basins (Sonawane et al. 2003). Illustrated in Figure 4.12, a medium to large open bowl with flat molded or scraped lower body and base (base type 2D and 4A) and a convex profile, which are identified as type

38 and 39 at Mohenjo Daro (Dales and Kenoyer 1986: 174-178, Figure 102, Table 10-A) and type 45 (molded) and type 47 (scraped) at Harappa (HARP pottery type reference manual).

Figure 4.12: Bowl 38 - *Medium to Large Bowl with Convex Sides and a Molded Base: Vessel type 38, 39 (Mohenjo Daro), 45, 47 (Harappa)*
(illustration from Dales and Kenoyer 1986: Figure 102)



Bowl 38 – Pottery from Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

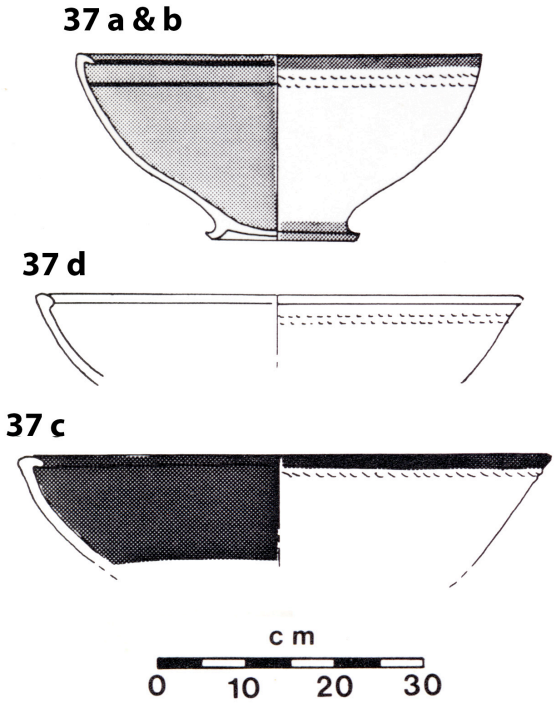


Type 38 and type 39 are deep open bowls with complex rims, a molded base, and convex sides. Type 38 has two varieties that are distinguished by rim type: variety 1 has an internal projecting rim (rim type category 5, 6) and variety 2 has a bilateral projecting rim (rim type category 8). Mohenjo Daro type 39 is a variant of type 38, which is distinguished by a bilateral projecting rim and distinctive black slip. At Harappa this vessel form is also found with simple rim types (rim type category 1). At Mohenjo Daro, Harappa, and Bagasra, bowl 38 were possibly made in a chuck mold and the rim was wheel thrown (Dales and Kenoyer 1986: 174). They come in fine to medium and coarse sandy reddish-yellow clay with tiny mica and white inclusions. I refer to this bowl form as type 38 in this chapter.

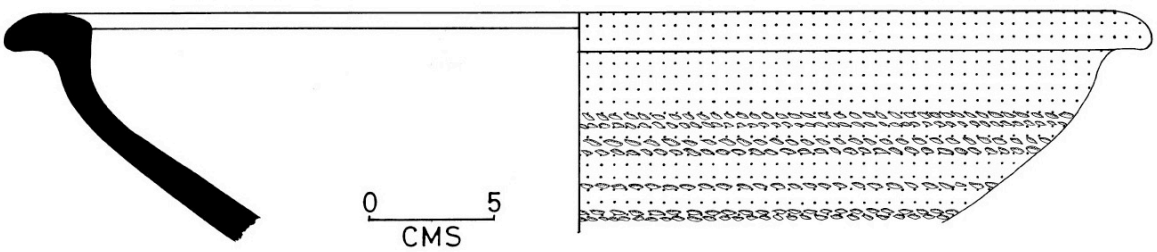
This bowl is generally unslipped at Harappa and Mohenjo Daro, but is occasionally found with a simple red slip painted on the exterior. Based on a sample of 32 (variety 1, internally projecting rim) and 44 (variety 2, bilaterally projecting rim), at Mohenjo Daro 84% of these bowls were not slipped (Dales and Kenoyer 1986: 174). Among a sample of 24 measurable rim diameters, the average size for variety 1 was 30.42 cm and ranged from 22.0 cm to 40.0 cm. The average external rim diameter for variety 2 was 36.51cm and ranged from 26.0 cm to 50.0 cm (n=51). Both varieties show no clear size groupings (Dales and Kenoyer 1986: 174-177).

A second type of deep open bowl (Figure 4.13) is much larger in size and has distinctive external cord impressions, a wide bilaterally projecting or interior projecting rim (rim type category 6 or 8), and ring, or channel-rim, base (base type category 6). This type is identified as type 37 at Mohenjo Daro (Dales and Kenoyer 1986: 169-172, Figure 102, Table 10-A) and type 44 at Harappa (HARP pottery type reference manual). Single or multiple exterior cord

Figure 4.13: Bowl 37 - *Large Deep Bowl with Cord Impressions: Vessel type 37 (Mohenjo Daro), 44 (Harappa)*
(illustration from Dales and Kenoyer 1986: Figure 102)



Bowl 37 – Pottery from Bagasra
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



impressions located on the rim and shoulder mark the maximum body diameter. The slip covers the interior and extends over the rim to the exterior shoulder, usually ending at the cord impressions. At Mohenjo Daro, the type has four variants, which are distinguished by rim and base type as well as slip (red slip, red slip black bands, or no slip). At Harappa, a vessel variant with a molded lower body and externally projecting rim was documented. At Mohenjo Daro, Harappa, and Bagasra, this form was thrown on a fast wheel in fine to medium sandy reddish-yellow clay with tiny mica and white inclusions. According to typological description, "(c)ord wrapping (was) required to hold the form from sagging during preliminary drying. This procedure appears to have been necessary for large heavy vessels when the body was not formed and held in shape by a deep mold" (Dales and Kenoyer 1986: 169). In this discussion, I will refer to this bowl form as type 37.

Based on a sample size of 5 rims and 12 bases, deep open bowl type 37 (Mohenjo Daro type 37) is very large and range in size from an external rim diameter of 46.0 cm to more than 60.0 cm and a base diameter mean of 13.76 cm, but falling into two size categories (7.8-11cm and 15-20cm) of for type 37 red-slipped variety 1 (Dales and Kenoyer 1986: 170). Variety 2, which is decorated with black bands, is slightly smaller than variety 1, with rim diameters ranging form 40.0 to 51.0cm (n=4). Variety 3, which is slipped in black, shows a maximum rim diameter ranging from 50.0 to 70.0cm (n=8), while variety 4 ranges from 50.0 to 60.0 cm (n=17). The preserved rim proportions are generally very relative to the original circumference, which limits accurate measurements.

The four types of Harappan bowls and dishes just discussed are relatively common at Bagasra and account for 5.44% (n=680) of the total analyzed ceramic assemblage of over 12,500 pottery sherds. Summarized in Table 4.13 below, these bowls and dish types were present during all four phases at Bagasra, however their relative percentage and distribution appears to change through time. The trend in these data is for their abundance to decrease across time, from a maximum of 8.23% (n=371) in Phase II to a minimum of 3.27% (n=54) in Phase IV. This trend is in keeping with the ceramic chronology established for Bagasra by the MS University excavation project directors (Sonawane et al. 2003). However, the data suggest a rather marked decrease in the abundance of these preferred Harappan bowls and dishes between Phase II (8.23%) and Phase III (3.65%). Thus, the percentage (3.27%) of some forms of Harappan bowls and dishes into the final phase may indicate continuity from their use patterns in Phase III. This pattern diverges from the established pottery chronology, which predicts Harappan pottery to be totally absent during Phase IV (Sonawane et al. 2003).

Separate examination of the four Harappan bowl and dish types indicates that bowldish 55 is more common than the other types during Phases I, II and III (2500-1900 BC), which fall within the Integration Era of the Indus Civilization. Bowl 56 is the least common type and is only recovered from Phase III and Phase IV contexts (2200-1700 BC), which span the economic transition between the Integration and Localization Eras.

Figure 4.14: The Percentage of Harappan Bowls and Dishes within the Total Ceramic Assemblage from each Phase at Bagasra

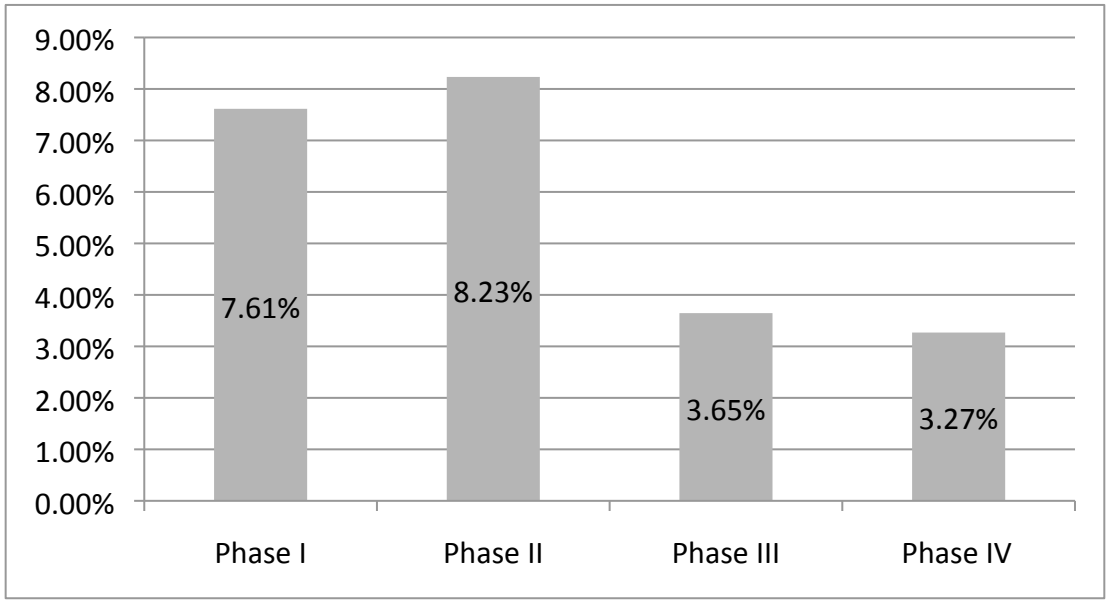
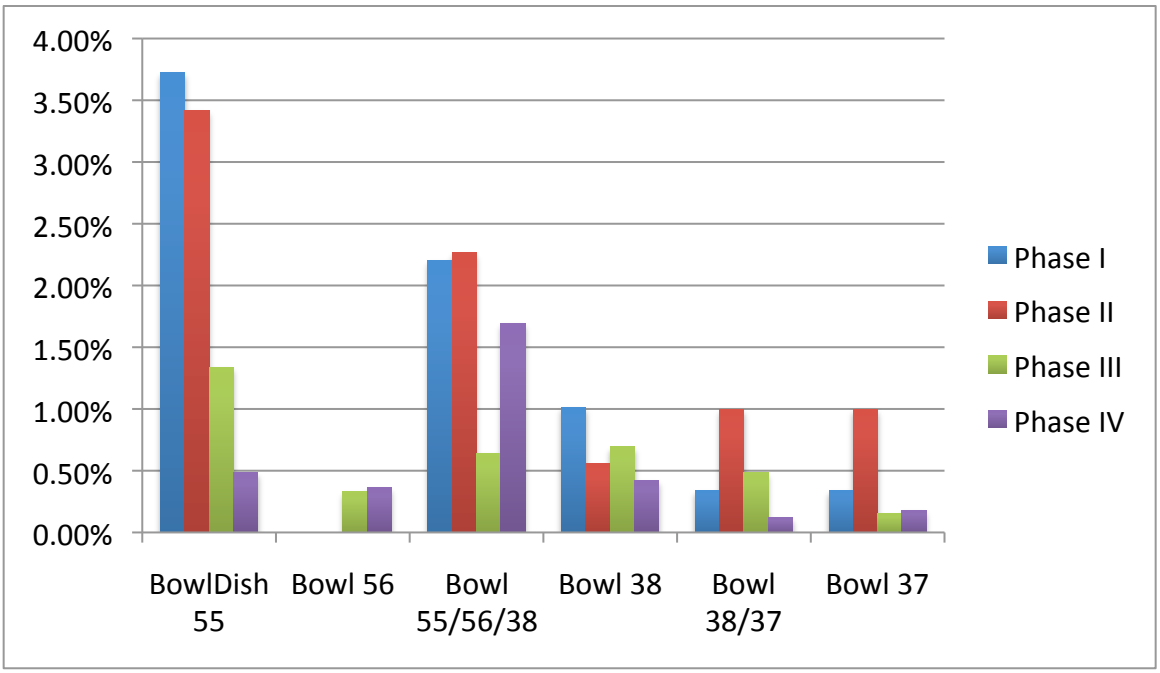


Table 4.13: Total Sample of Four types of Harappan Bowls and Dishes from Bagasra

Phase	BowlDish 55	Bowl 56	Bowl 55/56/38	Bowl 38	Bowl 38/37	Bowl 37	Total Ceramic Count	Harappan BowlDish as a Percentage of Ceramic Total
I	22 (3.72%)	0	13 (2.2%)	6 (1.02%)	2 0.34%)	2 (0.34%)	591	45 (7.61%)
II	154 (3.42%)	0	102 (2.26%)	25 (0.55%)	45 (1.0%)	45 (1.0%)	4506	371 (8.23%)
III	77 (1.34%)	19 (0.33%)	37 (0.64%)	40 (0.69%)	28 (0.49%)	9 (0.16%)	5760	210 (3.65%)
IV	8 (0.48%)	6	28 (1.69%)	7 (0.42%)	2 (0.12%)	3 (0.18%)	1652	54 (3.27%)
TOTALS	**261 (2.09%)**	**25 (0.2%)**	**180 (1.44%)**	**78 (0.62%)**	**77 (0.62%)**	**59 (0.47%)**	**12509**	**680 (5.44%)**

Figure 4.15: Percentage of Four Types of Harappan Bowls and Dishes within the Total Ceramic Assemblage from each Phase at Bagasra



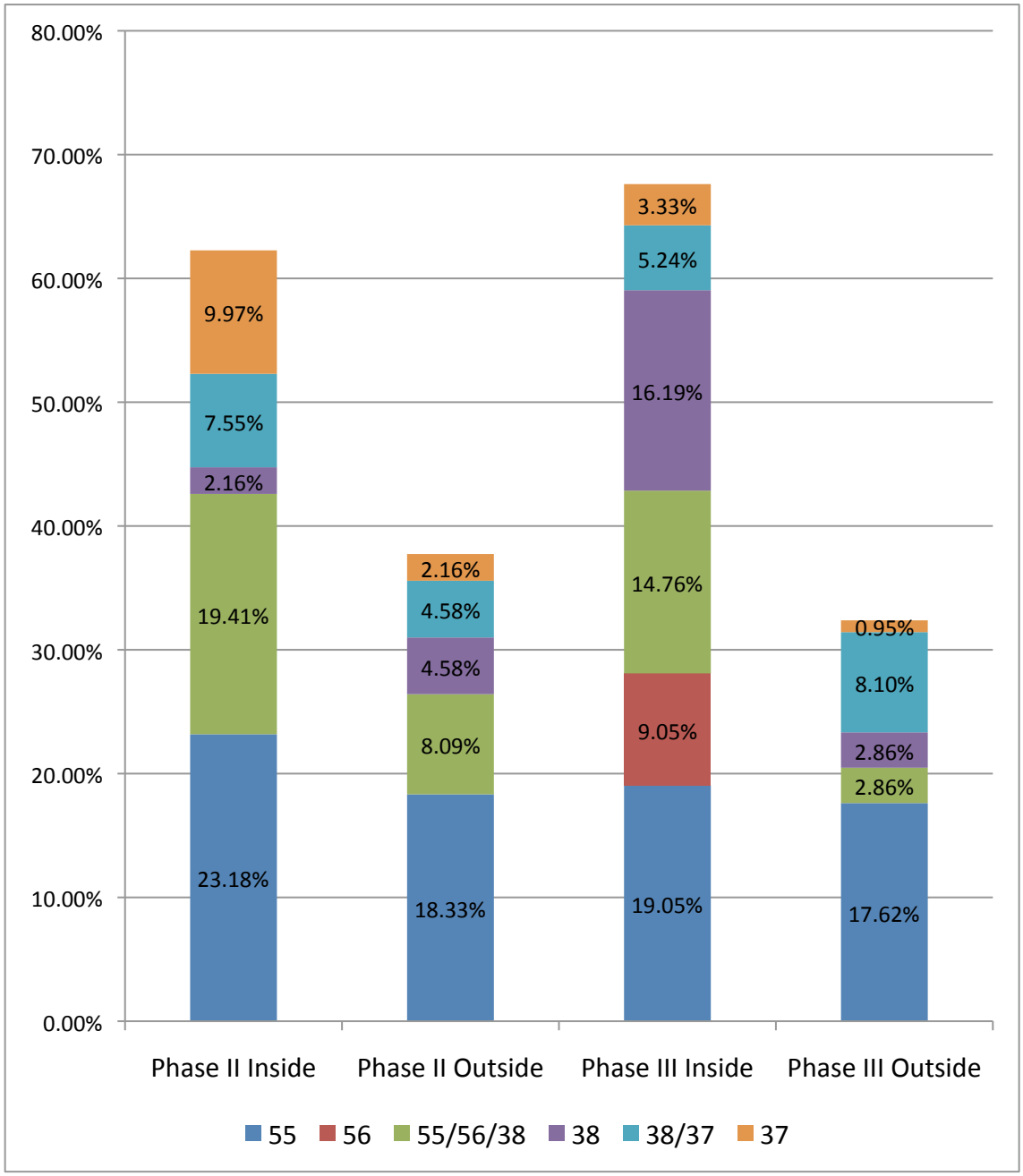
Analyses of the count (Table 4.14) and relative percentage (Figure 4.16) of these four types of Harappan bowls and dishes in locations on both sides of Bagasra's perimeter wall indicate a pattern of greater percentage inside the perimeter wall. Of the total Phase II findings (n=371), 62.26% (n=231) came from locations inside the wall compared to 37.74% (n=140) outside the wall. Of the total Phase III findings (n=210), 37.62% (n=142) came from locations inside the wall compared to 32.38% (n=68) outside the wall.

Table 4.14: Count of Four Types of Harappan Bowls and Dishes Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Harappan Bowls and Dishes
Phase II	55	86	68	154
	56	0	0	0
	55/56/38	72	30	102
	38	8	17	25
	38/37	28	17	45
	37	37	8	45
Phase II Total		231	140	371
Phase III	55	40	37	77
	56	19	0	19
	55/56/38	31	6	37
	38	34	6	40
	38/37	11	17	28
	37	7	2	9
Phase III Total		142	68	210

Examinations of the patterns of individual vessel types on either side of the perimeter wall suggest that bowldish 55, bowl 38 and bowl 37 were each found distributed across the site and are found both inside and outside the wall. Bowl 56 is the only vessel that appears to occur in a limited context inside the perimeter wall during Phase III. Otherwise, these findings indicate that the preferred types of Harappan serving vessels were relatively equivalent and common on both sides of the Phase II wall; a pattern which continues during Phase III. While it appears that residents on both sides of the wall utilized these vessel forms, these data preliminarily demonstrate that those primarily residing inside the wall used these vessel types in greater percentage.

Figure 4.16: Percentage of Four Types of Harappan Bowls and Dishes Inside and Outside the Perimeter Wall at Bagasra



Additional analysis of distribution of these four types of Harappan bowls and dishes in different types of contexts (Table 4.15) demonstrates that they were recovered in a range of deposits: craft production, habitation, structural and other. This type of spatial analysis further adds to our understanding of the distribution of Harappan bowls and dishes. During Phase II these data point to a greater percentage of Harappan bowls and dishes in craft context inside the perimeter wall (n=170 or 45.82% of the Phase II assemblage of these four vessel types, n=371). The second highest Phase II abundance is in habitation areas outside the perimeter wall, where 22.37% (n=83) occur. The remainder of the Phase II findings were found in habitation, structural, and other contexts on both sides of the wall. During Phase III these findings (n=210) indicate that the greatest percentage of Harappan bowls and dishes continued to occur in craft contexts located inside the wall where 44.76% (n=94) of the Phase III assemblage of these four vessel types occurred. The second highest percentage of vessels was located in habitation areas outside the wall where 24.29% (n=51) of the assemblage is documented. Moreover, in 20.48% (n=43) occurred in habitation areas inside the wall. The remainder of the Phase III findings were documented in low quantities in structural and other contexts on both sides of the perimeter wall.

Table 4.15: Counts of Four Types of Harappan Bowls and Dishes by Phase and Context Type

Phase	Location	Vessel Type	Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
I		55	0	2	12	4	4	22
		56	0	0	0	0	0	0
		55/56/38	0	0	9	4	0	13
		38	0	0	2	3	1	6
		38/37	0	2	0	0	0	2
		37	0	1	0	1	0	2
		Total Pottery	0	157	205	167	62	591
II	Inside	55	65	8	4	9	0	86
		56	0	0	0	0	0	0
		55/56/38	66	4	1	1	0	72
		38	2	2	1	3	0	8
		38/37	20	5	1	2	0	28
		37	17	1	7	12	0	37
		Total Pottery	1355	547	180	439	0	2521
II	Outside	55	1	47	0	20	0	68
		56	0	0	0	0	0	0
		55/56/38	9	13	0	5	3	30
		38	1	10	0	5	1	17
		38/37	0	10	0	7	0	17
		37	0	3	0	5	0	8
		Total Pottery	187	927	0	764	107	1985
III	Inside	55	13	25	0	0	2	40
		56	19	0	0	0	0	19
		55/56/38	28	1	0	0	2	31
		38	22	10	0	0	2	34
		38/37	4	7	0	0	0	11
		37	8	1	0	0	0	7
		Total Pottery	2527	1209	0	0	86	3822

Phase	Location	Vessel Type	Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
III	Outside	55	0	28	0	7	2	37
		56	0	0	0	0	0	0
		55/56/38	0	4	0	1	1	6
		38	0	2	0	4	0	6
		38/37	0	16	0	0	1	17
		37	0	1	0	1	0	2
		Total Pottery	0	1568	0	328	42	1938
IV		55	0	1	0	7	0	8
		56	0	6	0	0	0	6
		55/56/38	0	27	0	1	0	28
		38	0	7	0	0	0	7
		38/37	0	0	0	2	0	2
		37	0	0	0	3	0	3
		Total Pottery	0	1154	0	498	0	1652
Totals		55	79	111	16	47	8	261
		56	19	6	0	0	0	25
		55/56/38	103	49	10	12	6	180
		38	25	31	3	15	4	78
		38/37	24	40	1	11	1	77
		37	25	7	7	22	0	59
		Total Pottery	4069	5562	385	2196	297	12509

The spatial and chronological findings for preferred Harappan bowls and dishes suggest four patterns: 1) These vessel forms were found during the entire occupation history of Bagasra, 2) they appear to be most popular during Phase II (8.23%) and decrease significantly by Phase III (3.65%), 3) During Phase II and III, Harappan bowls and dishes are found inside and

outside the perimeter wall, but are much more abundant inside the wall, and 4) there is continuity in relative abundance from Phase III (3.65%) to Phase IV (3.27%).

3b. Bowl with Straight Flared Sides
Vessel types 36 (Mohenjo Daro), 42 (Harappa)

Figure 4.17: Straight-Sided Bowl with Broad Flat Base
(illustration from Dales and Kenoyer 1986: Figure 102)

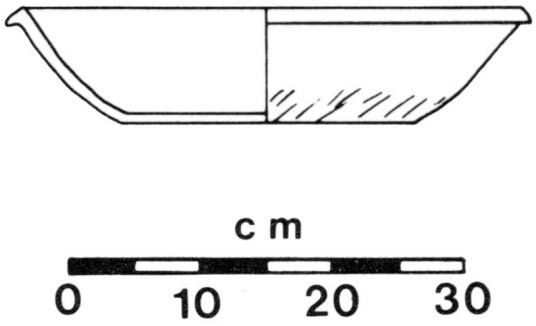


Figure 4.17 illustrates a medium bowl with straight flared sides that is defined in the Harappan typology (Dales and Kenoyer 1986: 166-168); it is assigned as type 36 at Mohenjo Daro (Dales and Kenoyer 1986: Figure 102, Table 10-A) and type 42 at Harappa (HARP pottery type reference manual). This undecorated dish was wheel made with a broad, flat, contiguous base (base type 2A) and an externally projecting rim (rim type categories 2 and 3). At Bagasra, rim type 3B2b is the common rim form. There are two variants: one with an angular lower body carination that is scraped and a second variety with straight sides. Based on the research conducted for this dissertation, the first variety is documented at Bagasra, and the second

appears to be absent. At Mohenjo Daro this bowl was made from a medium to coarse sandy reddish, reddish-yellow, or reddish-brown clay that had tiny mica and medium white inclusions. At Bagasra, this bowl is made from a fine sandy to medium sandy red and yellow brown clay. The measurements of known examples from Mohenjo Daro show a mean ratio of internal height to internal body diameter at 1:3.52cm for variety 1 and 1:3.64 for variety 2, which establishes this vessel type as a bowl. Because of the close similarity in the two varieties, combined measurements indicate that this bowl with flared sides had a mean external rim diameter of 40.5cm, an internal body diameter of 35.88cm, an internal height of 9.95cm and a base diameter of 21.75cm. In comparison, the examples of this bowl form at Bagasra show an average rim diameter of 35.0cm (Table 4.16).

The comprehensive ceramic analyses undertaken for this dissertation documented only 23 potsherds (Table 4.17) representing the bowl with flared sides and low carination identified as type 36, variety 1 in the Harappan pottery typology at Mohenjo Daro (7 of these are uncertain). Based on these data, it appears that this vessel form was present at Bagasra during Phase II and Phase III, and was not a component of Phase I and Phase IV ceramic assemblages. Furthermore, while the sample size is extremely small, these data indicate that these distinctive bowls were recovered in contexts located on both sides of the perimeter wall and in habitation and craft production deposits. Of the sample summarized in Table 4.17, all those found inside the Phase II perimeter wall were recovered in craft contexts. The Phase II sample outside the wall comes from habitation and structural contexts. During Phase III, all pottery sherds of this bowl type were found inside the wall, in both craft and habitation areas.

Table 4.16: Bowl with Flared Sides - External Rim Diameter

Rim
n = 13
Mean = 35cm
Median = 34cm
Max. = 40cm
Min. = 30cm

Artifact Number	External Rim Diameter (cm)
26-4	31-36
27-1	32
27-3	32
27-4	37
MSU Drawn-527	30-32
72-19	31-37
122-1	40
Lot56	32
30-17	34
41-33	35-40
41-34	35-39
Lot214	39
Lot222	36

Table 4.17: Phase-by-Phase Count and Percentage of Bowls with Flared Sides at Bagasra Compared to Total Ceramics

Phase	Count	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	0	591
Phase II (2450-2200 BC)	19 (0.42%)	4506
Phase III (2200-1900 BC)	4 (0.07%)	5760
Phase IV (1900-1700 BC)	0	1652
Totals	23	12509

Table 4.18: Count of Bowls with Flared Sides Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Bowls with Flared Sides
Phase II	Bowl 36	7	7	14
	Possible Bowl 36	1	4	5
Phase II Total		2521	1985	
Phase III	Bowl 36	2	0	2
	Possible Bowl 36	2	0	2
Phase III Total		3822	1938	

3c. Hand Formed Dish with a Broad Flat Base
Vessel types 55 (Mohenjo Daro), 60 (Harappa)

Figure 4.18: Hand Formed Dish with a Broad Flat Base
(Illustration from Dales and Kenoyer 1986: Figure 102)

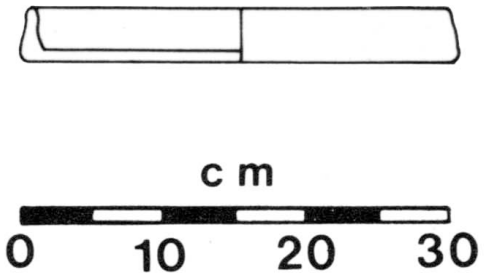


Figure 4.18 illustrates a hand formed straight-sided dish that is defined in the Harappan typology. It is designated type 55 at Mohenjo Daro (Dales and Kenoyer 1986: 209, Figure 102, Table 10-A) and 60 Harappa (HARP pottery type reference manual). This undecorated dish is

crudely made from either fine or coarse fabric. It has thick walls and an irregular shape. The base is broad and flat (base type category 2) and the rim is a simple and straight, but often irregular (rim type category 1). At Mohenjo Daro it was made from a medium to very coarse sandy yellowish-red clay that had tiny mica and large white and other inclusions. The measurements of known examples from Mohenjo Daro are irregular, but the mean ratio of internal height to internal body diameter at 1:10.08cm establishes it as a dish form. External rim diameters of the Mohenjo Daro sample range from 7.0 – to 60.0cm, with a majority clustering between 25.0 and 35.0cm and the external height ranges from 2.9cm to 5.6cm. In Bagasra sample (Table 4.20), rim diameters average 33.3cm and the height averages 3.77cm. Thus, the dimension of the Bagasra and Mohenjo Daro samples are similar. A similar style of wheel-made dish has been documented in the Harappan pottery typology, and is identified from assemblages at Mohenjo Daro (type 54, Dales and Kenoyer 1986: 208, Figure 102, Table 10-A) and Harappa (type 59). A wheel-made dish form was not documented in the Bagasra assemblage analyzed for this study.

Table 4.19: Handmade Dish - External Rim Diameter

Rim	**Height**
n = 3	n = 3
Mean = 33.33 cm	Mean = 3.77 cm
Median = 32.0 cm	Median = 3.8 cm
Max. = 37 ± 3.0 cm	Max. = 4.0 cm
Min. = 31.0 cm	Min. = 3.5 cm

Artifact Number	External Rim Diameter (cm)	External Base Diameter	External Height
19-1	37 ± 3.0		3.8
19.0	32		4.0
MSU Drawn-526	31.0	29.0	3.5

The comprehensive ceramic analyses undertaken for this dissertation documented only 5 potsherds (Table 4.20) representing this type of handmade dish. Based on these data, it appears that this vessel form was present at Bagasra only during Phase II, and was not a component of ceramic assemblages during the other phases of Bagasra's occupation. Furthermore, while the sample size is extremely small, these data indicate that this distinctive dish type was recovered primarily from craft contexts located inside of the perimeter wall. In fact, the 4 out of the 5 potsherds were recovered from the same trench (Ea12), where Bagasra's shell workshop is exposed. This association suggests the possibility that this hand formed vessel was associated with marine shell manufacturing, rather than food preparation or consumption.

Table 4.20: Phase-by-Phase Count and Percentage of Handmade Dishes at Bagasra Compared to Total Ceramics

Phase	Count	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	0	591
Phase II (2450-2200 BC)	5 (0.11%)	4506
Phase III (2200-1900 BC)	0	5760
Phase IV (1900-1700 BC)	0	1652
Totals	5	12509

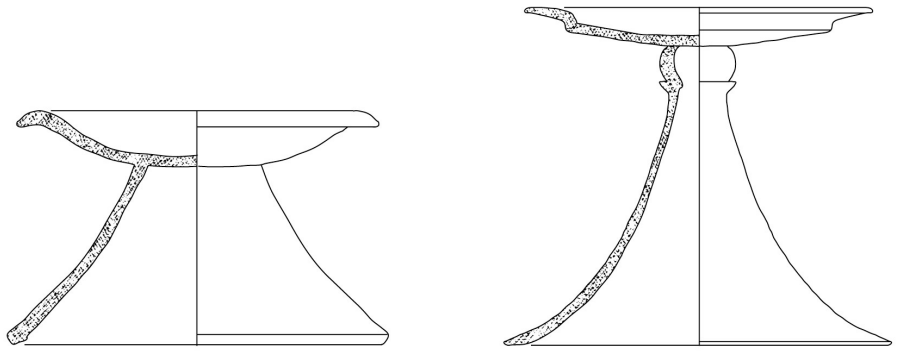
Table 4.21: Count of Bowls with Flared Sides Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Handmade Dishes
Phase II	Handmade Dish	4	0	4
	Possible Handmade Dish	0	1	5
Phase II Total		2521	1985	
Phase III	Handmade Dish	0	0	0
	Possible Handmade Dish	0	0	0
Phase III Total		3822	1938	

4. Other Harappan Vessels

4a. Bowl or Dish-on-Stand: Hollow Pedestal Bowl and Dish Forms
Vessel type 57, 58 (Mohenjo Daro), 85, 86 (Harappa)

Figure 4.19: Hollow Pedestalled Bowl and Dish



Harappan Pedestalled Dish (MD 57, H 86) Harappan Pedestalled Dish (MD 58, H 85)
(Redrawn from Dales and Kenoyer 1986)

Hollow pedestalled vessels are another diagnostic ceramic class found at sites of the Indus Civilization, where they are most commonly referred to as “dish-on-stand,” or “bowl-on-stand,” but are occasionally ascribed the functional terms “offering stand” or “food stand” (Dales and Kenoyer 1986: 212, Kenoyer 1998: 154). A comparison of hollow pedestalled vessels from Mohenjo Daro (Dales and Kenoyer 1986) and Harappa (HARP pottery type reference manual) shows variation in the types used at these two sites. At Harappa, seven types of hollow pedestalled vessels are reported: two jars (types 79, 80), one jarpot (type 82), one pot (type 83), one bowl (type 84), one bowldish (type 86) and one dish form (type 85). Pedestalled jars and pots are not documented at Mohenjo Daro, but a range of bowl and dish forms are reported (types 59, 60, 61), including two forms (types 57, 58) that are identical in formal appearance to types from Harappa. These two types of bowl and dish-on-stands (Figure 4.19), are also the only Harappan type hollow pedestalled vessels documented Bagasra. The remainder of this section refers to these shared forms and excludes other types of pedestalled bowls and dishes, such as regional forms reported from sites such as Rangpur (1963) and Rodji (Possehl and Raval 1989).

The function of hollow pedestalled bowl and dish forms is inferred by their design, which is described in the Harappan pottery typology (Dales and Kenoyer 1986: 212-221). Depicted in Figure 4.19, these vessels consist of a medium-sized bowl or dish form fixed on top of a hollow columnar base (base type categories 7 and 8), which can either be tall and narrow or squat. (These hollow base forms differ from solid pedestalled base types 7G. Non-contiguous narrow bases (base type category 5) are also occasionally referred to as pedestalled bases. In

order to avoid confusing terminology, I use the term hollow pedestalled base to refer to the base form found on bowl and dish-on-stands.) A columnar base elevates food or other items placed in the bowl or dish above the surface level. For this reason, and because they are common in habitation deposits, it is likely that pedestalled vessels were used for serving food to one's family and guests or for presenting ritual offerings (Kenoyer 1998). At Harappa (Jenkins 2000, 2005, Kenoyer 1998, Wheeler 1947), Farmana (Uesugi 2011), and Lothal (Rao 1979) bowl and dish-on-stands and other pedestalled types have also been found in burial contexts alongside other Harappan pottery types, suggesting their importance as items of personal value in the afterlife.

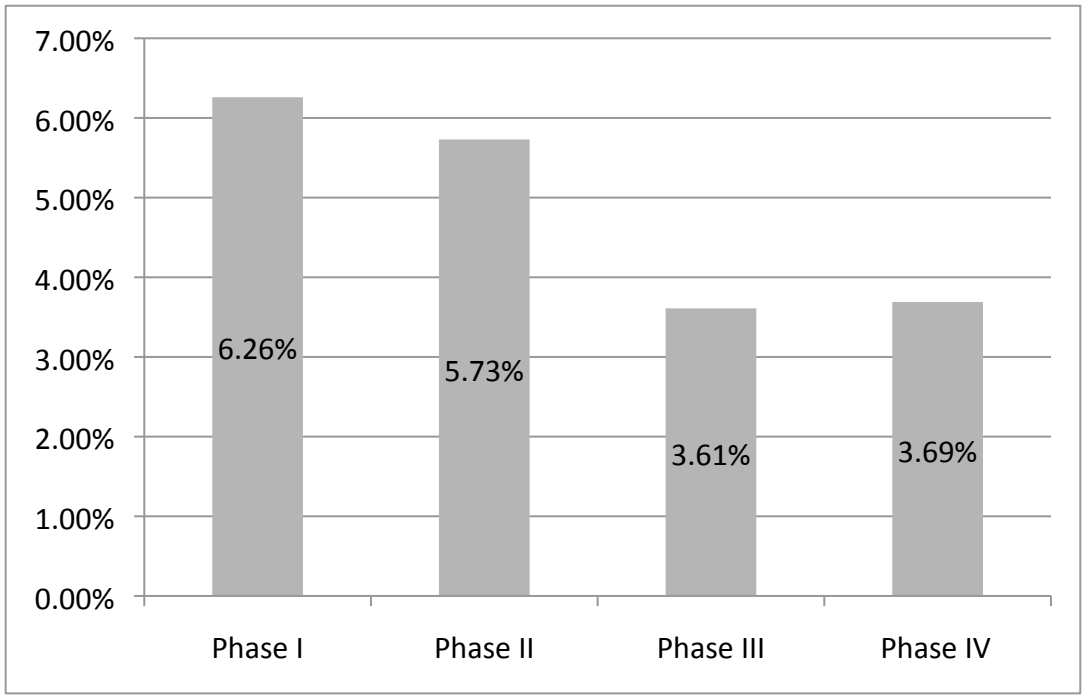
Several features distinguish hollow pedestalled bowl and dish potsherds from other types of broken Harappan pottery. First, the manufacture of pedestalled vessels in two parts resulted in distinctive visible characteristics. The bowl/dish and columnar base were thrown separately on a fast wheel and joined prior to firing (Dales and Kenoyer 1986: 212). This process leaves traces of scoring preserved on the bottom exterior of the upper bowl/dish form where the base was attached. Hollow pedestalled bases, which are themselves distinct in profile from body sherds, are further distinguishable from similarly shaped vessel rims by their scraped interior. The column may also show pronounced interior wheel marks and evidence of twisting during manufacture (Dales and Kenoyer 1986: 216). Distinctive decorative styles are also drawn upon to identify hollow pedestalled vessel potsherds within a larger assemblage. Discussed in detail below, certain decorative features, such as the impressed circle design, can specifically identify the type of hollow pedestalled vessel represented in the typology.

However, Harappan hollow pedestalled forms also come in simply slipped styles as well as those painted with black bands, elaborate floral and geometric design motifs, which are also typical of other Harappan vessels. Unique regional styles of pedestalled vessels, which are reported from sites in Gujarat and documented at Bagasra (Sonawane et al. 2003), differ from Harappan types in several key features related to body profile and decoration. These forms are illustrated in the Rangpur (Rao 1963) and Rojdi (Possehl and Raval 1989) excavation reports, among others. In sum, hollow pedestalled bowls and dishes display many unique features, which facilitate their identification out of a diverse ceramic assemblage. Additional features are shared between various pedestalled vessels, including Harappan and non-Harappan styles, as well as with other vessel forms. Therefore, in the absence of diagnostic features, pedestalled vessels, as a group or individual types, may be underrepresented within an assemblage.

Among the most distinctive Harappan decorative styles is a uniquely impressed pedestalled dish form, identified as type 58 at Mohenjo Daro (Dales and Kenoyer 1986: 215-217, Figure 102, Table 10-A) and type 85 at Harappa (HARP pottery type reference manual). This type features a flaring hollow pedestal base (base type category 8) supporting a tall narrow column, with or without a bulb, and a simple shallow dish with a distinctive ledge. A series of circular impressed designs may appear in the center interior of the dish and are unslipped, while the remainder of the vessel is covered with a highly polished red slip. Another distinctive pedestalled bowl/dish, identified at Mohenjo Daro as type 57 (Dales and Kenoyer 1986: 212-215, Figure 102, Table 10-A) and type 86 at Harappa (HARP pottery type reference manual), features a wide and short, or squat, pedestal base supporting a shallow bowl or dish. This type

is commonly decorated with a red slip and painted black bands on the interior of the bowl/dish as well as on the column and base rim. Complex painted decorations and impressed designs are also documented (Dales and Kenoyer 1986: 212-213). At Mohenjo Daro, type 57 is reported in medium to coarse sandy fabrics with mica and tiny to large white inclusions, while type 58 tended to be made from finer fabric with tiny mica inclusions.

Figure 4.20: Percentage of Hollow Pedestalled Bowls and Dishes within the Total Ceramic Assemblage from each Phase at Bagasra



Hollow pedestalled bowls and dishes are relatively common at Bagasra (Figure 4.20). Summarized in Table 4.23, the Bagasra assemblage of pedestalled vessels consists of 564 potsherds, or 4.51% of the total ceramic sample (over 12,500 potsherds), from all four phases of occupation. The trend in these data is for the abundance of pedestalled vessels to decrease

across time, from a maximum of 6.26% (n=37) during Phase I to a minimum of 3.61% (n=208) during Phase III and 3.69% (n=61) during Phase IV. Instead of pointing to a decline in the use of hollow pedestalled bowls and dishes, the relatively high proportion of this vessel class during each phase suggests continuity in use across time.

At Bagasra, both Harappan style and local, or non-Harappan, style hollow pedestalled vessel types have been reported (Sonawane et al. 2003), but not studied in detail prior to this analysis. Represented in these Bagasra findings are Harappan pedestalled bowl and dish, described above, as well as potsherds that are not specifically classifiable. Harappan pedestalled types account for 28.15% (Table 4.23) of the documented assemblage of hollow pedestalled bowls and dishes at Bagasra. Rim and body sherds from Harappan types retain the most diagnostic features, which are described above. The remaining 71.81% (Table 4.23) of hollow pedestalled rim, body and base sherds did not have features that clearly distinguish them as Harappan types. Pedestalled base sherds (base category 8) generally lack distinctive features that facilitate type identification. Base types are also shared between Harappan and local pedestalled vessel styles, which further complicates accurate type identification. For this reason, the majority of the pottery sherds classified as “other/non-diagnostic” are base sherds (Table 4.22, Figure 4.21). Thus, the assemblage of “other” pedestalled vessels likely includes non-Harappan pedestalled vessel types as well as undiagnostic body and base sherds from Harappan pedestalled types. As a consequence, is that possible that Harappan pedestalled bowls and dishes are underrepresented in these analyses. Additional metric and stylistic

evaluation, which references complete or reconstructable vessels, would help to establish the similarities and differences in Harappan and non-Harappan pedestalled vessels.

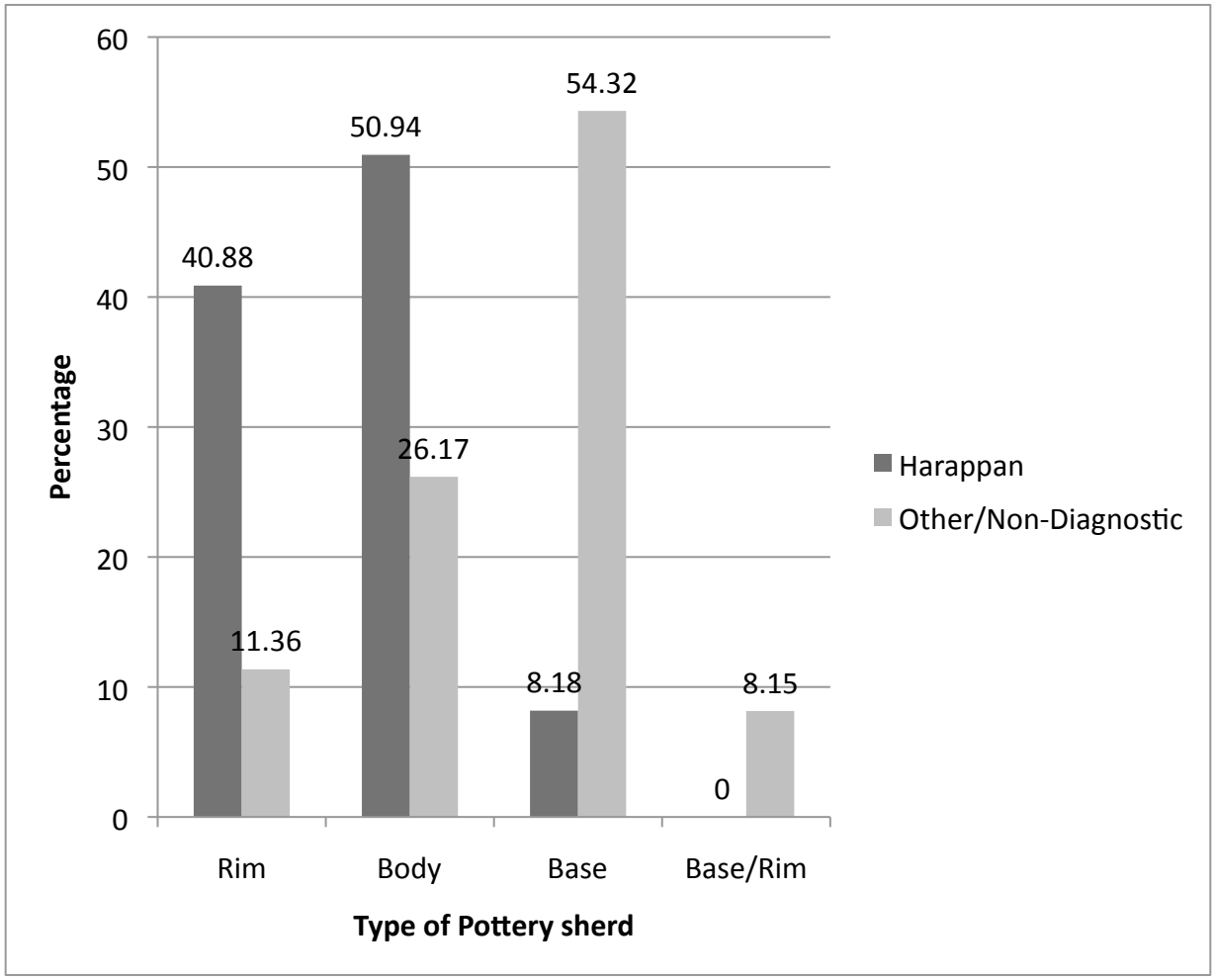
Table 4.22: Count of Hollow Pedestalled Vessel Rim, Base, and Body Sherds at Bagasra

	Rim	Body	Base	Base/Rim	Total
Harappan	65	81	13	0	159
Other/Non-Diagnostic	46	106	220	33	405
Total	111	187	233	33	564

Table 4.23: Total Sample of Pedestalled Bowls and Dishes from Bagasra

Phase	**Harappan Pedestalled Bowl and Dish**	**Pedestalled Bowls and Dishes (Other Types or Non-Diagnostic)**	**Total Pedestalled Vessel Count**	**Total Ceramic Count**	**Pedestalled Vessels as a Percentage of Ceramic Total**
I	13 (35.14%)	24 (64.86%)	37	591	6.26%
II	91 (35.27%)	167 (64.73%)	258	4506	5.73%
III	50 (24.04%)	158 (75.96%)	208	5760	3.61%
IV	5 (8.2%)	56 (91.2%)	61	1652	3.69%
TOTALS	159 (28.19%)	405 (71.81%)	564	12509	4.51%

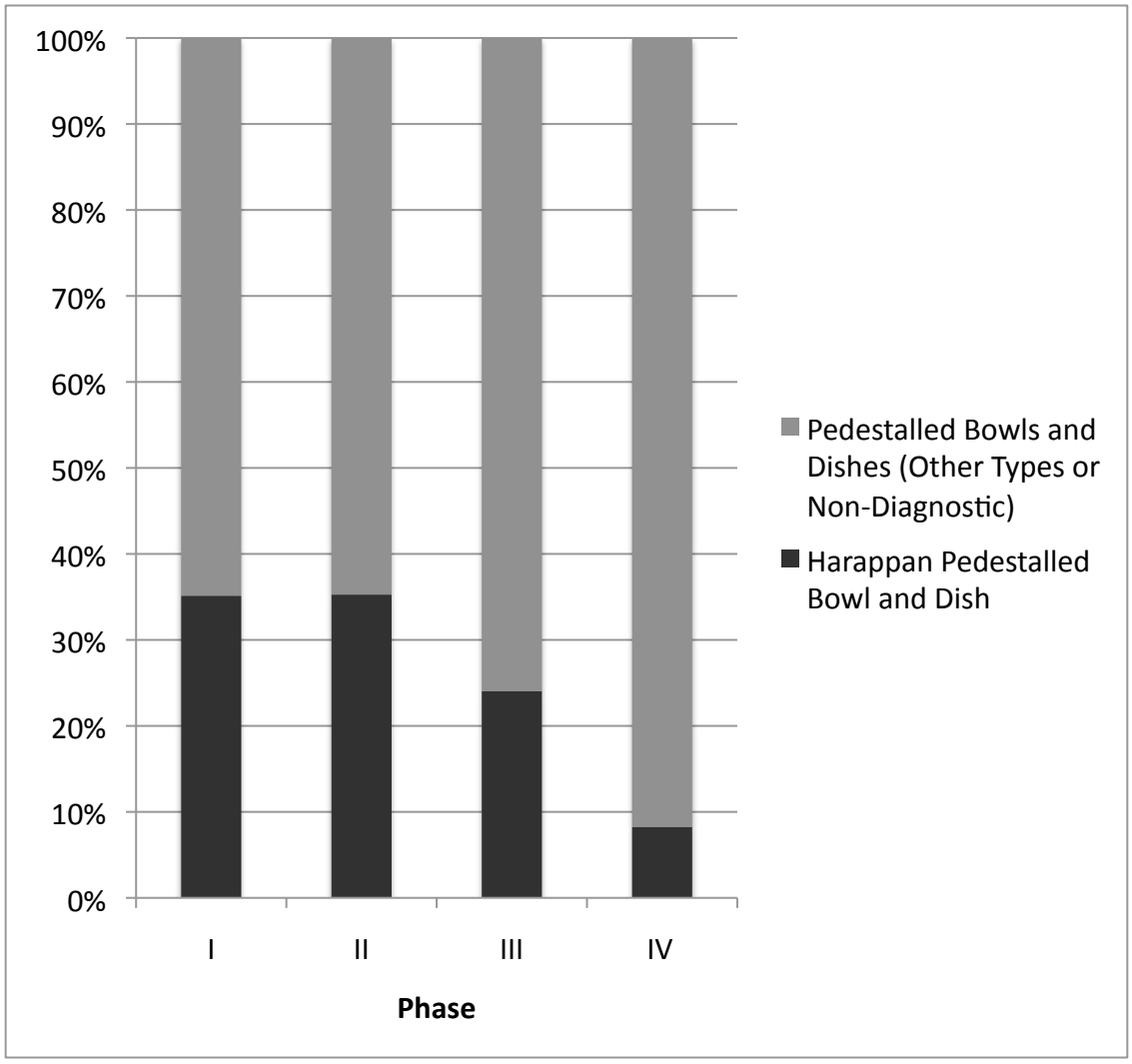
Figure 4.21: Percentage of Hollow Pedestalled Vessel Rim, Base, and Body Sherds at Bagasra



Labeled "Harappan pedestalled bowl and dish" in Table 4.23, several hollow pedestalled vessel types, which I documented at Bagasra, are identical in body form and surface decoration to the popularly termed "dish-on-stands" defined in the Harappan pottery typology (Dales and Kenoyer 1986: 212-217) and described in detail above. Bagasra and Mohenjo Daro samples share several formal features, especially rim types, body profile, and column design, as well as the decorative application of red slip, parallel black bands, and either distinctive black painted

designs or complex impressed decorations in the center of the vessel. The distinctiveness of these features makes Harappan pedestalled vessel potsherds stand out from other pedestalled vessel types and styles at Bagasra.

Figure 4.22: Comparison of the Percentage of Harappan and Other Types/Non-Diagnostic Pedestalled Vessels Across Time at Bagasra



Phase by phase (Table 4.23, Figure 4.22), Harappan hollow pedestalled vessels represent a decreasing percentage of the diagnostic ceramic assemblage at Bagasra, while other/non-diagnostic pedestalled vessels make up the majority of the sample in all four phases and appear to increase in proportion to Harappan pedestalled vessel types over time. These findings are further support for shifts in ceramic preferences over time at Bagasra. However, the presence of both styles of pottery throughout Bagasra's four phase occupation, points towards greater complexity in the data, which warrants additional testing.

An evaluation of the count (Table 4.24) and relative percentage (Figure 4.23) of hollow pedestalled bowls and dishes on either side of the Phase II and Phase III perimeter wall at Bagasra brings forth additional patterns in these data. These spatial data indicate that hollow pedestalled bowls and dishes, as a whole, occur in greater relative percentage inside the perimeter wall during Phase II and Phase III.

Table 4.24: Count of Pedestalled Bowls and Dishes Inside and Outside the Perimeter Wall at Bagasra

Phase	**Pedestalled Bowls and Dishes**	**Inside Perimeter Wall**	**Outside Perimeter Wall**	**Total Number of Pedestalled Bowls and Dishes**
Phase II	Harappan	60	31	91
	Other	95	72	167
Phase II Total		155	103	**258**
Phase III	Harappan	36	14	50
	Other	101	57	158
Phase III Total		137	71	**208**

The percentage of Harappan and other pedestalled bowls and dishes on either side of the Phase II and Phase II perimeter wall is shown in Figure 4.23. During Phase II (2450-2200 BC), 60% (n=155) of the pedestalled vessels were recovered inside the perimeter wall, compared to 40% (n=103) outside the wall. During Phase III (2200-1900 BC), 64% (n=101) of the pedestalled vessels were recovered inside the wall, compared to 36% (n=71) outside the wall. Frequency was calculated as a percentage of the total number of pedestalled bowls and dishes for each phase.

Moreover, the data presented in Figure 4.23 indicates that both Harappan and other/non-diagnostic hollow pedestalled vessels were recovered inside and outside the perimeter wall. While the category of other/non-diagnostic pedestalled vessels likely includes base forms from Harappan hollow pedestalled vessels, this pattern also indicates that identified Harappan types were not just found inside the wall, but were deposited across the site. The distribution of hollow pedestalled vessels is further explored in Table 4.25, which presents data on the number of Harappan and other/non-diagnostic pottery sherds in different types of contexts: craft, habitation, structural, and other.

Figure 4.23: Percentage of Pedestalled Bowls and Dishes Inside and Outside the Perimeter Wall at Bagasra

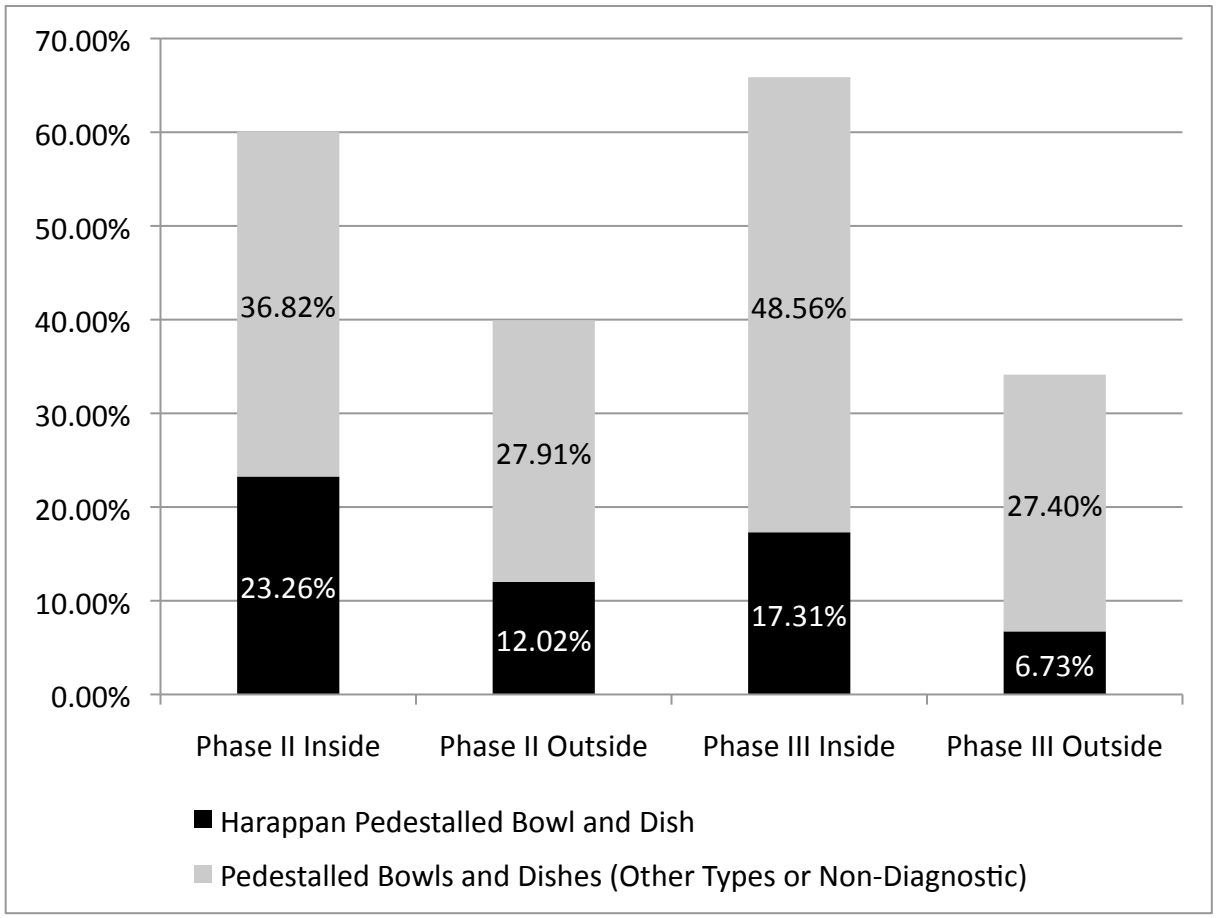
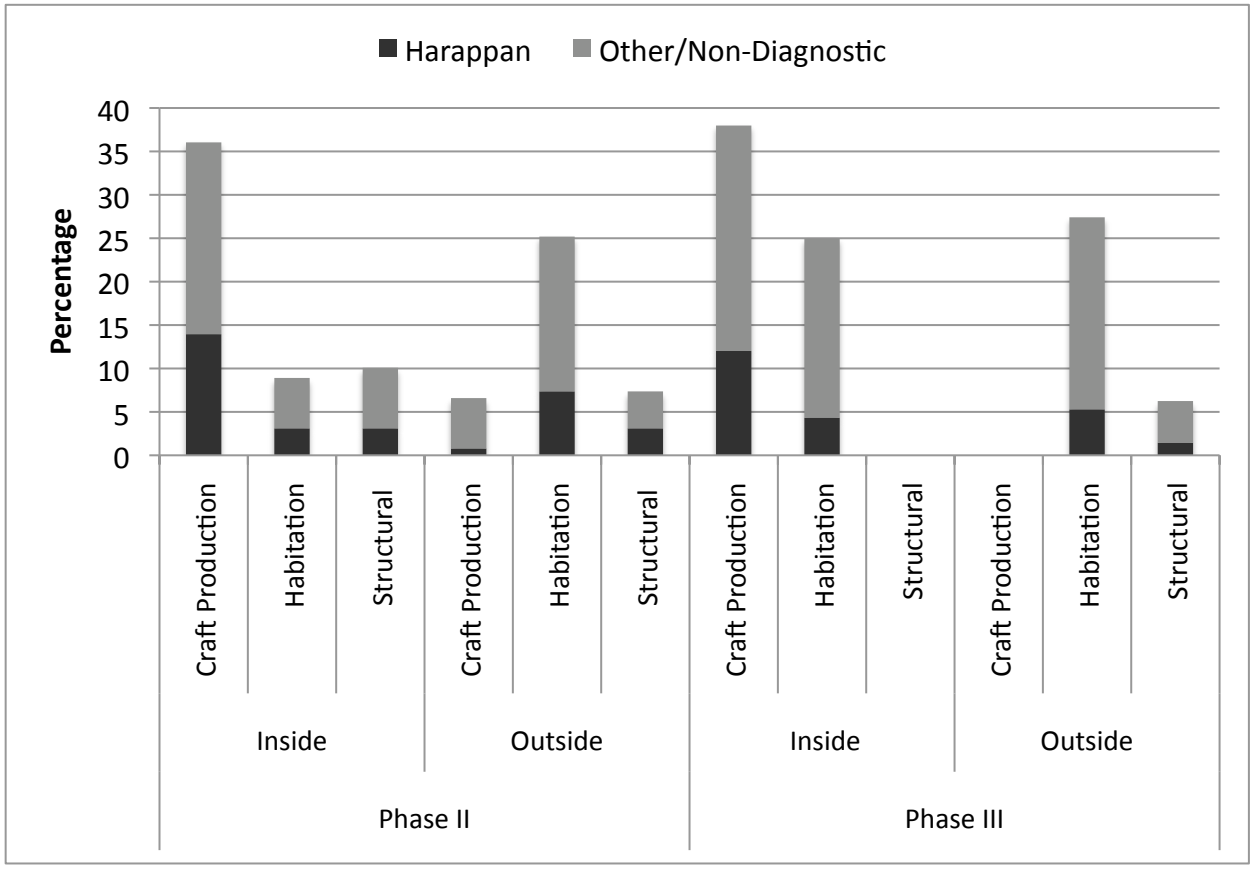


Table 4.25: Counts of Pedestalled Bowls and Dishes by Phase and Context Type

Phase	Location	Pedestalled Vessel	Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
I		Harappan	0	6	1	5	1	13
		Other	0	5	13	3	3	24
		Total Pottery	0	157	205	167	62	591
II	Inside	Harappan	36	8	8	8	0	60
		Other	57	15	5	18	0	95
		Total Pottery	1355	547	180	439	0	2521
	Outside	Harappan	2	19	0	8	2	31
		Other	15	46	0	11	0	72
		Total Pottery	187	927	0	764	107	1985
III	Inside	Harappan	25	9	0	0	2	36
		Other	54	43	0	0	4	101
		Total Pottery	2527	1209	0	0	86	3822
	Outside	Harappan	0	11	0	3	0	14
		Other	0	46	0	10	1	57
		Total Pottery	0	1568	0	328	42	1938
IV		Harappan	0	1	0	4	0	5
		Other	0	43	0	13	0	56
		Total Pottery	0	1154	0	498	0	1652
Totals		Harappan	63	54	9	28	5	159
		Other	126	198	18	55	8	405
		Total Pottery	4069	5562	385	2196	297	12509

The documented assemblage of Harappan and other/non-diagnostic hollow pedestalled bowls and dishes come from diverse depositional contexts on either side of the perimeter wall at Bagasra (Table 4.25). Figure 4.24 below illustrates the main patterns from Table 4.25: the relative percentage of hollow pedestalled vessels in craft production, habitation and structural contexts on either side of the wall. Frequency was calculated as a percentage of the total number of pedestalled bowls and dishes for each phase.

Figure 4.24: Percentage of Pedestalled Bowls and Dishes in Craft Production, Habitation and Structural Contexts Inside and Outside the Perimeter Wall at Bagasra



The findings of this analysis of the spatial distribution of hollow pedestalled bowls and dishes suggest two patterns: 1) During both Phase II and Phase III, pedestalled vessels occur in greatest percentage in craft production contests located inside of the perimeter wall, and 2) habitation deposits outside the wall show the second highest proportion of pedestalled vessels. During Phase II, the relatively high percentage (36.04%, n=93) of pedestalled vessels in craft contexts inside the wall contrasts with their low occurrence in craft areas outside the wall. Outside the Phase II wall, pedestalled vessels also occur in relatively high percentage in habitation areas (25.19%), however habitation areas inside the wall show a relatively low proportion (8.91%) of these vessels. This pattern continues during Phase III, when the data indicate a high relative proportion (37.98%, n=79) of hollow pedestalled vessels in craft contexts inside the wall. However, the data indicate that during Phase III these vessels were abundant in habitation areas across the site, as indicated by their relatively high percentage in habitation contexts inside (25%, n=52) as well as outside (27.41%, n=57) the perimeter wall.

Interestingly, these data suggest a preliminary finding that Harappan types of hollow pedestalled bowl and dish forms were proportionally more abundant than other pedestalled types in craft production contexts located inside the perimeter wall during Phase II. This interpretation requires further testing at neighboring sites because of the potential within this assemblage for the number of Harappan pedestalled types to be underinflated, for the reasons described above.

4b. Miniature Vessels: Jar, Pot, Bowl, Dish, and Pedestalled Forms
Vessel type 22 (Mohenjo Daro), 102, 103 (Harappa)

The category of miniature vessels (Dales and Kenoyer 1986: 120-125) refers to a special class of very small, finely crafted jars, pots, bowls, dishes, pedestalled and other vessels, which appear to be replicas of larger vessel types and are either wheel or hand-made. They are often decorated in a red slip with black bands and black painted decorations. There is great variability in the form, profile, rim/base type and style of these vessels. Since they are replicas of larger forms that I have discussed in this chapter, I will not go into additional detail here.

The comprehensive ceramic analysis undertaken for this dissertation documented only 7 miniature vessels (Table 4.26) including miniature forms of jars, pots, bowls, and pedestalled dishes (also known as dish-on-stands). These vessels come in both plain forms and styles decorated with red slip or red slip and black horizontal bands. Examples from Bagasra were commonly made from a fine-sandy red or yellow brown clay.

Based on these data, it appears that this vessel form was present at Bagasra during Phase 1, Phase II and Phase III, and was not a component of Phase IV ceramic assemblages. Furthermore, while the sample size is extremely small, these data (Table 4.26) indicate that miniature vessels were recovered from contexts inside as well as outside the perimeter wall and from habitation, craft production, and structural deposits.

Table 4.26: Phase-by-Phase Count and Percentage of Miniature Vessels at Bagasra Compared to Total Ceramics

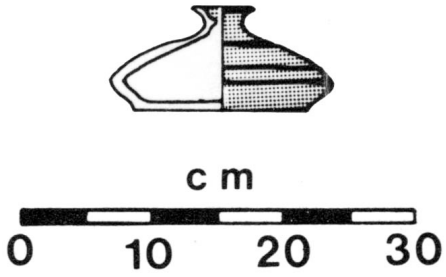
Phase	Count	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	1	591
Phase II (2450-2200 BC)	2	4506
Phase III (2200-1900 BC)	4	5760
Phase IV (1900-1700 BC)	0	1652
Totals	7	12509

Table 4.27: Count of Miniature Vessels Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Miniature Vessels
Phase II	Miniatures	1	1	2
Phase II Total		2521	1985	
Phase III	Miniatures	2	2	4
Phase III Total		3822	1938	

4c. Bottle:
Vessel types 63 (Mohenjo Daro), 91 (Harappa)

Figure 4.25: Small Carinated Bottle
(illustration from Dales and Kenoyer 1986: Figure 102)



There is one type of bottle defined in the Harappan pottery typology (Dales and Kenoyer 1986: 223): bottle type 63 at Mohenjo Daro (Dales and Kenoyer 1986: 223, Figure 102, Table 10-A) and 91 Harappa (HARP pottery type reference manual). This small bottle has a squat shape, a sharply carinated profile, and broad flat base. This carinated bottle was made on a fast-wheel and the base often retains the string-cut impressions. At Mohenjo Daro it was made from a fine sandy reddish-yellow or light red clay and was covered on the exterior with a red slip with horizontal black bands. It has a simple contiguous base (base type categories 2 and 4) and a complex rim with an internal ledge (rim type 7D), which forms a narrow, constricted throat that measures 0.5-1.0cm in diameter. Based a very small sample size from Mohenjo Daro, the external rim diameter ranges from 3.5 to 5.4cm.

Bagasra has a small sample of bottles, the lower bodies of which are not preserved. Thus, it is not possible to conclusively identify whether they were manufactured with a squat

shape, carination and broad flat base like the Harappan bottle type. The 8 of the 9 bottles from Bagasra were made from a fine sandy red or yellow brown clay and one bottle was made from a coarse red ware. Six examples were covered on the exterior with a red slip and one bottle was decorated with red slip and black horizontal bands. Based a very small sample size from Bagasra, the external rim diameter ranges from 3.5 to 7.0cm and the constricted throat measure 0.75 to 1.0cm in diameter. These measurements closely resemble the sample from Mohenjo Daro.

Table 4.28: Rim Diameter of Bottles from Bagasra

External Rim Diameter
n = 6
Mean = 5.12cm
Median = 5.25cm
Max. = 7.0cm
Min. = 3.5cm

Artifact Number	External Rim Diameter (cm)	Throat Diameter (cm)
Lot103		
MSU Drawn-516		
75-5	5.5	1.0
Lot98	6.0	
MSU Drawn-19	5.0	
MSU Drawn-20	7.0	1.0
MSU Drawn-363	3.5	0.75
Lot202		
Lot147	4.0	
Mean	**5.12**	**0.92**

Based on these data, it appears that this vessel form was present at Bagasra during Phase II and Phase III, and was not a component of Phase I and Phase IV ceramic assemblages. Furthermore, while the sample size is extremely small, these data (Table 4.29) indicate that bottles were recovered primarily from contexts inside the perimeter wall, which include habitation and craft production deposits.

Table 4.29: Phase-by-Phase Count and Percentage of Bottles at Bagasra Compared to Total Ceramics

Phase	Count	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	0	591
Phase II (2450-2200 BC)	4 (0.09%)	4506
Phase III (2200-1900 BC)	5 (0.09%)	5760
Phase IV (1900-1700 BC)	0	1652
Totals	9	12509

Table 4.30: Count of Bottles Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Bottles
Phase II	Bottles	2	0	2
	Possible Bottles	2	0	2
Phase II Total		2521	1985	
Phase III	Bottles	4	1	5
	Possible Bottles	0	0	0
Phase III Total		3822	1938	

5. A Note on Red Slipped Vessels with Black Horizontal Bands

The most common decorative motif added to Harappan vessel types, which are defined in the Harappan pottery typology, is the addition of black painted horizontal bands on red slipped vessels. This type of decoration was applied to a range of Harappan vessel types including small, medium and large jars and pots, small and medium bowls and dishes, pedestalled bowls and dishes, and miniature vessels. The red slipped black band motif is also a common component of the regional Sorath tradition in Gujarat (Herman 1989, Possehl and Herman 1990), therefore the design motif alone is not enough to classify a vessel type as Harappan. The data presented here show the combined total of vessels with a red slip and black horizontal bands. These data exclude vessels with black geometric or natural design motifs, which may also include black painted horizontal bands.

The red slip black band decorative motif occurs 14.67% of the total pottery analyzed for this dissertation. Phase-by-phase analyses (Table 4.31) of these data indicate a pattern of steady increase in the relative percentage of this decorative motif among assemblages. From the earliest habitation of Bagasra, red slip black band motifs occurred in 10.83% (n=64) of the total Phase 1 assemblage that was analyzed for this study. There is a slight increase in relative abundance to 11.2% (n=505) in Phase II and 15.5% (n=893) in Phase III. In the final phase of occupation, red slip black band motifs account for 22.64% (n=374) of the analyzed assemblage, which means that between the site's founding and it's final phase the motif doubled in popularity.

Table 4.31: Phase-by-Phase Count and Percentage of Vessels with Red Slip and Black Painted Bands at Bagasra Compared to Total Ceramics

Phase	Count	Percentage	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	64	10.83%	591
Phase II (2450-2200 BC)	505	11.2%	4506
Phase III (2200-1900 BC)	893	15.50%	5760
Phase IV (1900-1700 BC)	374	22.64%	1652
Totals	1836	14.67%	12509

While the above Table 4.31 presents the percentage of red slip black band motifs on all vessel forms, the tables below break down the vessel types into Jars and Pots (Table 4.32) and Bowls and Dishes (Table 4.33). Pottery documented in both tables consists of vessel forms that were not specifically classifiable to type, and are therefore not detailed elsewhere in this chapter. An evaluation of vessel form indicates that red slip black band decoration was more commonly applied to jars and pots at Bagasra, than it was to bowls and dishes. The percentage of red slip black band design motifs has not been reported from other Indus settlements, therefore formal comparison to other sites required further study.

Table 4.32: Phase-by-Phase Count and Percentage of Jars and Pots with Red Slip and Black Painted Bands at Bagasra Compared to Total Ceramics

Phase	Count	Percentage	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	15	1.83%	591
Phase II (2450-2200 BC)	163	3.62%	4506
Phase III (2200-1900 BC)	583	10.12%	5760
Phase IV (1900-1700 BC)	142	8.60%	1652
Totals	903	7.21%	12509

Table 4.33: Phase-by-Phase Count and Percentage of Bowls and Dishes with Red Slip and Black Painted Bands at Bagasra Compared to Total Ceramics

Phase	Count	Percentage	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	8	1.35%	591
Phase II (2450-2200 BC)	52	1.15%	4506
Phase III (2200-1900 BC)	183	3.18%	5760
Phase IV (1900-1700 BC)	144	8.72%	1652
Totals	387	3.09%	12509

The patterns in the data presented in Table 4.32 and Table 4.33 also indicate that the relative percentage of red slip black band decoration increased over time from a minimum of 1.83% (n=15) in Phase I to a maximum of 10.12% (n=583) in Phase III. Phase IV data suggest a decrease in the abundance of red slip black band vessels to 8.6% (n=142), a level of abundance that is higher than those documented for Phase I and Phase II. Overall, the bowls and dishes with the red slip black band motif occur in lower percentage than jars and pots. However, bowl and dish data also indicate an increase in the percentage of this decorative motif over time, with a minimum abundance of 1.15% (n=52) in Phase II and a maximum of 8.72% (n=144) occurring in Phase IV. These data are significant since the pattern in Phase IV pottery data suggests a general decrease in the variety of Harappan vessel types present at Bagasra and a decrease in the abundance of present Harappan types dating to the site's final phase. These data on red slip black horizontal painted motif, a decoration common to both Harappan and non-Harappan vessel types, point to two possible trends: 1) it is possible that over time people at Bagasra developed an increased preference for this particular type of decoration, or 2) their preference for particular types of pottery, which happen to be decorated with red slip and black

bands, increased over time. More detailed analysis of the variety of vessel forms and vessel types present in this assemble may help to distinguish these two patterns.

6. Conclusion

In summary, prior to these analyses, Bagasra excavation reports (Bhan et al. 2004, 2005, Sonawane et al. 2003) indicated that the material culture of this small town incorporated both Harappan and local, or non-Harappan, ceramic styles, but the exact patterning of these ceramic traditions was not well understood. My analyses of Bagasra's pottery assemblage indicate that a restricted set of Harappan vessel types were in use at the site. Among this set, certain vessels, such as the unique Harappan cooking pot and the black slipped jar, appear to have been present only during periods of major craft production. Other Harappan vessel types, such as perforated vessels and specific pedestal bowl and dish forms, show evidence of continuity in use through time. Thus, a phase-by-phase comparison of vessel percentages revealed important continuities and changes in the quantity of specific varieties of pottery used by the Bagasra community across time. Discussed in the Conclusion, changing pottery preferences appear to have been related to key social and economic transitions between Phase II and Phase III (Sonawane et al. 2003), while certain cultural habits, perhaps reflecting local domestic practices, appeared to continue through time.

Two major patterns in the chronological distribution of Harappan pottery types were identified and discussed in this chapter: vessel types that show variable percentage across the site's four occupation phases and those types that show greater evidence of continuity in use

across time. Of the set of vessel types analyzed in this chapter, several appeared in greatest relative percentage from the site's founding (Phase I, 2500-2450 BC) through its major craft production period (Phase II, 2450-1900 BC): the black slipped jar, jars and pots with Harappan black painted designs, hollow pedestalled bowls and dishes, cooking pots, and select types of bowls and dishes. Several of these types appear to decrease significantly in their relative abundance between Phase II and Phase III (1900-1700 BC): the black slipped jar, Harappan black painted designs, and select bowls and dishes. These vessel types continued to be found in Phase III contexts, but in reduced percentages. Several types of extremely rare Harappan vessel types were documented from Phase I through Phase III: tall slender decorated jar, cooking pot, bowl with flared sides, miniature vessels, and bottles. Moreover, based on these findings, three categories of Harappan vessels appear to have been relatively common during all four phases at Bagasra: perforated jars, pedestalled vessels and select bowls and dishes (types 55/38/37). Red slipped black band decorated vessels, though not unique to Harappan types, were present during all four phases and seem to increase in percentage over time.

Most significant among my findings are new spatial data, which show that many of the Harappan pottery types were documented in contexts on both sides of Bagasra's monumental perimeter wall. However, Harappan pottery, as a whole, was recorded in slightly higher percentages inside the wall, where Harappan types were found in relative association with the settlement's main craft manufacturing industries. Those Harappan pottery types documented on both sides of the wall include: the black slipped jar, perforated jar, tall slender decorated jar, cooking pot, jars and pots with black painted designs, hollow pedestalled bowls and dishes, and

select types of Harappan bowls and dishes (types 55, 37, 38 and 42). The findings of several types indicate that they were found in relatively equal proportion on both sides of the wall: cooking pot, bowl 42 and jars and pots with black painted designs. Interestingly, many vessel types were documented in higher percentage inside the wall: perforated jar, tall slender decorated jar, bowls and dishes (types 55/37/38) and hollow pedestalled bowls and dishes. The significance of these patterns will be discussed in the Conclusion.

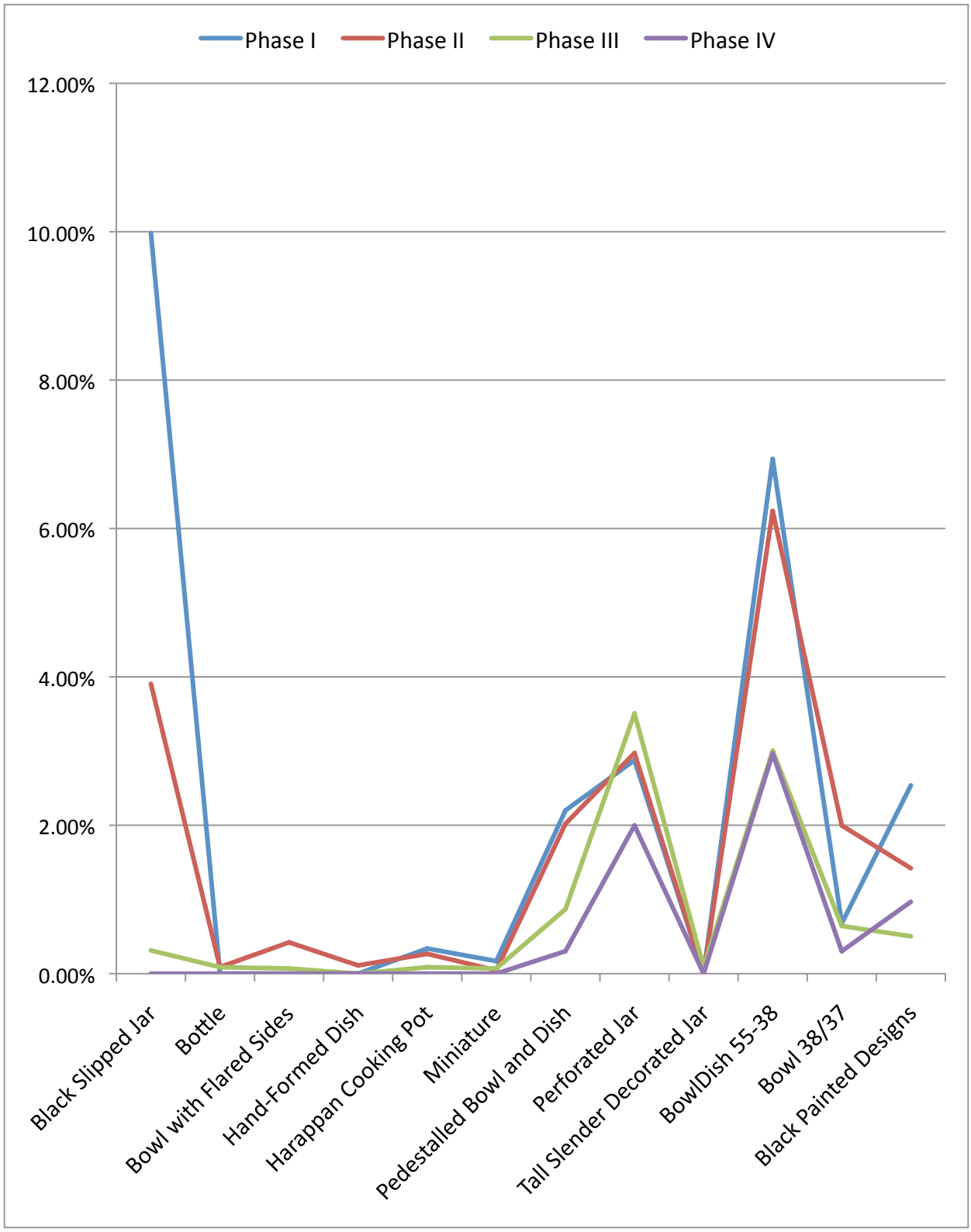
However, the overall quantity and percentage of individual Harappan vessel types is surprisingly low within the Bagasra ceramic assemblage. Most surprising to me are the extremely low quantities of Harappan cooking pots at the site. By necessity, these data and the interpretations I draw from them are therefore preliminary and represent a sample of the Harappan pottery types possibly used by the ancient residents of Bagasra. These data also highlight the efficacy of this approach to analyzing ceramics, which distinguishes patterns between specific types of vessels. In drawing out new pottery data from previously excavated collections this research contributes to the future study of existing archaeological collections. These new data can be used to better understand the roles pottery played in the changing economic and social fabric of ancient Indus settlements.

Table 4.34: Summary of the Relative Percentage of Select Types of Harappan Vessel at Bagasra

	Black Slipped Jar	Bottle	Bowl with Flared Sides	Hand-Formed Dish	Harappan Cooking Pot	Miniature
Phase I	9.98%	0.00%	0.00%	0.00%	0.34%	0.17%
Phase II	3.91%	0.09%	0.42%	0.11%	0.27%	0.04%
Phase III	0.31%	0.09%	0.07%	0.00%	0.09%	0.07%
Phase IV	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

	Pedestalled Bowl and Dish	Perforated Jar	Tall Slender Decorated Jar	BowlDish 55/38	Bowl 38/37	Black Painted Designs
Phase I	2.20%	2.88%	0.00%	6.94%	0.68%	2.54%
Phase II	2.02%	2.97%	0.00%	6.24%	2.00%	1.42%
Phase III	0.87%	3.51%	0.09%	3.00%	0.64%	0.50%
Phase IV	0.30%	2.00%	0.00%	2.97%	0.30%	0.97%

Figure 4.26: Percentage of Select Harappan Vessel Types at Bagasra



Chapter 5: Preferences for Harappan and Non-Harappan Pottery: Cooking Pots and Serving Bowls at Bagasra

1. Introduction

Though the community living at Bagasra was intensively involved in the manufacture of Harappan style prestige ornaments, the pottery data that I presented in previous chapters show that they selectively adopted only specific types of Harappan pottery. These preferred Harappan pottery forms are indicative of their long-distance trade relations and general participation in the broadly shared social and economic institutions of the Indus Civilization. Adding to this picture of Bagasra's pottery preferences, I now turn to examine the extent to which styles of domestic cooking pots and select types of serving vessels were shared between Bagasra and the major urban centers.

This chapter is divided into two sections: cooking pots and serving bowls and dishes. Cooking pots are defined as specialized vessels for boiling or heating food or liquid by bringing the vessel in contact with fire (Linton 1944). A serving vessel is one that was made or used for holding or storing food for short periods of time following cooking or food processing and prior to consumption. Almost any vessel can be used for serving liquid or solid food. For purposes of this dissertation study, the following are considered serving vessels: hollow pedestalled bowls and dishes, stud-handled bowls, fine ware bowls and dishes, squat pots and larger globular pots. This category excludes large storage jars or perforated vessels. In both sections, I examine the chronological and spatial distribution of select Harappan pottery types compared to

regional, or non-Harappan, types. The focal point of this chapter is an investigation of the potential similarities and differences in the types of bowls and dishes used by residents living inside the perimeter wall as compared to those living outside the wall.

This is the first study to present the counts of Harappan cooking pots in Gujarat and to identify the presence of a local cooking pot type at Bagasra. It is also the first study to present a spatial analysis of cooking pot and serving vessel types inside and outside a settlement perimeter wall. The results of these analyses demonstrate that the residents at Bagasra used different types of cooking pots and serving bowls than those who lived at the urban centers of Harappa and Mohenjo Daro located in the Indus Valley. These results also point to variation in the use of certain pottery types by residents inside and outside the wall at Bagasra. By focusing on these new spatial and chronological pottery data, this study specifically aims to contextualize the social practices of selection and use of the Harappan cooking pot, a widespread symbol of Harappan identity, at a single site that lies outside the Indus Valley.

Cooking pots and serving bowls are two specialized vessel forms representative of domestic ideology and communal identity. As indicators of communal food preferences, cooking pots and other cooking wares are important symbols of community affiliation that mark both social and personal identity in ethnographic (Choksi 1995, Miller 1985) and archaeological cultures (Joyner 2007, Kenoyer 1995, Pearce 1999). When constructed from a variety of raw materials, including terracotta, high-fired ceramic, and copper, a hierarchy of cooking wares is established that reflects the socio-economic status of the vessel owner (Kenoyer 1998) and marks significant technological shifts in the domestic economy (Skibo 1994)

of complex societies. The spatial analysis of distinct styles of cooking pots was successful in identifying the presence of an Uruk trading colony within the fourth millennium BC site of Hacinebi (Turkey) (Pearce 1999, Stein 2002b). In another pottery study, the introduction of Frankish cooking pots at the Byzantine city of Corinth (Greece) during the 13th century AD is put forward as material evidence of the cultural impact of Venetian refugees 50 years after the Frankish invasion of the city (Joyner 2007). As these studies demonstrate, analyses of the spatial distribution of distinct styles of cooking pots along with the investigation of their continuity and change through time are powerful tools in reconstructing the negotiation and manipulation of social networks and group identities in state-level societies.

These archaeological cases demonstrate the potential in studies of cooking wares to identify enclaves of foreigners and ethnic diversity within single settlements, or communities. Unlike these examples, however, in Gujarat questions still remain regarding the nature of the expansion of the Indus Civilization into the region. Some scholars have argued that Harappan settlements in Gujarat were themselves colonial trading outposts (Dhavakilar 1995), or were settled by traders and craftspeople who migrated into the region from the southern Indus Valley (Bisht 1989a, Joshi 1972, Possehl and Raval 1989, Possehl 1992a). Since Bagasra was settled after the regional pattern of urban living had been established at sites like Dholavira (Bisht 1989a, 1991), the site does not represent this early phase of Indus expansion. However, these models of early expansion imply that individuals or groups from outside Gujarat may have established and maintained the social, economic and civic infrastructure of Harappan settlements like Bagasra, which were occupied during the Integration Era. Studies of domestic

cooking wares and serving vessels, like this study, provide one set of data that can be used to evaluate these models. As articulated in previous chapters, if traditional migration-based models for the maintenance of Harappan cities and towns are correct, then we would expect to find Harappan cooking pots in abundance at all Harappan sites established in Gujarat. Furthermore, after accounting for depositional processes, one would expect to find an increased abundance of Harappan cooking pots located inside city walls and very few outside of the central walled area, where local cooking pot forms are expected to dominate. This present study tests these expectations at a single site in Gujarat.

Despite the importance of the Harappan cooking pot in the daily lives of inhabitants of Mohenjo Daro and Harappa (Dales and Kenoyer 1986, Kenoyer 1998) and its potential importance for understanding communal identities, discussion of this vessel form, or its possible regional equivalents, is largely absent in the literature on regional sites outside the Indus Valley. For instance, while illustrated in the Lothal excavation report (Rao 1985: Fig 45, Type 23), no further detail regarding this vessel form is presented, nor is it explicitly identified as a Harappan style cooking pot. I therefore contend that the Harappan cooking pot is likely to be underrepresented in existing ceramic studies. Research by M. R. Mughal (1970) in Pakistan and India as well as scholars in other parts of the world demonstrates the widespread distribution and continuity of cooking pots as symbols of group identity in complex societies. In these societies culture change is signaled by the introduction or disappearance of specific cooking ware forms (Arnold 1985: 234, Fuller 2005, Joyner 2007, Skibo 1994). For this reason the inclusion of this vessel form in Indus Civilization ceramic studies is crucial and has the

potential to contribute a more refined understanding of the emergence of the Indus Civilization in Gujarat and the negotiation of regional identities during the Integration Era.

Therefore, I begin this chapter with an analysis of the distribution of the two types of cooking pots that are documented at Bagasra: the Harappan cooking pot and a unique local cooking pot style, here referred to as the Bagasra local cooking pot, which had not previously been published. In Chapter 4 I presented findings that the Harappan cooking pot, though ubiquitous at Harappa and Mohenjo Daro, is extremely rare at Bagasra. In this chapter I define the diagnostic features of the Bagasra local cooking pot and argue that this pot was instead the primary cooking ware for daily meal preparation by most residents at Bagasra. After describing the similarities and differences in these two cooking pot types, I present a spatial and chronological analysis of their percentage and distribution. Additional analytical detail on their percentage inside as compared to outside the perimeter wall produced new data, which strongly suggest that residents in both areas of the site used the Bagasra local cooking pot for regular meal preparation.

In the second part of this chapter I present my analysis of the distribution of Harappan and non-Harappan serving vessels at Bagasra, which includes specific Harappan bowl and dish types as well as three distinct regional non-Harappan bowls. In Chapter 4 I established that specific types of Harappan dishes and serving bowls were in relative abundance for most of Bagasra's occupation. Alongside these data, I have argued that the total absence of other types of Harappan serving vessels is strong evidence that people at Bagasra used different styles of these functional pottery forms for serving and consuming meals. To address this gap, in this

chapter I present new data on the chronological and spatial distribution of three regional bowl types: the Anarta bowl, the Sorath bowl and the Jamnagar bowl. These three bowl types, whose names reflect the geographical regions where they are thought to have been concentrated, have distinct distributions inside Gujarat (Ajithprasad and Sonawane 2011, Ajithprasad et al. 1999, Possehl 2007) where they represent different cultural traditions. After describing each of these vessel types and their regional distribution, I present a spatial and chronological analysis of their percentage and distribution at Bagasra. Additional analytical detail on their percentage inside as compared to outside the perimeter wall produced data that strongly suggest specific Harappan bowl and dish types dominate this assemblage of serving vessels in Phase II craft production contexts located inside the wall. Further, Sorath bowls come to comprise the majority of serving vessels during Phase III, where they are concentrated in habitation contexts outside the perimeter wall.

I conclude this chapter with a summary of these cooking pot and serving vessel findings. In this summary I present a preliminary hypothesis regarding the use of Harappan and non-Harappan pottery associated with cooking and serving meals by Bagasra residents who lived inside the perimeter wall and how these pottery preferences might be similar to or differ from documented pottery patterns outside the wall.

2. The Bagasra Local Cooking Pot

The Bagasra local cooking pot is a distinctive coarse ware pot with diagnostic shoulder ridging (Figure 5.1), which has not previously been studied. We do not yet know its regional

distribution at other sites and it has not yet been specifically associated with a class of non-Harappan pottery (ie. Anarta, Sorath, or other pottery traditions). For this reason, there is no existing label in the literature to refer to this vessel type or the class of pottery to which it may belong. Therefore, I have chosen to call it "the Bagasra local cooking pot." Though its presence at sites in Gujarat is recognized (Ajithprasad personal communication), this study is the first to describe and document this vessel form. Drawing on these new data, I point out the significance of the Bagasra local cooking pot as a regional cooking pot that differs from the Harappan cooking pot and signals the distinct cooking traditions of Gujarat.

Potsherds of this vessel type stand out within ceramic assemblages, which are clear in the photographs above (Figure 5.2). The Bagasra local cooking pot shares several formal features with Harappan cooking pots but is distinct in fabric and overall appearance. This coarse ware terracotta pot has a brown fabric (Munsell soil color chart: 7.5YR 4/3, 5/4) that may appear in reddish-brown to yellowish red wares as well (Munsell soil color chart: 2.5 YR 5/4, 4/4; 5YR 5/4, 5/6, 4/6) with black and white inclusions, pebbles and sand. A black inner core is common. This vessel type comes in both plain and brown-slipped varieties. Brown slip comes in shades of dark reddish-brown (Munsell soil color chart: 5YR ¾, 5/2, 5/3, 4/3) and light brown (Munsell 10YR 5/3, 6/3). Slipped exteriors are occasionally burnished, resulting in a highly polished surface. No further painted decoration was applied.

Figure 5.1: The Bagasra Local Cooking Pot

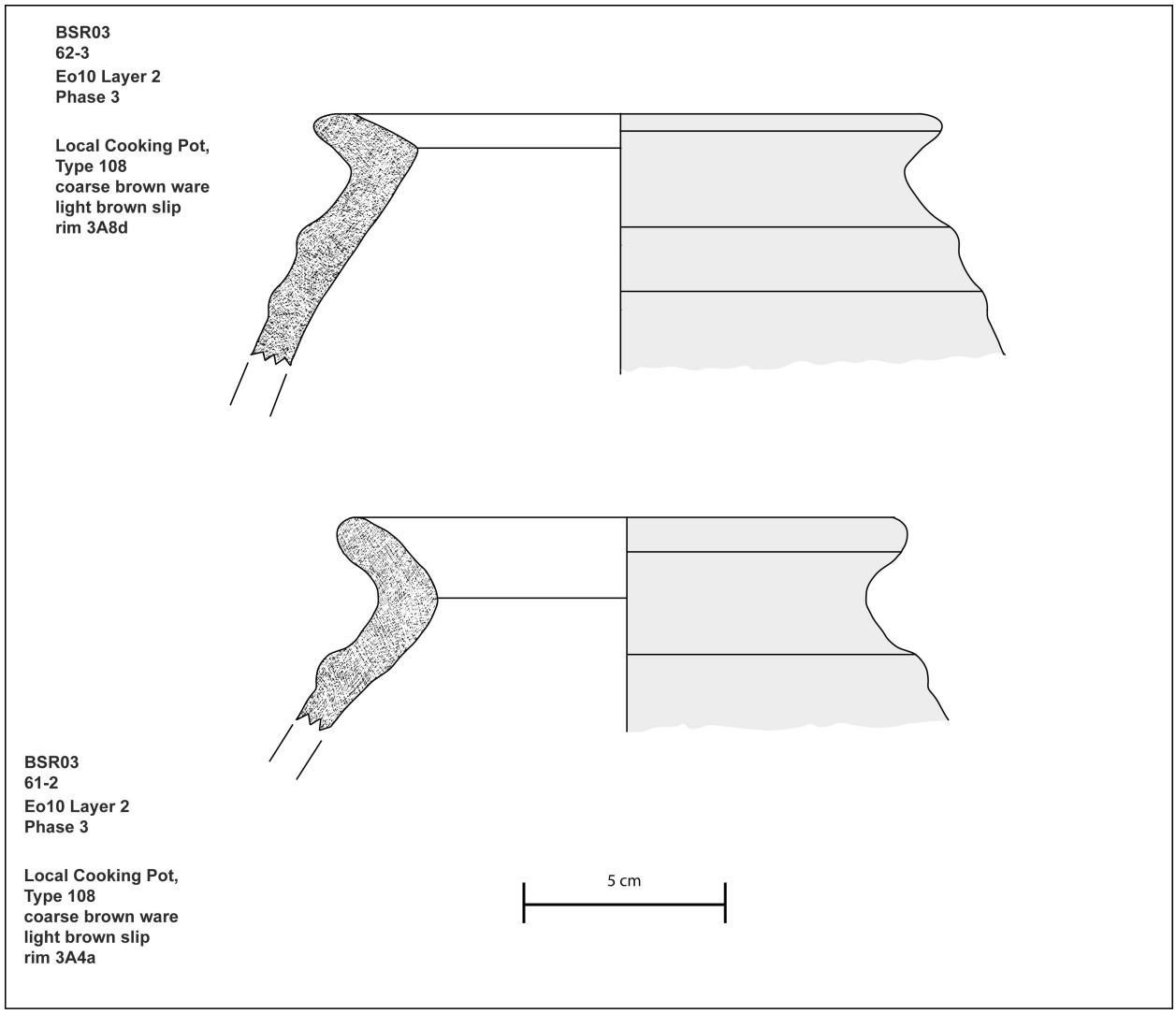


Figure 5.2: Photographs of Bagasra Local Cooking Pot Sherds from Bagasra

As with the Harappan cooking pot, the Bagasra local cooking pot has a wide throat and rim diameters ranging from 14 to 18cm with a rounded externally projecting rim (rim types 3A4a, 3A4b with a small number of variations. Bagasra local cooking pot rim types generally differ from the known Harappan cooking pot rim types from BSR in their degree of projection. However the small sample (3 sherds) and variation in Harappan cooking pot rims (rim type 3C4a is a wide externally projecting rim and rim type 1D2d is a simple everted rim) leaves the question of their similarity open. Further, the Bagasra local cooking pot, like the Harappan cooking pot, has distinct shoulder ridging - either with single or multiple ridges. While ridges on the Harappan cooking pot are sharp and pronounced, the ridging on the Bagasra local cooking pot is rounded and less pronounced. This difference might be a result of the limitations of shaping coarse clay fabric.

No base or lower body sherds have been identified that can be conclusively assigned to this vessel. Further, no complete or reconstructable examples of the Bagasra local cooking pot have been found, which would provide information about the overall vessel shape and its dimensions. However, formal resemblances to the Harappan cooking pot suggest that the Bagasra local cooking pot may have been globular in shape with a rounded base.

Furthermore, since no lower body sherds have been identified, it is not known whether the vessel had a sandy slurry application to protect the vessel from cracking due to repeated use on a hearth or cooking fire. However, it is likely that the coarse clay fabric served the same function. Evidence that the Bagasra local cooking pot was placed on a fire comes from the many recorded potsherds that show evidence of use alteration in the form of blackening and charring

on the exterior upper body and rim. Horizontal abrasion marks, located on the rim and shoulder, are preserved on a smaller sample and suggest repeated use.

3. The Harappan Cooking Pot

The Harappan cooking pot (Figure 5.3) is a class of squat globular pots formally defined in the pottery classification system established for Mohenjo Daro by George Dales and Jonathan M. Kenoyer (Dales and Kenoyer 1986: 132-144) and regularly identified at Harappa (Kenoyer 1998, Wright 1991, 1993) (presented in Chapter 4). This is the only type of cooking pot identified at either urban metropolis. In Gujarat, this vessel class is reported at some Harappan settlements, like Lothal (Rao 1985), but not others. For instance, the shell manufacturing town of Nageshwar (Hegde et. al. 1992) reports a wide array of Harappan style pottery forms, but no Harappan cooking pots. In other regions of the Indus Civilization, such as the site of Farmana, which is located in Haryana, only 20 sherds of Harappan cooking pots were recovered (Uesugi 2011: 190-191). These data from several sites in different regions of the Indus Civilization suggest that the prevalence of Harappan cooking pots differed between settlements and through time, which warrants further study such as that proposed here.

Figure 5.3: The Harappan Cooking Pot

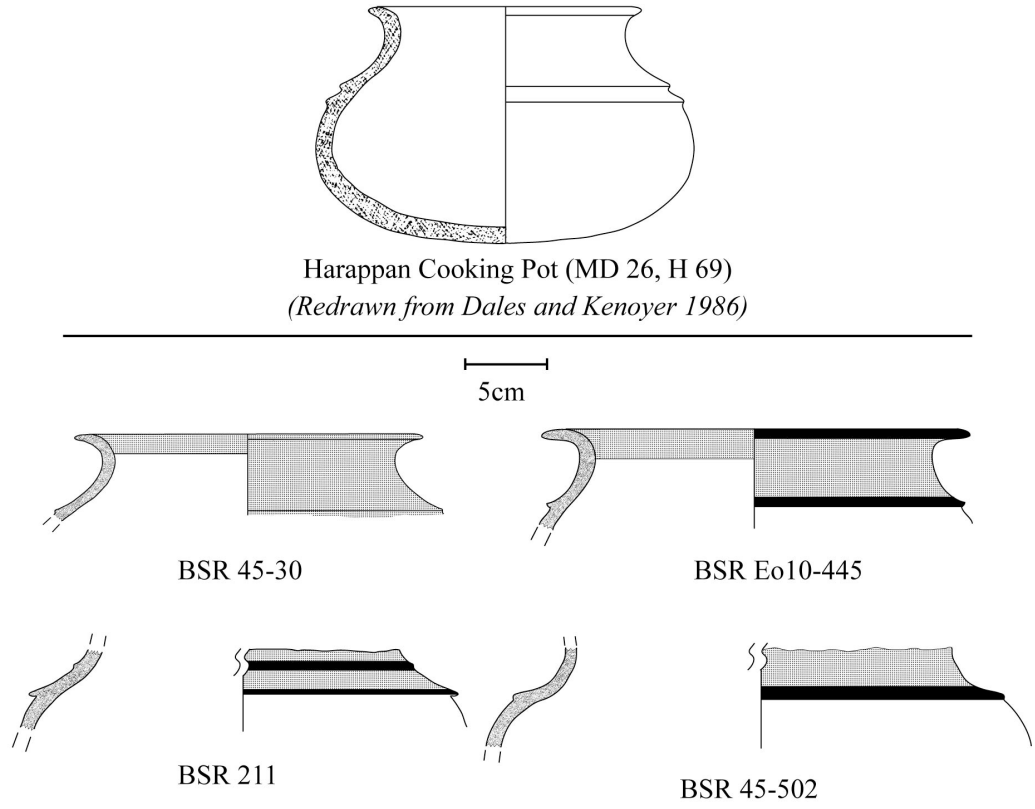


Figure 5.4: Photographs of Harappan Cooking Pot Sherds from Bagasra

Phase I (2500-2450 BC)

Phase II (2450-2200 BC) – inside the wall

Phase II – outside the wall

Phase III (2200-1900 BC)

Potsherds from Harappan cooking pots recovered at Bagasra resemble Harappan cooking pots from Mohenjo Daro and Harappa in form and decorative features (Lindstrom 2010). Potsherds of this vessel type tend to stand out within ceramic assemblages due to several distinctive features, which are clear in the photographs above (Figure 5.4). Overall this class of wheel-made, fine to medium sandy ware terracotta pots is quite uniform in style, surface treatment, and size. At Bagasra the fabric colors range from "Harappan red" (Dales and Kenoyer 1986: 64) to red and yellow brown (Chapter 4, Appendix B) with mica and tiny black and white inclusions, which are common to most of the fine ware pottery found at the site. Other types of vessels at Bagasra were made out of the same or similar fabric, which suggests that the Harappan cooking pots recovered here may have been made locally.

The Harappan cooking pot has a squat globular shape and rounded base. These pots have very diagnostic shoulder ridges, either single or multiple, a wide throat, and an externally projecting rim. In the sample from Bagasra are rim types 3C4a, a wide externally projecting rim, and rim type 1D2d, a simple everted rim. Vessel diameters of these three rims are 15cm, 21cm and 26cm, while at Harappa and Mohenjo Daro a wider variety of rims types and vessel sizes are documented. At Bagasra both single and double-ridged varieties are found (see Chapter 4). A wide throat would allow for easy access to vessel contents during cooking and serving. Kenoyer (1998: 156) has noted that the externally projecting rim could easily be grasped by hand or with two sticks to carry the vessel from the cooking fire to the serving area, and thus avoid holding the pot from the hot and blackened bottom. In testing replica cooking pots' ability to withstand heat, Kenoyer (personal communication) notes that the decorative ridges

may have also functioned to deflect heat away from the vessel rim, making it cooler and thus easier to pick up by hand or implement. The rounded base allows for even distribution of heat and is an aid to thermal shock resistance, thus preventing cracking (Rye 1981: 27, Kenoyer 1998: 156, Sinopoli 1991: 84). A low center of gravity makes it optimal for use on a hearth without tipping over (Kenoyer 1998: 156). This form is very much like the traditional "handi" used throughout most of South Asia today (Kenoyer 1998), which is a testament to its effectiveness as a cooking vessel and the depth of the cultural connection to this vessel form, cuisine and cooking practices in South Asia.

The rim and upper body were often decorated with black or red slip. The red slip likely served a decorative function since the mid to lower body, below the ridged portion, remained unslipped. Red-slipped rims were sometimes decorated with a black band on the external rim edge and on the ridge. As detailed in Chapter 4, the red slip color documented on Harappan cooking pots from Bagasra is extremely uniform in color and falls in the Munsell red (10R 5/6) to weak red (10R 5/4) color categories. The lower body and base were covered with a thick, coarse, sandy coating that contained pebbles, grog or large white inclusions (Dales and Kenoyer 1986, Kenoyer 1998). Ethnographic and experimental observations indicate that this sandy slurry protected the vessel from cracking through repeated heating (Kenoyer 1994, 1998, 2011, Rye and Evans 1976, Schiffer et al. 1994) and supports its function as a cooking vessel. Many of the specimens recorded in the Dales and Kenoyer Mohenjo Daro study were blackened on the exterior, which further attest to their use in the cooking fire. Of the Bagasra sample of

Harappan cooking pots, one sherd retains evidence of blackening (pottery number: BSR 33-500), suggestive of use in a cooking fire.

This study of the Bagasra ceramic assemblage takes a conservative approach in identifying sherds of Harappan cooking pots. Following the Dales and Kenoyer classification system, identification was based on the most diagnostic elements – namely ridged body sherds with a defined profile matching Mohenjo Daro vessel class 26. Using this methodology, I identified 19 classic Harappan cooking pot body sherds at Bagasra, including 3 rims. No base sherds or complete vessels were recovered.

4. Results: Cooking Pots at Bagasra

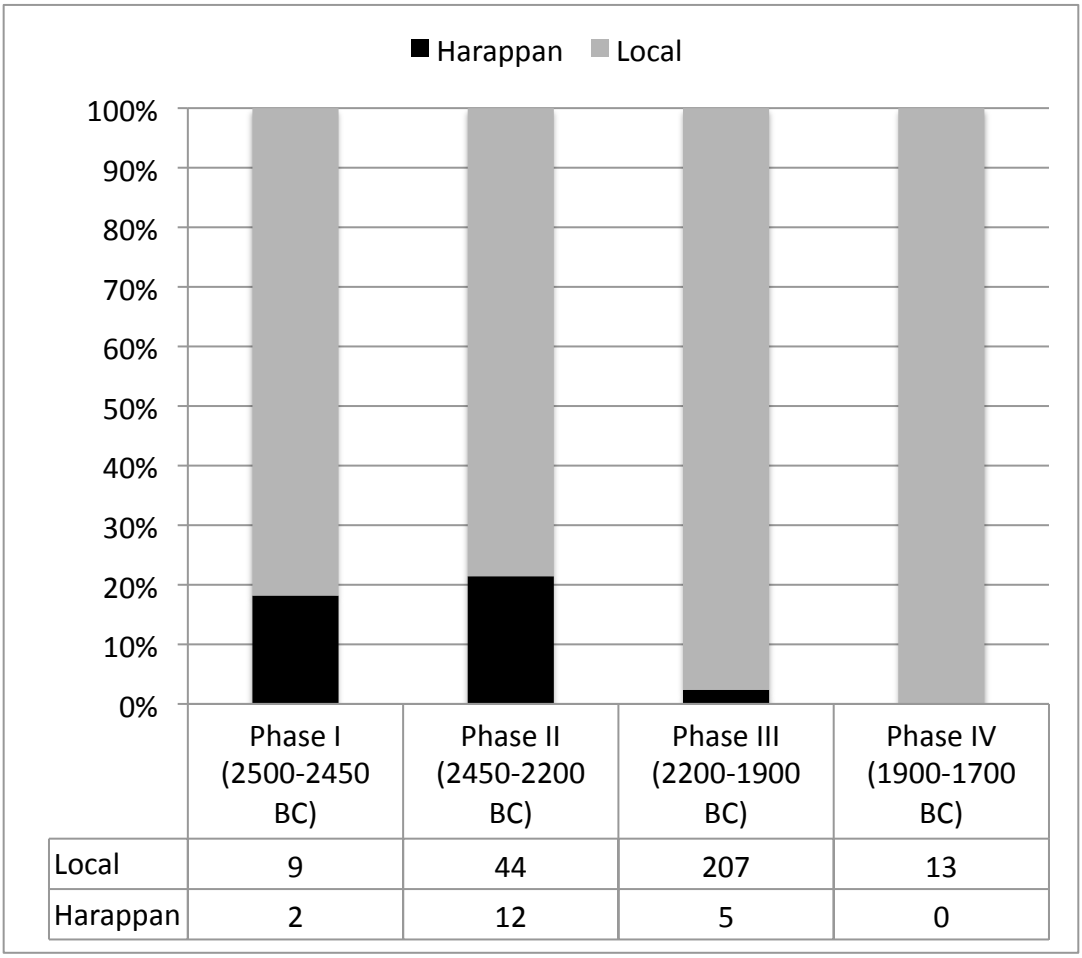
Comprehensive ceramic analyses of over 12,500 diagnostic potsherds from the 15 trenches at Bagasra that were included in this study indicate that the Bagasra local cooking pot occurs in much greater percentage than the Harappan cooking pot during all four phases at Bagasra (Table 5.1). Cooking pots represent 2.33% (n=292) of the total analyzed pottery assemblage (n=12,509). These cooking pot data indicate that the Harappan and Bagasra local cooking pot co-occur from the beginning of the site's occupation (2500-2450 BC) through the main craft production period of Phase II (2450-2200 BC) and into Phase III (2200-1900 BC). Not surprisingly however, during the final phase no Harappan cooking pots have been found and the total cooking pot assemblage is comprised of Bagasra local cooking pots. These data are suggestive of trends that require further testing.

Table 5.1: Phase-by-Phase Count and Percentage of Cooking Pots at Bagasra Compared to Total Ceramics

Phase	Harappan Cooking Pots	Bagasra Local Cooking Pots	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	2 (0.34%)	9 (1.52%)	591
Phase II (2450-2200 BC)	12 (0.27%)	44 (0.98%)	4506
Phase III (2200-1900 BC)	5 (0.09%)	207 (3.59%)	5760
Phase IV (1900-1700 BC)	0 (0%)	13 (0.79%)	1652
Totals	19 (0.15%)	273 (2.18%)	12509

Summarized in Table 5.1, analysis of the phase-by-phase percentage of the Harappan cooking pot compared to the Bagasra local cooking pot shows that Harappan cooking pots comprise less than 1% of the total ceramic assemblage during each phase. Bagasra local cooking pots, on the other hand, vary between a low of 0.79% during Phase IV and a high of 3.59% during Phase III. The chronological distribution of Harappan cooking pots may suggest a more common use during Phase II. However, the surprisingly small quantity of Harappan cooking pots (n=19) recovered limits our ability to draw substantive conclusions regarding potential chronological changes in the use of this particular Harappan vessel type. On the other hand, Bagasra local cooking pot data occur in much greater quantity (n=273) and suggest a potentially significant increase in the relative proportion of local cooking pots between Phase II (n=44, 0.98%) and Phase III (n=207, 3.59%).

Figure 5.5: Cooking Pots as a Percentage of the Total Ceramics from Each Phase



	Phase I (2500-2450 BC)	Phase II (2450-2200 BC)	Phase III (2200-1900 BC)	Phase IV (1900-1700 BC)
Local	9	44	207	13
Harappan	2	12	5	0

Harappan cooking pots are slightly more prevalent during Phase I and Phase II. During these periods of emergent and prospering craft production, the Harappan cooking pot comprises approximately the same percentage of total cooking pots used by the community. Phase III data suggest a decrease in Harappan cooking pots, which may coincide with this period of waning economic productivity and decline in civic authority (Sonawane et al. 2003). Further, the greatest quantity of Bagasra local cooking pots was recovered during Phase III. This pattern

suggests that the population did not dwindle as the regional economy changed. Finally, the total absence of the Harappan cooking pot during Phase IV, along with the scarcity of the Bagasra local cooking pot, is in keeping with previous site interpretations (Sonawane et al. 2003) which state that the people living at the site during the final phase were engaged in daily routines that differed from earlier inhabitants.

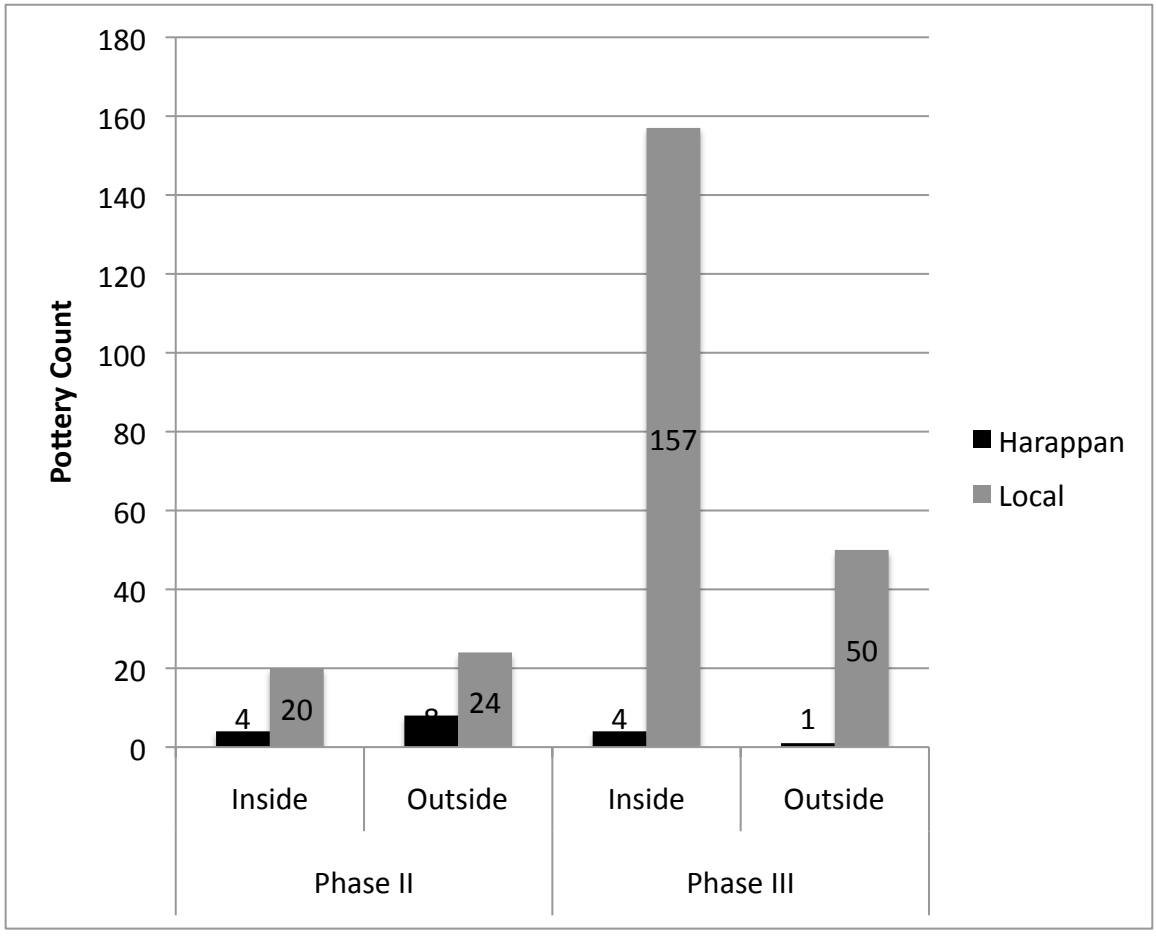
These cooking pot trends are in keeping with the pottery chronology established for Bagasra by the MSU excavation directors. Described in detail in Chapter 3, in their chronology the MSU excavation directors state that Harappan pottery is most common from the site's foundation through the major craft production period of Phase II and into Phase III, when regional ceramics types come to dominate the ceramic assemblage. In their chronology, the MSU excavation directors also note that Harappan pottery types are absent during Phase IV at Bagasra when the site was no longer a craft production center and its inhabitants lived in circular structures on top of the collapsed remains of earlier buildings and the city wall.

The documented sample of cooking pots from Bagasra represents diverse depositional contexts both inside and outside the perimeter wall. As described in Chapter 2, Bagasra's perimeter wall separated the settlement into walled and unwalled space during Phase II and Phase III, thus limiting access to important craft workshops located inside the wall. Shown in Table 5.2 and Figure 5.6, during Phase II no clear pattern exists in the distribution of the Harappan cooking pot compared to the Bagasra local cooking pot either inside and outside the perimeter wall. While 12 of the 19 documented Harappan cooking pots came from Phase II

Table 5.2: Count of Cooking Pots Inside and Outside the Perimeter Wall at Bagasra

Phase	Cooking Pot Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Cooking Pots
Phase II	Harappan	4	8	12
	Bagasra Local	20	24	44
Phase II Total		24	32	56
Phase III	Harappan	4	1	5
	Bagasra Local	157	50	207
Phase III Total		161	51	212

Figure 5.6: Count of Harappan and Bagasra Local Cooking Pots Inside and Outside the Perimeter Wall at Bagasra



contexts, these pots are found on both sides of the wall. Rather, Phase II patterns suggest that individuals or families living inside the wall used Harappan cooking vessels to a similar degree as those living outside the perimeter wall. Further, the Bagasra local cooking pot is documented in greater percentage in both areas of the site, which indicates that residents inside and outside the wall instead used these pots for daily meal preparation. Thus, for Phase II, the demarcation of space, which is symbolized by the perimeter wall, is not clearly reflected in the spatial distribution of cooking pots.

Phase III was a period of gradual political and economic change. It marks the end of major building projects at Bagasra. Existing structures continued to be used but were not well maintained, and craft activity came to a halt sometime during this phase. Phase III cooking pot data, however, suggest a slightly different, but complementary pattern, to that documented for Phase II. As illustrated above in Table 5.2, the greatest percentage of Bagasra local cooking pots is documented inside the perimeter wall during Phase III. By comparison, the five documented Harappan cooking pots appear as an insignificant part of the cooking pot assemblage, but their presence may reflect the continuity of a few individuals' connections to the major urban settlements in the Indus Valley.

To further explore patterns in the spatial distribution of cooking pot types inside as compared to outside Bagasra's perimeter wall, I also compared the percentage of Harappan cooking pots and Bagasra local cooking pots in different archaeological contexts (see Chapter 3 for a description of context types). The goal of this approach was to identify whether one type of cooking pot was more or less prevalent in certain contexts.

Table 5.3: Counts of Harappan and Bagasra Local Cooking Pots by Phase and Context Type

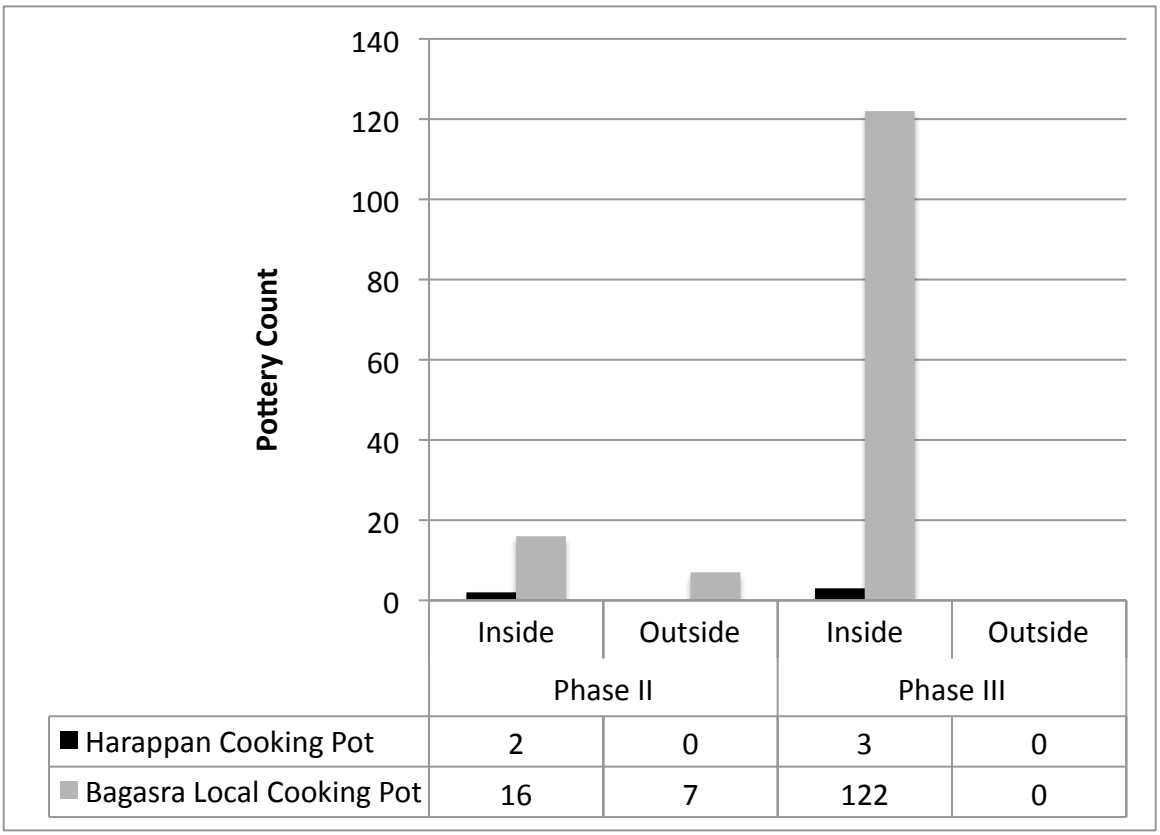
Phase	Location	Cooking Pot Type	Craft Production	Habitation	Habitation/ Structural	Structural	Other	Total
Phase I		Harappan	0	0	0	0	2	2
		Bagasra Local	0	0	0	9	0	9
		Total Pottery	0	157	205	167	62	591
Phase II	Inside	Harappan	2	0	0	0	2	4
		Bagasra Local	16	1	2	1	0	20
		Total Pottery	1355	547	180	439	0	2521
	Outside	Harappan	0	1	0	6	1	8
		Bagasra Local	7	11	0	6	0	24
		Total Pottery	187	927	0	764	107	1985
Phase III	Inside	Harappan	3	1	0	0	0	4
		Bagasra Local	122	35	0	0	0	157
		Total Pottery	2527	1209	0	0	86	3822
	Outside	Harappan	0	1	0	0	0	1
		Bagasra Local	0	30	0	17	3	50
		Total Pottery	0	1568	0	328	42	1938
Phase IV		Harappan	0	0	0	0	0	0
		Bagasra Local	0	4	0	9	0	13
		Total Pottery	0	1154	0	498	0	1652
Totals		Harappan	5	3	0	6	5	19
		Bagasra Local	145	81	2	42	3	273
		Total Pottery	4069	5562	385	2196	297	12509

Table 5.3 (above) and table 5.4 (below) summarize the cooking pot data from Bagasra. Table 5.3 presents the percentage of Harappan cooking pots and Bagasra local cooking pots by phase as well as context, alongside the total pottery from each unit. Table 5.4 provides the presence/absence and counts of both cooking pot types in each individual trench that is included this study. The detailed trench-by-trench data are presented in Table 5.4 to show that cooking pots were not recovered from all sampled trenches and low counts of cooking pots are reported from the most trenches where they did occur. Trench Ek5 is an exception, which I will discuss below.

Craft production contexts are the focus of this investigation into the distribution of cooking pot types by context. Craft manufacture is understood to have been key to the economy of Bagasra and the main factor connecting Bagasra residents to other cities and town of the Indus Civilization. Previously summarized in Chapter 2, shell working, faience manufacture, and the storage of semi-precious stone raw materials were concentrated in workshop structures located inside the monumental perimeter wall. The concentration of craft manufacture is one line of evidence that elite leaders controlled and restricted access to key craft activities. Further support for elite control of craft industries comes from steatite seals, which primarily recovered inside the wall. By comparison, bead manufacture, located outside the wall, may have been directed by craftspeople, who were otherwise not considered elite administrators of the community. This line of reasoning has direct implications for my dissertation study because it sets up the expectation that people inside the wall used Harappan pottery to a greater degree than people living outside the wall. Because there were no clear

patterns in the spatial distribution of the Harappan cooking pot and Bagasra local cooking pot inside as compared to outside the wall, an investigation of cooking pot distribution in craft production contexts is warranted.

Figure 5.7: Count of Harappan and Bagasra Local Cooking Pots in Craft Contexts at Bagasra



	Phase II		Phase III	
Harappan Cooking Pot	2	0	3	0
Bagasra Local Cooking Pot	16	7	122	0

As summarized in Chapter 3, no craft production contexts were excavated that date to either Phase I or Phase IV (MSU Dept of Archaeology n.d.) (Table 5.3). During Phase II and III, the Bagasra local cooking pot occurs in greater percentage than the Harappan cooking pot in all craft contexts included in this study (Figure 5.6). However, I consider these results preliminary

since the total cooking pot count reported here is a rather low percentage of the total analyzed ceramic assemblage from each phase (Figure 5.5).

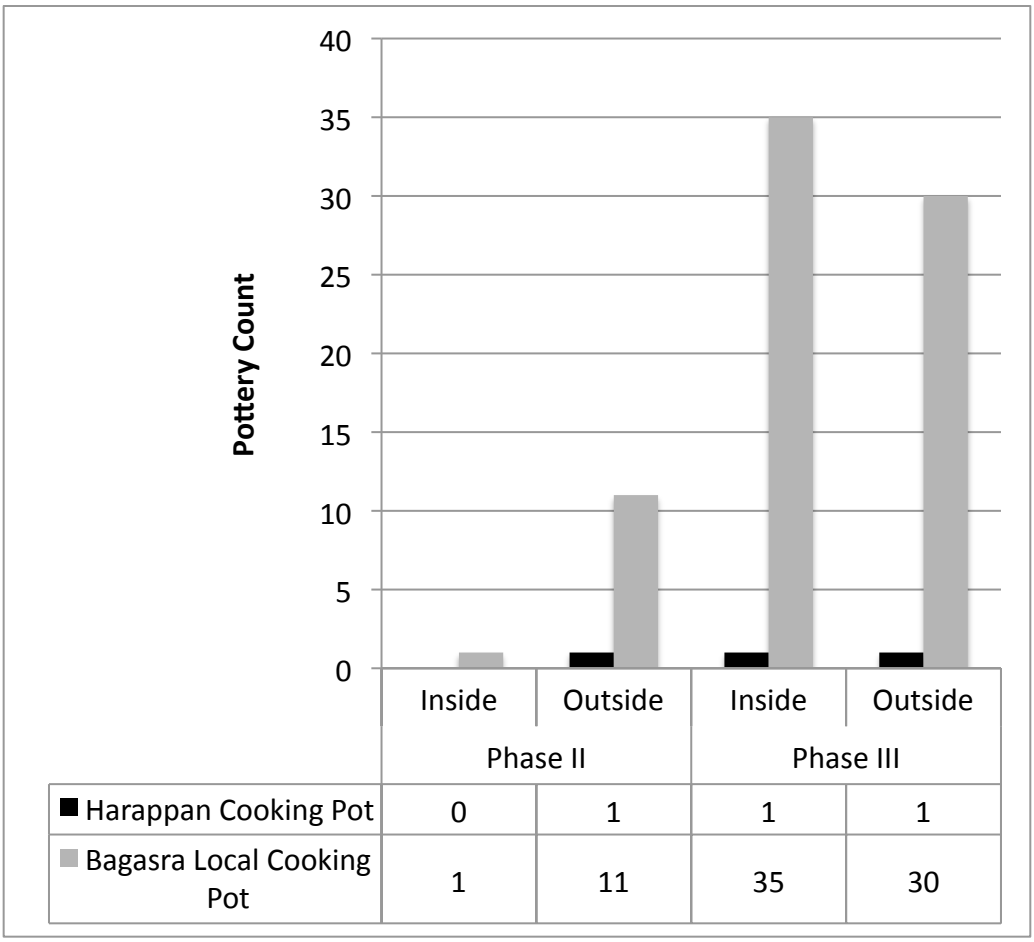
Most of the known craft production contexts at Bagasra occurred inside the perimeter wall. Summarizing the percentage of craft contexts compared to non-craft contexts, 34.22% (n=1542) of Phase II pottery (n=4506) and 43.87% (n=2527) of Phase III pottery (n=5760) came from craft contexts located inside the perimeter wall. Included in this pottery study (Table 5.3 and 5.4, see also Chapter 3) are 1330 potsherds from 30 Phase II layers from six trenches that represent the shell bangle workshop (trenches Ea6, Ea11, Ea12, Eg2 and Eg3) and the faience processing and lithic stockpile workshop (trench Eq2) (see Table 5.4). Based on annual excavation reports and section drawings, I understand these areas to likely be primary deposits. Only 2 Harappan cooking pots are documented from the shell bangle workshop, compared to 16 Bagasra local cooking pots. In the faience/stockpiling workshop no cooking pots were recovered (Table 5.4). During Phase III, a total of 2527 potsherds from 6 layers are included. These Phase III data come from one trench (Ek5). Based on annual excavation reports and section drawings, I understand these trench Ek5 layers to be a deep secondary deposit of craft manufacturing debris associated with a mudbrick platform, rather than a formal craft workshop as seen in Phase II. By far, the largest quantity of Bagasra local cooking pots come from this Ek5 Phase III secondary craft context with a total of 122 potsherds, which is an unexpectedly large quantity. Three Harappan cooking pot sherds were also recovered.

Outside the wall craft contexts were identified in one trench (Eh3), which dates to Phase II and has a total pottery count of 185 potsherds, coming from 3 layers. Based on annual

excavation reports and section drawings, I understand this area to be a small semi-precious stone bead workshop, which is located just outside the southern gateway of the perimeter wall. No Harappan cooking pots were excavated from this workshop and only 7 Bagasra local cooking pots were found. There are no clear craft contexts outside the wall dating to Phase III (MSU Dept of Archaeology n.d.).

Since cooking pots are associated with daily meal preparation, it is also important to consider the distribution of cooking pots types in habitation contexts (Figure 5.8). Shown in Table 5.4 and illustrated in Figure 5.8, Phase III cooking pot data show a considerable increase in the quantity of Bagasra local cooking pots recovered from habitation contexts on both sides of the perimeter wall. Habitation contexts are defined by the presence of floors, hearths and general habitation debris (see Chapter 3), which were documented for each of the four phases (Table 5.3) and occur in both inside and outside of the perimeter wall during Phase II and Phase III. The excavation approach did not identify household contexts, or distinguish domestic house habitation areas from other types of habitation structures. For this reason, it is not possible to examine the distribution of cooking pot types in households.

Figure 5.8: Count of Harappan and Bagasra Local Cooking Pots in Habitation Contexts at Bagasra



To summarize, in this chapter I have provided data that suggest the Bagasra local cooking pot occurs in much greater percentage than the Harappan cooking pot during all phases of occupation at Bagasra. Moreover, the Harappan cooking pot is extremely rare, even during Phase II, a time when the site was intensively involved in the manufacture of Harappan style shell, faience, and stone ornaments. In addition, the overall percentage of Bagasra cooking pots is also surprisingly low, which indicates that another cooking form was also in use

at the site. However, both Harappan and Bagasra local cooking pots were recovered in contexts inside and outside the perimeter wall, which suggests that they were used by people living in both areas.

When examining craft and habitation contexts specifically, we do not see Harappan cooking pots being used in greater percentage than the local cooking pot type. In fact, the greatest quantity of Bagasra local cooking pots is documented from a craft related context inside the wall.

Based on the spatial distribution of cooking pots by context type, I contend that these data suggest a slight increase in use of the Bagasra local cooking pot between Phase II and Phase III. This pattern may reflect an increase in the number of people living at the site during Phase III. Alternatively, it may also reflect a shift in the types of cooking pots used by members of the community. The relatively low number of Bagsra local cooking pots recovered from Phase I (1.52%, n=9) and Phase II (0.98%, n=44) contexts might suggest that an additional cooking pot form, which has yet to be identified, was more common during these periods at Bagsara. By comparison, an increase in the percentage of the Bagasra local cooking pot to 3.79% (n=207) of the assemblage during Phase III suggests the local cooking pot increased in prevalence during this phase of economic transition. In the final phase of occupation, cooking pot use may have again shifted as the Bagasra local cooking pots are present at only 0.79% (n=13).

Table 5.4: Count of Cooking Pots by Trench, Phase and Context Type

Trench	Phase	Location	Context Type	Harappan Cooking Pot	Bagasra Local Cooking Pot	Total Ceramic Count
Do8	2	Inside	(not otherwise sampled)	1	-	-
Ea11	2	Inside	Craft Production	0	0	235
Ea12	2	Inside	Craft Production	0	16	507
Ea6	1	North	Habitation	0	0	1
Ea6	2	Inside	Craft Production	0	0	140
Eg2	1	West	Other	1	0	58
Eg2	2	Inside	Craft Production	2	0	387
Eg2	3	Inside	Habitation	0	0	52
Eg3	2	Inside	Craft Production	0	0	16
Eg3	3	Inside	Habitation	0	2	196
Eg3	3	Inside	Other	0	0	86
Eh3	2	Outside	Craft Production	0	7	185
Eh3	3	Outside	Habitation	0	11	945
Eh3	3	Outside	Other	0	3	42
Ei15	2	Outside	Habitation	0	2	139
Ei15	2	Outside	Other	1	0	106
Ei15	3	Outside	Structural	0	16	261
Ek4	2	Inside	Habitation	0	1	186
Ek4	3	Inside	Habitation	1	33	941
Ek5	3	Inside	Craft Production	3	122	2374
Em9	4	Outside/Wall	Habitation	0	4	1005
Eo10	1	South	Habitation, Structural	0	0	141
Eo10	1	South	Structural	0	0	44
Eo10	2	Outside	Habitation	0	4	564

Trench	Phase	Location	Context Type	Harappan Cooking Pot	Bagasra Local Cooking Pot	Total Ceramic Count
Eo10	2	Outside	Structural	6	0	243
Eo10	3	Outside	Habitation	1	12	401
Eo2	1	South	(not otherwise sampled)	1	-	-
Eo6	1	South	Habitation	0	0	34
Eo6	1	South	Structural	0	9	71
Eo6	2	Outside	Habitation	1	5	193
Eo6	2	Outside	Structural	0	6	487
Eo6	3	Outside	Habitation	0	7	204
Eo6	3	Outside	Structural	0	1	57
Eq2	1	East	Habitation	0	0	110
Eq2	1	East	Habitation, Structural	0	0	48
Eq2	2	Inside	Craft Production	0	0	49
Eq2	2	Inside	Habitation	0	0	348
Eq2	2	Inside	Habitation, Structural	0	2	170
Eq2	2	Inside	Structural	0	1	424
Eq3	2	Inside/Wall	(not otherwise sampled)	1	-	-
Eq8	4	East	Habitation	0	0	88
Es3/4	4	South	Habitation	0	0	61
Es3/4	4	South	Structural	0	9	483
Totals				**19**	**273**	**12082**

Most Bagasra residents rarely, if ever, used Harappan cooking pots. Though the reasons for this pattern are unclear, two possible explanations for the rarity of the Harappan cooking pot at Bagasra pots are that residents either had limited access to Harappan cooking pots or

that residents preferred to not use them. On the other hand, the Bagasra local cooking pot is more common at the site. While the overall percentage of the local cooking pot type is rather low, these data suggest that residents either had more regular access to this form or they chose to use this style of cooking pot, rather than the Harappan style, for daily meal preparation. The selection of the Bagasra cooking pot over the Harappan style would suggest a shared preference for vessels used in meal preparation.

Because the total of both cooking pot types is a strikingly low percentage of the total ceramics analyzed during any phase, I regard the interpretations drawn in this section as preliminary. Further, because the Harappan cooking pot was extremely rare at Bagasra, and because people use cooking vessels daily for preparing meals, one would expect to find a greater quantity of Bagasra local cooking pots than are documented in this pottery sample. During Phase I (2500-2450 BC) cooking pots comprise just 1.86% of the total Phase I ceramic assemblage (n=591). During Phase II (2450-2200 BC) cooking pots show a slight decrease, down to 1.24% of the total Phase II pottery assemblage (n=4506). During Phase III (2200-1900 BC) the total quantity of cooking pots increases slightly, up to 3.68% of the total pottery assemblage (n=5760). Nonetheless, these Phase II and III cooking pot data are at a much smaller quantity than expected, when one considers the overall quantity of potsherds documented from these periods (n=10,266). During Phase IV cooking pots fall to just 0.79% of the total ceramics (n=1652), which is perhaps reflective of the shift in living standards.

From these data, I argue that the Harappan cooking pot and the Bagasra local cooking pot are only two specialized types of cooking vessels used at Bagasra. People must have utilized

additional vessels (made out of clay, stone, or organics) for regular meal preparation. While other cooking vessels have yet to be identified at Bagasra, new excavations at Shikarpur (Bhan and Ajithprasad 2008, 2009) are being used to study the diversity of cooking technology at a neighboring site (Ajithprasad 2012b).

5. Non-Harappan Serving Vessels: Anarta, Jamnagar and Sorath Bowls

Bowls are ubiquitous among the Bagasra ceramic assemblage. They are found in a range of sizes and shapes as well as a variety of fine, medium and coarse wares in red, yellow brown and buff colored clay. While many bowl potsherds are non-distinct, three distinct bowl types stand out as diagnostic potsherds within the assemblage. The focus of specific analysis in this dissertation, the Anarta bowl, the Jamnagar bowl and the Sorath bowl are thought to have distinct regional distributions within Gujarat (Ajithprasad and Sonawane 2011, Ajithprasad et al. 1999, Possehl 2007). Thus, data on their percentage and spatial distribution will not only be used to address the specific expectations set forth in this dissertation, but also add important new information on their spatial distribution and relative frequency at a single site, which is largely missing from published research.

As with other ceramics from the site, the overlapping features of many bowl forms makes it difficult or nearly impossible to classify much of the assemblage as either Harappan or as one of the regional non-Harappan traditions. However, these three selected bowl types are distinct from one another, while also being distinct in form, fabric and decoration from the Harappan pottery defined at Harappa or Mohenjo Daro. Furthermore, as bowls are plentiful at

the site during all phases, this class of pottery is amenable to quantitative analysis that evaluates distribution changes across time and space. Finally, an analysis of the distribution of different bowl types is warranted because Bagasra is the only site yet identified where Anarta, Jamnagar and Sorath bowls are found in stratigraphic relationship and in association with Harappan pottery.

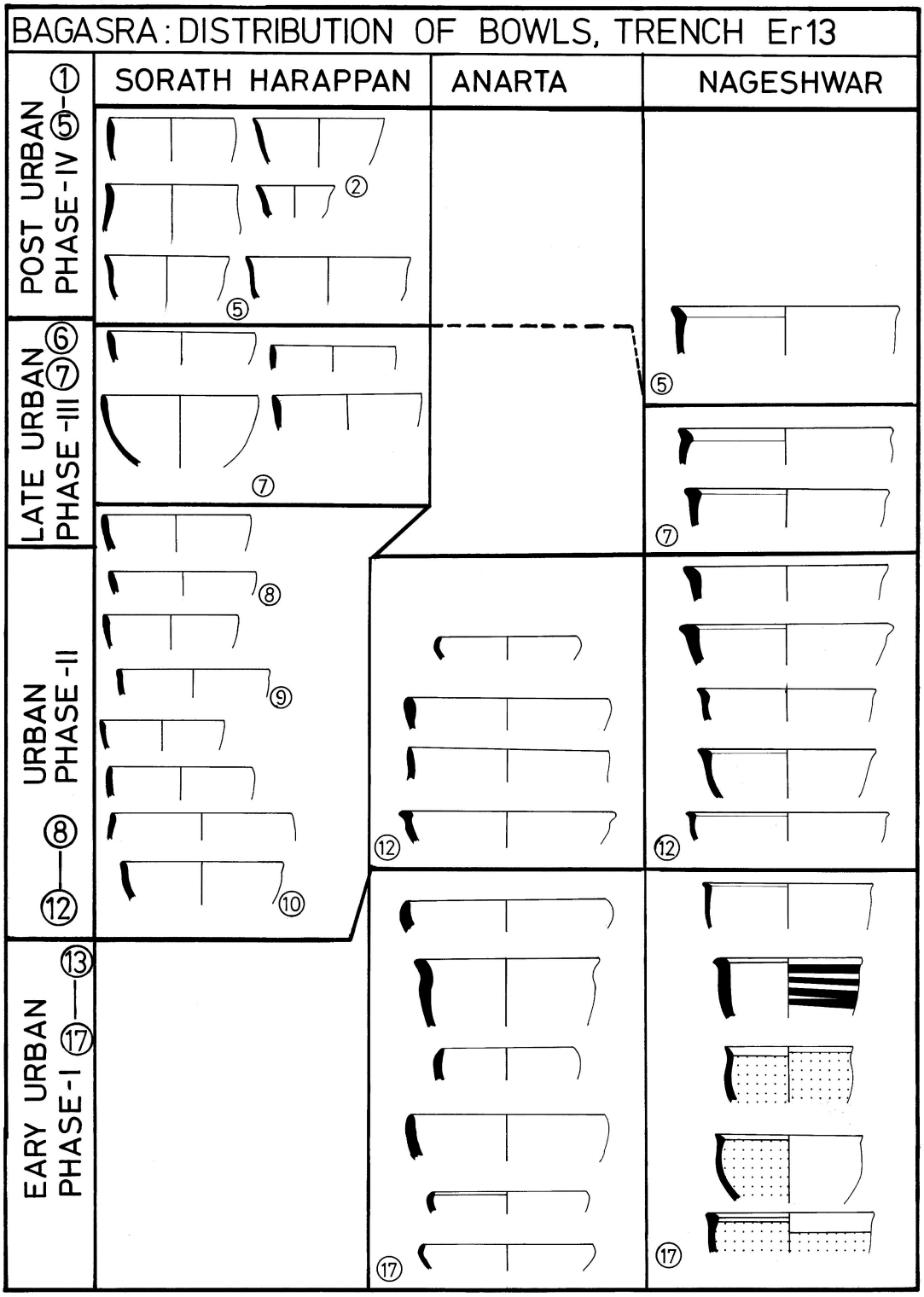
Previous archaeological research has established the typological sequence of Anarta, Jamnagar and Sorath bowls and their change through time in percentage and formal features (Ajithprasad et al. 1999, Herman 1989, Possehl and Herman 1990, Rao 1963). The most widely referenced regional chronology for Gujarat was first established by S. R. Rao (1963, 1979) and is based on changes in pottery as well as structural remains. Though Harappan and Sorath pottery have many overlapping traits, making it difficult to classify assemblages into distinct pottery types, Sorath bowls are very distinctive and thus became the focus of Rao's pottery chronology. A great deal of archaeological research has been directed at testing, critiquing and refining the chronology established by S. R. Rao (Herman 1997a, 1997b, Mishra 1965, Possehl 1980, 1991-1992). As a result of this research, the regional pottery chronology has been modified over the years to account for new site data and analytical innovations. In this process, the Anarta bowl and Jamnagar bowl have been added to the regional pottery chronology (Ajithprasad et al. 1999). Further evaluation of regional pottery chronologies lies outside the scope of this research. However, these studies identified several broad trends in the percentage and formal features of Anarta, Jamnagar and Sorath Bowls, which are briefly referenced in the following sections.

More directly relevant to this dissertation is a preliminary study by Ajithprasad and colleagues (Ajithprasad et al. 1999) of the relative abundance of Anarta, Jamnagar (or Nageshwar) and Sorath Bowls from four trenches at Bagasra (Er13, Es3/4, Et1 and Do7) (Figure 5.9). Presented at a conference of the Indian Society for Prehistoric and Quaternary Studies in Pune, India in 1999, the final analysis of this study has yet to be published. Focusing their analysis on Jamnagar bowls (which they refer to as Nageshwar bowls), Ajithprasad and colleagues' preliminary evaluation of the prevalence of Anarta, Jamnagar and Sorath bowls at Bagasra suggests that:

> Nagashwar [Jamnagar] bowls are found in considerable number in all four Phases of the Harappan occupation at Bagasra. Their distribution pattern reveals that these are the only variety of bowls, in addition to the Anarta bowls, present in the Phase-I and almost up to the end of Phase-II till the Sorath Harappan bowls start appearing in the assemblage. In the succeeding Phase-III, even though there is a preponderance of Sorath Harappan bowls the Nageshwar bowls are also present in good numbers. There is a remarkable decrease in their number in the post-Urban, Phase-IV assemblage. The presence of a few of these bowls in Phase-IV assemblage seems to be due to the lateral intrusion of earlier materials into a later stratum (Ajithprasad et al. 1999: 7-8).

As Bagasra was excavated from 1996-2005, Ajithprasad and colleagues' study was undertaken before many of the trenches sampled in this dissertation study were excavated. Thus, their bowl study presents a preliminary evaluation of relative abundance of Anarta, Jamnagar and Sorath bowls at Bagasra, which can be tested against the additional bowl data presented in this chapter. Furthermore, whereas Ajithprasad and colleagues' unpublished study, which was made available to me, does not include pottery counts and context-specific information, nor does it include Harappan bowl or dish types for comparison, the data I present in this chapter adds an additional level of detail. Adding comparative and spatial details

Figure 5.9: Bowl Chronology at Bagasra (Image from Ajithrasad et al. 1999)



enhances our understanding of the social contexts in which these bowls were used by the ancient residents of Bagasra.

In focusing on formal change over time and pottery chronology, the goals of the previous pottery studies referenced here (Ajithprasad et al. 1999, Herman 1989, Possehl and Herman 1990, Rao 1963) differ from the goals of this dissertation. It is important to point out that none of these prior studies employed a type-variety typology framework similar to the Mohenjo Daro pottery typology, which is applied in this research. Nonetheless, slight differences in rim types and bowl profiles are indicated by the figure drawings of Anarta, Jamnagar, and Sorath bowls available in numerous publications referenced in the following sections. Thus, previous studies provided the background for establishing the general categories of Anarta, Jamnagar and Sorath bowls types defined in this chapter.

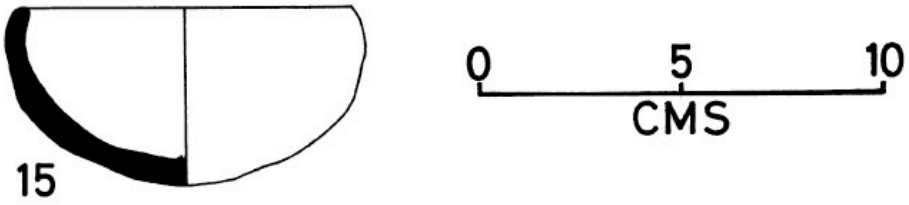
5a. The Anarta Bowl

The Anarta bowl (Figure 5.10) is one type of bowl among an assemblage of regionally distinctive Anarta pottery, which was described in Chapter 2 (see also Ajithprasad and Sonanwane 2011). As a whole, Anarta pottery types, typified by the pottery assemblages from Nagwada and Loteshwar (Ajithprasad 2002, Ajithprasad and Sonawane 2011, Hegde and Sonawane 1986, Hegde et al. 1988, 1990, Majumdar 1999, Sonawane and Ajithprasad 1994), are not found of the Mohenjo Daro pottery typology (Dales and Kenoyer 1986). At Nagwada Anarta, ceramics dominate an assemblage that includes Harappan pottery (Ajithprasad 2002).

On the other hand, Loteshwar, which has been dated to an earlier time period, Harappan pottery forms are absent (Ajithprasad 2002).

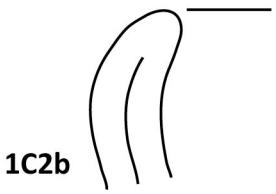
Like most Anarta pottery types, the Anarta bowl is either handmade or turned on a slow wheel (Ajithprasad and Sonewane 2011: 231) from sandy red clay, which is commonly called "gritty red ware" (Ajithprasad and Sonawane 2011). These bowls come in fine and coarse ware varieties that have tiny white and tiny black inclusions, larger kankar inclusions, mica, and sand or small pebbles. Coarse red ware bowls are usually thinly slipped (red 1 or red 5) or are left undecorated. Fine sandy red ware bowls are typically decorated with red slip on the interior and exterior and painted with geometric designs. A cream slip was often applied to the rim or upper body, over which red or black pigment was applied. Common designs include horizontal parallel lines, which are sometimes overlaid by an intersecting set of evenly spaced vertical lines or oblique strokes. Parallel wavy lines, hatched diamonds, squares, and circle motifs are common on bowls as well as Anarta jars and pots. Pigments used for these decorations come in black and shades of red, ranging from bright red to dark brown. White pigment was also occasionally used (Ajithprasad and Sonawane 2011: 238).

Figure 5.10: The Anarta Bowl (Vessel Type 211 at Bagasra)



While the fabric and decoration are the most prominent features used to distinguish Anarta bowls from other bowl types, their shape is also distinctive. Anarta bowls have a distinctive rim type - either convex or short, with straight sides with a slightly inverted rim. The most common rim form is a simple rounded rim (Figure 5.11). These bowls come in small and medium sizes.

Figure 5.11: The Anarta Bowl Rim Form at Bagasra



The word “Anarta” is the local name for the region of north Gujarat, where Anarta pottery types are thought to have originated. Anarta bowls have thus been indentified at sites across north Gujarat, including the Anarta type sites of Nagwada and Loteshwar. Scholars (Ajithprasad and Sonawane 2011: 238) have argued that the shape of Anarta bowls resembles bowl forms from the Pre-Harappan levels at the site of Amri (Casal 1964), which is located in southern Sindh. This similarity is one line of evidence that has been used to argue for interaction between north Gujarat and Sindh during the Regionalization Era, which I discussed in Chapter 2. Thus, by the time the site of Bagasra was established around 2500 BC, the

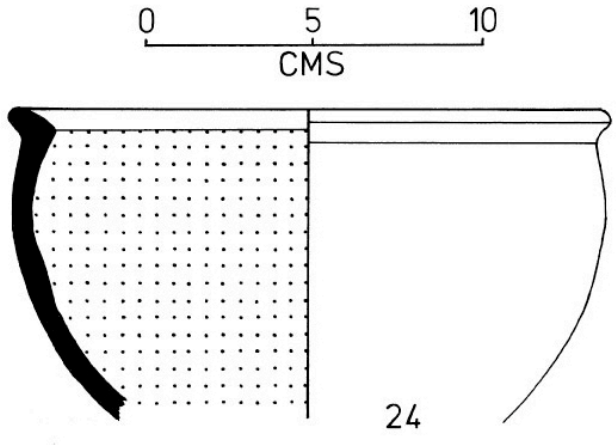
tradition of manufacturing Anarta bowls for meal consumption had been part of communal practice in north Gujarat for at least 1000 years.

5b. The Jamnagar Bowl

The Jamnagar bowl differs from Anarta and Sorath bowls in rim form and surface treatment. The Jamnagar bowl was first identified at the site of Nageshwar, in Jamnagar District, Gujarat. Since Nageshwar is considered a Harappan site (Hegde et al. 1992), this bowl type is included as a regionally distinctive type within a largely Harappan pottery assemblage. Thus, it differs from Anarta bowls in not being part of a larger regionally distinctive pottery assemblage.

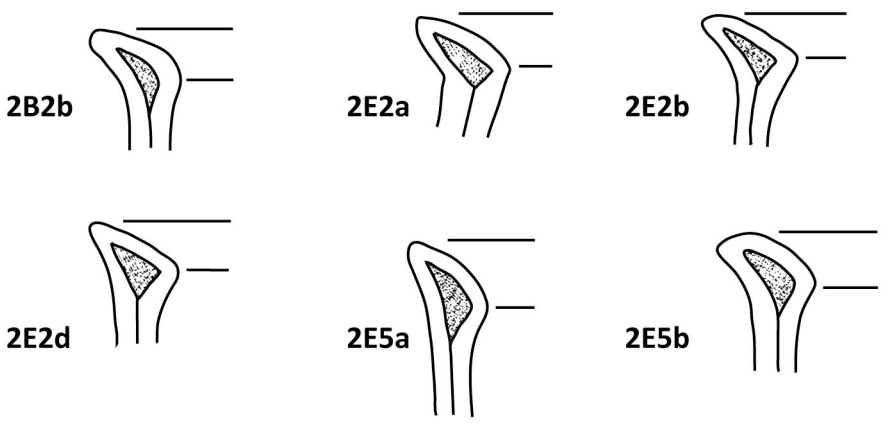
The Jamnagar bowl (Figure 5.12) is wheel-made from elutriated clay. It is documented in red ware, yellow-brown ware and buff ware (Appendix B) and comes in fine and medium sandy varieties with mica, tiny or medium white and black inclusions. This type of red ware bowls is typically slipped on the exterior with a red or red-brown ("chocolate") slip (red slip varieties: red 1, red 2, red 4, red 5; Appendix B), which covers the rim and extends to the interior throat. This bowl is not typically decorated with additional paintings. Through his studies of the Jamnagar bowl, Ajithprasad (Ajithprasad et al. 1999) observed that this bowl is often first covered entirely with a thin light cream slip or wash and then covered with a red slip on just the exterior. Ajithprasad further notes changes in surface decoration including a shift from red painted bands to a red slip covering the entire exterior surface and extending over the rim.

Figure 5.12: The Jamnagar Bowl (Vessel Type 250 at Bagasra)



The Jamnagar bowl has a distinctive rim that is either a simple or complex externally projecting and slightly everted with internal thickening that is triangular in shape. Like Anarta and Sorath bowls, the sides are either straight or convex. At Nageshar, the Jamnagar bowl rim diameter measures 8cm to 26.2cm, with the majority measuring between 12-21cm (Bhan, Krishnan and Sonawane 1992: 43).

Figure 5.13: Common Jamnagar Bowl Rim Forms at Bagasra



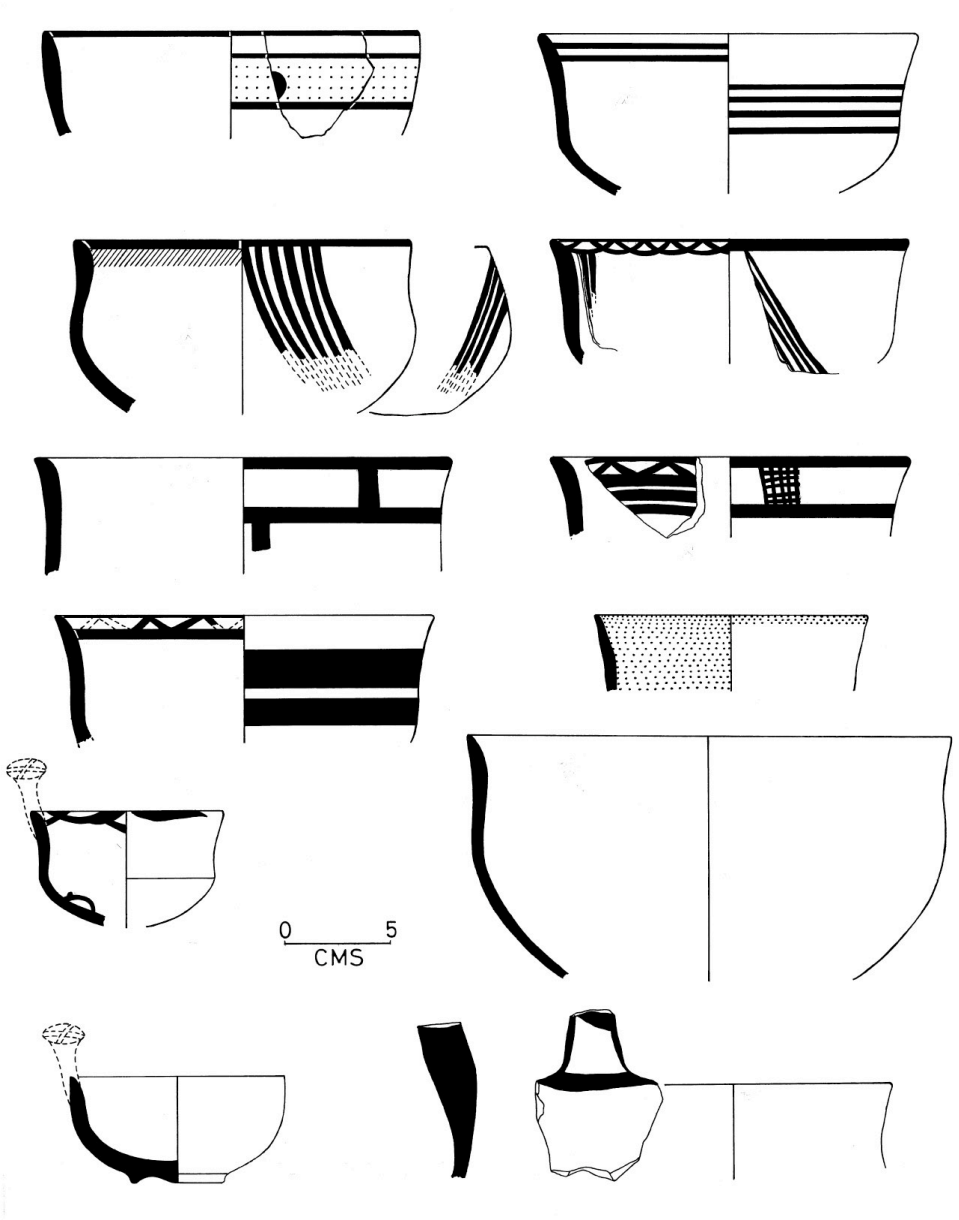
This particular type of bowl was first identified at the site of Nageshwar (Bhan, Krishnan and Sonawane 1992: 42-43, Variety 2). It is the most common type of bowl at Nageshwar, and represents over 15% of the total rim sherds (Bhan, Krishnan and Sonawane 1992: 43). Since then, P. Ajithprasad has studied the presence of this bowl type at other sites in Gujarat and found that it occurs at a number of Harappan sites in the Jamnagar District of Gujarat, especially in the coastal areas of the Gulf of Kachchh (Ajithprasad et al. 1999, Bhan 1986). From these studies it appears that the Jamnagar bowl is fairly common at Nagwada (Hegde et al. 1988, 1990), which is linked to the Rann of Kachchh via the Rupen Estuary. However, it seems to be very rare at Kuntasi (Dhavalikar 1996), which is very close to the Gulf of Kachchh and is roughly 20 km from Bagasra. As summarized in by Bhan, Krishnan and Sonawane (1992: 43) and Ajithprasad et al. (1999), this bowl is very rare outside of Jamnagar District, but similar bowls have been reported at Rangpur (Rao 1963: Fig. 15: 4, Fig. 28: 23-24), Lothal (Rao 1985: Fig. 52: 61-61d, Fig. 68: 185a, Fig. 82: 255, Fig. 86: 278a), and Surkotada (Joshi 1990, 1972: Fig. 10: 8). The percentage of the Jamnagar bowl at these sites has not been reported, but the number of sherds appears to be very low (Ajithprasad et al. 1999). Other reports (Bhan, Krishnan and Sonawane 1992: 43) of Jamnagar bowls at Rojdi (Herman 1989: Fig. 31) and Mohenjo Daro (Dales and Kenoyer 1986: Fig. 41:4) do not fit with the typological description of this bowl presented in this dissertation and also in reports by P. Ajithprasad (Ajithprasad et al. 1999). This bowl type has not been reported at sites in Sindh (Bhan, Krishnan and Sonawane 1992: 43).

In the literature the Jamnagar bowl type is also referred to as the Nageshwar bowl (Ajithprasad et al. 1999). However, in this dissertation I choose to refer to it as the Jamnagar bowl to reflects it's known regional distribution in the Jamnagar District of the Indian state of Gujarat. This convention is also in keeping with the labeling system for Anarta and Sorath pottery (Anarta is a local name for the region of north Gujarat and Sorath is a local name for Saurashtra).

5c. The Sorath Bowl

The Sorath bowl (Figure 5.14) is one type of wheel made bowl among the assemblage of Sorath pottery, which I explained in detail in Chapter 2 (see also Herman 1989, Possehl 1980, Possehl and Herman 1990). While many Sorath vessels forms, such as pedestalled bowl and dish forms, closely resemble certain Harappan vessel types (Herman 1997a, Possehl and Herman 1990), the Sorath bowl is quite distinct and is not part of the Mohenjo Daro pottery typology (Dales and Kenoyer 1986). The distinctive features of the Sorath bowl are its concave or convex-sided profile and simple rim with internal thickening. The rim diameter tends to be equal to or slightly smaller than the maximum body diameter (Herman 1989: 59). In the select sample of Sorath bowls from Bagasra, the external rim diameters range from 9cm to 24cm, and thus include both small and medium-sized bowls. The Sorath bowl is the most common vessel type during all three phases of occupation of the site of Rojdi, the type site of the Sorath tradition (Possehl and Raval 1989), where it accounts for two-thirds or more of the fine ware vessels (Rojdi A, 2500-2000 BC) (Herman 1989, Possehl and Herman 1990).

Figure 5.14: The Sorath Bowl (Vessel Type 270 at Bagasra)
(Image courtesy of the Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



The Sorath bowl is a class of fine ware bowls that share many formal features, but show slight differences in rim form and body profile. Therefore, while the descriptions of Sorath bowls drawn on for this research (Herman 1989, Possehl and Herman 1990, Rao 1963) do not apply the type-variety framework, it is possible to group these bowls into one single type, which I refer to as "the Sorath bowl" (recorded as vessel form 270). This bowl type contains several varieties, which vary in rim form and body profile and are described below. In addition, a variety with a stud-handle is rare at Bagasra, as at Rojdi (Herman 1989: 75, 96; 0.3-0.5% of fine ware rims).

As a side note - S. R. Rao (1963: 23) first proposed that stud-handled bowls at the site of Rangpur show an evolution over time from a short, squat in Rangpur period IIA to longer, slender handles in period IIC. A Rojdi, Charles Herman (1989: 75) noted that these two handle types co-occur. The long, slender stud-handle type are confined to Rojdi periods B and C and are associated with fine ware Sorath bowls, which he explains as the result of throwing these bowls, and their handles, on a fast wheel. Further, at Rojdi the short stud-handle tended to be found on hand-made bowls in, what Herman calls, "non-Harappan" fabrics (Prabhas Ware and Smooth Red Ware), which are found during all three periods at the site (Rojdi A, B and C). In this sample from Bagasra only five stud handles where documented. Two are short stud handles and the stud handle is not preserved on the other three.

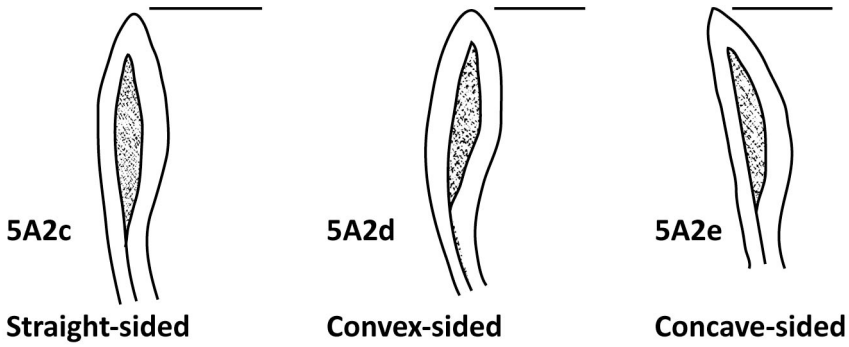
A subset of the Sorath bowls documented for this study have been identified to the specific Sorath bowl variety. However, since changes in this bowl over time are not central to

the main questions of this dissertation, and they have been extensively studied by other scholars, I chose to restrict identification and data analysis of Sorath bowls to their main type.

Archaeologists working at sites with a rich array of Sorath pottery have studied the variation in the Sorath bowl over time and identified chronological variation in the rim and vessel profile. The earliest documented Sorath bowl variety (periods Rojdi A and Rangpur IIA) had convex sided walls and a flat-non-contiguous discoid base (Dales and Kenoyer 1986: Fig. F, IV, A) (Herman 1989: 59, Possehl and Herman 1990: 301). The convex-sided bowl is the dominant bowl variety during all three phases at Rojdi (2500-1700 BC). A straight-sided variety is found during Rojdi B and C (date-1700 BC). The concave, or S-shaped profile, is found during Rojdi C (1700-1900) and Rangpur IIC. During Rojdi B a carinated variety appears, which continues during Rojdi C. At Rangpur, S. R. Rao (1963: Fig. 16) noted a trend from blunt carination to sharp carination between Rangpur period IIC and period III.

In this sample from Bagasra are documented the convex-sided, straight-sided, and concave-sided Sorath bowl varieties, which are distinguishable by the angle of their rims (Figure 5.15). The distinctive rim has internal thickening, which appears as a bulge (see also Herman 1989: Fig. 28, 7). This type of rim is found on most varieties of the Sorath bowl (Herman 1989: 59). However, the angle of the rim differs in convex-sided, straight, and concave-sided varieties. The carinated Sorath bowl variety is also documented in this Bagasra sample.

Figure 5.15: Sorath Bowl Rim Forms at Bagasra



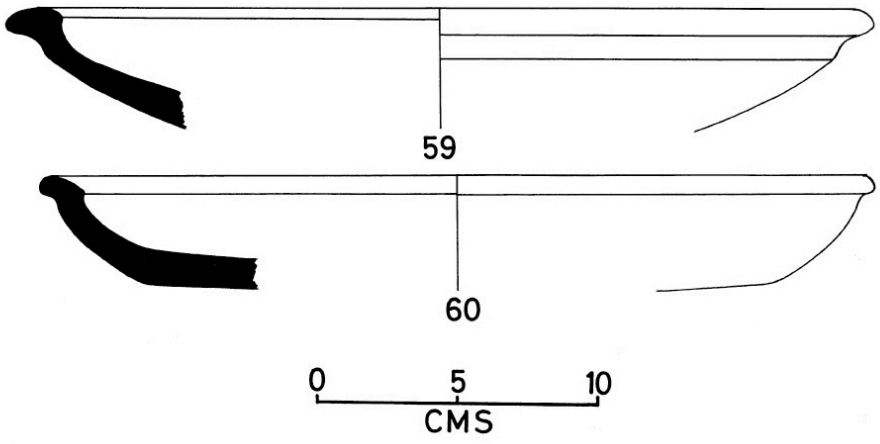
At Rojdi, this fine ware bowl comes in red, yellow-brown and buff wares at Rojdi (Herman 1989) as well as at Bagasra (Appendix B). The clay is well levigated and the fabric often contains mica, tiny white and tiny black inclusion typical of most fine wares at Bagasra. As with most Sorath pottery forms (Herman 1989, Possehl and Herman 1990), it is commonly decorated with a thick red slip and black horizontal bands. At Rojdi, the red slip ranges in color from 10R 5/6 (red) to 5YR 5/6 (yellowish-red) and 7.5YR 6/4 (light brown) (Possehl and Herman 1990: Fig. 3, 3). At Bagasra, Sorath bowls are slipped in a variety of shades of red (red 1, red 2, red 3, red 5), with red 1 (7.5 R 4/6, R 5/4) being the most common (see Appendix B). Sorath bowls may also be decorated with complex painted geometric and natural motifs in black and white color. At Rojdi, these highly decorated bowls are associated with Rojdi C (1900-1700BC), which is equivalent to Phase IV at Bagasra and represents Localization Era trends of de-urbanization, economic and technological change.

6. Harappan Serving Vessels: The Harappan Bowls and Dishes

Documented at Bagasra are several types of bowls and dishes that are defined in the Harappan pottery typology. As described in Chapter 4, this set of Harappan bowls and dishes share several features, including rim types and upper body profiles, which limits precise vessel identification from small pottery sherds. Therefore, this section presents a combined analysis of the four vessel types:

- ***Bowl/Dish 55:*** *a medium to large bowl/dish with flared sides and a pressed base;* Mohenjo Daro types 40, 49 and 50 (Dales and Kenoyer 1986: 179-180, 199-201, Figure 102, Table 10-A) and Harappa type 55 (HARP pottery type reference manual)
- ***Bowl/Dish 56:*** *a medium to large bowl/dish with flared sides and a ring base;* Mohenjo Daro type 47 and 48 (Dales and Kenoyer 1986: 193-195, Figure 102, Table 10-A) and Harappa type 56 (HARP pottery type reference manual)
- ***Bowl 38:*** *a medium to large bowl with convex sides and a molded base;* Mohenjo Daro type 38 and 39 (Dales and Kenoyer 1986: 174-178, Figure 102, Table 10-A) and Harappa type 45 (molded) and type 47 (scraped) (HARP pottery type reference manual)
- ***Bowl 37:*** *a large deep bowl with cord impressions;* Mohenjo Daro type 37 (Dales and Kenoyer 1986: 169-172, Figure 102, Table 10-A) and Harappa type 44 (HARP pottery type reference manual)

Figure 5.16: Harappan Bowl and Dish Types from Bagasra



Detailed in Chapter 4, bowl/dish 55 appears to be the most common at Bagasra based on this data set. Bowl/Dish 55 is described (Dales and Kenoyer 1986: 179-180, 199-201) as a large bowl or dish with a pressed contiguous base (base type category 2 and 4, with base 2A, 2D and 4A as the most common), a complex internally projecting (rim type category 5) or bilaterally projecting rim (rim type category 8) and convex or flared sides. Dish forms have a broad flat base and bowls have a narrow base. As a bowl or dish, the vessel comes in both plain and red slipped, or red slip black band decoration. Most examples from Bagasra are red slipped on the interior and extending over the rim; many are completely slipped. Red slipped black band varieties are also common at Bagasra. At Mohenjo Daro and Bagasra, this form comes in a fine to medium sandy reddish-yellow clay fabric with mica and tiny white inclusions. Type 50 at Mohenjo Daro is also documented in coarser fabrics. The form is wheel thrown and the lower body and base are carved and smoothed (Dales and Kenoyer 1986: 199). The Mohenjo Daro type 49 samples range in size from an external rim diameter of 36.5 cm to 22.0 cm, and an average ERD of 29.1 cm (n=11). As a dish, the external height averages 2.7 cm (n=8) with a base diameter from 25.0 to 16.5cm (average 18.8 cm, n=6) (Dales and Kenoyer 1986: 1999).

Bowl 38 is another common Harappan form documented at Bagasra. Bowl 38 is a medium to large deep open bowl with a complex internal or bilaterally projecting rim, convex sides and a flat molded or scraped lower body and base (base type 2D and 4A) and a convex profile (Dales and Kenoyer 1986: 174-178). They come in fine to medium and coarse sandy reddish-yellow clay with tiny mica and white inclusions. This bowl is generally unslipped at Harappa and Mohenjo Daro, but is occasionally found with a simple red slip painted on the

exterior. Among a sample of 24 measurable rim diameters, the average size for variety 1 was 30.42 cm and ranged from 22.0 cm to 40.0 cm. The average external rim diameter for variety 2 was 36.51cm and ranged from 26.0 cm to 50.0 cm (n=51). Both varieties show no clear size groupings (Dales and Kenoyer 1986: 174-177).

Bowl 37 is much larger in size and has distinctive external cord impressions, a wide bilaterally projecting or interior projecting rim (rim type category 6 or 8), and ring, or channel-rim, base (base type category 6). Single or multiple exterior cord impressions located on the rim and shoulder mark the maximum body diameter. The slip covers the interior and extends over the rim to the exterior shoulder, usually ending at the cord impressions. At Mohenjo Daro, the type has four variants, which are distinguished by rim and base type as well as slip (red slip, red slip black bands, or no slip). At Mohenjo Daro, Harappa, and Bagasra, this form was thrown on a fast wheel in fine to medium sandy reddish-yellow clay with tiny mica and white inclusions.

7. Results: Serving Vessels at Bagasra

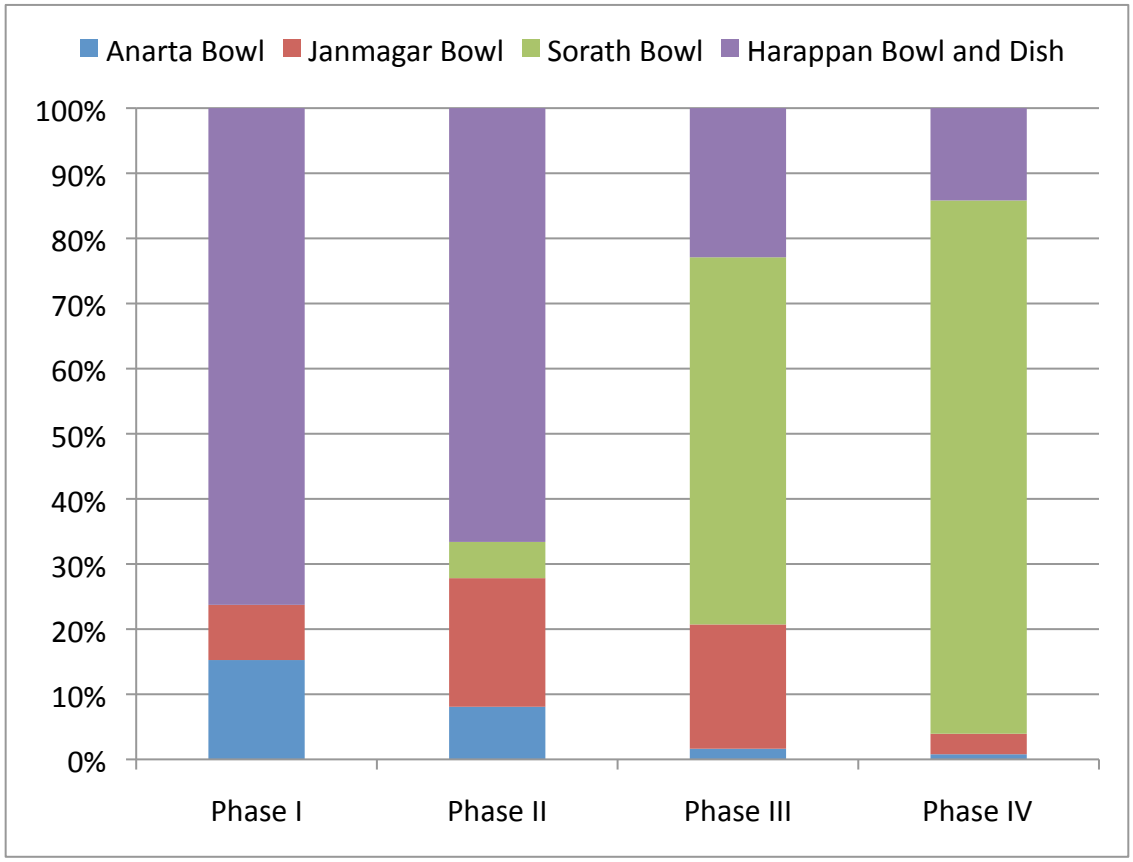
Comprehensive ceramic analyses of over 12,500 diagnostic potsherds from the 15 trenches at Bagasra that are included in this study indicate that there are notable chronological differences in the percentages of Anarta, Jamnagar and Sorath bowls as well as Harappan bowls and dishes (Table 5.5). Moreover, these serving bowl data also indicate that the Harappan and non-Harappan bowl types co-occur during the entire occupational history of the site. In this section I present new data on the quantity, percentage, and spatial distribution of distinct bowl types during the four phases at Bagasra. These bowl types are an important component of

regional pottery chronologies and have been documented at sites across Gujarat. As Bagasra is the first site where all three have been found in stratigraphic association, these new data have the potential to enhance our understanding of the social contexts in which these bowls were used and discarded.

Table 5.5: Phase-by-Phase Count and Percentage of Selected Bowl Types at Bagasra Compared to Total Ceramics

Phase	Anarta Bowl	Jamnagar Bowl	Sorath Bowl	Harappan Bowl and Dish	Total Analyzed Ceramic Assemblage
Phase I (2500-2450 BC)	9 (1.52%)	5 (0.85%)	0 (0%)	45 (7.61%)	591
Phase II (2450-2200 BC)	45 (1.0%)	110 (2.44%)	31 (0.69%)	371 (8.23%)	4506
Phase III (2200-1900 BC)	15 (0.26%)	175 (3.04%)	517 (8.98%)	210 (3.65%)	5760
Phase IV (1900-1700 BC)	3 (0.18%)	12 (0.73%)	312 (18.89%)	54 (3.27%)	1652
Totals	72 (0.58%)	302 (2.41%)	860 (6.88%)	680 (5.44%)	12509

Figure 5.17: Selected Bowl Types as a Percentage of the Total Ceramics from Each Phase



Summarized in Table 5.5 and Figure 5.17, analyses of the phase-by-phase percentage of these three non-Harappan bowl types compared to the selected Harappan bowl and dish forms indicate a significant shift between Phase II and Phase III in the relative proportion of Harappan bowls and dishes compared to Sorath bowls. The significant shift in serving bowl preferences is represented by the relative decrease Harappan bowls and dishes, from a maximum abundance of 8.23% (n=371) in Phase II, to 3.65% (n=210) of the Phase III assemblage. Sorath bowls, on the other hand, increase from a low of 0.69% (n=31) in Phase II, to 8.98% (n=517) in Phase III. This

trend continues into Phase IV, when Sorath bowls represent 18.89% (n=312) of the overall assemblage, which is a remarkably high proportion compared to other analyzed vessels forms. At the same time, the relative abundance of Harappan bowls and dishes shows continuity in use between Phase III and Phase IV (3.27% , n=54).

In comparison to Harappan and Sorath bowls, Anarta and Jamnagar bowl data do not suggest a significant shift in their use between Phases II and III. Anarta bowls comprise a much smaller percentage of the overall pottery count (0.58%, n=72) and appear to have been slightly more common during the site's initial occupation (1.52%, n=9). Anarta bowls general trend in declined use, though the overall quantity of this bowl type in this pottery sample is very low. Jamnagar Bowls are more common, and total 2.41% (n=302) of the overall assemblage. Jamnagar bowls occur in greatest percentage during Phase II and III, when they total 2.44% (n=110) and 3.04% (175) of the pottery totals for each phase – indicating continuity in use between Phase II and Phase III.

Further, these phase-by-phase data show that during Phase I and Phase II, Harappan bowl and dish types occur in greater percentage than the selected non-Harappan bowls. (During Phase I Harappan forms comprise 7.61% of the total assemblage while non-Harappan forms, when combined, total 2.37%. Non-Harappan bowl types increase to a combined 4.13% of the total assemblage during Phase II, but Harappan forms are still more frequent at 8.23%. In addition, Sorath bowls, which first appear in Phase II, become the dominant type during Phase III (8.98%) and remain the most frequent bowl type during Phase IV (18.89%).

These selected bowl and dish chronological trends are in keeping with the pottery chronology established for Bagasra by the MSU excavation directors as well as P. Ajithprasad and colleagues' study of changes in bowl form and percentage at Bagasra (Ajithprasad 2012a, Ajithprasad et al. 1999). Described in detail in Chapter 2 and Chapter 3, the MSU chronology for Bagasra is primarily defined by stages of perimeter wall construction and broad changes in groups of diagnostic pottery types, rather than changes in individual vessels. Thus, it establishes the presence/absence and relative proportion of Harappan, Anarta and Sorath ceramics during each phase.

My analysis of selected Anarta, Jamnagar, Sorath bowls as well as specific Harappan bowl and dish forms produced data that diverges from the expectations outlined in the MSU pottery chronology in several important ways. First, Harappan bowl and dish types outnumber the Anarta bowl in both number and percentage during Phase I. This pattern differs from the expectations established by the MSU pottery chronology, which states that Anarta pottery, as a whole, dominates the Phase I assemblage. Second, as reflected in the MSU pottery chronology at Bagasra, Harappan pottery types are generally absent from Phase IV deposits. However, these new data on select Harappan bowl and dish types imply that certain Harappan vessel forms continued to be used by residents, but to a much lesser degree, while most other Harappan forms were no longer produced and used locally.

On the other hand, the data in this section is also consistent with the expectations outlined in the MSU pottery chronology as well as in Ajithprasad's preliminary bowl study (Ajithprasad et al. 1999). First, Harappan and Anarta pottery, including Harappan and Anarta

bowls as well as the Jamnagar bowl, are present from the site's initial occupation (Phase I) and continue to be found in Phase II deposits. Harappan pottery dominates the pottery assemblage during Phase II, as do the selected Harappan bowl and dish forms included in this study. Sorath pottery, including the Sorath bowl, first appears during Phase II, when they comprise a small percentage of the overall pottery assemblage. During Phase III, Harappan pottery as a whole is still more common than other pottery classes, however, these Sorath bowl data indicate that this specific vessel form actually occurred in much greater percentage than the other selected bowl types. Finally, during Phase IV, when most of the pottery assemblage consisted of Sorath pottery, Sorath bowls are also occur in greater percentage than the other bowl types. However, Jamnagar and Anarta bowls continue to occur alongside the Sorath bowl in Phase IV deposits.

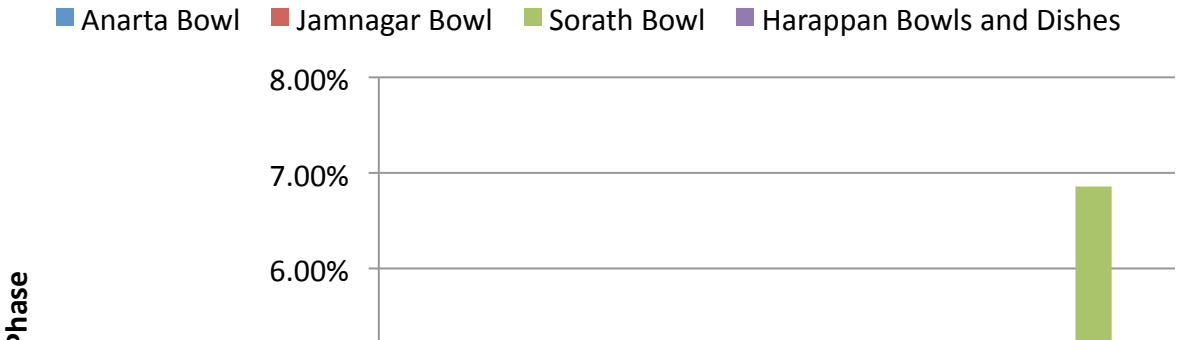
The documented sample of serving bowl and dish types come from diverse depositional contexts both inside and outside of Bagasra's perimeter wall. Table 5.6 represents a comparison of the counts of the selected bowl and dish types inside and outside the wall. Figure 5.17 illustrates the percentage of each vessel type from the total ceramics for each phase. Only Phase II (2450-2200 BC) and Phase III (2200-1900 BC) (Integration Era) are represented in the table since these were the periods when the perimeter wall separated the settlement into walled and unwalled space and thus limited access to important craft workshops located inside.

Table 5.6: Count of Selected Bowl Types Inside and Outside the Perimeter Wall at Bagasra

Phase	Vessel Type	Inside Perimeter Wall	Outside Perimeter Wall	Total Number of Bowls and Dishes
Phase II	Anarta Bowl	15	30	45
	Jamnagar Bowl	49	61	110
	Sorath Bowl	8	23	31
	Harappan Bowls and Dishes	231	140	371
Phase II Total		303	254	557
Phase III	Anarta Bowl	8	7	15
	Jamnagar Bowl	119	56	175
	Sorath Bowl	122	395	517
	Harappan Bowls and Dishes	142	68	210
Phase III Total		391	526	917

Whereas a phase-by-phase comparison of bowl percentages (Table 5.5) establishes that selected Harappan bowl and dish types occur in greater percentage than non-Harappan types during Phase II, data in Table 5.6 more specifically show that this pattern is consistent both inside and outside the perimeter wall. In other words, Harappan bowls and dishes occur in greater percentage than the non-Harappan bowl forms both inside and outside the Phase II perimeter wall. These data further suggest that Harappan forms occur in greater percentage (5.13%, n=231) inside the wall than outside the wall (3.11%, n=140). At this time the Jamnagar

Figure 5.18: Percentage of Bowl and Dish Types Inside and Outside the Perimeter Wall at Bagasra



	Phase II		Phase III	
	Inside	Outside	Inside	Outside
Anarta Bowl	0.33%	0.67%	0.14%	0.12%
Jamnagar Bowl	1.09%	1.35%	2.07%	0.97%
Sorath Bowl	0.18%	0.51%	2.12%	6.86%
Harappan Bowls and Dishes	5.13%	3.11%	2.47%	1.18%

bowl appears in roughly the same percentage in sampled areas inside (1.09%, n=49) and outside the wall (1.35%, n=61). The reported percentages of Anarta and Sorath bowls are very low (<1.0%), but show trends that suggest these bowl types may have been more slightly prevalent outside of the wall during Phase II.

Phase III bowl data establish that the Sorath bowl increases significantly in both quantity and percentage between Phase II and Phase III (Table 5.5, Figure 5.18). Analysis of its distribution inside and outside the perimeter wall shows that this type of bowl is significantly more frequent (6.86%, n=395) outside the wall than it is inside (2.12%, n=122) at this time. At the same time that Harappan bowls and dishes show a decrease in percentage between Phase II and Phase III (Table 5.5, Figure 5.18), their percentage inside the Phase III perimeter wall (2.47%, n=142) remains slightly greater than the percentage outside the wall (1.18%, n=68), which is a pattern that continued from Phase II. Phase III Jamnagar bowl patterns show a possible increase in their percentage inside the perimeter wall (2.07%, n=119) compared to outside the wall (0.97%, n=56). However, overall Jamnagar bowls show continuity from Phase II. Anarta bowls, on the other hand, show an apparent decrease across the site and represent an extremely small percentage of the Phase III assemblage on either side of the wall (0.14% inside, 0.12% outside).

These data are consistent with interpretations that the community living inside and outside the perimeter wall at Bagasra had access to the same types of vessels, but perhaps those residing inside, where the craft industry was concentrated during Phase II, had greater

access to, or a greater preference for, Harappan serving dishes. During Phase III this pattern appears to change and those living in both areas of the site had similar preference for Harappan pottery types. Moreover, during Phase III those residing outside the perimeter wall are much more likely to have used Sorath style bowls for regular food or drink consumption. In sum, these bowl data point to differences in the percentage of Harappan and non-Harappan pottery types recovered inside and outside the wall between Phase II and Phase III.

To further explore patterns in the spatial distribution of Harappan and non-Harappan serving bowl and dish types inside as compared to outside Bagasra's perimeter wall, I also compared their percentage in different archaeological contexts (see Chapter 3 for a description of context types). The goal of this approach was to identify whether one type of cooking pot was more or less prevalent in certain contexts.

The table below (Table 5.7) represents presents the percentage of Anarta, Jamnagar, Sorath and Harappan types by phase as well as context, alongside the total pottery from each unit. In order to explore patterns inside and outside the perimeter wall, the following figures (Figure 5.19, 5.20) present data from craft and habitation contexts from Phase II and Phase III only.

Table 5.7: Counts of Selected Harappan and Non-Harappan Bowl and Dish Types by Phase and Context Type

Phase	Location	Vessel Type	Craft Production	Habitation	Habitation/Structural	Structural	Other	Total
Phase I		Anarta Bowl	0	0	5	4	0	9
		Jamnagar Bowl	0	0	4	1	0	5
		Sorath Bowl	0	0	0	0	0	0
		Harappan Bowl and Dish	0	5	23	12	5	45
		Total Pottery	0	157	205	167	62	591
Phase II	Inside	Anarta Bowl	15	0	0	0	0	15
		Jamnagar Bowl	31	8	2	8	0	49
		Sorath Bowl	6	1	1	0	0	8
		Harappan Bowl and Dish	170	20	14	27	0	231
		Total Pottery	1355	547	180	439	0	2521
	Outside	Anarta Bowl	10	8	0	12	0	30
		Jamnagar Bowl	0	35	0	24	2	61
		Sorath Bowl	5	18	0	0	0	23
		Harappan Bowl and Dish	11	83	0	42	4	140
		Total Pottery	187	927	0	764	107	1985
Phase III	Inside	Anarta Bowl	8	0	0	0	0	8
		Jamnagar Bowl	88	28	0	0	3	119
		Sorath Bowl	60	61	0	0	1	122

		Harappan Bowl and Dish	94	44	0	0	6	144
		Total Pottery	2527	1209	0	0	86	3822
	Outside	Anarta Bowl	0	4	0	3	0	7
		Jamnagar Bowl	0	44	0	12	0	56
		Sorath Bowl	0	358	0	29	8	395
		Harappan Bowl and Dish	0	51	0	13	4	68
		Total Pottery	0	1568	0	328	42	1938
Phase IV		Anarta Bowl	0	3	0	0	0	3
		Jamnagar Bowl	0	9	0	3	0	12
		Sorath Bowl	0	235	0	77	0	312
		Harappan Bowl and Dish	0	41	0	13	0	54
		Total Pottery	0	1154	0	498	0	1652
Totals		Anarta Bowl	33	15	5	19	0	72
		Jamnagar Bowl	119	124	6	48	5	302
		Sorath Bowl	71	673	1	106	9	860
		Harappan Bowl and Dish	275	244	37	107	19	682
		Total Pottery	4069	5562	385	2196	297	12509

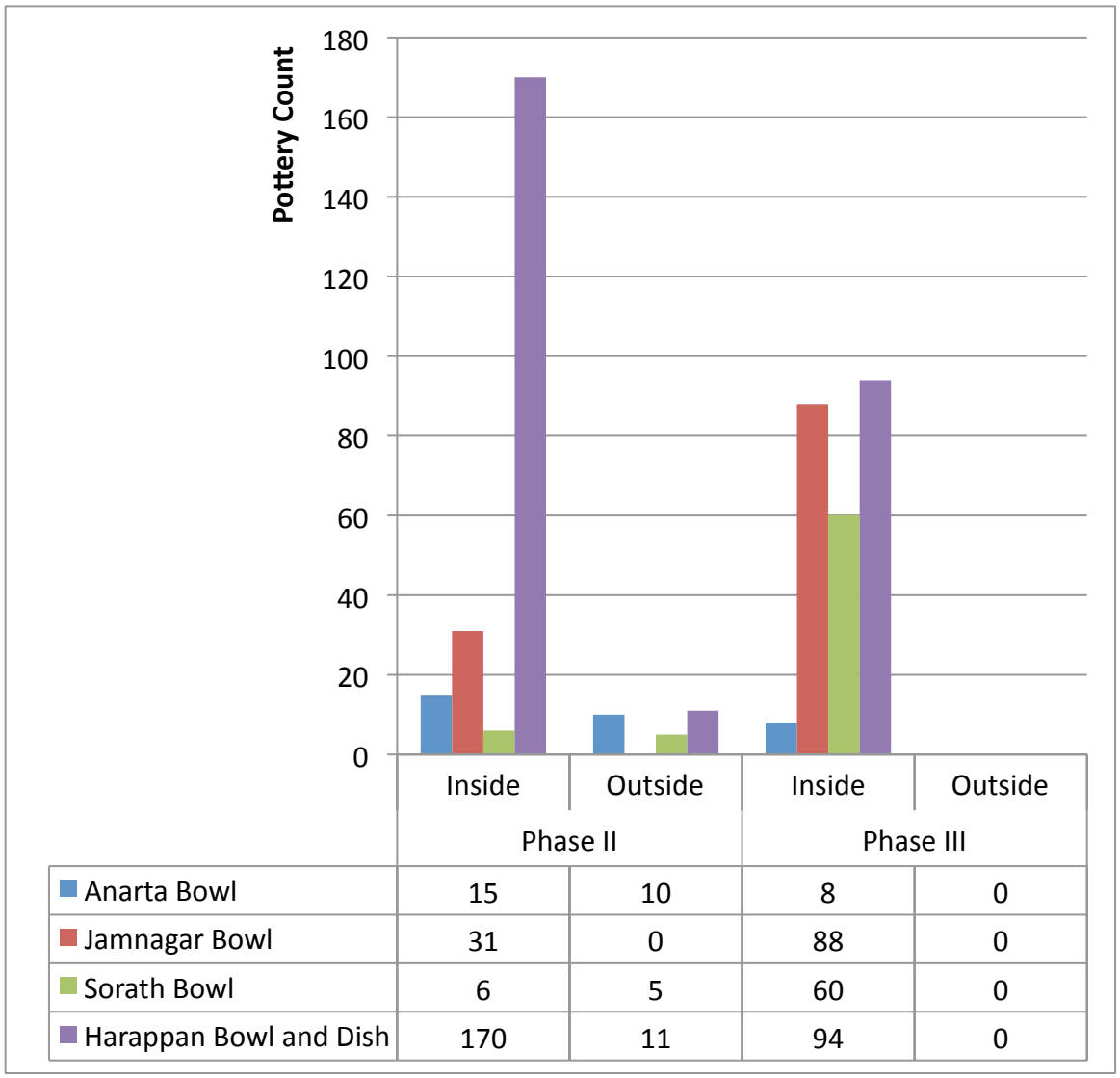
Presented in Table 5.7 and Figure 5.19, there are several notable differences in the frequencies of selected bowl types in Phase II and Phase III craft contexts. First, Figure 5.19 illustrates greater percentage of selected bowl and dish types inside the wall during both Phase II and Phase III, when compared to craft contexts outside the wall. These data reflect the location of excavated craft workshops and have more to do with activity areas than pottery preferences.

The more outstanding pattern, which I observed from these data, is that during Phase II Harappan bowl and dish types stand out as having a relatively high count (181 sherds) and percentage (11.73% of the total pottery from Phase II craft contexts, n=1542) in craft production contexts located inside the perimeter wall. For comparison, Anarta, Jamnagar and Sorath bowls combined total 4.34% (n=67) of the pottery from Phase II craft contexts. Described in detail in Chapter 2, craft areas inside the wall include a regionally prominent shell bangle manufacturing workshop (trenches Ea6, Ea11, Ea12, Eg2 and Eg3) as well as faience production workshop and lithic stockpiling area (trench Eq2). In comparison, bowl data from Phase III craft contexts appears to show a decrease in the prevalence of Harappan serving bowl and dish types (94 sherds, 3.72% of total), which is accompanied by an apparent increase in Sorath and Jamnagar bowls. Non-Harappan bowls comprise 6.17% (n=156) of the assemblage from Phase III craft contexts inside the wall.

Craft activities documented outside of the wall during Phase II include a semi-precious stone bead workshop adjacent to the southern gateway (Trench Eh3), which is represented as the total of bowls in Table 5.7 (Phase II, outside, craft production). While the amount of

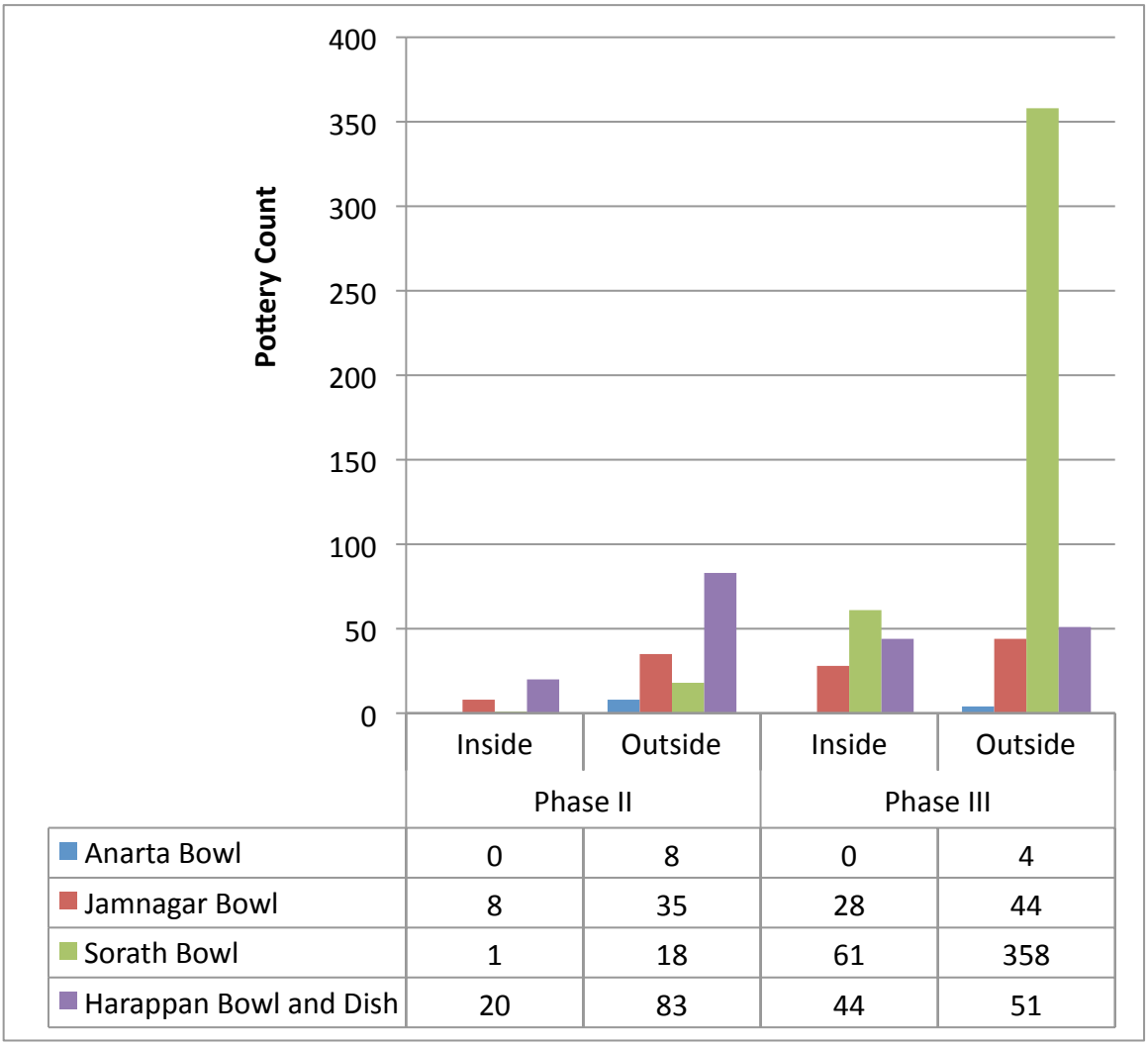
pottery from this craft context outside is very low (185 sherds), Anarta and Harappan bowls appear in greater percentage than Sorath bowls.

Figure 5.19: Count of Selected Harappan and Non-Harappan Bowl and Dish Types in Craft Contexts at Bagasra



	Phase II		Phase III	
	Inside	Outside	Inside	Outside
Anarta Bowl	15	10	8	0
Jamnagar Bowl	31	0	88	0
Sorath Bowl	6	5	60	0
Harappan Bowl and Dish	170	11	94	0

Figure 5.20: Count of Selected Harappan and Non-Harappan Bowl and Dish Types in Habitation Contexts at Bagasra



	Phase II		Phase III	
	Inside	Outside	Inside	Outside
Anarta Bowl	0	8	0	4
Jamnagar Bowl	8	35	28	44
Sorath Bowl	1	18	61	358
Harappan Bowl and Dish	20	83	44	51

Harappan and non-Harappan bowl and dish data from sampled habitation contexts are illustrated in Figure 5.20 above. As stated earlier (Table 5.5, Table 5.6), Sorath bowls first appear during Phase II at Bagasra, but show a significant increase in both quantity and percentage during Phase III, especially in contexts located outside the perimeter wall.

Additional context-specific data (Table 5.7, Figure 5.20) show that a greater percentage of Sorath bowls is associated habitation contexts located outside the wall, which date to Phase III, where they account for 12.89% (n=358) of the total pottery from habitation contexts from this period (n=2777).

The pattern of significantly higher percentage of Sorath bowls in habitation contexts located outside the perimeter wall may be explained by the evidence that, in fact, all Phase III contexts excavated outside the wall were associated with general habitation debris, and not craft production. However, this context-specific analysis adds an interpretive dimension to evaluations of these pottery data by clarifying the types of archaeological contexts where the Sorath bowl is more likely to be found as well as by providing additional information on the possible dimensions of their past use. Furthermore, bowl data from Phase II and Phase III habitation contexts located inside and outside the wall show that patterns in percentage and spatial distribution of Anarta, Jamnagar and Harappan types are less clear in habitation deposits than the craft contexts discussed above. These Anarta, Jamnagar and Harappan bowl data are instead suggestive of a community trend towards using these bowls in similar proportions in habitation related contexts across the settlement.

In summary, in this section I presented new data on the percentage, chronological, and spatial distribution of three types of bowls - the Anarta bowl, the Jamnagar bowl and the Sorath bowl, which are not included in the Harappan pottery typology (Dales and Kenoyer 1986), and are thus classified as non-Harappan in this dissertation. These data were compared to Harappan bowl and dish types, which are common at Bagasra, and which were discussed in

greater detail in Chapter 4. These vessel-specific data are in keeping with patterns in Harappan and non-Harappan pottery overall, but diverge from chronological pottery trends in several important ways. First, during Phase I, when Anarta pottery dominates the Bagasra pottery assemblage, the select Harappan bowl and dish type seems to outnumber the Anarta bowl in both number and percentage. Second, during Phase IV, when Harappan pottery types are generally absent from Phase IV deposits, select Harappan bowl and dish types appear to have continued to be used by residents, though to a much lesser degree than previously.

8. Conclusion

In this chapter I examined the percentage, chronological and spatial distribution of select Harappan and non-Harappan vessels that are associated with cooking and consuming food. In keeping with the main research questions of this dissertation, this chapter focused on the similarities and differences in the types of Harappan and non-Harappan cooking pots and serving bowls used by residents who lived inside Bagasra's perimeter wall as compared to those who lived outside the wall. Further, in this chapter I also analyzed the distribution of this set of culinary equipment (Bray 2003) in craft contexts and habitation areas inside and outside the wall.

The results of this analysis not only demonstrate that the residents at Bagasra used different types of cooking pots and serving bowls and dishes than those who lived at the urban centers in the Indus Valley, but also point to important variation in the use of certain pottery

types by residents inside and outside the perimeter wall at Bagasra. Two pottery preferences stand out amongst the data presented in this chapter. First, the extremely low recovered quantity of Harappan cooking pots clearly indicates that most residents at Bagasra rarely, if ever, used Harappan cooking pots for meal preparation. Instead, the recovery of the newly identified Bagasra local cooking pot indicates that this vessel form was more commonly used, perhaps in addition to other, yet unidentified, cooking vessels or technologies. Second, the percentage of the analyzed culinary vessels clearly points to a shift in the relative abundance of cooking pots and serving bowls and dishes between Phase II (2450BC-2200 BC) and Phase III (2200-1900 BC.) This shift in pottery preferences is evident by the notably greater relative abundance of the Bagasra local cooking pot, as well as the Sorath serving bowl, during Phase III as compared to Phase II. The notable decrease in the percentage of Harappan serving bowls and dishes between Phase II and Phase III is a second line of evidence for a shift in pottery preferences between Phase II and Phase III, a period of Integration Era (2500-1900 BC) economic transition in Gujarat (Possehl 1997a), which is reflected in the decline in craft manufacture and building projects at Bagasra (Sonawane et al. 2003).

This chapter also examined the spatial distribution of Harappan and non-Harappan cooking pots and select serving vessels inside as compared to outside Bagasra's monumental perimeter wall. As outlined in Chapter 2, a primary goal of this study was to test the inside/outside the wall model. The inside/outside the wall postulates that Bagasra's elite leaders concentrated their craft, mercantile, and domestic activities inside the settlement's monumental perimeter wall in order to distinguish themselves from the local, non-Harappan

inhabitants living outside the wall (Chase 2007). For this reason, this model predicts that Harappan style pottery will be predominantly recovered from deposits inside Bagasra's perimeter wall. Non-Harappan style pottery, on the other hand, will be primarily found in deposits outside the perimeter wall.

Analyses of the spatial distribution of Phase II cooking pot and select serving bowl and dish data suggest that individuals or families living inside the perimeter wall used Harappan cooking vessels to a similar degree as those living outside the wall. Further, the Bagasra local cooking pot was found to have been more common than the Harappan cooking pot in both areas of the site, indicating that residents inside and outside the wall instead used these pots for daily meal preparation. Thus, for Phase II, the spatial distribution of cooking pots does not reflect the symbolic demarcation of space represented by the perimeter wall.

However, analyses of serving bowl percentages and spatial distribution on both sides of the perimeter wall indicate that during Phase II the Harappan bowl and dish occurred in greater percentage than Anarta, Jamnagar and Sorath bowl forms. Further, the Harappan serving vessel occurred in greater percentage inside the wall at this time. Additional analytical detail on the percentage of these vessel types in specific archaeological contexts suggests, more specifically, that Harappan bowls and dishes occur in greater percentage than non-Harappan bowls in Phase II craft production contexts located inside the perimeter wall. These data point to the possibility that Harappan pottery was associated with craft activities, which concentrate inside Bagasra's perimeter wall, rather than being restricted in use to areas inside the wall by elites who displayed a non-local ethnic identity. One possible explanation for this pattern is that

Harappan pottery was associated with craftspeople and traders. Bagasra's craftspeople and traders had local ancestral connections and ethnic identity, but maintained long-distance social and economic connections to distant areas of trade and exchange.

During Phase III it appears that the Bagasra local cooking pot increases in percentage and is accompanied by an overall increase in the use of Sorath bowls, which comprise the majority of serving vessels during this period. Furthermore, these data suggest that Sorath bowls are much more frequent in areas outside the perimeter wall and are specifically concentrated in habitation contexts.

These data point to a shift in the culinary equipment (Bray 2003) used by residents at Bagasra between Phase II and Phase III. They also illustrate the potential of vessel-specific analyses to inform our understanding of the use of Harappan and non-Harappan pottery. Whereas aggregate comparisons of pottery types across time produce general patterns of ceramic change, context-specific analyses have the potential to inform our interpretation of the social contexts in which pottery was used and the changes in their use over time. By comparing the percentage of cooking pots and serving vessels in craft production and habitation contexts located on both sides of the perimeter wall, this chapter put forth new data that can be used to test and refine the expectations established by the inside/outside the wall model. These new data thus add a new dimension of understanding to the co-occurrence of Harappan and non-Harappan pottery at Bagasra.

Based on these new pottery data, a dichotomy that was originally explained by the perimeter wall, can be more accurately explained by the activities identified with the context of

archaeological recovery. Rather than being strictly confined within the perimeter wall, Harappan cooking pot and serving bowl and dish data suggest that the prevalence of Harappan pottery may be more closely connected to craft production activities than had previously been known. As craft workshops are concentrated inside the wall during Phase II, more Harappan pottery has been documented in these excavated areas. This pattern further explains the relatively low occurrence of Harappan pottery in areas outside the perimeter wall, where craft workshops are less common, and also during Phase III when craft production activities wane and eventually come to an end. The prevalence of non-Harappan cooking pot and bowl forms is also explained by this hypothesis, since they seem to be more frequent in non-craft production contexts during both Phase II and Phase III.

In conclusion, these data support a preliminary hypothesis that residents of Bagasra were not migrants from the Indus Valley, nor did they have strong and direct ancestral connections to the core regions of Indus urbanism. Two lines of evidence from this chapter support of this hypothesis: 1) Bagasra contains a restricted set of Harappan culinary vessels and Harappan cooking pots extremely rare, and 2) Harappan cooking pots, bowls and dishes were found deposited across the site, thus refuting models of their restricted use derived from their association with elite status. Whereas the traditional migration-based model, which this dissertation tests, predicts that migrant elite leaders would have displayed their ancestral connections to the Indus Valley through preferences for a wide array of Harappan pottery types, including domestic culinary equipment (Bray 2003), these data instead indicate that most people at Bagasra used a non-Harappan cooking pot as well as a diverse set of Harappan and

non-Harappan domestic culinary vessels. In other words, Bagasra residents, neither those living inside the perimeter wall, nor those living on the outside of the wall, used strictly Harappan or non-Harappan pottery for meal preparation and consumption. These data do, however, support a preliminary hypothesis that elite leaders at Bagasra did not have strong and direct ancestral connections to the Indus Valley, but instead displayed regional preferences for a small and specific set of domestic Harappan pottery types.

Chapter 6: Inscribed Ceramics and Contexts for the Use of the Indus Script at Bagasra

1. Introduction

In previous chapters I presented my analyses of archaeological pottery data from Bagasra. Based on observed patterns in Harappan and non-Harappan pottery I contend that people living at Bagasra selectively adopted specific types of Harappan pottery. Contrary to suppositions of traditional models, Harappan pottery types at Bagasra are documented in contexts on both sides of the perimeter wall, where they are found in direct association with non-Harappan pottery. Chronological patterns presented here further suggest that the preference for certain types of Harappan pottery was more closely associated with Phase II and Phase III, when Bagasra's craft economy and long-distance trade relations were flourishing. However, patterns in select types of domestic vessels point to the possibility that certain Harappan pottery types were used during the site's entire occupation, including into Phase IV.

In this chapter I now turn to examine the evidence for writing on Harappan and non-Harappan pottery forms at Bagasra. Unlike the classical Aegean world, were script is found carved on broken potsherds called ostracon, in the Indus Civilization writing was inscribed on the outside of complete vessels. As a tool of elite power and control over the transmission of knowledge, the presence of steatite seals and pottery with Indus script signifies that literate individuals or families at Bagasra used writing to maintain and display their social and economic position to other members of their community. My study is the first in Gujarat to apply a method for distinguishing different types of pottery graffiti that was developed at Harappa. My

study of graffiti also documents and analyzes patterns in the use of Indus script on pottery and thus provides important new regional data on the use of writing in the Indus Civilization borderlands.

In this dissertation I use the terms "writing" and "script" when I refer to Indus inscriptions. I also use the term "inscribed" to refer to post-firing carved signs, or written graffiti, which represent language and resemble characters in the Indus writing system. As explained in the methods section of this chapter, I distinguish "inscribed" pottery from "incised" pottery, which refers to notations that were potentially not part of a writing system. Incised notations are often located on the rim of the vessel and likely denote the volume or quantity of the contents inside (Kenoyer 2006: 20). The term "graffiti" is used in the broadest possible sense to refer to all types of incised, inscribed, impressed, and painted pre-firing and post-firing signs, symbols and notations found on pottery.

Though Steve Farmer, Richard Sprout and Michael Witzel (2004) contest that Indus inscriptions do not represent a system of writing based on spoken language (see also Lawler 2004), several prominent Indus scholars have refuted their contention (Parpola 2005, 2008a, Kenoyer and Meadow 2010, Vidale 2007) with an array of archaeological and linguistic evidence. Most important for the purposes of this research is their analytical distinction between complex linguistic script, like that inscribed on steatite seals and pottery, and non-linguistic symbol systems, such as pre-firing potter's marks (Kenoyer and Meadow 2008, Parpola 2008a, Vidale 2007).

I begin this chapter with a brief background on studies of Indus script and pottery graffiti. I then move on to describe my methodology for distinguishing text-based from non-textual pottery graffiti, which is based on the methods developed by J. Mark Kenoyer and developed further through long term research undertaken at Harappa by J. Mark Kenoyer and Richard Meadow. By differentiating pre-firing graffiti from post-firing graffiti and script from non-script symbols, this analytical technique produced a robust data set on the Indus writing system, as distinct from other notation systems used by regional communities. I employed a four-part categorization for separating and recording the types of graffiti commonly found on ceramics: pre-firing potter's marks, post-firing graffiti, and painted graffiti. Post-firing graffiti was further divided into incised lines, or notations, and inscribed signs, or writing. In this chapter I argue that the prevalence of writing on pottery in the Indus Civilization can best be examined by separately studying pre-firing potter's marks, post-firing incised lines and inscribed and painted script as suggested by recent work at Harappa (Kenoyer and Meadow 2010).

In the second section of this chapter I present the Bagasra graffiti data in four parts: pre-firing potter's marks, pre-firing painted script, post-firing inscribed graffiti (or script), and post-firing incised graffiti. My discussion of these distinct graffiti data sets is preceded by a comparative evaluation of the prevalence of graffiti across time. Of these four symbol systems evidenced at Bagasra, the Indus writing system was represented by pre-firing painted script as well as post-firing inscribed graffiti, which is also called post-firing inscribed script. Pre-firing potter's marks and post-firing incised graffiti potentially represent non-script, or non-linguistic systems of notation.

In discussing my results, I focus on the Bagasra data set of written language, or script, graffiti, both painted and inscribed, which were documented during each of the four occupation phases and in areas on both sides of the perimeter wall, which stood during Phase II and Phase III. By distinguishing writing from other forms of non-script symbols found on pottery, I have been able to establish that local elites inscribed both Harappan and non-Harappan vessels with Indus script. Furthermore, these data suggest that the practice of writing on ceramic vessels at Bagasra may have increased over time and was most prevalent during Phase III (1900-1700BC), or the later portion of the Integration Era (2600-1900BC), when craft activities began to wane and then cease by the beginning of Phase IV. Further, these data point to continuities in the practice of writing on pottery during Phase IV (1900-1700BC), dated to the Localization Era (1900-1700BC), by which time other preserved media for written communication had disappeared. These findings enhance, and perhaps contrast with archaeological interpretations of writing derived from studies of seals and tablets, which date primarily to Phase II (2450-2200 BC) at Bagasra (Jamison 2012) based on their relative stratigraphic position. Carved script associated with seals and tablets suggests a strong correlation between writing, as a practice of knowledge control, and craft production. While these examples of inscribed pottery have not been securely dated by radiocarbon, these Bagasra script graffiti data signify that contexts for the use of writing on pottery may have changed over time and also may have differed from those established for seals and tablets.

2. Background

Since the time of Sir Alexander Cunningham (1875), scholars have attempted to translate or decipher the words and language behind Indus script (Coningham 2002, Parpola 2005, Possehl 1996), yet the Indus writing system remains undeciphered. However, over one hundred years of research dedicated to understanding the Indus script has generated a significant amount of archaeological data on Indus writing in various media. While we do not yet know the meanings conveyed between ancient people through their written language, Indus scholars have gained a great deal of understanding for the contexts of its use (Kenoyer 1998, 2006, Kenoyer and Meadow 2008, Parpola 1994, 2008a).

As an undeciphered ancient language, lack of consensus remains regarding the language family to which the Indus writing system belongs. Some argue that it represents an ancient Dravidian language (Marshall 1931, Fairservis 1983, Mahadevan 1977, 2008, Parpola 1994, 2008a), while others contend that the Indus script is an ancient Indo-Aryan language (Rao 1984), or another yet unknown language (Fairservis and Southworth 1989). Moving beyond these differences of opinion, scholars generally agree that the Indus script represents a logo-syllabic writing system (Parpola 2008a), which contained pictographs and around 400 different graphemes, or signs (Parpola 1994, 2008a). Known inscriptions average five signs long, with the longest inscription consisting of 26 signs and the shortest being one sign. Indus script was primarily written right to left, but there are examples of inscriptions written left to right and both patterns have been found on an occasional artifact (Parpola 1994, 2008).

During the Integration Era (2600-1900 BC), when the Indus writing system was at its most sophisticated, core signs in the Indus script were relatively standardized and were carved, incised, chiseled, inlaid, painted, molded, and embossed on a wide range of preserved artifacts (Kenoyer and Meadow 2010). Script has been most commonly found carved into steatite seals and inscribed and molded on tablets and tokens made of steatite, glazed faience, copper and terracotta (Kenoyer 1998). Steatite seals bearing Indus script and animal motifs were impressed into clay, which have occasionally been preserved as sealings, or "tags" (Frenez and Tosi 2005, Kenoyer and Meadow 2010, Parpola 2007). Indus script was also added to bronze implements, stoneware bangles, bone and ivory objects, gold and silver ornaments, as well as complete ceramic vessels (Franke-Vogt 1989, Kenoyer 1998, 2006). While inscriptions on seals and tablets average five characters long (Parpola 1994), those on tools, ornaments, and various domestic items contain only one or two signs (Kenoyer 2006). The diversity of writing media infer diverse contexts for the production and use of writing, which need to be studied individually as well as by comparative approaches.

More than 5900 artifacts bearing the Indus script have been recovered from the cities and towns of the Indus Civilization and adjacent areas (Kenoyer and Meadow 2008: 128). The greatest quantity of artifacts with Indus script (n=5500) have been recovered from Harappa and Mohenjo Daro (Franke-Vogt 1992, Joshi and Parpola 1987, Kenoyer and Meadow 2008, 2010, Parpola 2008b, Parpola et al. 2010, Shah and Parpola 1991), where several thousand inscribed objects are documented. In addition, Indus script has been found on objects from over sixty other Indus Civilization sites (Parpola 1994), including over 300 examples from Lothal (Frenez

and Tosi 2005, Parpola 2007, Rao 1979, 1985) and Kalibangan (Lal et al. 2003) and 83 inscribed artifacts from Chanhu-Daro (Mackay 1943).

Likewise, objects inscribed the Indus script have been recovered from sites in Gujarat dating to the Indus Civilization Integration Era (2600-1900 BC). Recent research by Gregg Jamison (Jamison 2010, 2012) documents 144 steatite seals and molded tablets from eight sites in Gujarat, many bearing Indus script. Lothal contains the largest assemblage of seals and tablets (n=127), as well as the largest assemblage of clay sealings (n=93) in the Indus Civilization (Frenez and Tosi 2005, Parpola 2007). Sealings are rarely preserved at Indus Civilization sites. At Harappa, for example, only six sealings have been found despite the systematic excavation and recovery techniques of the Harappa Archaeological Research Project (Kenoyer and Meadow 2010). Thus, the recovery of several sealing from Bagasra is noteworthy.

Seven steatite seals were recovered from Bagasra. Based on their relative stratigraphic position, six Bagasra seals have been tentatively dated to Phase II (2450-2200 BC) – five were found inside the perimeter wall and one came from a trench located outside the perimeter wall – and one seal has been dated to Phase III (2200-1900 BC), and was recovered inside the wall (Bhan et al. 2009, Jamison 2012, MSU Dept of Archaeology n.d., Sonawane et al. 2003). The remaining ten seals studied by Jamison come from Desalpur, Dholavira, Khirasara, Pabumath, Prabhas Patan and Surkotada. Jamison's research (Jamison 2010, 2012) establishes that steatite seals in Gujarat were made using a range of artistic styles and production technologies, including a distinctive carving style that appears to have been unique to the region. The

quantity and nature of other types of inscribed objects from sites in Gujarat has yet to be studied.

At present, much of what we know about the Indus script comes from studies of seals and tablets, which were carved by skilled artisans for elite patrons. However, Harappa data show that pottery is the most common item on which writing occurs (Kenoyer 2006: 19). Writing on pottery in the Indus Civilization differs from well known examples in the classical Aegean world were script is found carved on broken potsherds called ostracon. In South Asia today broken pottery is considered ritually polluting (Kenoyer 1998). Perhaps for this reason, and because writing in the ancient Indus Civilization had strong ideological connotations, Indus script was carved on the outside of complete ceramic vessels, which are today most often preserved as broken pottery fragments.

Kenoyer and Meadow (2010) have maintained that compared to the formal use of writing on seals and tablets in the Indus Civilization, script on other artifacts, such as pottery, appears less formally carved and, in some cases, may even represent a more spontaneous use of the writing system. They add,

> Spontaneity is particularly likely for graffiti on ceramic vessels, which were incised with script after manufacturing and firing. This use of signs clearly demonstrates that it was not only craftsmen commissioned to prepare formal devices who incised the script, but also others who employed it directly to label a container with perhaps one or more of the following: the name of its owner, the nature of its contents, its destination, or an incantation – to name some of the more obvious possibilities (Kenoyer and Meadow 2010: xlviii).

Presumably, every adult resident of the cities and towns of the Indus Civilization owned and utilized pottery on a daily basis for storing goods, cooking and food consumption. Thus, I contend that the practice of inscribing pottery with Indus signs was likely to have taken place more often and was practiced by more people than other, more formal, contexts for the production of script in specialized craft production settings.

Widespread archaeological remains of broken pottery sherds are evidence that complete ceramic vessels were impressed and inscribed with several types of graffiti including pre-firing and post-firing signs, symbols and notations. In addition, a single vessel may have more than one type of graffiti on it, which suggests to Kenoyer (2006: 17) that "writing had multiple functions even within a single context." Discussed in detail in the following methods section, post-firing pottery graffiti was carved, incised or inscribed after the vessel was fired and represents signs or notations made by the owner of the vessel. In contrast, pre-firing marks were made by the potter during the manufacturing process. These often appear as simple 'x' or 'v' notations on the base of a vessel, which distinguished them in the kiln, as well as formal Indus signs that were painted or stamped into the vessel before firing. Pre-firing potter's marks do not represent script, or signs in the Indus writing system (Kenoyer 2006). Post-firing graffiti, on the other hand, reflects a spontaneous act by pottery users during the vessel's use-life, pre-firing painted and stamped Indus signs reflect a technological elaboration of traditional pottery making to include the addition of script in the manufacturing process. Pre-firing painted signs are extremely rare at Indus sites, but a few pottery sherds have been recovered from select sites such as Harappa, Mohenjo Daro, Balakot (Dales 1979, Dales and

Kenoyer 1986, Kenoyer personal communication) and Shikarpur (Ajithprasad personal communication) and now Bagasra (see below). Stamped graffiti is most widely known at Harappa, where specialized drinking vessels known as “pointed base goblets,” or “PBGs” were mass-produced during Harappa Period 3C, and occasionally bear stamped sign impressions (Kenoyer and Meadow 2010).

In comparison to painted and stamped script, post-firing pottery graffiti was relatively abundant and has been found at sites across the Indus Civilization. In fact, Harappa data show that pottery with inscribed graffiti is the most common item on which Indus script occurs, and reconstructed vessels are inscribed with one to six or more Indus signs (Kenoyer 2006: 19). In Gujarat, excavation reports indicate that pottery sherds bearing various types of graffiti have been found at both Harappan and non-Harappan sites, including Jamnagar (Hedge et al 1992), Rangpur (Rao 1963), Kanmer (Kharakwal et al. 2012), Padri (Shinde 2004), and Rojdi (Possehl and Raval 1989). However, the tendency of scholars to lump together script and non-script graffiti in excavation reports has so far prevented a more detailed analysis of the practice of writing on pottery in the region.

The vast amount of recorded archaeological evidence indicates that ceramics were inscribed as complete vessels, and not inscribed as broken potsherds (see Coningham et al. 1996 for an approach to distinguishing pre- and post-breakage inscriptions). However, the preservation of vessels as unreconstructable fragments, or pottery sherds, limits our ability to accurately identify individual characters and complete sign sequences. As Kenoyer and

Meadow (2010: xlix) point out, “This provides a challenge in trying to investigate what degree of overlap there may be in sign sequences between graffiti and inscriptions on seals, tablets, and other media.” This fragmentary data set also limits our ability to detect regional differences in language that might have been reflected in variation in the use of signs and sign sequences on pottery.

Application of systematic recovery and recording procedures offer methods to move beyond the limitations of fragmentary graffiti data sets in order to study individual and patterned contexts for writing on pottery. Among the most prominent are several recent studies by Jonathan M. Kenoyer (Kenoyer 2006, 2009, Kenoyer and Meadow 1997, 2000, 2008, 2010, Meadow and Kenoyer 1994, 1997, 2000, 2001) based on excavations at Harappa (1986-present). Recent research at Harappa has contributed new understandings of the Indus script while revealing that earlier assumptions about the uniformity of the Indus writing system and technologies of inscribing (Parpola 1994) require revision. Recent work at Harappa has established a typology of inscribed objects, especially seals and tablets, which show chronological changes in style and technology over the course of the Integration Era (2600-1900 BC). More directly related to this study, Harappa studies of pottery graffiti document that the practice of writing on ceramic vessels played a significant role in the development of the Indus script during the Regionalization Era (3300-2600 BC). More specifically, Harappa provides evidence for the origins of the Indus script on pottery as early as 3300 BC, during the Ravi Phase (3300-2800 BC) of the Regionalization Era. Moreover, recent work at Harappa produced new evidence of the development of specific characters in Indus script that first appear as graffiti on

pottery during the Kot Diji Phase (2800-2600 BC) of the Regionalization Era and take on their fully developed form on steatite seals during the Integration Era. Documentation of these early stages in Indus writing contradicts a one-hundred year old assumption held by scholars attempting to decipher the Indus script who believed that it was invented suddenly and with the rise of urban centers around 2600 to 2500 BC (Kenoyer 2006, Parpola 1996).

Recent work at Harappa demonstrates the potential for studies of graffiti on pottery to advance our understanding of the ancient Indus writing system through both chronological and regional refinements in writing technologies and the contexts for their use. Despite the widespread geographic and chronological evidence for pottery graffiti in Indus cities and towns of Gujarat, there has been very little research devoted to better understanding the regional diversity of graffiti practices detailed in this chapter. In the following section I outline my methods and analytical framework for interpreting the assemblage of pottery graffiti from Bagasra. In applying the Harappa framework for documenting pottery graffiti at a new site, outside the core regions of Indus urban development, I hope to contribute a regional perspective on the diversity in contexts for the use of the Indus writing system that supplements the perspectives established at Harappa.

3. Methods for Documenting Pottery with Graffiti

The methods of documentation and analysis that I employed in this study of writing on pottery differ from the rest of this dissertation study in two main ways. First, the data set of

writing on pottery at Bagasra includes the entire excavated site area and therefore the sample potentially represents all preserved evidence of graffiti. Second, the lack of sufficient context detail from many trenches prevented my analysis of writing on pottery by context type, which was the analytical approach taken in Chapter 4 and Chapter 5. Despite this limitation, I was able to draw meaningful patterns from these pottery data by applying a technique for documenting pottery with graffiti that was developed at Harappa.

Unlike most pottery sherds, pottery with graffiti is considered an antiquity by the site excavators and were therefore removed from the rest of the excavated ceramics and stored separately. This practice made the entire data set accessible for study. The data set also includes all recovered Black Slipped Jar potsherds with graffiti, which have been published by P. Ajithprasad (Ajithprasad 2006). Based on this sample, I identified that potsherds with graffiti were recovered from 53 trenches at Bagasra. These data represent all four phases of occupation and locations on both sides of the Phase II and Phase III perimeter wall: 17 of these trenches were located inside the perimeter wall, 20 trenches were located outside the wall, and 16 represent the wall itself. Of the 53 trenches where potsherds with graffiti were recovered, 12 were also included in this dissertation sample (see Chapter 3). Thus, only four of the trenches that were sampled for this dissertation did not contain pottery with graffiti.

As discussed in Chapter 3, the site excavators did not record the original volume of ceramics that was excavated from each trench. For this reason I was unable to evaluate the overall percentage of pottery with graffiti within the total ceramic assemblage. Moreover, the volume of diagnostic pottery, which was curated and is available for study, from the trenches

that were not part of my research sample has also yet to be measured. Thus, I was unable to evaluate the percentage of pottery with graffiti by either phase or context, as was my approach in Chapter 5 and Chapter 6. These limitations require that graffiti data be presented in counts and relative percentage. However, when compared to the total sample of pottery in this study (both included and omitted samples combined total 12,663 potsherds weighing 353.9kg), potsherds with graffiti comprise just 1.19% of diagnostic ceramics. By extension, these data indicate that the percentage of inscribed and incised pottery at Bagasra appears to be extremely low**.**

My documentation procedure included formal attribute analysis, drawing and photography of each potsherd. I also recorded the number of characters and number of strokes that comprise each character. When possible, the order that the strokes were carved was documented and is included on each pottery drawing. I took detailed notes for each pottery sherd with evidence of graffiti that includes a description of the carved strokes, such as the shape of the groove and end points of each stroke.

In keeping with the overall goals of this dissertation, my analysis of this set of potsherds with graffiti focused on evaluating the percentage of writing on pottery during each of Bagasra's four occupation phases, and thus I do not go into detail on the technological aspects of inscribing pottery. Every attempt was made to precisely identify the phase of each potsherd. However, in a few cases potsherds came from excavated layers that were assigned as mixed deposits, represented in the following results section (see Table 6.1).

In recording pottery with graffiti from Bagasra, I adopted the documentation procedure employed at Harappa and developed by J. Mark Kenoyer (Kenoyer 2006, 2009, Kenoyer and Meadow 1997, 2008, 2010, Meadow and Kenoyer 1994, 1997). Applied in his analysis of over 1,200 pottery sherds with pre-firing potter's marks and post-firing graffiti (Kenoyer and Meadow 2008: 124), this documentation procedure has been effective in identifying early stages in the development of the Indus script during the Ravi Phase (3300-2800 BC) and Kot Diji Phase (2800-2600 BC) of the Regionalization Era. Moreover, recent work at Harappa provides new evidence of the development of specific characters in Indus script that first appear as graffiti on pottery during the Kot Diji Phase and take on their fully developed form on steatite seals during the Integration Era. In other words, through the methods employed at Harappa it has been possible to identify significant chronological changes in the form and style of script and inscribed objects during the emergence, expansion and transformation of Indus cities and towns.

Traditional approaches have grouped all forms of abstract graphic symbols on pottery under the label of either potter's marks or graffiti. In contrast, the Harappa framework distinguishes pre-firing potter's marks from post-firing inscribed script and incised notations (Kenoyer and Meadow 2008, see also Parpola 2008a). "While the former signs are relatively simple and continued to be used for a long time, spanning several cultural periods, post-firing graffiti should be dealt with in a different manner" (Kenoyer and Meadow 2008: 126).

Potter's marks are presumably non-linguistic symbol systems that appear before the earliest evidence of writing. In Baluchistan and Iranian Seistan and Kerman (Durrani et al. 1995,

Potts 1981, Quivron 1997, Vidale 2007) they appear around 4500-4000 BC and at Harappa (Kenoyer and Meadow 2008, Kenoyer personal communication) the earliest potter's marks are dated to roughly 3700 BC (they had earlier been dated to 3300 BC), during the Ravi Phase. Most Ravi Phase pottery was hand-made and potter's marks often took the form of single or double strokes or a 'v' or 'x' motif on the base and lower body of some vessels. These marks continue to be produced during the entire history of the site of Harappa and do not appear to be connected to the development of Indus script (Kenoyer and Meadow 2008: 126). Rather, since they were carved before the vessel was fired, Kenoyer (Kenoyer and Meadow 2008: 126) interprets these signs as those "made by potters to differentiate pots beings produced for a specific customer or by a specific individual." Beginning in the Kot Diji Phase at Harappa a new type of potter's marks with multiple signs emerged, which, according to Kenoyer (Kenoyer and Meadow 2008: 128), may have been a form of script. These potter's marks were found on large jarpot molds and coincide with the earliest examples of writing on pottery in the form of post-firing graffiti.

Recent work at Harappa (Kenoyer and Meadow 2008) distinguishes potter's marks from abstract graphic symbols that represent early forms of the Indus script, Kenoyer (Kenoyer and Meadow 2008) refers to as post-firing graffiti, and which I refer to as post-firing inscribed graffiti, or script. In evaluating the contexts for use of early script, Kenoyer (Kenoyer and Meadow 2008: 126) adds,

> Post-firing graffiti is put on the pot by the consumer or user of the pot and not necessarily by the potter. The types of information encoded in these signs could be indicative of the owner (human or spiritual), the contents of the vessel, or possibly a

> destination to which the vessel is being directed. Ethnographically, pottery used to hold food offerings in rituals is often marked with some signs that indicate the ritual or the deity to whom the pot is dedicated.

The earliest evidence of post-firing graffiti is documented at Harappa during the Kot Diji Phase, by which time wheel-made pottery became the dominant technology (Kenoyer and Meadow 2008). Writing emerged in a context of diversification of specialized craft technologies and expansion of urbanism living. Harappa excavations provide numerous inscribed potsherds dating to the Kot Diji Phase (2800-2600 BC), which have been securely dated by radiocarbon. Documented on several mounds (Mound E and Mound AB), several of these inscriptions consist of multiple signs that were identical to signs common in the Indus script (Kenoyer and Meadow 2008: 128).

Recent at Harappa (Kenoyer 2006, 2009, Kenoyer and Meadow 1997, 2008, 2010, Meadow and Kenoyer 1994, 1997), as well as published examples of Indus script from other sites (the most comprehensive publications are Joshi and Parpola 1987, Parpola et al. 2010, Shah and Parpola 1991) suggest that in certain cases it is not possible to clearly distinguish between script and non-script notations. For instance, an "x" when placed on the bottom of a vessel before firing, can be considered a non-script pre-firing potter's mark, but when placed on the side of a vessel after firing, may be interpreted as script. In addition, a single straight line, or set of parallel lines, when inscribed on the rim of a vessel, can be interpreted as non-script post-firing counting notations. However, when placed on the side of a vessel, a set of parallel straight lines may be interpreted as characters in the Indus script (Parpola 1994).

However, in an attempt to further identify and analyze patterns in use of script and non-script graffiti at Bagasra, the graffiti data in the chapter distinguishes two main types of post-firing graffiti: incised graffiti and inscribed signs or characters. Incised graffiti often consists of a single or multiple lines, which may or may not be script. At Bagasra, the most common form of incising is a set of single or multiple lines carved into the rim of a vessel. These lines may be parallel or irregular in style and design. According to Asko Parpola (1994), a prominent scholar of writing in the Indus Civilization, the Indus script system included equidistant parallel lines that were tightly spaced (Parpola 1994: Fig. 5.1). Thus, when a set of parallel straight lines is found on Indus seals, it is interpreted as a character in the Indus writing system. At Bagasra, the examples of incised graffiti often occur alone, and are not associated with other characters. In keeping with the trends in current research at Harappa (Kenoyer 2006, 2009, Kenoyer and Meadow 2008, 2010), this study distinguishes incised graffiti from inscribed characters, but is not currently able to distinguish script-based from non-script based incised lines. In the results section of this chapter I present the Bagasra data on incised and inscribed post-firing graffiti side-by-side, for comparison.

Inscribed graffiti is defined as formal script carved on the outside of a vessel that can be associated with known examples of characters in the Indus script (Joshi and Parpola 1987, Parpola 1994, Parpola et al. 2010, Shah and Parpola 1991), and may also represent unknown or new signs found only on pottery in Gujarat. Thus, this chapter presents the inscribed graffiti data in two sets: 1) those complete or partial inscribed signs that represent known characters in the Indus writing system, and 2) complete or partial inscribed signs that may represent

unknown or new characters. While signs in the second data set may represent characters in another writing system, they also have close *stylistic parallels* to Indus script at Bagasra, which is detailed in the results section of this chapter. The Bagasra inscribed pottery data set is highly fragmentary and contains very few complete signs. Thus, my documentation approach identified Indus characters from among a highly fragmentary data set, which may include other forms of writing that have yet to be identified.

Once the Indus script was fully formed, potters at some sites occasionally painted Indus characters on the outside of select ceramic vessels. Though rare, examples of painted script on pottery sherds have been reported at several Indus sites, including Harappa, Mohenjo Daro, Balakot (Dales 1979, Dales and Kenoyer 1986, Kenoyer personal communication), Shikarpur (Ajithprasad personal communication), and now Bagasra. This evidence suggests that sometime during the Integration Era potters began painting script onto vessels as part of the manufacturing process. Patterns that might signal shared practices and contexts of use of painted script between sites, for instance in the types of vessels with painted script, have not yet been studied. However, the practice is evidence of diversity in contexts for the use of writing while the rarity of painted pottery sherds suggests that this practice varied between sites.

What follows are the results of my analysis of the pottery graffiti from Bagasra. The data in this chapter adds to the published corpus of pottery with graffiti in Gujarat, primarily reported from the site of Lothal (Rao 1979), where inscribed pottery data indicate that Indus pottery graffiti first appears during the Harappan period, or Integration Era (2600-1900 BC), and

continued in to the Late Harappan period, or Localization Era (1900-1700 BC). Dated by their relative stratigraphic position, these Bagasra data span a similar time frame, and thus extend our regional understanding of pottery graffiti in Gujarat.

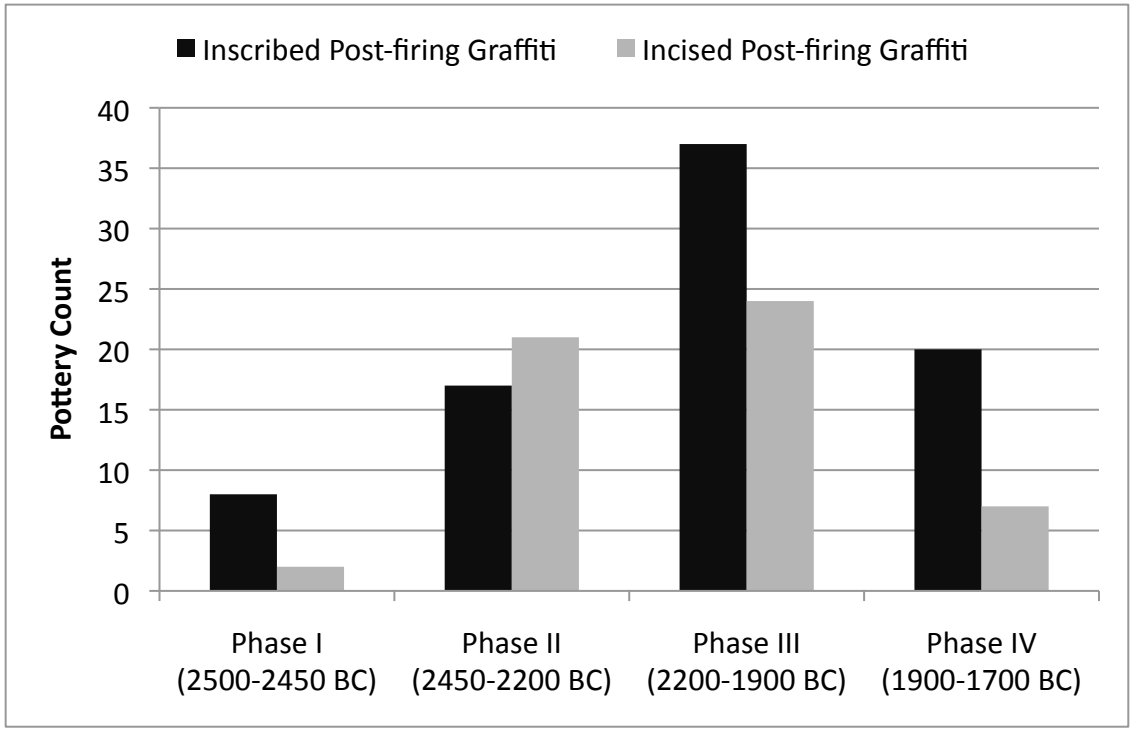
4. Results: Pre-firing and Post-firing Graffiti Data from Bagasra

A phase-by-phase analysis (Table 6.1) of the quantity of pottery sherds with graffiti shows that post-firing inscribed (n=89 or 58.6% of total potsherds [n=152] with graffiti) and incised graffiti (n=57 or 37.5%) occurred in much greater percentage than either pre-firing potter's marks (n=4 or 2.6%) or painted script (n=2 or 1.3%), which were extremely rare at Bagasra. (Percentages in this paragraph are based on the total number of potsherds with graffiti, n=152.) In addition, these data (Figure 6.1) indicate that the practice of incising pottery with notations and inscribing pottery with script occurred during the entire occupation of the site, which spans the Integration (2600-1900 BC) and Localization Eras (1900-1700 BC). These data suggest that post-firing graffiti was more frequent during Phase II (n=38 or 25%) and Phase III (n=61 or 40.1%), than it was during the initial (n=10 or 6.5%) and final occupation phases (n=27 or 17.8%). Within post-firing graffiti, incised pottery sherds were equally as common during Phase II (n=21 or 13.8%) compared to Phase III (n=24 or 15.9%), while inscribed pottery data indicate that script graffiti increased from Phase II (n=17 or 11.2%) to Phase III (n=37 or 24.3%), when it was also most prevalent. Finally, these data show that inscribed pottery was more common during Phase IV (n=20 or 13.2%) than either Phase I (n=8 or 5.3%) or Phase II.

Table 6.1: Count of Pottery Sherds with Graffiti by Phase and Graffiti Type

Phase	Post-firing Inscribed Graffiti	Post-firing Incised Graffiti	Pre-firing Painted Script	Pre-firing Potter's Mark	Total Potsherds with Graffiti
Phase I (2500-2450 BC)	8	2	0	0	10
Phase I or II	0	0	0	0	0
Phase II (2450-2200 BC)	17	21	2	2	42
Phase II or III	2	1	0	1	4
Phase III (2200-1900 BC)	37	24	0	1	62
Phase III or IV	4	1	0	0	5
Phase IV (1900-1700 BC)	20	7	0	0	27
Phase Unknown	1	1	0	0	2
Totals	**89**	**57**	**2**	**4**	**152**

Figure 6.1: Comparison of the Count of Inscribed and Incised Potsherds by Phase



These chronological patterns, which indicate that the practice of carving script graffiti on pottery by the vessel owner was most common during Phase III, is significant in that they differ from patterns of inscribed steatite seals at Bagasra. Steatite seals, the only other type of artifact at Bagasra with Indus script, were most prominent during Phase II and are thought to be associated with economic aspects of intensified craft production specific to the period (Jamison 2012). While inscribed graffiti is relatively common during Phase II, the noted Phase III increase in inscribed graffiti may signal the expansion of informal contexts for the use of writing during the late Integration Era as the power associated with writing practices shifted away from aspects of economic control. This theory may also explains the continuity of inscribing practices in Phase IV (1900-1700 BC), Localization Era deposits, a period writing on steatite seals and writing on other media at Bagasra and elsewhere in the greater Indus world had already disappeared.

The documented sample of graffiti came from diverse depositional contexts on both sides of Bagasra's perimeter wall. As with other chapters in this dissertation, I focused my analysis on Phase II and Phase III in order to compare the prevalence of script graffiti in areas inside and outside the perimeter wall. During Phase II and Phase III the perimeter wall separated the settlement into walled and unwalled space thereby limiting access to important craft workshops located inside. As detailed in Chapter 2, at Bagasra steatite seals are primarily found inside the perimeter wall during Phase II. Drawing from these data, along with the interpretation of the faunal evidence from the site (Chapter 2), which suggests that people living inside the perimeter wall had greater access to choice cuts of meat than people who lived

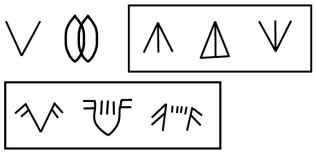
outside the perimeter wall, in this section I present graffiti data that I used to test the inside/outside the wall hypothesis that the people who occupied areas inside the perimeter wall had greater access to writing, and thus inscribed the outside of their pottery with script graffiti more often than people who primarily resided outside the perimeter wall.

Figure 6.2: Possible Indus Signs found on Pottery Sherds from Bagasra

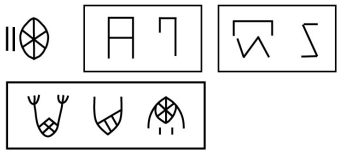
** Much of the sign assemblage is fragmentary. Therefore, signs grouped inside boxes indicate that there are multiple signs possibly represented by the preserved sign fragment.*
(sign list from Parpola 1994: 70-78, Figure 5.1)

Phase I: Indus Signs at Bagasra

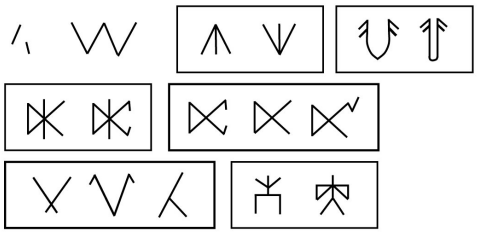
Phase II: Indus Signs Inside the Enclosure Wall at Bagasra



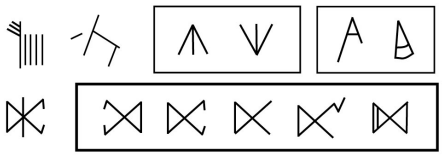
Phase II: Indus Signs Outside the Enclosure Wall at Bagasra



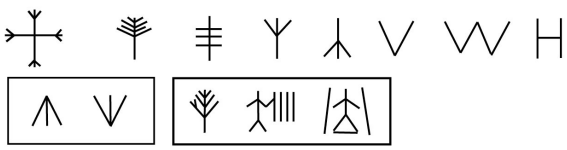
Phase III: Indus Signs Inside the Enclosure Wall at Bagasra



Phase III: Indus Signs Outside the Enclosure Wall at Bagasra



Phase IV: Indus Signs at Bagasra



Focusing specifically on inscribed, or script graffiti, Table 6.2 represents a comparison of the counts of graffiti found in contexts inside and outside the perimeter wall, as well as trenches that included the perimeter wall. Within this script data set, I made the distinction between Indus script and script that may represent unknown or new signs. Indus script refers to signs that match or closely resemble signs from other Indus sites, which are summarized in the *Deciphering the Indus Script* by Asko Parpola (1994: 70-78, Fig. 5.1), and illustrated in Figure 6.2. (Since the Bagasra sign assemblage is fragmentary, some of the sign fragments are too incomplete to associate with one known Indus character. In Figure 6.2, the set of characters possibly represented by the sign fragment is indicated by grouping them inside of a box.) Unknown or new script, or script for short, includes those inscriptions which do not match known India signs. These new signs could represent local forms of writing that were never incorporated into the Indus script system, which was used on seals, and therefore are potentially important for understanding regional variation in the Indus writing system. Alternatively, these new signs found at Bagasra could simply be non-script symbols. Within the Bagasra data set, most graffiti that was classified as unknown or script consist of inscriptions that were either illegible or too fragmentary to identify (see Appendix C notes column), but show similarity to the style and form of Indus signs. After close comparison of all inscribed data from Bagasra I believe that the most, if not all, of the inscribed graffiti represents Indus script. Therefore, while several data tables (Table 6.2, Figure 6.3) in this chapter present Indus script and unknown or new script data separately, I discuss them together in the following paragraphs

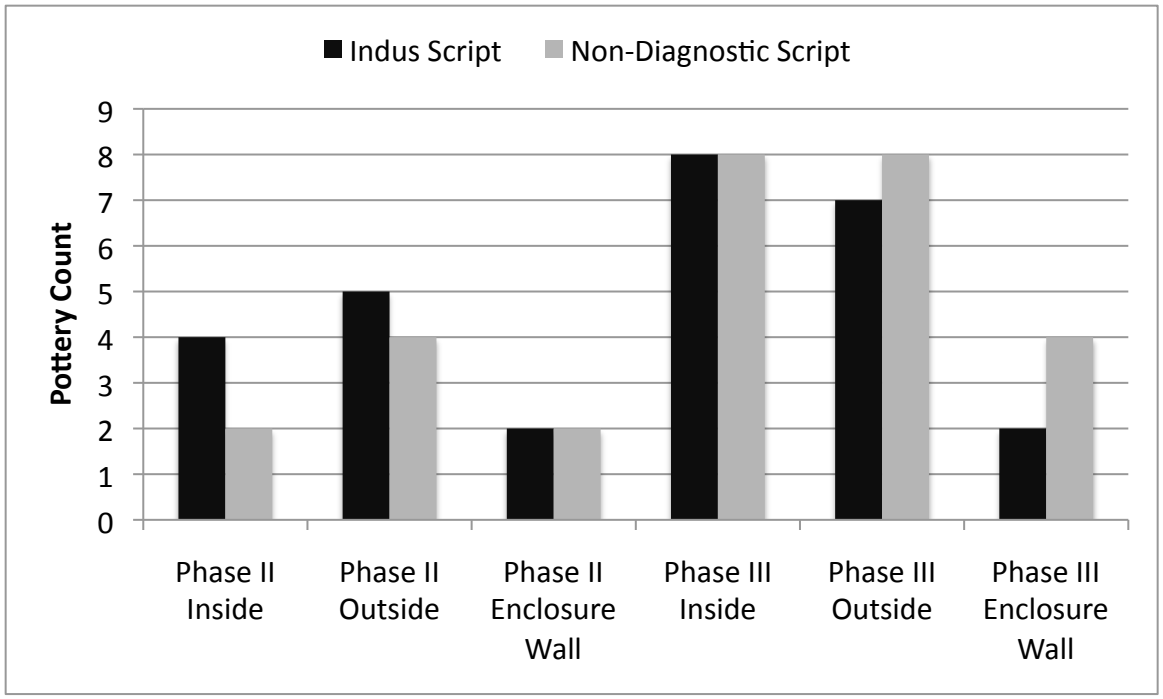
(Figure 6.4). Additional research is necessary to test the analytical significance of distinguishing Indus script from unknown or new script.

Table 6.2: Count of Script Graffiti Inside and Outside the Perimeter Wall at Bagasra

Phase	Perimeter Wall	Indus Script	Unknown/ New Script	Total Potsherds with Script Graffiti
Phase II	Inside	4	2	6
	Outside	5	4	9
	Wall	2*	2	4
Phase III	Inside	8	8	16
	Outside	7	8	15
	Wall	2	4	6
Totals		28	28	56

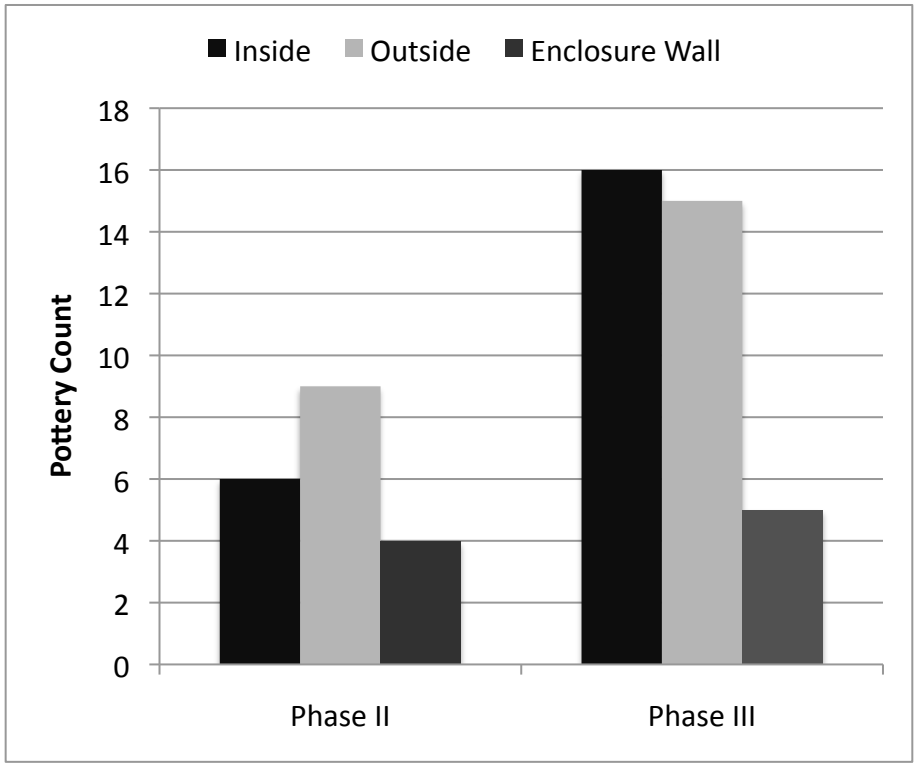
***** This graffiti consists of pre-firing painted script, whereas the rest of the sample consists of post-firing inscriptions.

Figure 6.3: Count of Potsherds with Indus Script and Unknown/New Script Inside and Outside the Perimeter Wall



The above phase-by-phase comparison of the percentage of post-firing inscribed graffiti on pottery (Figure 6.1) illustrated the pattern that writing on pottery occurred during all four phases at Bagasra and occurred in highest percentage during Phase III. Though the data set is relatively small (n=89), further analysis of the spatial distribution of this script graffiti illustrates that the noted Phase III increase in script graffiti occurred on both sides of the perimeter wall (Table 6.2, Figure 6.4). Moreover, the number of inscribed pottery sherds found inside (n=16) and outside (n=15) the perimeter wall that date to Phase III is equivalent. During Phase II, the count of pottery shreds with script graffiti on both sides of the perimeter wall is relatively the same. I regard these interpretations as preliminary given the extremely low count of pottery with script graffiti at Bagasra. However, these data suggest that pottery with script graffiti was deposited in relatively equal proportion in areas inside and outside the perimeter wall during Phase II as well as Phase III.

Figure 6.4: Count of Potsherds with Script Graffiti Inside and Outside the Perimeter Wall



Having presented an analysis of the chronological and spatial distribution of graffiti in the Bagasra ceramic assemblage, I now present a description of the assemblage of potsherds from each category of graffiti: pre-firing potter's marks, pre-firing painted script, post-firing incised graffiti and post-firing inscribed, or script, graffiti.

4a. Pre-firing Potter's Marks

Potter's marks are signs, symbols, or notations made by the potter prior to firing "to differentiate pots beings produced for a specific customer or by a specific individual" (Kenoyer and Meadow 2008: 126). This practice was widespread before the invention of writing and continued in the same form even after the Indus script emerged. (Kenoyer and Meadow 2008, Vidale 2007). At Harappa, where the most detailed evidence of pottery graffiti has been collected, potter's marks take the form of single or double strokes or a 'v' or 'x' motif on the base and lower body of some vessels (Kenoyer and Meadow 2008). Research by Kenoyer and Meadow demonstrates that this type of potter's marks' do not appear to be connected to the development of Indus script (Kenoyer and Meadow 2008: 126).

At Bagasra, ceramics show very little evidence for the use of pre-firing potter's marks. Among the assemblage of 151 potsherds with graffiti, only four have potter's marks (Table 6.3, Figure 6.5). All potter's marks take the form of an 'x' and are found in Phase II and Phase III deposits on both sides of the perimeter wall. Three of the potter's marks were located on the bottom of the vessel and one was located on the side of the medium-sized plain, undecorated vessels made from the common clay fabric.

No chronological or spatial patterns can be reliably drawn from such a small sample size. However, the lack of pottery with this type of pre-firing graffiti can be regarded as preliminary evidence that potters marks were not a prevalent technology at Bagasra.

Figure 6.5: Pottery Sherds with Pre-firing Potter's Marks from Bagasra

Graffiti49, 'x' on bottom of vessel

Graffiti66, 'x' on side of vessel

Graffiti67, 'x' on bottom of vessel

Graffiti132, 'x' on bottom of vessel

Table 6.3: Pottery Sherds with Pre-firing Potter's Marks from Bagasra

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer, Depth	Sherd Type	Type of Inscription	Location of Graffiti	Vessel Type	Size	Ware Color/ Texture	Decoration /Slip	Base Form	Base Dia (cm)
4477	49	2	inside, wall	Eb5	3, SE 60cm	Base	x on bottom of vessel	bottom of vessel	indeterminate	M	RW/FS	none	4A2	7
5951	66	2	outside	Eo10	7, 170cm	Body	x on side of vessel	exterior body	indeterminate	M-L	YB/C	none		
4760	67	3	outside	Eo10	3, 95cm	Base	x on bottom of vessel	bottom of vessel	jar (?)	M	RW/MS	none	4C?; 4K	5.5-6
3063	132	3/2?	inside	El9	7, SW 165cm	Base	x on bottom of vessel	bottom of vessel	jarpot (jar?)	M	RW/FS MS	none	4K?	

Table 6.4: Pottery Sherds with Pre-firing Painted Script from Bagasra

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer, Depth	Sherd Type	Type of Inscription	Location of Graffiti	Number of signs	Vessel Type	Size	Ware Color/ Texture	Decoration	Slip
988	78	2	Inside, wall	Do7	4A, SW 160-170cm	Body	Indus script	Body exterior	1-2	Jarpot	M	RW/ FS	Black script	Red1 slip
964	81	2	Inside, wall	Do7	3, 95-100cm	Body	Indus script	Body exterior	1	JarPot	S-M	RW/ FS MS	Reddish-brown script	Cream and red1 slip

4b. Pre-firing Painted Script

Painted script is rare throughout the Indus world. Therefore its presence at Bagasra is significant, pointing to a diversity in the contexts for writing at this small craft production center in the Indus Civilization borderlands. Painted Indus script has been reported from several Indus sites, including Harappa, Mohenjo Daro, Balakot (Kenoyer personal communication), Shikarpur (Ajithprasad personal communication), but so far it appears in extremely low quantities at each of these sites. The geographic distribution and dates of this writing have yet to be studied, but known examples suggest that it was a practice found at select sites across the Indus Civilization during the Integration Era.

Two examples of painted script were recovered from Bagasra and date to Phase II (Table 6.4), the major period of craft production. They both come from trench Do7, which was unearthed during the first excavation season (1996) and includes a northeastern portion of the perimeter wall and areas lying just inside the wall (MSU Department of Archaeology n.d.). These two potsherds are from red ware vessels; one vessel was slipped in red with black painted script and the other was covered in a thick cream slip with the Indus script painted in red. Illustrated in Figure 6.6, these characters are very similar to those known in the Indus Script (Figure 6.7).

Figure 6.6: Pre-firing Painted Script at Bagasra
(Line drawing courtesy of Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

BSR Graffiti78
Trench Do7, SW 160-170cm
Phase II

BSR Graffiti81
Trench Do7, 95-100cm
Phase II

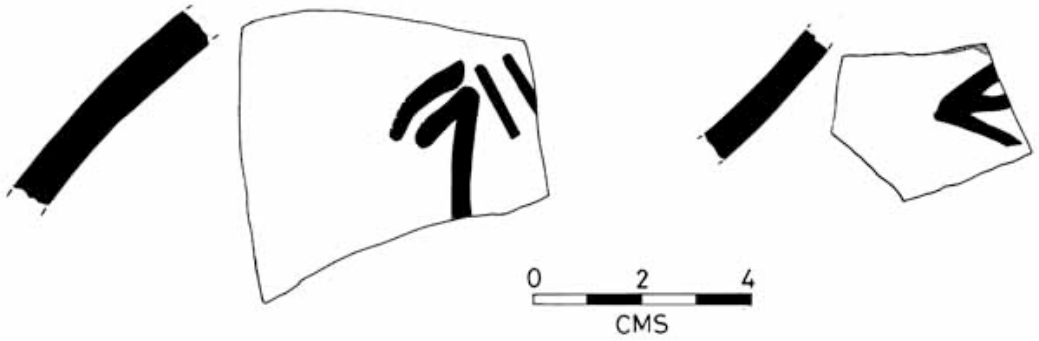


Figure 6.7: Indus Signs that Resemble the Painted Signs on Pottery Sherds from Bagasra (from Parpola 1994: 70-78, Figure 5.1)

Graffiti78 - Indus Signs

Graffiti81 - Indus Signs

A restricted use of writing is suggested by the rare occurrence of painted script throughout the Indus world. While the finds from Bagasra are too fragmentary to identify the complete vessel forms or the complete inscriptions, a Harappan dish recovered from the surface of Shikarpur (Figure 6.8), Bagasra's nearest neighbor (Bhan and Ajithprasad 2008), suggests that Indus script was painted on common vessel forms. As described in Chapter 5, this type of Harappan dish is among the most common Harappan vessel forms at Bagasra and was used during all four occupation phases. This unique example from Shikarpur consists of three Indus characters and is one of at least three pottery sherds with painted Indus script from the site, which is still under excavation (Ajithprasad 2012).

One possible interpretation of these limited data from Gujarat is that pottery vessels with painted script signal a different context for the use of writing other than post-firing script graffiti. Post-firing inscriptions, on the one hand, were carved by the owner or user of the

vessel and come in both ornate and legible fonts as well as casual and illegible fonts. In comparison, painted script was skillfully written by the potter, rather than the vessel owner. Thus, it is possible that elite leaders commissioned specific potters with skill in writing to add script to their vessels. These elite leaders also used steatite seals and tablets, which were formally inscribed with Indus characters. As a local craft production center, elite leaders who lived at Bagasra and commissioned or acquired inscribed steatite seals also acquired pottery that was manufactured with skillfully painted Indus script. This pattern of use differs from the less formal script graffiti that was carved onto a vessel by the owner sometime during its use life.

Figure 6.8: Harappan Dish with Painted Script from Shikarpur
(Image courtesy of Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)

4c. Post-firing Inscribed Graffiti

Post-firing inscribed, or script, graffiti are abstract graphic symbols or script, which are usually carved on the outside of a fired ceramic vessel. Unlike potter's marks and painted script, which were made by the potter during the manufacturing process, inscribed graffiti was carved by the vessel owner (Kenoyer 1998, Kenoyer and Meadow 2008) and therefore represents a practice of writing shared by members of a community.

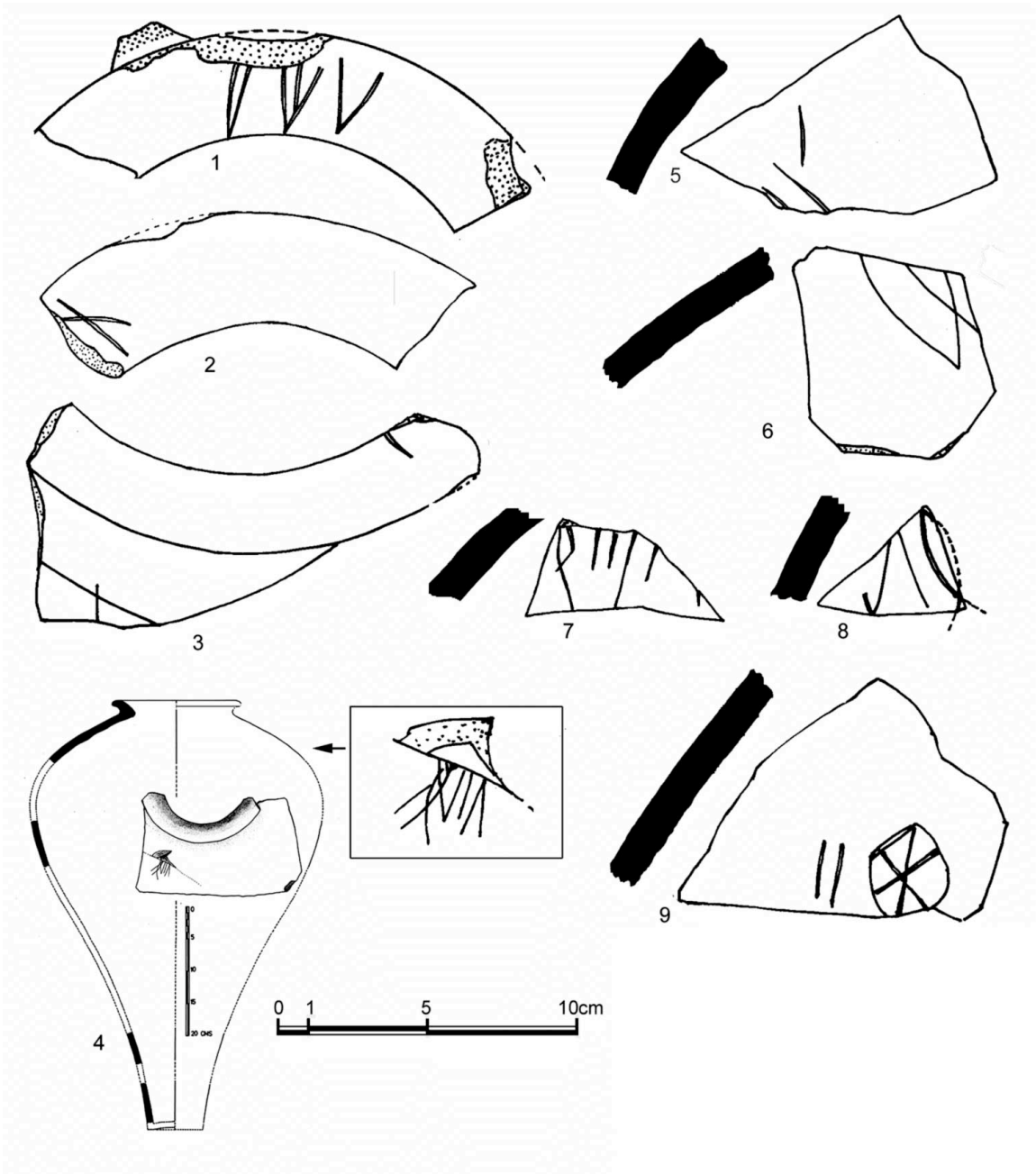
Inscribed graffiti from Bagasra shows a range in the legibility, precision, and carving styles within a single chronological phase and across all four occupation phases. This pattern suggests graffiti was produced by multiple people, across several generations, with various levels of experience and skill in writing Indus signs.

Table 6.5: Count of Pottery Sherds with Post-firing Inscribed Graffiti by Phase

Phase	**Post-firing Inscribed Graffiti**	**Total Potsherds with Graffiti**
Phase I (2500-2450 BC)	8	10
Phase I or II	0	0
Phase II (2450-2200 BC)	17	42
Phase II or III	2	4
Phase III (2200-1900 BC)	37	62
Phase III or IV	4	5
Phase IV (1900-1700 BC)	20	27
Phase Unknown	1	2
Totals	**89**	**152**

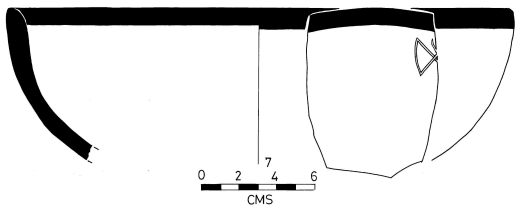
At Bagasra, script graffiti is found on a variety of vessel forms including large and medium-sized jars as well as medium-sized pots and bowls. Recorded in Appendix C, most inscribed vessel forms were common types of jars and pots made from the fine to medium-sandy red, yellow brown, or buff ware typical of the majority of the pottery assemblage. Most of these vessels cannot be classified as either Harappan or non-Harappan. Exceptions shown in the figures below are the 9 black slipped jars from Phases I and II (Figure 6.9), 8 Sorath bowls from Phases III and IV (Figure 6.10), 3 Jamnagar bowls from Phases III and IV (Figure 6.11), one pedestalled bowl from a mixed PhaseIII/IV deposit, and a single inscribed perforated jar (Graffiti MSUDrawn244) from a Phase IV deposit (Figure 6.12). All vessels in the data set are common domestic vessels except black slipped jars, which are a very distinctive large storage jar that is associated with long-distance trade. What is most significant about these Bagasra graffiti data is that they document that Indus script was also inscribed on non-Harappan Sorath and Jamnagar bowls, which were the focused on detailed chronological and spatial analysis in Chapter 5.

Figure 6.9: Black Slipped Jar Potsherds from Bagasra with Post-firing Inscribed Graffiti (Figure modified from Ajithprasad 2006)

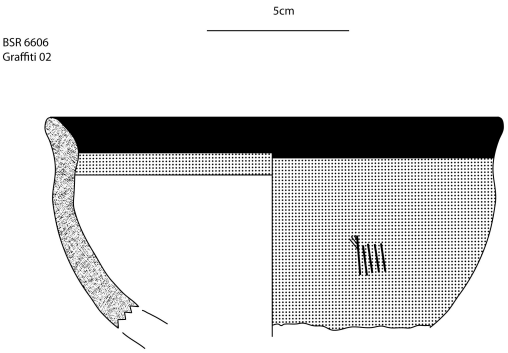


1. Graffiti BSJ 126 (Phase I), 2. Graffiti , BSJ 127 (Phase I), 3. Graffiti BSJ 124 (Phase I), 4. Graffiti BSJ 1 (Phase 2), 5. Graffiti BSJ 25 (Phase II), 6. Graffiti BSJ 81 (Phase II), 7. Graffiti BSJ 100 (Phase I), 8. Graffiti BSJ 99 (Phase I), 9. Graffiti BSJ 101 (Phase II), 9. Graffiti BSJ 129 (Phase III)

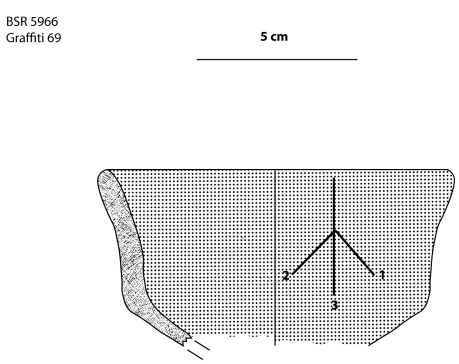
Figure 6.10: Sorath Bowl Potsherds from Bagasra with Post-firing Inscribed Graffiti



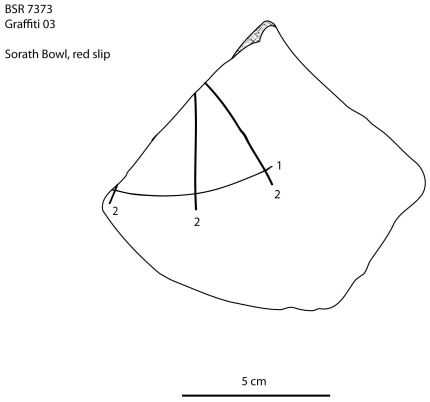
Graffiti 83 (Phase III)
(image courtesy of Department of Archaeology and Ancient History, MS University of Baroda)



Graffiti 2 (Phase III)

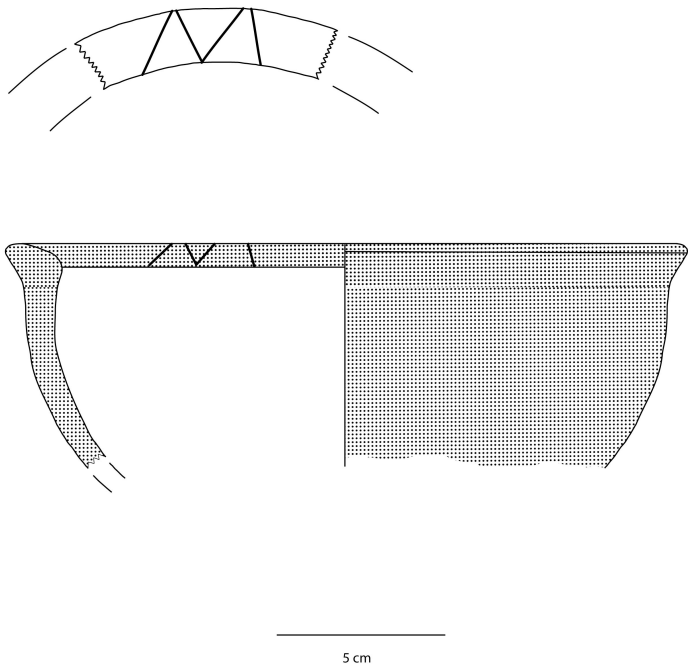


Graffiti 69 (Phase IV)



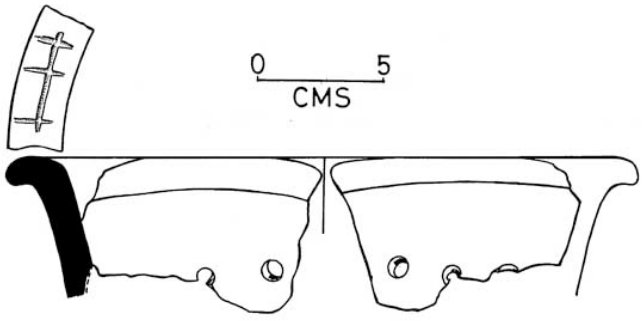
Graffiti 3 (Phase IV)

Figure 6.11: Jamnagar Bowl Potsherds from Bagasra with Post-firing Inscribed Graffiti



Graffiti 133 (Phase III)

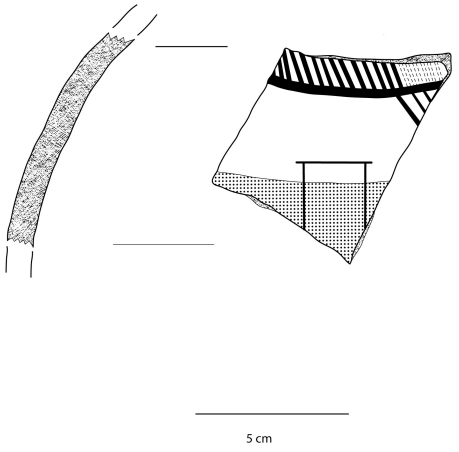
Figure 6.12: Perforated Jar Potsherd from Bagasra with Post-firing Inscribed Graffiti
(Image courtesy of Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



Graffiti MSU Drawn 244 (Phase IV)

Recorded in Appendix C, most inscribed vessels were plain and simply decorated common vessels. Of the total assemblage of potsherds with script graffiti (n=89), 12.4% (n= 11) were plain vessels, 45% (n=40) were decorated with red slip and 11.2% (n=10) were decorated with red slip and black bands. Only 2 medium jarpots were decorated with black painted designs (Figure 6.13); one dating to Phase I (Graffiti99) and the second dates to Phase IV (Graffiti MSUDrawn292). The designs on these two potsherds are very similar and consist of parallel horizontal and vertical black bands on fine to medium-sandy red ware jarpots. No inscriptions were found on vessels with typical Harappan black painted motifs, even though they are common at Bagasra (Chapter 5).

Figure 6.13: JarPot Potsherd with Black Painted Design and Post-firing Inscribed Graffiti



BSR Graffiti99
Phase I

Inscriptions from other Indus sites range from 1 to 26 characters long, with most inscriptions average 5 signs (Parpola 1994). However, as noted at Harappa, inscriptions on pottery are often relatively short and may consist of just one or two signs (Kenoyer 2006).

Recorded in Appendix C, At Bagasra, 67.4% (n=60) of the inscribed graffiti dataset consists of one sign and 91% (n=81) of the inscribed data set consists of one or more characters. Only 8 potsherds (9%) consist of two or more signs and 5 of these are black slipped jars, which have been published by P. Ajithprasad (2006). Since black slipped jars are vessels associated with long-distance trade (Ajithprasad 2006, Mery and Blackman 1996, 2005), it is possible that the black slipped jar sherds recovered at Bagasra were inscribed at other sites, and thus do not represent writing practices of the Bagasra residents. Therefore, these data demonstrate that the practice of inscribing pottery at Bagasra averaged 1-2 signs. Nonetheless, since over 90% of the dataset consists of fragmentary inscriptions, it is possible that original inscriptions contained more signs.

Inscribed graffiti from other Indus sites was commonly carved on the upper body or shoulder of a vessel and occasionally on the vessel rim. The Bagasra assemblage seems to follow this pattern, though the fragmentary nature of the Bagasra graffiti data make it difficult to precisely identify the location of many inscriptions. However, all but three potsherds were inscribed on the vessel exterior and there are several examples of inscribed rims and shoulder or upper body sherds. One sherd was inscribed on the bottom of the base (Graffiti 143, Phase III). Two vessels were inscribed on the interior: a single pedestal bowl (Graffiti125, Phase III/IV) and a Sorath bowl (Graffiti4, Phase IV).

4d. Post-firing Incised Graffiti

Incising is a form of post-firing graffiti using notations that are not clearly writing. Incising may have served to mark the vessel contents and measure or count what goes into and out of the vessel (Kenoyer personal communication). This can apply to both foods and liquids as well as craft products such as beads.

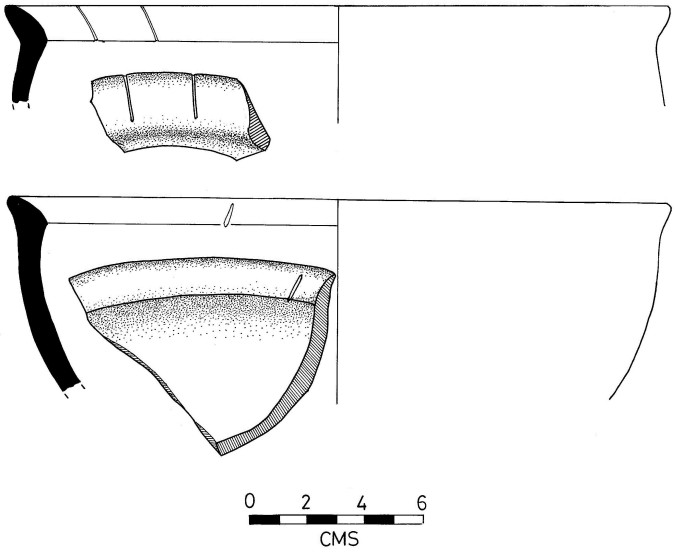
Table 6.6: Count of Pottery sherds with Post-firing Incised Graffiti by Phase

Phase	Post-firing Incised Graffiti	Total Potsherds with Graffiti
Phase I (2500-2450 BC)	2	10
Phase I or II	0	0
Phase II (2450-2200 BC)	21	42
Phase II or III	1	4
Phase III (2200-1900 BC)	24	62
Phase III or IV	1	5
Phase IV (1900-1700 BC)	7	27
Phase Unknown	1	2
Totals	**57**	**152**

Recorded in Appendix C, which can be found at the end of this chapter, at Bagasra incised graffiti is found on a variety of vessel forms including large and medium-sized jars as well as medium-sized pots and bowls with rim diameters ranging from 7cm to 40cm. Within the assemblage of vessels with incised graffiti (n=57, Table 6.1), 71.9% (n=41) were jars and pots (jarpots), 19.3% (n=11) were bowls and the vessel form for the remaining 8.8% as indeterminate. These vessel forms were made from the fine, medium-sandy and coarse red,

yellow brown and buff ware typical of the majority of the pottery assemblage. Most of these vessels cannot be classified as either Harappan or non-Harappan. Exceptions documented in Appendix C are the 6 Jamnagar bowls from all four occupation phases (Figure 6.14), a single Sorath bowl from Phases III, and a single black slipped jar from Phases III (Figure 6.15).

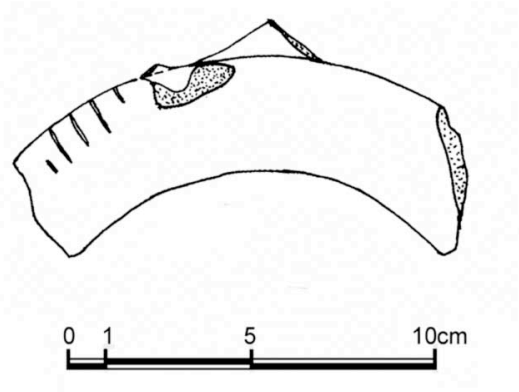
Figure 6.14: Jamnagar Bowl Potsherds with Post-firing Incised Graffiti from Bagasra (Images courtesy of Department of Archaeology and Ancient History, Maharaja Sayajirao University of Baroda)



Top: Graffiti 86 (Phase III), Bottom: Graffiti 80 (Phase III)

Recorded in Appendix C, most incised vessels were plain and simply decorated common vessels. Of the total assemblage of potsherds with incised graffiti (n=57), 10.5% (n= 6) were plain vessels, 70.2% (n=40) were decorated with red slip and 8.8% (n=5) were decorated with red slip and black bands. Only one jarpot was decorated with black painted design.

Figure 6.15: Black Slipped Jar Potsherd with Post-firing Incised Graffiti from Bagasra (Figure modified from Ajithprasad 2006G

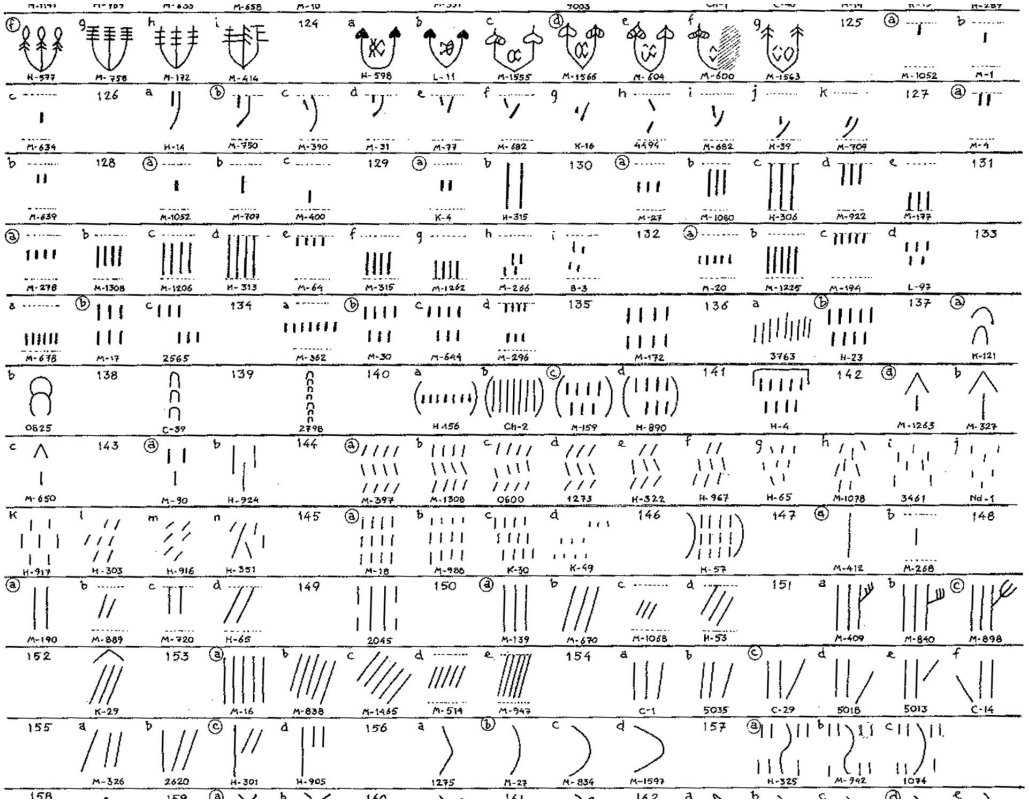


Graffiti BSJ 129 (Phase III)

Incised graffiti at Bagasra occurred as single or multiple lines on the vessel rim and body of jars, pots and bowls. Straight incised lines were carved in regular patterns consisting of equally spaced parallel lines of equal length as well as irregular patterns of lines of differing lengths that were unevenly spaced. Recorded in Appendix C, of the 57 potsherds with incised graffiti, 94.7% (n=54) were located on the vessel rim and only three were located on the exterior body. The number of incised lines ranges from 1 to 9, with 57.9% (n=33) consisting of 1-2 lines. Only 8 sherds (14%) consisted of 4-9 lines. Parpola's corpus of Indus script (1994: 70-78, Figure 5.1) includes several signs that consist of a set of parallel, tightly spaced lines, which are excerpted in Figure 6.16 below. These signs contain or more lines, like the Bagasra assemblage of incised, non-script, graffiti. However, most of these signs in the Indus writing system contain 3 or more lines. Since the 57.9% of the Bagasra data set consists of 1-2 lines, I have interpreted this data set to represent non-script incised notations. However, it is possible

that some of the incised potsherds from Bagasra that consist of more than 2 lines (n=23) did represent Indus script. These data are ambiguous and it is not possible to clearly distinguish those sets of straight lines, which represent script from those that represent non-script notations.

Figure 6.16: Signs in the Indus Script that Consist of Sets of Straight Lines (Image from Parpola 1994: 73, Figure 5.1)



5. Conclusion

In this chapter I presented my analysis of the assemblage of pottery with graffiti from Bagasra. Following methodological frameworks advanced by J. Mark Kenoyer and Richard

Meadow at Harappa, I contend that an approach that distinguishes script graffiti from other forms of non-linguistic symbols found on pottery has the potential to yield significant new information on the diversity of inscribing practices at Bagasra. As evidence, in this chapter I presented data that indicate the practice of writing on ceramic vessels at Bagasra increased over time and was most prevalent during Phase III (1900-1700BC), or the later portion of the Integration Era (2600-1900 BC), which was a period when craft activities had began to wane and regional economic transitions were underway. These new data show the relative equivalence of inscribed pottery on both sides of Bagasra's Phase II and Phase III perimeter wall. These new spatial data, combined with the discovery of inscribed Harappan and non-Harappan vessels, is compelling evidence that the elite residents who had access to the technology of writing inhabited areas inside as well as outside Bagasra's monumental perimeter wall. Further, these data point to continuities in the practice of writing on pottery into the site's final phase (Phase IV, 1900-1700BC), dated to the Localization Era (1900-1700BC), by which time other preserved media for written communication had disappeared. These inscribed pottery data contrast with patterns for steatite seals, which date to Phase II and suggest a strong correlation between writing, as a practice of knowledge control, and craft production. In sum, these new graffiti data from Bagasra point to varied contexts for the use of writing on pottery, which changed over time and may have differed from those established for seals and tablets. While these patterns had previously been established at Harappa, this study is the first to identify similar patterns among the regional towns of the Indus Civilization borderlands.

Chapter 7: Conclusion

1. Introduction

In Gujarat, Harappan and non-Harappan "cultures" or "communities" have traditionally been defined by pottery (Ajithprasad 2002, Ajithprasad and Sonawane 2011, Hegde and Sonawane 1986, Herman 1997a, Herman and Krishnan 1994, Majumdar 2001, Possehl 2007, Possehl 1992, Possehl 1991-92, Possehl and Herman 1990, Shinde 1998, Shinde and Kar 1992, Sonawane 1998-99, Sonawane and Ajithprasad 1994). Pottery has therefore been used to infer the presence of Harappan, Sorath, and Anarta peoples at sites like Bagasra, where these pottery types are found in stratigraphic association (Sonawane et al. 2003). Archaeologists working in Gujarat have struggled for decades to interpret the co-existence of Harappan and non-Harappan pottery, but have yet to put forward compelling social and economic hypotheses. In this dissertation, I have reframed this discussion by asking two questions. "Which Harappan pottery types were used by communities in Gujarat?" and "How ubiquitous were these pottery types in comparison to regional pottery?" By defining archaeological patterns of pottery through time and across space, it is possible to gain new insights into regional pottery preferences as well as the complex social and economic interactions, which occurred at sites such as Bagasra.

I approached pottery analysis through a comparative methodology. By applying *the Harappan pottery typology* (Dales and Kenoyer 1986), it was possible to specifically identify the types and styles of Harappan pottery that were and were not in use at Bagasra. Defined by

ceramic assemblages from the Indus Civilization type sites (Jansen 1993b, 1994, Mughal 1990b) of Mohenjo Daro (Dales and Kenoyer 1986) and Harappa (Dales 1991, Dales and Kenoyer 1993), the Harappan pottery typology establishes a definition for individual types of Harappan vessels. By extension, this method allows for detailed analyses of the percentage of separate Harappan vessel forms while also facilitating vessel-specific chronological and spatial analyses. In contrast, non-Harappan vessel types have yet to be clearly defined within a type-variety system akin to the Harappan pottery typology. However, several regional pottery reports (Ajithprasad and Sonawane 2011, Sonawane and Ajithprasad 1994, Possehl and Raval 1989, Rao 1963) based on ceramic data drawn from various archaeological sites in Gujarat do provide a useful baseline for identifying Anarta and Sorath vessel forms at Bagasra. In my research, an important criterion for vessel classification as non-Harappan was that the specific vessel form, defined by its unique combination of rim, body, and base features, was absent in the Harappan pottery typology.

Using these typologies as a baseline to define Harappan and non-Harappan vessel forms and styles, my study identified what I refer to as "*regional pottery preferences"* in Harappan ceramics – as opposed to discrete ceramic patterns – in order to emphasize and encapsulate the idea that at the local level, people in Gujarat made specific material choices to shape the form, style, and function of both Harappan and non-Harappan pottery types that were used by their communities. In this dissertation, I also evaluated changes in these pottery preferences by studying vessel counts and percentages across space and time. Thus, by identifying the unique pottery preferences of the Bagasra community, I have developed a comparative method that

has the potential to reveal the agency of people living at Bagasra. This type of agent-based interpretive framework is largely missing from the predominantly descriptive approach used in much of the regional site reports and Harappan pottery studies today.

In the next section of this conclusion I integrate my interpretations of the data presented in Chapter 4, 5 and 6. I frame these data around testable research expectations, which were presented in the Introduction and further detailed in Chapter 2. Thus, the interpretive summary that follows serves as a baseline for critically evaluating the inside/outside the wall and traditional-migration based models. These two models are derived from current literature (Bisht 1989a, Chase 2007, 2010a, Dhavalikar 1995, Joshi 1972, Possehl 1980, Rao 1973) and would predict that Harappan pottery was a symbol of elite status and ancestral connections between elite community leaders living at Bagasra and the communities located in the core regions of the Indus Valley. My research directly tested these predictions against spatial and chronological pottery data from Bagasra. In doing so, this study provides new data and deeper understandings of the regional pottery preferences in Gujarat.

2. Research Hypotheses and Results

Utilizing Bagasra's rich assemblage of Harappan and non-Harappan pottery, my dissertation tested a related set of hypotheses, which I refer to as the inside/outside the wall model, that stems from the existing body of literature (Chase 2007, 2010a, Dhavalikar 1995). Extensive excavations across Bagasra have shown that the manufacture of economically valuable marine shell, agate, and faience ornaments was primarily located inside the perimeter

wall, where raw materials were also stockpiled, and within which inscribed steatite seals have been recovered (Bhan et al. 2004, 2005, Sonawane et al. 2003). In short, this inside/outside the wall model predicts that if Harappan elites were primarily associated with control and implementation of craft production then Harappan pottery, as well as writing on pottery, should have been concentrated within Bagasra's perimeter wall. In comparison, non-Harappan pottery, which is assumed to have been used by non-elite local communities, is expected to have been abundant in areas outside the perimeter wall. My research has clearly shown that these simplistic assumptions about pottery use by Harappan elites and locals are not supported. In sum, the Bagasra pottery distributions do not support the basic premises of the inside/outside the wall model. Rather, Harappan and non-Harappan pottery are abundant across the site from its founding (2500 BC) through Phase III (2200-1900 BC), which roughly corresponds to the 700 years of the Harappan Phase of the Integration Era (circa 2600-1900 BC) as defined by Shaffer (1992) and Kenoyer (1991).

Expectation 1) Drawn from traditional migration-based models (Dhavalikar 1995), my research tests the hypothesis that Bagasra's craft production economy was established and maintained by elite leaders who directed the production and exchange of valuable prestige goods from inside the monumental perimeter wall. More specifically testable against pottery data, the traditional model would predict that elite leaders at Bagasra were either migrants from outside the region, or had strong ancestral connections (in other words, they were descendants of migrants) to the core regions of Indus urban development.

As explained in Chapter 2, for this premise to be supported by the Bagasra pottery data, I would expect to find evidence that elites displayed their ancestral connections to the Indus

Valley through preferences for a wide array of Harappan pottery types including domestic culinary equipment (Bray 2003), trade vessels and other ceramics.

Based on the research presented in this dissertation, the ceramic data for Bagasra point to regional preferences for specific types of Harappan pottery, rather than broad-scale use of a wide array of pottery types as seen at the Indus Civilization type-sites of Harappa and Mohenjo Daro (Dales 1991, Dales and Kenoyer 1986, 1993). In other words, many types of Harappan pottery are absent or extremely rare at Bagasra. Select types of Harappan vessels, such as perforated jars, the so-called dish-on-stand (hollow pedestalled bowl and dish), and distinctive Harappan bowl and dish types, were documented in relatively high percentages at Bagasra, suggesting their regular use. At the same time, many Harappan pottery types, such as tall slender decorated jars and Harappan cooking pots, are extremely rare while other Harappan pottery types, most notably the carinated bowl and other bowl types, are absent from the documented pottery assemblage.

Also contradicting the traditional migration-based model, the set of documented Harappan pottery types at Bagasra shows variation in use across time. Some Harappan types, such as the black slipped jar, Harappan cooking pot, and select bowls and dishes, were more abundant during the site's initial occupation (Phase 1, 2500-2400 BC) and period of intensive craft manufacture (Phase II, 2450-2200 BC). These types appear to decrease significantly in percentage between Phase II and Phase III (2200-1900 BC). Other types, such as perforated jars, show a marked increase in percentage between Phase II and Phase III. Between Phase II and III, select non-Harappan pottery, such as the Bagasra local cooking pot and Sorath bowl,

also show a significant increase in relative percentage. Finally, based on these findings, three categories of Harappan vessels appear to have been common during all four phases at Bagasra: perforated jars, hollow pedestalled vessels and select bowls and dishes (types 55/38/37). Red slipped black band decorated vessels, though not unique to Harappan types, were present during all four phases and seem to increase in percentage over time. These documented chronological changes in the percentage of individual types of pottery demonstrate broader patterns of change in the use of pottery and pottery preferences over time at Bagasra.

A restricted set of Harappan pottery types was present at Bagasra. Several types related to cuisine and food serving (Bray 2003, Chase 2012) appear in relatively high percentage compared to other forms (perforated jars, hollow pedestalled vessels and select bowls and dishes), while the Harappan cooking pot is virtually absent at the site. The presence of other common types, black slipped jars among the most notable, appear to have been related to trade (Ajithprasad 2006, Méry and Blackman 2005). The presence of trade vessels reflects Bagasra's role as a regional craft production center for shell bangles and semi-precious stone beads. In other words, the restricted set of Harappan pottery types used at Bagasra represent a range of activities and human behaviors, and do not necessarily signal ancestral identity. Most vessel types appear in relatively low quantity and the common preferred forms show continuity in use throughout Bagasra's occupation history, long after the community stopped producing Harappan-style crafts.

Thus, the documented preference for a restricted set of Harappan pottery types suggests that most elite leaders at Bagasra did not use Harappan pottery to signal strong and

direct ancestral connections to the Indus Valley. If they had such connections they may have expressed them in other ways that have not yet been identified archaeologically.

Alternatively, if elite did not have ancestral connections to the Indus Valley, they may have expressed their status through the use of elite forms of non-Harappan pottery, such as the Reserved Slip Ware. Reserved Slip Ware is a fine ware pottery with a black and pale bichrome decoration that was produced through a very sophisticated manufacturing process (Krishnan et al. 2005), and is made from clays found in nearby Kachchh. Though generally rare in the Indus Civilization, this high-fired pottery has been noted in larger quantities at sites close to Bagasra such as Shikarpur and Dholavira (Krishnan et al. 2005) as well as through on-going excavations at Khirsara, conducted by the Archaeological Survey of India (Kenoyer personal communication). Since Reserved Slip Ware has been noted in the Bagasra excavations (Sonawane et al. 2003), its absence from this research sample is surprising and deserves further investigation.

Expectation 2) In addition, if Harappan pottery was viewed as a symbol of elite status, as predicted by the traditional model, I would expect to find evidence for its restricted access or use. This pattern would stand in contrast to spatial patterns in non-Harappan pottery, if it were not viewed as a symbol of elite status. One possible way to restrict access would be through the segregation of space demarcated by the perimeter wall.

As explained in Chapter 2, if the use of Harappan pottery symbolized the elite status of the vessel owner, I would expect to find Harappan pottery primarily deposited in association with the major craft industries located inside the perimeter wall. Moreover, if non-elite

residents did not have access to Harappan pottery and primarily used non-Harappan pottery, then I would expect to see this reflected in the spatial patterning of non-Harappan pottery outside the perimeter wall, away from the major craft industries. An alternative hypothesis is that Harappan pottery was not viewed as a symbol of elite identity with restricted access, but was used by most members of the Bagasra community. If this was the case then I would expect to find Harappan pottery distributed across the site and intermingled with non-Harappan pottery in domestic and craft production settings. An alternative explanation for this spatial pattern is that elites and non-elites distinguished themselves by their pottery preferences, but did not live in segregated spaces. If elites and non-elites instead lived in neighboring households on both sides of the wall and discarded their pottery across the site, then we would expect to see Harappan and non-Harappan pottery distributed on both sides of the perimeter wall.

Analyses of the spatial distribution of the set of Harappan pottery found at Bagasra identified patterns of shared use by residents who lived on both sides of the settlement's 7.5m thick stone and mudbrick perimeter wall, which was an imposing feature of the townscape during Phase II (2450-2200 BC) and Phase III (2200-1900 BC). In other words, most documented Harappan pottery types were found in contexts on both sides of the wall. While the overall count and percentage of individual pottery types is very low, these Bagasra findings document that select Harappan vessel types may have occurred in greater percentage in certain areas inside the perimeter wall, compared to their percentage outside the wall.

It is important to note that rare Harappan pottery types, such as the tall slender decorated jar and Harappan cooking pot, as well as relatively common types, such as hollow pedestalled vessels, specific Harappan bowls and dishes, and perforated jars, were documented on both sides of the perimeter wall. Of this set, certain vessels, such as the perforated jar, tall slender decorated jar, hollow pedestalled vessels, and select bowls and dishes, were found to be more abundant inside the perimeter wall during Phase II, where they were documented in relative association with the major craft workshops. These spatial data provide compelling evidence that Harappan pottery was not narrowly restricted to activities and archaeological contexts that took place inside the perimeter wall. Rather, the greater percentage of many Harappan vessel types inside the perimeter wall signifies that people who had access to areas inside the perimeter wall may have used Harappan pottery in greater quantities than those who primarily resided outside the wall.

Harappan pottery may have appeared more frequent inside the perimeter wall if those residing and operating craft workshops inside the walled area had greater access to Harappan pottery than those residing outside. A second interpretation might be that those acting inside the wall had a greater preference for Harappan pottery. This preference may have been influenced by their long-distance social and economic networks connected with craft production and the trade of finished goods manufactured inside the wall at Bagasra.

Adding to these pottery findings are additional data on inscribed pottery. My analysis of inscribed pottery, and other pottery with graffiti, was presented in Chapter 6. These inscribed pottery data clearly indicate that the practice of writing on ceramic vessels at Bagasra increased

over time and was most prevalent during Phase III (2200-1900 BC), which corresponds to Harappa Period 3C, during the later portion of the Integration Era. At Harappa, this is when the site is at its largest extent and writing was highly diversified (Kenoyer and Meadow 2010). In marked contrast to what was happening at Harappa and other major urban centers, at Bagasra Phase III was a period when craft activities began to wane and regional economic transitions were underway. The presence of inscribed pottery on both sides of Bagasra's Phase II and Phase III perimeter wall, combined with the discovery of inscribed Harappan and non-Harappan vessels, is compelling evidence that the elite residents who had access to the technology of writing inhabited areas inside as well as outside Bagasra's monumental wall. What is most surprising at Bagasra is the fact that there appear to have been some continuity in the practice of writing on pottery during the site's final phase (Phase IV, 1900-1700BC). This period corresponds to the Localization Era (1900-1700BC), during which time diagnostic artifacts indicating control of economic activities, such as cubical chert weights, steatite seals, and the Indus script, had disappeared from Indus Civilization sites (Kenoyer 1998). These inscribed pottery data from Bagasra contrast with the pattern of steatite seals at the site, which date to Phase II and suggest a strong correlation between writing, as a practice of knowledge control, and craft production. In sum, these new graffiti data from Bagasra point to varied contexts for the use of writing on pottery, which changed over time and may have differed from those established for seals and tablets. While these patterns had previously been established at Harappa, this study is the first to identify similar patterns among the regional towns of the Indus Civilization borderlands.

Having just outlined the results of these Bagasra pottery findings by testing the traditional migration-based and inside/outside the wall models, I now turn to a brief evaluation of the pottery data from each phase at Bagasra. Instead of repeating the detailed spatial data, which was provided in Chapters 4, 5 and 6, in the following section emphasis is placed on key continuities and transitions in the relative frequencies of Harappan and non-Harappan pottery types, which were the focus of this dissertation.

2a. Phase I (2500-2450 BC, Integration Era)

Bagasra, like most urban-style Harappan towns in Gujarat, was settled at the beginning of the Integration Era just after many cities and towns of the Indus Civilization had already been established along the Indus Valley. While the forces that brought Harappan material culture to Bagasra around 2500 BC are not well understood, from the very beginning of its establishment, the material culture and lifeways point to a social and economic landscape that already included writing and a variety of other sophisticated technological traditions to suit an urban society. The presence of triangular terracotta cakes, clay toy-cart frames and wheels along with marine shell bangles, stone beads made from agate and carnelian, a single cubical agate weight, beads of lapis lazuli, copper implements, and Rohri-type chert blades (Bhan et al. 2004, 2005, 2009; Sonawane et al. 2003) suggest that Bagasra's earliest residents valued personal objects that symbolized Harappan identity (Kenoyer 1995a). There is no clear evidence for centralized craft production in workshop settings at this time, and the perimeter wall did not exist. Instead, small-scale crafting of marine shell, semi-precious stone beads, and

copper/bronze appears to have occurred in several dispersed contexts (Bhan et al. 2004, 2005, 2009; Sonawane et al. 2003). Thus, while Bagasra was a rather small agro-pastoral village (Chase 2010: 7, 260) when it was founded, it already had the markings of a community linked to urban state-level society.

The total sample of pottery dating to Phase I comprised 4.72% (n= 591) of the total pottery count (12,509 potsherds) included in this study and represented five of the ten total trenches with excavated Phase I deposits. In publications (Ajithprasad et al. 1999, Sonawane et al. 2003) and unpublished excavation reports (MSU Dept of Archaeology n.d.) written prior to this study, the Phase I pottery assemblage had been characterized as a mixture of classic Harappan, Anarta, and a class of local ceramics specific to Bagasra. Anarta ceramics, predominantly associated with sites to the northeast of Bagasra, are identified in these reports as the majority ceramic class. However, since my study's sample from Phase I is rather small, my hypotheses that include the initial occupation are preliminary and require further testing.

Analyses of Harappan pottery types in Chapter 4 support previous interpretations (Ajithprasad 2006, Bhan et al. 2004, 2005, 2009, Chase 2010a, Sonawane et al. 2003) that people living at Bagasra utilized Harappan material culture, including pottery, from its foundation during the early Integration Era, or around 2500 BC. This study has further documented that specific types of Harappan pottery were relatively abundant during Phase I, while other types were present but appear in extremely low relative percentages. Of those documented vessel types, the black slipped jar, hollow pedestalled bowl and dish, perforated jar, jar/pots with Harappan black painted designs, and select bowls and dishes appear to have

been common components of the early Bagasra ceramic assemblage. Within this set are those vessels associated with domestic culinary practices (pedestalled vessels, bowls and dishes, and the perforated jar) as well as those associated with trade and exchange (black slipped jar). Rare Phase I vessel types include the Harappan cooking pot and miniature vessels, among others. Moreover, several types present in later phases appear to be absent from the Phase I assemblage; examples include various bottles, bowl with flared sides, and the tall slender decorated jar.

Furthermore, comparative evaluation of two types of cooking pot, provided in Chapter 5, indicated that the Bagasra local cooking pot, a non-Harappan form, was much more common than the Harappan cooking pot during all four phases at Bagasra. This pattern began in Phase I, when the Harappan and Bagasra local cooking pot co-occur in archaeological contexts found across the unwalled site. In contrast to cooking pot patterns, Phase I data on serving bowls and dishes (Chapter 5) indicate that Harappan bowls and dishes were much more common than non-Harappan bowl forms during this early occupation phase.

These Phase I data indicate that early inhabitants of Bagasra utilized a distinctive set of Harappan vessel forms. These preferred types represent a range of activities and behaviors, from preparing and serving certain foods and beverages, to trade and exchange of commodities. Adding to this pattern, this period shows the lowest percentage of inscribed pottery from all four occupation phases. Small sample sizes (Chapter 3), in conjunction with an incomplete understanding of the dating and spatial extent of the settlement during this time

period (Chapter 2), limit the extent to which the patterning of pottery at the site can be further interpreted.

2b. Phase II (2450-2200 BC, Integration Era)

Phase II was a period in which the community flourished through craft production, economic connections, and civic building programs. Thick habitation deposits of up to 5 meters (Sonawane et. al. 2003: 30) contained a variety of features associated with domestic and communal activities. Ceramic assessments made in the field and outlined in excavation reports (Ajithprasad et al. 1999, MSU Dept of Archaeology n.d., Sonawane et al. 2003), characterize Phase II pottery as a mixture of Harappan, Anarta, and other non-specific local pottery. Prior reports also note a Phase II increase in the proportion of Harappan pottery with a concomitant decrease in the proportion of Anarta pottery. Isolated sherds of Sorath style pottery were found in the upper layers (Sonawane et al. 2003: 27), but became much more common in Phase III.

Phase II (2450-2200 BC) pottery sampled for this study consisted of 36.02% (n=4506 potsherds) of the total and came from eleven trenches from the southern, eastern, and western parts of the site (presented in Chapter 3). These trenches were located both inside the perimeter wall (55.95%, n=2521) and outside (44.05%, n=1985 potsherds) Bagasra's 7.5m thick perimeter wall, which was erected at the start of this phase (Sonawane et al. 2003). This Phase II sample included craft production contexts, habitation, and structural deposits.

The construction of a massive perimeter wall, extensive mud-brick and stone structural remains, and extensive evidence for craft production are outstanding features of Phase II (presented in Chapter 2). The construction and maintenance of perimeter walls demonstrates the power and authority of elite leaders to amass building materials and mobilize and manage labor directed towards a single community goal and thus defines an area of social investment (Smith 2003). The massive perimeter walls, which were erected around cities and towns in Gujarat including Kanmer (Kharakwal et al. 2012), Kuntasi (Dhavalikar et al. 1996), Lothal (Rao 1979, 1985), Shikarpur (Bhan and Ajithprasad 2008, 2009), and Surkotada (Joshi 1972), thus reflect the power and authority of local and regional elite community leaders. Nonetheless, current excavation reports and site interpretations tend to focus on the walled portions of Indus settlements. For this reason, my comparative study of areas inside and outside the wall fills a critical gap in knowledge of walled settlements in this region of the world.

Phase II pottery data generally show continuity in the prevalence of the select Harappan pottery types that were commonly used at Bagasra (presented in Chapter 4). Specifically, the percentage of black slipped jars, jars, and pots with Harappan black painted designs, perforated jars, hollow pedestalled bowls and dishes, and select types of bowls and dishes (55/38/37) continued from Phase I. Moreover, of this preferred set of Harappan pottery, the most common forms were perforated jars, pedestalled vessels, and select bowls and dishes (types 55/38/37). These three forms continue as common components of the Bagasra pottery assemblage until the site is abandoned. My findings also suggest that these commonly preferred Harappan pottery types were found in contexts located on both sides of the

perimeter wall. It is interesting, however, that these preferred Harappan vessel types show a greater percentage inside the perimeter wall, where they were found in association with the settlement's main craft manufacturing industries.

Several types of extremely rare Harappan vessel types, absent from the Phase I sample, were documented during Phase II: tall slender decorated jar, bowl with flared sides, and bottles. Moreover, rare types, such as the Harappan cooking pot and miniature vessels, continued to appear in extremely low quantities. This pattern suggests that rare Harappan pottery types represent sporadic activities and interactions of individuals, perhaps associated with trade and interaction networks, which did not result in the incorporation of additional pottery forms into the domestic pottery repertoire.

New findings on the use of the Harappan and Bagasra local cooking pot, as well as select Harappan and non-Harappan serving bowls that were found to co-occur during Phase II were presented in Chapter 5. The Anarta bowl, the Sorath bowl and the Jamnagar bowl, whose names reflect the geographical region where they are thought to have been concentrated, have distinct distributions inside Gujarat (Ajithprasad and Sonawane 2011, Ajithprasad et al. 1999, Possehl 2007) where they represent different cultural traditions. The regional distribution of the Bagasra local cooking pot is not yet understood. These cooking pot and serving bowl data clearly demonstrate that the Harappan cooking pot was extremely rare at Bagasra, while the Bagasra local cooking pot was fairly common – a pattern of continuity from Phase I. In addition, the three regional bowl forms were much less common than the select Harappan bowls and dishes (55/38/37), presented in Chapter 5.

Spatial analysis of vessel distribution indicate that there is no clear pattern in the distribution of the Harappan cooking pot compared to the Bagasra local cooking pot on either side of the Phase II perimeter wall. Rather, Phase II patterns suggest that individuals or families living inside the wall used Harappan cooking vessels to a similar degree as those living outside the perimeter wall. In addition, these findings demonstrate that the Bagasra local cooking pot was more common in both areas of the site, which indicates that residents instead used these pots for daily meal preparation. In addition, specific Harappan bowl and dish types dominate this assemblage of serving vessels in Phase II craft production contexts located inside the wall, but were also relatively abundant outside the perimeter wall. Thus, for Phase II, it appears that most people at Bagasra were using Bagasra local cooking pots (or some other yet unidentified vessel) along with select types of Harappan bowls and dishes (55/38/37) for regular meal preparation and consumption. Accordingly, the demarcation of space, which is symbolized by the monumental perimeter wall, is not clearly reflected in the spatial distribution of domestic cooking pots and serving vessels.

Both Harappan and non-Harappan pottery types were inscribed with Indus script and inscribed and incised with new or unknown characters. Detailed in Chapter 6, data on inscribed pottery indicate that post-firing graffiti occurred in higher percentage during Phase II, than it was during the initial occupation phase. These findings also suggest that pottery with script graffiti was deposited in relatively equal proportion in areas inside and outside the perimeter wall during Phase II, a pattern that continues into Phase III. The most notable examples of Phase II writing were found inscribed on steatite seals, which are thought to be associated with

economic aspects of intensified craft production specific to the period (Jamison 2012). In comparison, inscribed graffiti appears as a rather informal use of writing that was perhaps accessible to more residents of the site – those who used both Harappan as well as non-Harappan pottery.

2c. Phase III (2200-1900 BC, Integration Era)

Phase III marks a social and economic transition at Bagasra (Sonawane et al. 2003). Detailed in Chapter 2, Phase III closely resembles Phase II in terms of the array of Harappan artifacts found across the site, but is considered the "terminal stage of the Urban Harappan occupation" (Sonawane et al. 2003: 31). Craft production continued during Phase III, but seems to have slowed down and eventually ceased. The major craft industries inside the wall were abandoned and craft production appears to have shifted to dispersed, uncontrolled locations. Existing buildings and the perimeter wall were maintained, but no major building projects were initiated. The Phase III pottery assemblage, also drawn upon in dating deposits, is distinguished from Phase II deposits by the noticeably greater proportion of Sorath pottery, as compared to Harappan and Anarta pottery. Anarta and local pottery are also present, but in much smaller quantities than earlier periods.

Phase III (2200-1900 BC) pottery sampled for this study consisted of 46.05% (n=5760 potsherds) of the total pottery and came from eight trenches located in the central and southern part of the known site (presented in Chapter 3). Four of these trenches were located inside Bagasra's 7.5m thick perimeter wall (66.35%, n=3822) and four were located outside the

wall (33.65%, n=1938 potsherds). Diffuse craft production areas inside the perimeter wall and habitation deposits across the site make up the majority of the Phase III pottery sample included in this study. While no new building projects were undertaken during Phase III, existing buildings were maintained; therefore pottery from a small portion of structural deposits was documented.

My findings point to an important transition in the use of pottery between Phase II and Phase III at Bagasra, which coincides with changes in structural building and craft activities at the site. Several of the relatively common Harappan pottery types, such as black slipped jars, select bowls and dishes, and jar/pots with diagnostic Harappan black painted designs, which show continuity in use from Phase I through Phase II, show a marked declined in use and percentage between Phase II and Phase III. However, a few rare Harappan vessel types continued to appear: tall slender decorated jar, cooking pot, bowl with flared sides, miniature vessels, and bottles. Moreover, based on these findings, three categories of Harappan vessels, which were common during Phase I and II, continued to be common during Phase III: perforated jars, pedestalled vessels, and select bowls and dishes (types 55/38/37). My findings also suggest that these commonly preferred Harappan pottery types continued to be deposited in contexts located on both sides of the Phase III perimeter wall. As during Phase II, these preferred Harappan vessel types show a greater percentage inside the perimeter wall, where they were found in association with the settlement's main craft manufacturing industries. What this suggests is that, while the overall use for Harappan vessel forms decreased between Phase II and Phase III, certain select vessels (perforated jars, hollow pedestalled bowls and

dishes, and select bowls and dishes) had become an integral component in the cultural ceramic repertoire.

In addition, these pottery data clearly demonstrate an increase in the use of certain types of regional non-Harappan pottery forms between Phase II and Phase III. During Phase III, the Harappan cooking pot was extremely rare and the previously common Harappan bowls and dishes (types 55/38/37) decreased in percentage. In contrast, an increase in the percentage of Bagasra cooking pots as well as Sorath bowls was documented, suggesting that these vessel types were in greater use. Additional spatial analysis of cooking pots on either side of the Phase III perimeter wall indicates that the greatest percentage of Bagasra local cooking pots was documented inside the perimeter wall. Sorath bowls, which comprise the majority of Phase III serving vessels, were found concentrated in habitation contexts outside the perimeter wall. Therefore, these cooking pot and serving bowl data are evidence that the population of Bagasra did not dwindle as the regional economy changed during Phase III.

Data on inscribed pottery presented in Chapter 6 indicate that post-firing graffiti increased in percentage between Phase II and Phase III. Moreover, these findings also suggest that pottery with script graffiti was deposited in relatively equal proportion in areas inside and outside the perimeter wall during Phase III, a pattern of continuity from the previous phase. These chronological patterns, which indicate that the practice of carving script graffiti on pottery by the vessel owner was most common during Phase III (late Integration Era), is significant in that they differ from patterns of inscribed steatite seals at Bagasra. Steatite seals, the only other type of artifact at Bagasra with Indus script, were most prominent during Phase

II and are thought to be associated with economic aspects of intensified craft production specific to the period (Jamison 2012). While inscribed graffiti is relatively common during Phase II, the noted Phase III increase in inscribed graffiti may signal the expansion of informal contexts for the use of writing during the late Integration Era as the power associated with writing practices shifted away from aspects of economic control. This theory may also explain the continuity of inscribing practices in Phase IV (1900-1700 BC), Localization Era deposits, a period in which writing on steatite seals and writing on other media at Bagasra and elsewhere in the greater Indus world had already disappeared.

2d. Phase IV (1900-1700 BC, Localization Era)

Phase IV deposits are found overlying Phase III occupation without a stratigraphic hiatus (Sonawane et al. 2003: 33), however Phase IV deposits are unique from earlier occupation phases in the design of structures, occupational activities, and artifacts (presented in Chapter 2). Rubble stone structures were built by reusing materials found at the site and were placed in ad hoc locations, which differs from the well-constructed and laid out stone and mudbrick architecture of earlier phases. Occupation debris accumulated on top of and outside the southern side of the perimeter wall. Large pits were dug into the mound in several places, including on top of the remnant perimeter wall. Excavations inside the wall indicate that Phase IV occupants did not reside inside this space. There is no evidence for formal craft production, further differentiating Phase IV from earlier occupation phases. Evaluation of the pottery during excavation (Sonawane et al. 2003, MSU Dept of Archaeology n.d.) indicated an

assemblage of mainly Sorath pottery types. These preliminary studies further suggest that Phase IV deposits do not contain Harappan pottery or other Harappan artifacts – such as steatite seals, cubical chert weights, and shell, faience and semi-precious stone ornaments.

As discussed in Chapter 3, the Phase IV (1900-1700 BC) pottery sample consisted of 1652 potsherds weighing 29.81 kg, which is 13.21% of the total sample (n=12,509) and concentrated in the southern half of the site - the locus of Phase IV occupation. Most Harappan pottery types were found to be absent from Phase IV contexts. However, three types of Harappan vessels analyzed in this dissertation did show evidence of continuity in use from earlier phases: perforated jars, pedestalled vessels and select bowls and dishes (types 55/38/37). Sorath bowls appear alongside these select Harappan vessels, indicating continuity in use from earlier periods. Red slipped black band decorated vessels, though not unique to Harappan types, were present during all four phases and seem to increase in percentage over time, reaching its highest percentage during Phase IV. The total absence of the Harappan cooking pot during Phase IV, along with the scarcity of the Bagasra local cooking pot, is in keeping with previous site interpretations (Sonawane et al. 2003), which state that the people living at the site during the final phase were engaged in daily routines that differed from earlier inhabitants. However, the practice of writing on pottery continued and even more types of non-Harappan pottery were found inscribed and incised with graffiti.

3. Theoretical Significance

Grounded in humanistic approaches to agency and identity, recent archaeological and anthropological approaches to studying interaction networks indicate that borderland, or frontier regions, like Harappan period Gujarat (Chase 2010a, 2012, Fuller 2006, Law 2011, Possehl 1976, 2002a), have unique social and political structures making them fascinating places to study the construction, negotiation, and manipulation of local and regional group identities. This growing body of literature addresses the layered dynamics of interregional interaction networks and their social effects in complex societies. What we have learned from this work is that interacting communities cannot be dichotomized into core and periphery, or colonizer and colonized, but must be studied through overlapping ethnic, class, and personal identities, which are expressed in different ways depending on the social context (Schortman et al. 2001, Stein 2002a).

Models that emphasize unilinear, core-dominated, diffusionary, or migration-based explanations for regional interactions do not appear to work for the Harappan regions, including the site of Bagasra. Therefore one cannot assume that all material culture associated with the central regions of urban development in the Indus Valley were equally prevalent in borderland areas, like Gujarat. Instead, it is necessary to develop more complex models that combine perspectives from both the Indus Valley and outlying locales. With the increased interpretive sophistication of interregional interaction studies, research questions, like those posed here, can be framed to emphasize borderland regions as “zones of cultural interfaces, in which cross-cutting segmentary groups can be defined and recombined at different spatial and

temporal scales of analysis" (Lightfoot and Martinez 1995: 474). Rather than being viewed as passive recipients of core innovations, material culture and ideologies, borderlands should be viewed as places where complex social and economic relationships are worked out and new social and technological innovations occur (Schortman and Urban 1992) that affect broader social processes and economic networks in complex societies.

For example, in order to acquire and defend power, elites must establish and maintain their unique social identity. This is often done through the creation of symbolic markers of identity and the control of the production, distribution, and consumption of portable prestige goods that require a great deal of skill to create and that can also be easily displayed and "owned" (DeMarrais et al. 1996, Kenoyer 1995a, 2000, Schortman et al. 2001, Vidale and Miller 2000). Elite community leaders in "peripheral" regions, or borderlands, garner prestige and status through participating in regional social and political hierarchies and the adoption of symbols of regional elite identity. Therefore, these individuals have two competing social roles (Schortman et al. 2001), one that maintains alliances with elites in other regions in order to protect their shared status and acquisition of key resources, and another that establishes a common identity with their local community, which legitimizes their social position at home.

My interpretation of the pottery data at Bagasra is that these overlapping identities may have been expressed differently in public and private contexts. Overlapping identities may also have been expressed differently in contexts inside and outside the walled area of the settlement, which reflect restricted access to both public and private space. Within such an environment of layered interaction networks and dynamic identity-formation processes some

material styles become increasingly regionalized, while others become increasingly widespread (Shortman et al. 2001). These abstract social processes have been identified archaeologically through detailed analysis of material and technological styles of local and foreign domestic and prestige goods, especially diagnostic ceramics, as well as their spatial distributions and social contexts (Cusick 1998, Chilton 1999, Emberling 1997, Santley et al. 1987, Schortman and Urban 1992, 1994, Spence 2005, Stark 1998, Stein 2001, 2005).

Through specific material culture studies archaeologically preserved reflections of shared elite status can be defined and distinguished from regionalized reflections of local identity. As indicators of communal food preference, cooking pots and other cooking wares are important symbols of community affiliation that mark both social and personal identity in ethnographic (Choksi 1995, Miller 1985) and archaeological cultures (Joyner 2007, Kenoyer 1995a, Pearce 1999). When constructed from a variety of raw materials, including terracotta, high-fired ceramic and copper, a hierarchy of cooking wares is established that reflects the socio-economic status of the vessel owner (Kenoyer 1998) and marks significant technological shifts in the domestic economy (Skibo 1994) of complex societies. The spatial analysis of distinct styles of cooking pots was successful in identifying the presence of an Uruk trading colony within the fourth millennium BC site of Hacinebi (Turkey) (Pearce 1999, Stein 2002b). The introduction of Frankish cooking pots at the Byzantine city of Corinth (Greece) during the 13th century AD is evidence of the cultural impact of Venetian refugees 50 years after the Frankish invasion of the city (Joyner 2007). These studies demonstrate that analyses of the spatial distribution of distinct styles of cooking pots along with the investigation of their

continuity and change through time are powerful tools in reconstructing the negotiation and manipulation of social networks and group identities in state-level societies.

These archaeological cases demonstrate the potential in studies of cooking wares to identify enclaves of foreign groups. Unlike these examples, however, questions still remain regarding the nature of the expansion of the Indus Civilization into Gujarat. As detailed in this dissertation, some Indus scholars have argued that Harappan settlements in Gujarat were themselves colonial trading outposts (Dhavakilar 1995), or were settled by traders and craftspeople who migrated into the region from the southern Indus Valley (Bisht 1989a, Joshi 1972, Possehl and Raval 1989, Possehl 1992a). These models imply that individuals or groups from outside Gujarat established and maintained the social, economic and civic infrastructure of Harappan settlements founded in Kachchh and northern Saurashtra during the Harappan Phase, or Integration Era. Cooking pot studies, like the one presented here, effectively demonstrate that regional and borderland communities may participate in inter-regional interaction networks and also maintain their own regional identity, as displayed in their preference for local cooking pot styles.

There is still a lot of work that needs to be done to test these hypotheses. Recent research by Brad Chase (2007, 2010a, Chase and Meiggs 2012) has begun to test the basic premises of the traditional migration-based model for Harappan Gujarat. Chase's work indicates that residents living inside the perimeter wall at Bagasra may have distinguished themselves from those living outside the wall through minority food preferences and food preparation techniques. My ceramic data suggest that the pottery used to prepare and serve

these different types of cuisine were not differentiated on the inside and outside of the perimeter wall. These new pottery data provide a more complex model of social and economic interaction between people living inside and outside the monumental settlement walls.

The present state of archaeological research is only just beginning to address the material foundations and socio-cultural impact of interactions between people living in Gujarat and those in neighboring regions. Reconstructions of this ancient cultural landscape must recognize reciprocal interactions and identify the impact of Harappan communities from the Indus Valley on the indigenous communities of Gujarat as well as the contribution of local cultures to the cultural and economic institutions of the Indus Civilization.

4. Conclusion

In conclusion, this dissertation has tested several hypotheses regarding the patterning of Harappan and non-Harappan pottery at the site of Bagasra, a small, walled craft production center located in the borderlands of the Indus Civilization (2600-1900 BC). My research represents a systematic evaluation and presentation of the quantity and spatial distribution of many different types of Harappan pottery in Gujarat and is the first study to carefully link this type of evaluation to the pottery typologies of the sites of Mohenjo Daro and Harappa. This is also the first study in Gujarat to present the counts of Harappan cooking pots and to identify the presence of a local cooking pot type at Bagasra. This work focused on the pottery that was reliably assigned to specific Harappan pottery types based on a conglomerate of preserved attributes states. By necessity, these data and the interpretations I draw from them are

therefore preliminary and represent a sample of the Harappan pottery types possibly used by the ancient residents of Bagasra.

This study documented that the counts and percentages of individual Harappan pottery types is generally low at Bagasra. However, these findings clearly show that Harappan pottery is found on both sides of the perimeter wall at Bagasra. Thus, this work presents new data that contradicts suppositions of the traditional model for the Indus Civilization in Gujarat regarding the spatial patterning of Harappan ceramics. I contend here that we can no longer assume that Harappan pottery was the only pottery utilized by elite residents of Indus settlements, nor that Harappan and non-Harappan pottery will appear in discrete locations segregated by perimeter walls.

My conclusions presented throughout this work are drawn from the application of a new method of comparative data analysis, which defined the types and styles of Harappan pottery that were and were not in use at Bagasra. By applying the Harappan pottery typology, my study has identified a set of Harappan vessels that were common at Bagasra as well as a set of rare, or uncommon, Harappan pottery types. Both common and rare Harappan pottery types were found to co-occur with various non-Harappan ceramics in diverse archaeological contexts on either side of the perimeter wall. A phase-by-phase comparison of vessel percentages further revealed important continuities and changes in the quantity of specific types of pottery used by the Bagasra community. Certain cultural habits and pottery preferences, such as those reflecting local domestic practices, appear to have remained the

same. At the same time, changes in pottery preferences were noted, which were related to key social and economic transitions between Phase II and III at Bagasra.

I argue that comparative analysis, which identifies site-specific variation and regional patterns in the preference for Harappan ceramics, warrants extended application at additional sites in Gujarat and in other regions of the Indus Civilization. This comparative method can also be expanded to studies of beads, bangles, and other shared craft technologies. Insights gained from this method help to refine our understanding of the connection between pottery, other material culture and society by identifying a community's unique material preferences. In order to better situate these preferences within a regional framework, one that includes Harappan and non-Harappan archaeological cultures, future research must apply this method of comparative data analysis with the aim of identifying site-specific variation and regional patterns in the preferences for Harappan ceramics and other craft technologies.

Bibliography

Abrams, E.

1998 Structures as Sites: The Construction Process and Maya Architecture. In Function and Meaning in Classic Maya Architecture, edited by S. D. Houston, pp. 123-140. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Adams, R. M.

1966 The Evolution of Urban Society: Early Mesopotamia and prehispanic Mexico. Aldine, Chicago.

Ajithprasad, P.

2012b Excavations at Shikarpur: A Harappan Site in Gujarat. Paper presented at the Center for South Asia Lecture Series, October 4, 2012, Madison, WI.

2012a Exploring the Roots of Harappan Regional Diversity in Saurashtra. Paper presented at the 41st Annual Conference on South Asia, October 11-14, 2012, Madison, WI.

2011 Chalcolithic Cultural Patterns and the Early Harappan Interaction in Gujarat. In Cultural Relations between the Indus and Iranian Plateau during the Third Millennium BCE, edited by T. Osada and M. Witzel, pp. 11-40. Harvard Oriental Series, Opera Minora Vol. 7. Cambridge.

2008 Jaidak (Pithad): A Sorath Harappan Site in Jamnagar District, Gujarat and its Architectural Features. In Occasional Paper 4: Linguistics, Archaeology and the Human Past, edited by T. Osada and A. Uesugi, pp. 83-99. Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan.

2006 (in press)The Cultural and Stratigraphic Context of the Harappan Black Slipped Jar at Bagasra, Gujarat. Proceedings of the Magan and the Indus Civilization: proceedings of the international conference on Magan and the Indus Civilization, January 4-6, 2006, Baroda, India. New Delhi.

2004 Holocene Adaptation of the Mesolithic and Chalcolithic Settlements in North Gujarat. In Monsoon and Civilizations, edited by Y. Yasuda and V. Shinde, pp. 115-132. Roli Books Pvt. Ltd., New Delhi.

2002 The Pre-Harappan Cultures of Gujarat. In Protohistory: Archaeology of the Harappan Civilization, edited by S. Settar and R. Korisettar, pp. 129-158. Indian Archaeology in Retrospect, Vol. 2. Manohar, New Delhi.

Ajithprasad, P. and M. Madella

2012 The Early Harappan Encounters and Chalcolithic Developments in Gujarat. Paper presented at the 21st Conference of the European Association of South Asian Archaeologists, July 2-6, 2012, Paris, France.

Ajithprasad, P., S. V. Rajesh and B. Sharma

2011 Archaeological Explorations in the Saurashtra Coast of Junagadh District, Gujarat. In Occasional Paper 10: Linguistics, Archaeology and the Human Past, edited by T. Osada and A. Uesugi, pp. 27-70. Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan.

Ajithprasad, P. and V. H. Sonawane

2011 The Harappa Culture in North Gujarat: A Regional Paradigm. In Occasional Paper 12: Linguistics, Archaeology and Human Past, edited by T. Osada and E. Hitoshi, pp. 223-269. Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan.

1993 The Harappa Culture in North Gujarat: A Regional Paradigm. Paper presented at the Conference on The Harappans in Gujarat: Problems and Prospects, Pune, India.

Ajithprasad, P., V. H. Sonawane, A. Majumdar and K. Dimri

1999 The Chacolithic Cultural Sequence at Rangpur and New Data from Bagasra. Paper presented at the XXVII Annual Conference of the Indian Society for Prehistoric and Quaternary Studies, Pune, India.

Allchin, B. and R. Allchin

1982 The Rise of Civilization in India and Pakistan. 1996 South Asian ed, reprint 1999 ed. Cambridge World Archaeology. Cambridge University Press, Cambridge.

Arnold, D. E.

1985 Ceramic Theory and Cultural Process. Cambridge University Press, Cambridge.

Beck, M., J. M. Skibo, D. J. Hally and P. Yang

2002 Sample selection for ceramic use-alteration analysis: the effects of abrasion on soot. Journal of Archaeological Science 29:1-15.

Bhan, K. K.

2004 In the Sand Dunes of North Gujarat. In Indus Civilization Sites in India: New Discoveries, edited by D. K. Chakrabarti, pp. 96-105. Marg, Mumbai.

1994 Cultural Development of the Prehistoric Period in North Gujarat with Reference to Western India. South Asian Studies 10:71-90.

1992 Late Harappan Gujarat. The Eastern Anthropologist 45(1-2):173-192.

1989 Late Harappan Settlements of Western India, with Specific Reference to Gujarat. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 219-242. Wisconsin Archaeological Reports. vol. 2. Wisconsin Archaeological Reports, Madison, WI.

1986 Recent Explorations in the Jamnagar District of Saurashtra. Man And Environment 10:1-21.

Bhan, K. K. and P. Ajithprasad

2009 Excavations at Shikarpur, Gujarat 2008-2009, http://www.harappa.com/goladhoro/Shikarpur-2008-2009.pdf.

2008 Excavations at Shikarpur 2007-2008: a coastal port and craft production center of the Indus Civilization in Kutch, India, http://www.harappa.com/goladhoro/Excavations-at-Shikarpur-2007.pdf.

Bhan, K. K. and D. Gowda

2003 Shell Working at Nagwada (North Gujarat) with Special Reference to Shell Industries of the Harappan Tradition in Gujarat. Man and Environment XXVIII(2):51-80.

Bhan, K. K. and J. M. Kenoyer

1980-81 Nageshwar, an Industrial Centre of the Chalcolithic Period. Puratattva (12):115-120.

Bhan, K. K., K. Krishnan and V. H. Sonawane

1992 Chapter IV: Pottery. In Excavation at Nageswar, Gujarat: A Harappan Shell Working Site on the Gulf of Kutch, edited by K. T. M. Hegde, K. K. Bhan, V. H. Sonawane, K. Krishnan and D. R. Shah, pp. 15-123. Maharaja Sayajirao University Archaeology Series No. 18 (1990). Department of Archaeology & Ancient History, M. S. University Baroda, Baroda.

Bhan, K. K., V. H. Sonawane, P. Ajithprasad and S. Pratapchandran

2009 Gola Dhoro, http://www.harappa.com/goladhoro/index.html.

Bhan, K. K., V. H. Sonawane, P. Ajithprasad and S. Pratapchandran

2005 A Harappan trading and craft production center at Gola Dhoro (Bagasra). Antiquity 79(304):http://antiquity.ac.uk/Projgall/bhan304/.

Bhan, K. K., V. H. Sonawane, P. Ajithprasad and S. Pratapchandran

2004 Excavations of an Important Harappan Trading and Craft Production Center at Gola Dhoro (Bagasra), on the Gulf of Kutch, Gujarat, India. Journal of Interdisciplinary Studies in History and Archaeology 1(2):153-158.

Bhan, K. K., M. Vidale and J. M. Kenoyer

2002 Some important aspects of the Harappan technological tradition. In Protohistory: Archaeology of the Harappan Civilization, edited by S. Settar and R. Korisettar, pp. 223-271. Indian Archaeology in Retrospect, vol. 2. Manohar, New Delhi.

Bisht, R. S.

2005 The Water Structures and Engineering of the Harappans at Dholavira (India). In South Asian Archaeology 2001, edited by C. Jarrige and V. Lefevre, pp. 11-25. Editions Recherche Sur les Civilizations, Paris.

2000 Urban Planning at Dholavira: A Harappan City. In Ancient Cities, Sacred Skies: Cosmic Geometries and City Planning in Ancient India, edited by J. M. Malville and L. M. Gujral, pp. 11-23. Aryan Books International, New Delhi.

1999 Dholavira and Banawali: Two Different Paradigms for the Harappan Urbis Forma. Puratattva 29:14-32.

1994 Secrets of the Water Fort. Down to Earth (May):25-31.

1991 Dholavira: New Horizons of the Indus Civilization. Puratattva 20:71-82.

1989b A New Model of the Harappan Town Planning as Revealed at Dholavira in Kutch: a surface study of its plan and architecture. In History and Archaeology, edited by B. Chatterjee, pp. 397-408. Ramanand Vidhya Bhawan, Delhi.

1989a The Harappan Colonization of Kutch: An Ergonomic Study with Reference to Dholavira and Surkotada. In History and Art, edited by K. Deva, L. Gopal and S. B. Singh, pp. 265-272. Ramanand Vidhya Bhawan, Delhi.

Boivin, N.

2008 Material Cultures, Material Minds: The Impact of Things on Human Thought, Society, and Evolution. Cambridge University Press, New York.

Bourgeois, G. and P. Gouin

1995 Résultats d'une analyse de traces organiques fossiles dans une "faisselle" harappéenne. Paléorient:125-128.

Bray, T. L.
2003 Inka Pottery as Culinary Equipment: Food, Feasting, and Gender in Imperial State Design. Latin American Antiquity 14(1):3-28.

Casal, J. M.
1964 Fouilles D'Amri 2 Vol. De La Commission Des Fouilles Archeologiques, Paris.

Chakrabarti, D. K.
1990 The External Trade of the Indus Civilization. Munshiram Manoharlal, New Delhi.

1988 A history of Indian archaeology from the beginning until 1947. Munshiram Manoharlal Publishers, New Delhi.

Chamyal, L. S., D. M. Maurya and R. Raj
2003 Fluvial Systems of the drylands of western India: A Synthesis of Late Quaternary Environmental and Tectonic Changes. Quaternary International 104:69-86.

Chase, B.
2012 Crafting Harappan Cuisine in the Saurashtran Frontier of the Indus Civilization. In The Menial Art of Cooking: Archaeological Studies of Cooking and Food Preparation, edited by S. Graff and E. Rodriguez-Alegria, pp. 145-172. University Press of Colorado, Denver.

2010b On the Pastoral Economies of Harappan Gujarat: A First Look at the Faunal Remains From New Excavations at Shikarpur and a Comparison with Gola Dhoro. Proceedings of the Proceedings of the Bhuj Roundtable 2010 on Gujarat Harappans and Rural Chalcolithic Cultures. Bhuj, India.

2010a Social change at the Harappan settlement of Gola Dhoro: a reading from animal bones. Antiquity 84:1-16.

2007 Meat Provisioning and the Integration of the Indus Civilization: A Perspective from Gujarat (India). Ph.D. Dissertation, Department of Anthropology, University of Wisconsin-Madison.

Chase, B., P. Ajithprasad and S. V. Rajesh
in press The Identification of Diversity: Material Culture and Social Practice in Harappan Gujarat. In South Asian Archaeology 2010, edited by D. Klimburg-Salter and V. Widorn.

Chase, B., P. Ajithprasad, S. V. Rajesh, A. Patel and B. Sharma
2012 Exploring Harappan Diversity: Material Variation in the Borderlands of Gujarat. Paper presented at the 21st Conference of the European Association of South Asian Archaeologists, July 2-6, 2012, Paris, France.

Chase, B. and D. Meiggs
2012 Harappan Shepherds and Their Flocks: A First Look at Pastoral Land-use and Social Networking in Harappan Gujarat Using Strontium Isotopes. Paper presented at the 41st Annual Conference on South Asia, October 11-14, 2012, Madison, WI.

Childe, V. G.
1950 The Urban Revolution. Town Planning Review 21:3-17.

Chilton, E. S. (editor)
1999 Material Meanings: Critical Approaches to the Interpretation of Material Culture. The University Of Utah Press, Salt Lake City.

Choksi, A.
1995 Ceramic Vessels: their Role in Illuminating Past and Present Social and Economic Relationships. Man and Environment 20(1):87-108.

Coningham, R., F. R. Allchin, C. M. Batt and D. Lucy
1996 Passage to India? Anuradhapura and the early use of the Brahmi script. Cambridge Archaeological Journal 6(1):73-97.

Coningham, R. A. E.
2002 Deciphering the Indus script. In Protohistory: Archaeology of the Harappan Civilization, edited by S. Settar and R. Korisettar, pp. 81-104. Indian Archaology in Retrospect Vol. 2. Manohar, New Delhi.

Cork, E.
2005 Peaceful Harappans? Reviewing the evidence for the absence of warfare in the Indus Civilization of north-west India and Pakistan (c.2500-1900 BC). Antiquity 79:411-423.

Cusick, J. G. (editor)
1998 Studies in Culture Contact: Interaction, Culture Change, and Archaeology. Southern Illinois University Press, Carbondale.

Dales, G. F.
1991 Some Specialized Ceramic Studies at Harappa. In Harappa Excavations 1986-1990: A Multidisciplinary Approach to Third Millennium Urbanism, edited by R. H. Meadow, pp. 61-70. Prehistory Press, Madison.

Dales, G. F.
1979 The Balakot Project: Summary of Four Years of Excavations in Pakistan. Man and Environment 3:45-53.

1973 Archaeological and Radiocarbon Chronologies for Protohistoric South Asia. In South Asian Archaeology 1971, edited by N. Hammond, pp. 157-169. Duckworth, London.

Dales, G. F. and J. M. Kenoyer
1993 The Harappa Project 1986-1989: New Investigation at an Ancient Indus City. In Harappan Civilization: A Recent Perspective, edited by G. L. Possehl, pp. 469-520. Oxford & IBH Co. Pvt. Ltd., New Delhi.

1986 Excavations at Mohenjo Daro, Pakistan: The Pottery. University Museum Press, Philadelphia.

DeMarrais, E., L. J. Castillo and T. Earle
1996 Ideology, Materialization, and Power Strategies. Current Anthropology 37(1):15-31.

Department of Archaeology and Ancient History, M. U. o. B.
n.d. Excavations at Bagasra (1995-2005): annual reports submitted to the Archaeological Survey of India. Maharaja Sayajirao University of Baroda.

Deshpande-Mukherjee, A.
1998 Shellfishing and Shell Crafts during the Harappan Period in Gujarat. Man and Environment 23(1):63-80.

Dhavalikar, M. K.
1995 Cultural Imperialism: Indus Civilization in Western India. Books & Books, New Delhi.

Dhavalikar, M. K. and G. L. Possehl
1992 The Pre-Harappan Period at Prabhas Patan and the Pre-Harappan Phase in Gujarat. Man and Environment 17(1):71-78.

Dhavalikar, M. K., M. R. Raval and Y. M. Chitalwala
1996 Kuntasi: A Harappan Emporium on West Coast. Deccan College Post-Graduate Research Institute, Pune.

Durrani, F. A., I. Ali and G. Erdosy
1995 Seals and Inscribed Sherds of Rehman Dheri. Ancient Pakistan 10:198-233.

Edens, C.
1993 Indus-Arabian Interaction during the Bronze Age: A Review of Evidence. In Harappan Civilization: A Recent Perspective, edited by G. L. Possehl, pp. 335-363. Oxford & IBH Co. Pvt. Ltd., New Delhi.

Emberling, G.
1997 Ethnicity in Complex Societies: Archaeological Perspectives. Journal of Archaeological Research 5(4):295-344.

Erdosy, G.
1995 City States of North India and Pakistan at the Time of the Buddha. In The Archaeology of Early Historic South Asia, edited by F. R. Allchin, pp. 99-122. Cambridge University Press, Cambridge.

Fairservis, W. A.
1989 An epigenetic view of the Harappan culture. In Archaeological Thought in America, edited by C. C. Lamberg-Karlovsky, pp. 205-217. Cambridge University Press, New York.

Fairservis, W. A. J.
1983 The Script of the Indus Valley Civilization. Scientific American 248(3):58-66.

Fairservis, W. A. J. and F. C. Southworth
1989 Linguistic Archaeology and the Indus Valley Culture. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 133-141. Wisconsin Archaeological Reports. vol. 2. Wisconsin Archaeological Reports, Madison, WI.

Farmer, S., R. Sproat and M. Witzel
2004 The collapse of the Indus-script thesis: The myth of a literate Harappan Civilization. Electronic Journal of Vedic Studies 11(2):19-57.

Franke-Vogt, U.
2005 Balakot Period I: A Review of its Stratigraphy, Cultural Sequence and Date. In South Asian Archaeology 2001: Proceedings of the Sixteenth International Conference of the European Association of South Asian Archaeologists, held in Collège de France, Paris 2-6 July 2001, edited by C. Jarrige and V. Lefèvre, pp. 93-102. vol. Volume 1: Prehistory. Editions Recherche sur les Civilisations, Paris.

1997 Reopening Research on Balakot: A Summary of Perspectives and First Results. In South Asian Archaeology 1995, edited by R. Allchin and B. Allchin, pp. 217-235. Oxford and IBH, New Delhi.

1992 Inscribed Objects from Moenjo-daro: Some Remarks on Stylistic Variability and Distribution Patterns. In South Asian Archaeology 1989, edited by C. Jarrige, pp. 103-112. Prehistory Press, Madison, WI.

1989 Inscribed Bangles : an inquiry into their relevance. In South Asian Archaeology 1985, edited by K. Frifelt and P. Sørensen, pp. 237-246. Curzon Press, London.

Frenez, D. and M. Tosi

2005 The Lothal Sealings: Records from an Indus Civilization Town at the Eastern End of the Maritime Trade Circuits across the Arabian Sea. In Studi in Onore di Enrica Fiandra. , edited by M. Perna, pp. 65-103. Contributi di archeologia egea e vicinorientale, Naples.

Fuller, D. Q.

2006 Agricultural origins and frontiers in South Asia: a working synthesis. Journal of World Prehistory 20(1):1-86.

2005 Ceramics, seeds and culinary change in prehistoric India. Antiquity 79:761-777.

Gouin, P.

1997 Ancient oriental dairy techniques derived from archaeological evidence. Food and Foodways: Explorations in the History and Culture of Human Nourishment 7(3):157-188.

Hegde, K. T. M., K. K. Bhan, V. H. Sonawane, K. Krishnan and D. R. Shah (editors)

1992 Excavation at Nageswar, Gujarat: A Harappan Shell Working Site on the Gulf of Kutch. M. S. University Baroda Press, Baroda.

Hegde, K. T. M. and V. H. Sonawane

1986 Landscape and Settlement Patterns of Harappa Culture Villages in the Rupen Estuary. Man and Environment 10:23-31.

Hegde, K. T. M., V. H. Sonawane, K. K. Bhan, P. Ajithprasad and K. Krishnan

1990 Excavation at Nagwada - 1987-88: A Preliminary Report. In Adaptation and Other Essays: Proceedings of the Archaeological Conference 1988, edited by N. C. Ghosh and S. Chakrabarti, pp. 191-195. Visva-Bharati Research Publications, Santiniketan.

Hegde, K. T. M., V. H. Sonawane, D. R. Shah, K. K. Bhan, Ajitprasad, K. Krishnan and S. Pratapa Chandran

1988 Excavation at Nagwada - 1986 and 1987: A Preliminary Report. Man and Environment 12:55-65.

Herman, C. F.

1997b The Rangpur Sequence of "Harappan" Gujarat (India): A Re-assessment. In South Asian Archaeology 1995, edited by R. Allchin and B. Allchin, pp. 187-198. Oxford and IBH, New Delhi.

1997a "Harappan" Gujarat: The Archaeology-Chronology Connection. Paléorient 22(2):77-112.

1991 Bronze-Age Complexes in Gujarat before the Harappan Urbanization Expansion: A Working Hypothesis. M. A., Anthropology, University of Pennsylvania, Philadelphia.

1989 Rojdi Material Culture: The Sorath Harappan Ceramics. In Harappan Civilization and Rojdi, edited by G. L. Possehl and M. H. Raval, pp. 53-156. Oxford & IBH, New Delhi.

Herman, C. F. and K. Krishnan

1994 Micaceous Red Ware: a Gujarat Proto-Historic cultural complex or just ceramics? In South Asian Archaeology, 1993, edited by A. Parpola and P. Koskikallio, pp. 225-244. vol. 1. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

Insoll, T. and K. Bhan

2001 Carnelian Mines in Gujarat. Antiquity 75:495-496.

Jacobson, J.

1986 The Harappan Civilization: An Early State. In Studies in the Archaeology of India and Pakistan, edited by J. Jacobson, pp. 137-174. Oxford and IBH, New Delhi.

Jamison, G. M.

2012 Harappan Seals from Bagasra and Shikarpur: New Perspectives on Seal Use at Regional Harappan Sites in Gujarat. Paper presented at the 41st Annual Conference on South Asia, October 11-14, 2012, Madison, WI.

2010 Harappan Seals in Gujarat: A Comparative Analysis. Proceedings of the Proceedings of the Bhuj Roundtable 2010 on Gujarat Harappans and Rural Chalcolithic Cultures. Bhuj, India.

Jansen, M.

2002 Settlement networks of the Indus civilization. In Protohistory: Archaeology of the Harappan Civilization, edited by S. Settar and R. Korisettar, pp. 105-128. Indian Archaeology in Retrospect. vol. 2. Manohar, New Delhi.

1994 Mohenjo-daro, type site of the earliest urbanization process in South Asia: ten years of research at Mohenjo-daro Pakistan and an attempt at a synopsis. In South Asian Archaeology, 1993, edited by A. Parpola and P. Koskikallio, pp. 263-280. vol. 1. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

1993b Mohenjo-daro: Type Site of the Earliest Urbanization Process in South Asia. In Urban Form and Meaning in South Asia: The Shaping of Cities from Prehistoric to Precolonial Times, edited by H. Spodek and D. M. Srinivasan, pp. 35-52. vol. 31. National Gallery of Art, Washington.

1993a Pre-, Proto-, Early-, Mature-, Urban-, Late-, Post-Harappan: Linearity, Multilinearity: "Babylonianlanguage Confusion" or Ideological Dispute? In South Asian Archaeology 1991, edited by A. G. Gail and G. J. R. Mevissen, pp. 135-148. F. S. Verlag, Stuttgart.

1989b Early Cities - A Comparative Study of Urban Development. Lahore Museum Bulletin 11(1):5-14.

1989a Some problems regarding the Forma Urbis Mohenjo-Daro. In South Asian Archaeology, 1985, edited by K. Frifelt and P. Sørensen, pp. 247-254. Curzon Press, London.

Jansen, M. and G. Urban (editors)

1988 Interim Reports Vol. 3: Reports on Field Work Carried out at Mohenjo-Daro, Pakistan 1983-86 by IsMEO-Aachen-University Mission. IsMEO/RWTH, Aachen.

1987 Interim Reports Vol. 2: Reports on Field Work Carried out at Mohenjo-Daro, Pakistan 1983-84 by IsMEO-Aachen University Mission. IsMEO/RWTH, Aachen.

1984 Interim Reports Vol. 1: Reports on Field Work Carried out at Mohenjo-Daro, Pakistan 1983-84 by IsMEO-Aachen University Mission. IsMEO/RWTH, Aachen.

Jenkins, P. C.

2005 Cemetery R37 and Harappa Site: A Comparative Study of Mortuary and Domestic Pottery. In South Asian Archaeology 2001: Proceedings of the Sixteenth International Conference of the European Association of South Asian Archaeologists, held in Collège de France, Paris 2-6 July 2001, edited by C. Jarrige and V. Lefèvre, pp. 143-150. vol. Volume 1: Prehistory. Editions Recherche sur les Civilisations, Paris.

2000 The pottery from cemetery R37: chronology and the changing social structure of Harappan society. In South Asian Archaeology 1997, edited by M. Taddei and G. De Marco, pp. 35-54. vol. 1. 3 vols. Istituto Italiano Per L'Africa E L'Oriente, Rome.

1994b Cemetery R 37: New Perspectives on Style and Chronology. In From Sumer to Meluhha: Contributions to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., edited by J. M. Kenoyer, pp. 105-112. Wisconsin Archaeological Reports, 3. Department of Anthropology, Madison.

1994a Continuity and change in the ceramic sequence at Harappa. In South Asian Archaeology, 1993, edited by A. Parpola and P. Koskikallio, pp. 315-328. vol. 1. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

Johansen, P. G.

2003 Recasting the Foundations: New Approaches to Regional Understandings of South Asian Archaeology and the Problem of Culture History. Asian Perspectives 42(2):193-206.

Joshi, J. P.

1990 Excavations at Surkotada and Exploration in Kutch. Memoirs of the Archaeological Survey of India, Vol. 87. Archaeological Survey of India, New Delhi.

1972 Exploration in Kutch and Excavation at Surkotada and New Light on Harappan Migration. Journal of the Oriental Institute 22(1-2):98-144.

Joshi, J. P. and A. Parpola

1987 Corpus of Indus Seals and Inscriptions: Vol. 1. Annales Academiae Scientiarum Fennicae Humaniora, Sarja Series B, NIDE Tome 239. Suomalainen Tiedeakatemia, Helsinki.

Joyner, L.

2007 Cooking Pots as Indicators of Cultural Change: A Petrographic Study of Byzantine and Frankish Cooking Wares form Corinth. Hesperia 76:183-227.

Keeley, L., M. Fontana and R. Quick

2007 Baffles and Bastions: The Universal Features of Fortifications. Journal of Archaeological Research 15(1):55-95.

Kenoyer, J. M.

2012 Marine and Riverine Trade of the Indus Cities: Strategies for Research and Interpretation. In Proceedings of the International Seminar on Marine Archaeology 3, 23-24 Aug 2007, edited by A. Tripathi. Archaeological Survey of India, New Delhi.

Kenoyer, J. M.

2011 Regional Cultures of the Greater Indus Valley: The Ravi and Kot Diji Phase Assemblages of Harappa, Pakistan. In Cultural Relations between the Indus and Iranian Plateau during the Third Millennium BCE, edited by T. Osada and M. Witzel, pp. 165-218. Harvard Oriental Series, Opera Minora Vol. 7. Cambridge.

2009b Graphic Design of Indus Seals: Geometric, Naturalistic and Narrative Motifs. In Visual Culture in Pakisan, edited by S. Zaidi, pp. 315-327. Oxford University Press & Prince Claus Funds Library, Karachi.

2009a Indus Seals: An Overview of Iconography and Style. Ancient Sindh 9(2006-2007):7-30.

2008c Indus Urbanism: New Perspectives on its Origin and Character. In The Ancient City: New Perspectives on Urbanism in the Old and New World, edited by J. Marcus and J. A. Sabloff, pp. 183-208. School for Advanced Research Press Santa Fe, New Mexico.

2008b Indus Civilization. In Encyclopedia of Archaeology, edited by D. Pearsall, pp. 715-733. Elsevier, San Diego.

2008a Indus and Mesopotamian Trade Networks: New Insights from Shell and Carnelian Artifacts. In Intercultural Relations between South and Southwest Asia: Studies in commmemoration of E.C.L. During Caspers (1934-1996), edited by E. Olijdam and R. H. Spoor, pp. 19-28. BAR International Series 1826. Archaeopress, Oxford.

2006 Cultures and Societies of the Indus Tradition. In India: Historical Beginnings and the Concept of the Aryan, pp. 41-97. National Book Trust, India, New Delhi.

2004 Die Karren der Induskultur Pakistans und Indiens (Wheeled Vehicles of the Indus Valley Civilization of Pakistan and India). In Rad und Wagen: Der Ursprung einer Innovation Wagen im Vorderen Orient und Europa (Wheel and Wagon: Origins of an Innovation), edited by M. Fansa and S. Burmeister, pp. 87-106. Verlagg Philipp von Zabern, Mainz am Rhein.

2001 Early developments of art, symbol, and technology in the Indus Valley tradition. Indo Koko Kenkyu 22.

2000 Wealth and Socio-Economic Hierarchies of the Indus Valley Civilization. In Order, Legitimacy, and Wealth in Ancient States, edited by J. Richards and M. Van Buren, pp. 88-109. Cambridge University Press, Cambridge.

Kenoyer, J. M.

1998 Ancient Cities of the Indus Valley Civilization. Oxford University Press, New York.

1995b Interaction Systems, Specialized Crafts and Culture Change: The Indus Valley Tradition and the Indo-Gangetic Tradition in South Asia. In The Indo-Aryans in Ancient South Asia: Language, Material Culture and Ethnicity, edited by G. Erdosy, pp. 213-257. W. DeGruyter, Berlin.

1995a Ideology and Legitimation in the Indus State as Revealed Through Symbolic Objects. The Archaeological Review 4(1-2):87-131.

1994b Experimental Studies of Indus Valley Technology at Harappa. In South Asian Archaeology, 1993, edited by A. Parpola and P. Koskikallio, pp. 245-262. vol. 1. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

1994a The Harappan State: Was it or wasn't it? In From Sumer to Meluhha: Contributions to the Archaeology of South and West Asia in Memory of George F. Dales, Jr., edited by J. M. Kenoyer, pp. 71-80. Wisconsin Archaeological Reports, 3. Department of Anthropology, Madison.

1993 Excavations on Mound E, Harappa: A systematic approach to the study of Indus urbanism. In South Asian Archaeology, 1991, edited by A. J. Gail and G. J. R. Mevissen, pp. 165-194. F. S. Verlag, Stuttgart.

1991 The Indus Valley Tradition of Pakistan and Western India. Journal of World Prehistory 5(4):331-385.

1989 Socio-Economic Structures of the Indus Civilization as Reflected in Specialized Crafts and the Question of Ritual Segregation. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 183-192. Wisconsin Archaeological Reports. vol. 2. Dept. of Anthropology, U.W.-Madison, Madison, WI.

1983 Shell Working Industries of the Indus Civilization: An Archaeological and Ethnographic Perspective. PhD, University of California-Berkeley.

Kenoyer, J. M. and R. H. Meadow

2010 Inscribed Objects from Harappa Excavations: 1986-2007. In Corpus of Indus Seals and Inscriptions: Vol. 3: New Material, Untraced Objects and Collections Outside India and Pakistan. Part 1: Mohenjo-daro and Harappa, edited by A. Parpola, B. M. Pande and P. Koskikallio, pp. xliv-lviii. Suomalainen Tiedeakatemia, Helsinki.

Kenoyer, J. M. and R. H. Meadow

2000 The Ravi Phase: a new cultural manifestation at Harappa. In South Asian Archaeology 1997, edited by M. Taddei and G. De Marco, pp. 55-76. vol. 1. Istituto Italiano per l'Africa e l'Oriente/Istituto Universitario Orientale, Rome/Naples.

1999 Harappa: New Discoveries on its origins and growth. Lahore Museum Bulletin XII(1):1-12.

1997 New Inscribed Objects From Harappa. Lahore Museum Bulletin IX(1 (1996)):1-20.

Kenoyer, J. M. and H. M.-L. Miller

2007 Multiple Crafts and Socioeconomic Associations in the Indus Civilization: New Perspectives from Harappa, Pakistan. In Craft Production in Complex Societies, edited by I. Shimada, pp. 152-183. University of Utah Press, Salt Lake City.

Kenoyer, J. M., T. D. Price and J. H. Burton

2013 A New Approach to Tracking Connections between the Indus Valley and Mesopotamia: Initial Results of Strontium Isotope Analyses from Harappa and Ur. Journal of Archaeological Science doi: 10.1016/j.jas.2012.12.040.

Kenoyer, J. M., M. Vidale and K. K. Bhan

1994 Carnelian Bead Production in Khambhat India: An Ethnoarchaeological Study. In Living Traditions: Studies in the Ethnoarchaeology of South Asia, edited by B. Allchin, pp. 281-306. Oxford and IBH, New Delhi.

1991 Contemporary Stone Bead Making in Khambhat India: patterns of craft specialization and organization of production as reflected in the archaeological record. World Archaeology 23(1):44-63.

Khan, F. A.

1965 Excavations at Kot Diji. Pakistan Archaeology 2:11-85.

Kharakwal, J. S., Y. S. Rawat and T. Osada (editors)

2012 Excavation at Kanmer. Indus Project, Research Institute for Humanity and Nature, Kyoto.

Kim, N. C.

2013 Lasting monuments and durable institutions: Labor, urbanism, and statehood in northern Vietnam and beyond. Journal of Archaeological Research, published online: 01 February 2013.

Kobayashi, M.
1994 Use-Alteration Analysis of Kalinga Pottery: Interior carbon deposits of cooking pots. In Kalinga Ethnoarchaeology: Expanding Archaeological Method and Theory, edited by W. A. Longacre and J. M. Skibo, pp. 127-168. Smithsonian Institution Press, Washington, D.C.

Krishnan, K., I. C. Freestone and A. P. Middleton
2005 The Technology of 'Glazed' Reserved Slip Ware - A Fine Ceramic of the Harappan Period. Archaeometry 4:691-703.

Krishnan, K. and K. T. M. Hegde
1987 Chemical and Petrographic Studies in Pottery of Harappa Culture in Gujarat. Journal of The Maharaja Sayajirao University of Baroda 35-36(1):27-56.

Lahiri, N.
1992 The Archaeology of Indian Trade Routes Upto c. 200 BC: Resource Use, Resource Access and Lines of Communication. Oxford University Press, Delhi.

Lal, B. B., B. K. Thapar, J. P. Joshi and M. Bala
2003 Excavations at Kalibangan: the Early Harappans (1960-1969). Memoirs of the ASI, No. 98. Archaeological Survey of India, New Delhi.

Laursen, S. T.
2010 The westward transmission of Indus Valley sealing technology: origin and development of the 'Gulf Type' seal and other administrative technologies in Early Dilmun, c. 2100-2000 BC. Arabian Archaeology and Epigraphy 21:96-134.

2008 Early Dilmun and its rulers: New evidence of the burial mounds of the elite and the development of social complexity, c. 2200-1750 BC. Arabian Archaeology and Epigraphy 19:155-166.

Law, R. W.
2011 Inter-Regional Interaction and Urbanism in the Ancient Indus Valley: A Geologic Provenience Study of Harappa's Rock and Mineral Assemblage. Occasional Paper 11: Linguistics, Archaeology and the Human Past. Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan.

Lawler, A.
2004 The Indus script - write or wrong? Science 306(17 December 2004):2026-2029.

Lightfoot, K. G. and A. Martinez
1995 Frontiers and Boundaries in Archaeological Perspective. Annual Review of Anthropology 24:471-492.

Lindstrom, K. E.
In press Database Applications and Research Strategies for the Comparative Study of Harappan Ceramic Traditions. To be published in the Proceedings of the American Institute of Pakistan Studies Conference on Cultural Heritage Issues in Pakistan: Archaeology, Museums and Conservation, Margalla Hotel, Islamabad, Pakistan, January 6-8, 2011. (submitted August 2012)

2010 The Harappan Cooking Pot in the Borderlands of the Indus Civilization: New Data from Bagasra (Gola Dhoro mound), Gujarat. Proceedings of the Proceedings of the Bhuj Roundtable 2010 on Gujarat Harappans and Rural Chalcolithic Cultures. Bhuj, India.

Linton, R.
1944 North American Cooking Pots. American Antiquity IX(4):369-380.

Mackay, E. J. H.
1943 Chanhu-Daro Excavations 1935-36. American Oriental Series 20. American Oriental Society, New Haven, CN.

1938 Further Excavations at Mohenjo Daro. Government of India Press, Delhi.

Madella, M., P. Ajithprasad, C. Lancelotti, B. Rondelli, A. Balbo, C. French, D. Rodríguez, J. J. García-Granero, V. Yannitto, S. V. Rajesh, C. S. Gadekar and I. Briz
2010 Social and environmental transitions in arid zones: the North Gujarat Archaeological Project — NoGAP. Antiquity 84(325):project gallery.

Mahadevan, I.
2008 Murukan in Indus script. In Airāvati : felicitation volume in honour of Iravatham Mahadevan, edited by Varalaaru.com, pp. 461-488. Varalaaru.com, Chennai.

1977 The Indus Script: Texts, Concordance and Tables. Memoirs of the Archaeological Survey of India 77. Archaeological Survey of India, New Delhi.

Mahida, B. A.
1995 Loteshwar: A Chalcolithic Regional Ceramic Tradition Site of North Gujarat. Journal of the Oriental Institute 45(1-2):85-92.

Majumdar, A.

2001 Emergence of the Early Harappans in North Gujarat. Man and Environment 26(1):23-38.

1999 A Ceramic Study of the Harappan Burials from North Gujarat. unpublished PhD dissertation, Department of Archaeology and Ancient History, The Maharaja Sayajirao University of Baroda, Vadodara, India.

1998-99 Early Harappan Settlements in North Gujarat. Pragdhara 9:15-25.

Marshall, J.

1931 Mohenjodaro and the Indus Civilization. Arthur Probsthain, London.

Meadow, R. H.

1997 The dynamics of change at Harappa (2600-1900 BC) and its implications for understanding the Indus Civilization. Proceedings of the Society for American Archaeologists. Nashville, TN.

1989 Continuity and Change in the Agriculture of the Greater Indus Valley: The Palaeoethnobotanical and Zooarchaeological Evidence. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 61-74. vol. 2. Wisconsin Anthropological Reports, Madison, WI.

Meadow, R. H. and J. M. Kenoyer

2008 Harappa Excavations 1998-1999: New evidence for the development and manifestation of the Harappan phenomenon. In South Asian Archaeology 1999, edited by E. M. Raven, pp. 85-109. Egbert Forsten, Groningen.

2001 Recent Discoveries and Highlights from Excavations at Harappa: 1998-2000. Indo Koko Kenkyu, Indian Archaeological Studies 22:19-36.

2000 The "tiny steatite seals" (incised steatite tablets) of Harappa: some observations their context and dating. In South Asian Archaeology 1997, edited by M. Taddei and G. De Marco, pp. 321-340. Istituto Italiano per l'Africa e l'Oriente/Istituto Universitario Orientale, Rome/Naples.

1997 Excavations at Harappa 1994-1995: New perspectives on the Indus script, craft activities and city organization. In South Asian Archaeology 1995, edited by B. Allchin and R. Allchin, pp. 139-172. Oxford & IBH, New Delhi.

Meadow, R. H. and J. M. Kenoyer
1994 Harappa Excavations 1993: The City Wall and Inscribed Materials. In South Asian Archaeology 1993, edited by A. Parpola and P. Koskikallio, pp. 451-470. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

Meadow, R. H. and A. K. Patel
2003 Prehistoric Pastoralism in Northwestern South Asia from the Neolithic through the Harappan Period. In Indus Ethnobiology: New Perspectives from the Field, edited by S. A. Weber and W. R. Belcher, pp. 65-93. Lexington Books, Lanham, Md.

Mehr, S. S.
1995 Geology of Gujarat. Geological Society of India, Bangalore.

Mehta, R. N.
1984 Valabhi- A Station of Harappan Cattle-breeders. In Frontiers of the Indus Civilization, edited by B. B. Lal and S. P. Gupta, pp. 227-230. I. M. Sharma of Books and Books, New Delhi.

1982 Some Rural Harappan Settlements in Gujarat. In Harappan Civilization, edited by G. L. Possehl, pp. 167-174. Oxford and IBH Publishing Co., New Delhi.

Mehta, R. N., K. N. Momin and D. R. Shah
1980 Excavation at Kanewal. Maharaja Sayajirao University Archaeology Series No. 11. Maharaja Sayajirao University of Baroda, Vadodara, India.

Méry, S.
1996 Ceramics and patterns of exchange across the Arabian Sea and the Persian Gulf in the Early Bronze Age. In The Prehistory of Asia and Oceania: XIII International Congress of Prehistoric and Protohistoric Sciences, edited by G. Afanas'ev, S. Cleuziou, J. R. Lukacs and M. Tosi, pp. 167-179. vol. Vol. 16. ABACO, Forli, Italy.

Méry, S. and M. J. Blackman
2005 Socio-economic patterns of a ceramic container: the Harappan Black Slipped Jar. In South Asian Archaeology 2001, edited by C. Jarrige and V. Lefévre, pp. 227-236. vol. 1. Editions Recherche sur les Civilisations, Paris.

2000 Harappa et Mohenjo-Daro: Deux Zones de Production de Jarres à engobe noir au Pakistan à la Péiode Indus. Paleorient 25(2):167-177.

Miller, D.
1985 Artefacts as Categories: A Study of Ceramic Variability in Central India. Cambridge University Press, Cambridge.

Mughal, M. R.

1990c The Decline Of The Indus Civilization And The Late Harappan Period In The Indus Valley. Lahore Museum Bulletin 3(2):1-17.

1990b The Harappan "Twin Capitals" And Reality. Journal of Central Asia 13(1):155-162.

1990a Further Evidence of the Early Harappan Culture in the Greater Indus Valley: 1971-90. South Asian Studies 6:175-200.

1970 The Early Harappan Period in the Greater Indus Valley and Northern Baluchistan. Ph.D. Dissertation, Department of Anthropology, University of Pennsylvania, Philadelphia.

Nath, A.

1998 Rakhigarhi: A Harappan Metropolis in the Saraswati-Drishadvati Divide. Puratattva 28:39-45.

Parpola, A.

2008b Copper tablets from Mohenjo-daro and the study of the Indus script. In Intercultural Relations between South and Southwest Asia: Studies in commmemoration of E.C.L. During Caspers (1934-1996), edited by E. Olijdam and R. H. Spoor, pp. 32-39. BAR International Series 1826. Archaeopress, Oxford.

2008a Is the Indus script, indeed not a writing system? In Airāvati : felicitation volume in honour of Iravatham Mahadevan, edited by Varalaaru.com, pp. 111-132. Varalaaru.com, Chennai.

2007 Seal impressions on the clay tags from Lothal: a re-analysis. In Occassional Paper 2: Linguistics, Archaeology, and the Human Past, edited by T. Osada, pp. 1-12. Research Institute for Humanity and Nature, Kyoto.

2005 Study of the Indus Script. Proceedings of the Transactions of the 50th International Conference of Eastern Studies:28-66. Tokyo.

1996 The Indus Script. In The World's Writing Systems, edited by P. T. Daniels and W. Bright, pp. 165-167. Oxford University Press, New York.

1994 Deciphering the Indus Script. Cambridge University Press, Cambridge.

Parpola, A., B. M. Pande and P. Koskikallio

2010 Corpus of Indus Seals and Inscriptions: Vol. 3: new material, untraced objects and collections outside India and Pakistan. Part 1: Mohenjo-daro and Harappa. Annales Academiae Scientiarum Fennicae Humaniora 359, Memoirs of the Archaeological Survey of India 96. Suomalainen Tiedeakatemia, Helsinki.

Pearce, J.

1999 Investigating Ethnicity at Hacinebi: Ceramic Perspectives on Style and Behavior in 4th Millennium Mesopotamian-Anatolian Interaction. Paleorient 25(1):35-42.

Piggott, S.

1950 Prehistoric India to 1000 B.C. Penguine Books, Baltimore.

Possehl, G. L.

2007 The Harappan Settlement of Gujarat. In Settlement and Society: Essays Dedicated to Robert McCormick Adams, edited by E. C. Stone, pp. 297-328. Cotsen Institute of Archaeology, Los Angeles.

2004 Rojdi: A Sorath Harappan settlement in Saurashtra. In Indus Civilization Sites in India: New Discoveries, edited by D. K. Chakrabarti, pp. 80-88. vol. 55. Marg, Mumbai.

2002e The Indus Civilization: A Contemporary Perspective. Vistaar Publications, New Delhi.

2002d The Mature Harappan. In Recent Studies in Indian Archaeology, edited by K. Paddayya, pp. 129-139. Munshiram Manoharlal, New Delhi.

2002c The Early Harappan. In Recent Studies in Indian Archaeology, edited by K. Paddayya. Munshiram Manoharlal, New Delhi.

2002b Indus-Mesopotamian Trade: The Record in the Indus. Iranica Antiqua XXXVII:325-342.

2002a Harappans and hunters: economic interaction and specialization in prehistoric India. In Forager-Traders in South and Southeast Asia: Long Term Histories, edited by K. D. Morrison and L. L. Junker, pp. 62-76. Cambridge University Press, Cambridge.

2000 The drying up of the Sarasvati: environmental disruption in South Asian prehistory. In Environmental Disaster and the Archaeology of Human Response, edited by G. Bawden and R. M. Reycraft, pp. 63-74. Anthropological Papers No.7. Maxwell Musuem of Anthropology, Alburquerque.

1999 Indus Age: The Beginnings. University of Pennsylvania Press, Philadelphia.

Possehl, G. L.

1998 Sociocultural Complexity Without the State: The Indus Civilization. In Archaic States, edited by G. M. Feinman and J. Marcus, pp. 261-291. School of American Research Press, Sante Fe.

1997b Seafaring Merchants of Meluhha. In South Asian Archaeology 1995, edited by B. Allchin and R. Allchin, pp. 87-100. Oxford & IBH, New Delhi.

1997a The Transformation of the Indus Civilization. Journal of World Prehistory 11(4):425-472.

1996 Indus Age: The Writing System. Oxford and IBH/University of Pennsylvania Press, Delhi/Philadelphia.

1992b The Harappan Cultural Mosaic: Ecology Revisited. In South Asian Archaeology 1989, edited by C. Jarrige, pp. 237-244. Prehistory Press, Madison, WI.

1992a The Harappan Civilization in Gujarat: The Sorath and Sindhi Harappans. Eastern Anthropologist 45(1-2):117-154.

1991-1992 The Harappans in Saurashtra: New Chronological Considerations. Puratattva 22:25-29.

1990 Revolution in the Urban Revolution: The Emergence of Indus Urbanization. Annual Review of Anthropology 19:261-282.

1984 Archaeological Terminology and the Harappan Civilization. In Frontiers of the Indus Civilization, edited by B. B. Lal and S. P. Gupta, pp. 27-36. Books and Books, New Delhi.

1980 Indus Civilization in Saurashtra. B. R. Publishing Corporation, Delhi.

1976 Lothal: A Gateway Settlement of the Harappan Civilization. In Ecological Backgrounds of South Asian Prehistory, edited by K. A. R. Kennedy and G. L. Possehl, pp. 118-131. South Asia Occasional Papers and Theses No.4. Cornell University, Ithaca.

Possehl, G. L. and C. F. Herman

1990 The Sorath Harappan: A New Regional Manifestation of the Indus Urban Phase. In South Asian Archaeology 1987, edited by M. Taddei, pp. 295-319. IsMEO, Rome.

Possehl, G. L. and M. H. Raval

1989 Harappan Civilization and Rojdi. Oxford & IBH and AIIS, New Delhi.

Potts, D.

2005 A Note on Post-Harappan Seals and Sealings from the Persian Gulf. Man and Environment XXX(2):108-111.

1993a Rethinking some aspects of trade in the Arabian Gulf. World Archaeology 24(3):423-440.

1993b Tell Abraq and the Harappan Tradition in Southeastern Arabia. In Harappan Civilization: A Recent Perspective, edited by G. L. Possehl, pp. 323-333. Oxford & IBH Co. Pvt. Ltd., New Delhi.

1981 The Potter's Marks of Tepe Yahya. Paléorient 7(1):107-122.

Quivron, G.

2000 The Evolution of the Mature Indus Pottery Style in the Light of the Excavations at Nausharo, Pakistan. East and West 50:147-190.

1997 Incised and painted marks on the pottery of Mehrgarh and Nausharo-Baluchistan. In South Asian Archaeology 1995, edited by B. Allchin and R. Allchin, pp. 45-62. Oxford & IBH, New Delhi.

1994 The pottery sequence from 2700-2400 BC at Nausharo, Baluchistan. In South Asian Archaeology, 1993, edited by A. Parpola and P. Koskikallio, pp. 629-644. vol. 2. 2 vols. Suomalainen Tiedeakatemia, Helsinki.

Rajesh, S. V.

2011 A Comprehensive Study of the Regional Chalcolothic Cultures of Gujarat, Department of Archaeology and Ancient History, The Maharaja Sayajirao University of Baroda, Vadodara, India.

Rao, S. R.

1985 Lothal: A Harappan Port Town (1955-62), Vol. 2. Memoirs of the Archaeological Survey of India 78. Archaeological Survey of India, New Delhi.

1984 New Light on the Indus Script and Language. In Frontiers of the Indus Civilization, edited by B. B. L. a. S. P. Gupta, pp. 193-201. Books and Books, New Delhi.

1982 The Decipherment of the Indus Script. Asia Publishing, Bombay.

1979 Lothal: A Harappan Port Town (1955-62), Vol.1. Memoirs of the Archaeological Survey of India 78. Archaeological Survey of India, New Delhi.

1973 Lothal and the Indus Civilization. Asia Publishing House, New York.

1963 Excavations at Rangpur and other explorations in Gujarat. Ancient India 18-19:5-207.

Ratnagar, S.
2003 Theorizing Bronze-Age Intercultural Trade: The Evidence of the Weights. Paleorient 29(1):79-92.

2001 The Bronze Age: Unique Instance of a Pre-Industrial World System. Current Anthropology 42(3):351-379.

1991 Enquiries into the Political Organization of Harappan Society. Ravish, Pune.

1981 Encounters: The Westerly Trade of the Harappan Civilization. Oxford University Press, New Delhi.

Reade, J.
2001 Assyrian King-Lists, the Royal Tombs of Ur, and Indus Origins. Journal of Near Eastern Studies 60(1):1-29.

Rye, O. S.
1981 Pottery Technology: Principles and Reconstruction. Aldine Manuals on Archaeology 3. Taraxacum, Washington, D. C.

Rye, O. S. and C. Evans
1976 Traditional Pottery Techniques of Pakistan. Smithsonian Contributions to Anthropology 21.

Salque, M., P. I. Bogucki, J. Pyzel, I. Sobkowiak-Tabaka, R. Grygiel, M. Szmyt and R. P. Evershed
2013 Earliest evidence for cheese making in the sixth millennium bc in northern Europe. Nature 493(7433):522-525.

Santley, R., C. Yarborough and B. Hall
1987 Enclaves, Ethnicity, and the Archaeological Record at Matacapan. In Ethnicity and Culture, edited by R. Auger, M. Glass, S. MacEachern and P. McCartney, pp. 85-100. University of Calgary Archaeological Association, Calgary.

Schiffer, M. B., J. M. Skibo, T. C. Boelke, M. A. Neupert and M. Aronson
1994 New Perspectives on Experimental Archaeology: Surface Treatments and Thermal Response of the Clay Cooking Pot. American Antiquity 59(2):197-217.

Schortman, E., P. A. Urban and M. Ausec
2001 Politics with style: identity formation in prehispanic Mesoamerica. American Anthropologist 3(2):312-330.

Schortman, E. M. and P. A. Urban
1994 Living on the edge: core-periphery relations in ancient southeastern Mesoamerica. Current Anthropology 35(4):401-430.

Schortman, E. M. and P. A. Urban (editors)
1992 Resources, Power, and Interregional Interaction. Plenum, New York.

Service, E. R.
1975 Origins of the state and civilization : the process of cultural evolution. 1st ed. Norton, New York.

Shaffer, J. G.
1993 Reurbanization: The Eastern Punjab and Beyond. In Urban Form and Meaning in South Asia: The Shaping of Cities from Prehistoric to Precolonial Times, edited by H. Spodek and D. M. Srinivasan, pp. 53-67. National Gallery of Art, Washington, D. C.

1992 The Indus Valley, Baluchistan, and Helmand Traditions: Neolithic through Bronze Age. In Chronologies in Old World Archaeology, edited by R. W. Ehrich, pp. Vol. 1 441-464, Vol. 442 425-446. 3rd ed. Chicago University press, Chicago.

1982 Harappan Culture: A Reconsideration. In Harappan Civilization, edited by G. L. Possehl, pp. 41-50. Oxford and IBH Publishing, New Delhi.

Shaffer, J. G. and D. A. Lichtenstein
1995 The concepts of "cultural tradition" and "paleoethnicity" in South Asian archaeology. In The Indo-Aryans of Ancient South Asia: Language, Material Culture, and Ethnicity, edited by G. Erdosy, pp. 126-154. Walter de Gruyter, Berlin.

1989 Ethnicity and Change in the Indus Valley Cultural Tradition. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 117-126. Wisconsin Archaeological Reports. vol. 2. Wisconsin Archaeological Reports, Madison, WI.

Shah, S. G. M. and A. Parpola
1991 Corpus of Indus Seals and Inscriptions: Vol. 2. Annales Academiae Scientiarum Fennicae Humaniora, Sarja Series B, NIDE Tome 240. Suomalainen Tiedeakatemia, Helsinki.

Shinde, V.
2004 Saurashtra and the Harappan Sites of Padri and Kuntasi. Marg 55(3):8-14.

1998 Pre-Harappan Padri culture in Saurashtra: the recent discovery. South Asian Studies 14:173-182.

Shinde, V. and S. B. Kar
1992 Padri Ware: A New painted Ceramic Found in the Harappan Levels at Padri in Gujarat. Man and Environment 17(2):105-110.

Sinopoli, C. M.
1991 Approaches to Archaeological Ceramics. Plenum Press, New York.

Skibo, J. M.
1994 The Kalinga Cooking Pot: An ethnoarchaeological and experimental study of technological change. In Kalinga Ethnoarchaeology, edited by W. A. Longacre and J. M. Skibo, pp. 113-126. Smithsonian Institution Press, Washington, D.C.

Smith, M. L.
2006 The Archaeology of Food Preference. American Anthropologist 108(3):480-493.

2005 The Archaeology of South Asian Cities. Journal of Archaeological Research 14(2):97-142.

2003 Early Walled Cities of the Indian Subcontinent as "Small Worlds". In The Social Construction of Ancient Cities, edited by M. L. Smith, pp. 269-289. Smithsonian Books, Washington.

1999 The role of Ordinary Goods in Premodern Exchange. Journal of Archaeological Method and Theory 6(2):109-135.

Sonawane, V. H.
2004 Nageshwar: A center of Harappan shell craft in Saurashtra. Marg 55(3):15-23.

2002a Mesolithic Culture of Gujarat. In Mesolithic India, edited by V. D. Misra and J. N. Pal, pp. 104-153. Department of Ancient History, Culture & Archaeology University of Allahabad, Allahabad.

1998-99 Harappan Civilization in Gujarat: A Recent Perspective. Pragdhara 9:1-13.

1994-95 Harappan settlements of Rupen Estuary, Gujarat. Pragdhara 5:1-11.

1992 Fresh Light on the Specialized Crafts of the Harappans in Gujarat. Eastern Anthropologist 45(1-2):155-172.

Sonawane, V. H. and P. Ajithprasad
1994 Harappa Culture and Gujarat. Man and Environment XIX(1-2):130-139.

Sonawane, V. H., P. Ajithprasad, K. K. Bhan, K. Krishnan, S. Prathapachandran, A. Majumdar, A. J. Patel and J. Menon
2003 Excavations at Bagasra 1996-2003: A Preliminary Report. Man and Environment XXVIII(2):21-50.

Sonawane, V. H. and R. N. Mehta
1985 Vagad - A Rural Harappan Settlement in Gujarat. Man and Environment 9:38-44.

Spence, M. W.
2005 A Zapotec Diaspora Network in Classic-Period Central Mexico. In The Archaeology of Colonial Encounters: Comparative Perspectives, edited by G. J. Stein, pp. 173-206. School of American Research Advanced Seminar Series. School of American Research Press, Sante Fe.

Stark, M. T. (editor)
1998 The Archaeology of Social Boundaries. Smithsonian Institution Press, Washington,D.C.

Stein, G. J. (editor)
2005 The Archaeology of Colonial Encounters: Comparative Perspectives. School of American Research Press, Sante Fe.

Stein, G. J.
2002b Colonies without colonialism: a trade diaspora model of fourth millennium B.C. Mesopotamian enclaves in Anatolia. In The Archaeology of Colonialism, edited by C. Lyons and J. Papadopoulos, pp. 27-64. Getty Research Institute, Los Angeles.

2002a Distinguished Lecture: From Passive Periphery to Active Agents: Emerging Perspectives in the Archaeology of Interregional Interaction. American Anthropologist 104:903-916.

2001 Indigenous Social complexity at Hacinebi (Turkey) and the Organization of Uruk Colonial contact. In Uruk Mesopotamia and Its Neighbors, edited by M. S. Rothman, pp. 265-306. School of American Research Press, Sante Fe.

Thomas, P. K., P. P. Joglekar, Y. Matsushima, S. J. Pawankar and A. Deshpande
1997 Subsistence based on animals in the Harappan culture of Gujarat, India. Anthropozoologica 25-26:767-776.

Tracy, J. D. (editor)
2000 City Walls: The Urban Enceinte in Global Perspective. Cambridge University Press, Cambridge.

Twiss, K.
2012 The Archaeology of Food and Social Diversity. Journal of Archaeological Research 20:357-395.

Uesugi, A.
2011b Development of the Inter-regional Interaction System in th Indus Valley and Beyond - A Hypothetical Vew towards the Formation of an Urban Society. In Cultural Relations between the Indus and Iranian Plateau during the Third Millennium BCE, edited by T. Osada and M. Witzel, pp. 359-? Harvard Oriental Series, Opera Minora Vol. 7. Cambridge.

2011a Chapter 6: Pottery from the Settlement Area, Chapter 9: Pottery from the Cemetery. In Excavations at Farmana, District Rohtak, Haryana, India (2006-2008), edited by V. Shinde, T. Osada and M. Kumar, pp. 168-368, 674-800. Indus Project, Research Institute for Humanity and Nature, Kyoto.

Uesugi, A. and S. Meena
2012 Chapter 6: Pottery. In Excavation at Kanmer, edited by J. S. Kharakwal, Y. S. Rawat and T. Osada, pp. 219-480. Indus Project, Research Institute for Humanity and Nature, Kyoto.

Vats, M. S.
1940 Excavations at Harappa. 2 vols. Government of India Press, Delhi.

Vidale, M.
2010 Aspects of Palace Life at Mohenjo-daro. South Asian Studies 26(1):59-76.

2007 The collapse melts down: A reply to Farmer, Sprout & Witzel. East and West 57:333-366.

2000 The Archaeology of Indus Crafts: Indus craftspeople and why we study them. IsIAO, Rome.

Vidale, M.
1989 Specialized Producers and Urban Elites: on the Role of Craft Industries in Mature Harappan Urban Contexts. In Old Problems and New Perspectives in the Archaeology of South Asia, edited by J. M. Kenoyer, pp. 171-182. Wisconsin Archaeological Reports. vol. 2. Wisconsin Archaeological Reports, Madison, WI.

Vidale, M., J. M. Kenoyer and K. K. Bhan
1993 Ethnoarchaeological Excavations of the Bead Making Workshops of Khambhat: A View From Beneath the Floors. In South Asian Archaeology, 1991, edited by A. J. Gail and G. J. Mevissen, pp. 273-288. G. J. R. Verlag, Stuttgart.

Vidale, M. and H. M.-L. Miller
2000 On the Development of Indus Technical Virtuosity and Its Relation to Social Structure. In South Asian Archaeology 1997, edited by M. Taddei and G. De Marco, pp. 115-132. vol. 1. 3 vols. Istituto Italiano Per L'Africa E L'Oriente, Rome.

Wallerstein, I.
1974 The Modern World System, Vol. 1: Capitalist Agriculture and the Origins of European World-Economy in the Sixteenth Century. Academic Press, New York.

Wheeler, R. E. M.
1953 The Indus Civilization. 1st ed. Cambridge History of India. Cambridge University Press, Cambridge.

1947 Harappa 1946: The defences and cemetery R-37. Ancient India 3:58-130.

Willey, G. R. and P. Phillips
1958 Method and Theory in American Archaeology. University of Chicago Press, Chicago.

Woolley, C. L.
1934 Ur Excavations, Volume II, The Royal Cemetery: A Report on the Predynastic and Sargonid Graves between 1926-1931. British Museum and University of Pennsylvania Museum, London and Philadelphia.

Wright, R. P.
2010 The Ancient Indus: Urbanism, Economy, and Society Case Studies in Eearly Societies. Cambridge University Press, New York.

Wright, R. P.

1993 The Harappa Museum Pottery Collections: Some typological and technical evidence. Pakistan Archaeology 28:231-241.

1991 Patterns of Technology and the Organization of Production at Harappa. In Harappa Excavations 1986-1990, edited by R. H. Meadow, pp. 71-88. Prehistory Press, Madison.

Yoffee, N.

1993 Too Many Chiefs? (or, Safe Texts for the '90s). In Archaeological Theory: Who Sets the Agenda?, edited by N. Yoffee and A. Sherratt, pp. 60-78. Cambridge University Press, Cambridge.

Appendix A: List of Pottery Collection Units from Bagasra

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**2**	1996	Do7	unknown	3	Inside	Unknown		Omit	54	1.90
2007	**2-3**	1996	Do7	unknown	3	Inside	Unknown		Omit	31	0.20
2007	**3**	1996	Do7	unknown	3	Inside	Unknown		Omit	32	0.80
2007	**4-5**	1996	Do7	SE4 SW3	3	Inside	Other	occupation debris/fill	Omit	95	2.14
2007	**6**	1996	Do7	7	2	Inside	Structural	structural foundation, occupation debris/fill	Omit	18	0.35
2007	**7**	1996	Do7	7, 7A?, 8	2	Inside	Structural	structural foundation, occupation debris/fill	Omit	15	0.40
2007	**8**	1996	Do7	8-12	2	Inside	Habitation	habitation-floor, occupation debris/fill	Omit	17	0.50
2007	**9**	1996	Do7	4A-5	2	Inside	Habitation, Structural	habitation-floor, structural debris/fill	Omit	5	0.00
2007	**10**	1996	Do7	4-4A	2	Inside	Habitation	habitation-floor	Omit	28	0.60
2007	**11**	1996	Do7	4A	2	Inside	Habitation	habitation-floor	Omit	49	1.80
2007	**12**	1996	Do7	4A-5	2	Inside	Habitation, Structural	habitation-floor, structural debris/fill	Omit	38	0.90
2007	**10-12**	1996	Do7	4, 4A, 5	2	Inside	Habitation, Structural	habitation-floor, structural debris/fill	Omit	11	0.00
2007	**11-12**	1996	Do7	4A-5	2	Inside	Habitation, Structural	habitation-floor, structural debris/fill	Omit	22	0.33

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**13**	1996	Do7	6, 7	2	Inside	Structural	structural foundation, structural debris/fill	Omit	16	0.80
2007	**14**	1996	Do7	5A, 6	2	Inside	Structural	sand/silt lens, structural debris/fill	Omit	11	0.30
2007	**15**	1996	Do7	12-15	1	North	Habitation	habitation-floor, occupation debris/fill	Omit	8	0.35
2007	**18**	2002	Ea12	1, 2	2	Inside	Craft Production	Shell Workshop, structural debris/fill	Yes	122	2.90
2007	**16**	2004	Ea12	2	2	Inside	Craft Production	Shell Workshop, trash	Yes	29	1.30
2007	**17, 19**	2004	Ea12	3	2	Inside	Craft Production	Shell Workshop, structural	Yes	105	4.00
2007	**20**	2004	Ea12	4	2	Inside	Craft Production	Shell Workshop, trash	Yes	23	0.95
2007	**21**	2004	Ea12	4 or 5	2	Inside	Craft Production	Shell Workshop, trash	Yes	17	1.00
2007	**22-26**	2004	Ea12	5	2	Inside	Craft Production	Shell Workshop, trash	Yes	178	8.27
2007	**27**	2004	Ea12	6	2	Inside	Craft Production	Shell Workshop, trash	Yes	33	1.90
2007	**28**	2004	Ea12	7	2	Inside	Craft Production	Shell Workshop, trash	Yes	0	0.00
2007	**36**	2004	Eo6	3 or 4	3	Outside	Structural	Structural debris/fill	Yes	57	2.42
2007	**37-39**	2004	Eo6	4	3	Outside	Habitation	occupation debris/trash	Yes	204	7.28

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**40-41**	2004	Eo6	5	2	Outside	Habitation	habitation-floors, occupation debris/trash	Yes	193	5.70
2007	**29-32**	2004	Eo6	6	2	Outside	Structural	structural foundation, structural collapse/fill, occupation debris/fill	Yes	487	12.59
2007	**33**	2004	E06	7	1	South	Structural	Structural debris/fill	Yes	71	3.23
2007	**34**	2004	Eo6	8	1	South	Habitation	habitation-floors, occupation debris/trash	Yes	30	1.13
2007	**35**	2004	Eo6	9	1	South	Habitation	habitation-floors, occupation debris/trash	Yes	4	0.24
2007	**61-62**	2003	Eo10	2	3	Outside	Habitation	occupation debris/fill	Yes	120	4.53
2007	**59-60**	2003	Eo10	3	3	Outside	Habitation	occupation debris/fill	Yes	117	3.62
2007	**57-58**	2003	Eo10	4	3	Outside	Habitation	habitation-floors, occupation debris/fill	Yes	164	5.11
2007	**55-56**	2003	Eo10	5	2	Outside	Habitation	habitation-floors, occupation debris/fill	Yes	159	4.35
2007	**49-54**	2003	Eo10	6	2	Outside	Habitation	habitation-floors, occupation debris/fill	Yes	404	14.25
2007	**45-48**	2003	Eo10	7	2	Outside	Structural	Structural debris/fill	Yes	242	9.11

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**44**	2003	Eo10	8	1	South	Structural	structural foundation, structural debris/fill	Yes	44	2.18
2007	**43**	2003	Eo10	9	1	South	Habitation, Structural	structural foundation wall, habitation-floor, occupation debris/fill	Yes	81	3.00
2007	**42**	2003	Eo10	10	1	South	Habitation, Structural	habitation-floors, structural debris/fill	Yes	59	1.90
2007	**63**	2003	Eg3	1	3	Inside	Other	unknown	Yes	86	3.45
2007	**64**	2003	Eg3	2	3	Inside	Habitation	occupation debris/trash	Yes	107	2.80
2007	**65**	2003	Eg3	3	3	Inside	Habitation	occupation debris/fill	Yes	89	1.88
2007	**66**	2003	Eg3	4	2	Inside	Craft Production	Shell Workshop, structural foundation, structural debris/fill	Yes	16	0.65
2007	**67**	2003	Eg2	2	3	Inside	Habitation	occupation debris/fill	Yes	52	2.05
2007	**68**	2003	Eg2	3	2	Inside	Craft Production	shell workshop, structural foundation wall, occupation debris/fill	Yes	95	2.60
2007	**69**	2003	Eg2	4	2	Inside	Craft Production	shell workshop, structural foundation wall, occupation debris/fill	Yes	83	2.29

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**70**	2003	Eg2	5	2	Inside	Craft Production	occupation debris/fill	Yes	36	1.00
2007	**71**	2003	Eg2	6	2	Inside	Craft Production	occupation debris/fill	Yes	19	0.47
2007	**72**	2003	Eg2	7	2	Inside	Craft Production	occupation debris/fill	Yes	38	0.64
2007	**73**	2003	Eg2	8	2	Inside	Craft Production	occupation debris/fill	Yes	18	0.45
2007	**74**	2003	Eg2	9	2	Inside	Craft Production	occupation debris/fill	Yes	35	0.66
2007	**75**	2003	Eg2	10	2	Inside	Craft Production	occupation debris/fill	Yes	23	1.08
2007	**76**	2003	Eg2	11	2	Inside	Craft Production	occupation debris/fill	Yes	7	0.15
2007	**77**	2003	Eg2	Eb7 wall	2	Inside	Craft Production	occupation debris/fill	Yes	11	0.35
2007	**78**	2003	Eg2	12	2	Inside	Craft Production	occupation debris/fill	Yes	18	0.35
2007	**79**	2003	Eg2	13	1	West	Other	Unknown	Yes	9	0.45
2007	**80**	2003	Eg2	14, 15	1	West	Other	Unknown	Yes	46	1.43
2007	**82**	2003	Eg2	16	1	West	Other	Unknown	Yes	3	0.15
2007	**78-82 mix**	2003	Eg2	12-16	mostly 1, some 2	West		Mixed Pottery	Omit	23	0.25
2007	**83-96**	2000	Ek4	1-8	3	Inside	Habitation	habitation-floors, occupation debris/fill	Yes	941	29.63

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**97**	2000	Ek4	unknown	2/3	Inside		mixed pottery	Omit	53	1.02
2007	**98-102**	2000	Ek4	9-13	2	Inside	Habitation	occupation debris/fill	Yes	186	4.70
2007	**103**	2002	Ea11	2	2	Inside	Craft Production	Shell Workshop, trash	Yes	211	8.05
2007	**104**	2002	Ea11	3	2	Inside	Craft Production	Shell Workshop, structural	Yes	0	0.00
2007	**105**	2002	Ea11	3a	2	Inside	Craft Production	Shell Workshop, trash	Yes	0	0.00
2007	**106**	2002	Ea11	4	2	Inside	Craft Production	Shell Workshop, trash	Yes	7	0.20
2007	**107**	2002	Ea11	5	2	Inside	Craft Production	Shell Workshop, unknown	Yes	17	0.50
2007	**108**	2002	Ea6	2	2/3	Inside	Disturbed	Shell Workshop, Disturbed	Omit	36	1.20
2007	**109**	2002	Ea6	3	2	Inside	Craft Production	Shell Workshop, manufacturing debris	Yes	22	1.05
2007	**110**	2002	Ea6	4	2	Inside	Craft Production	Shell Workshop, trash	Yes	32	1.20
2007	**111**	2002	Ea6	5	2	Inside	Craft Production	Shell Workshop, trash	Yes	16	0.60
2007	**112**	2002	Ea6	6	2	Inside	Craft Production	Shell Workshop, trash	Yes	70	1.40
2007	**113**	2002	Ea6	7	1 (some ph2)	North	Habitation	habitation-floors, occupation debris/fill	Omit	30	0.95
2007	**114**	2002	Ea6	8	1	North	Habitation	habitation-floor	Yes	1	0.03

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**115**	1998	Eq2	1	2	Inside	Disturbed	Disturbed	Omit	2	0.12
2007	**116**	1998	Eq2	2	2	Inside	Robber's Trench	Robbers' trench (Disturbed)	Omit	22	0.40
2007	**117**	1998	Eq2	3	2	Inside	Habitation, Structural	Enclosure wall, structural debris, habitation-floors	Yes	39	0.75
2007	**118**	1998	Eq2	4	2	Inside	Structural	Enclosure wall, structural debris	Yes	97	3.40
2007	**119**	1998	Eq2	5	2	Inside	Habitation, Structural	Enclosure wall, structural debris, habitation-floors	Yes	56	1.75
2007	**120**	1998	Eq2	6	2	Inside	Habitation	Enclosure wall, habitation-floors	Yes	28	0.97
2007	**121**	1998	Eq2	7	2	Inside	Structural	Enclosure wall, Fill	Yes	64	2.50
2007	**122**	1998	Eq2	8	2	Inside	Craft Production	Enclosure Wall, craft production-workshop	Yes	49	3.65
2007	**123**	1998, 1999	Eq2	9	2	Inside	Structural	Enclosure wall, Fill	Yes	85	1.85
2007	**124**	1998, 1999	Eq2	10	2	Inside	Structural	Enclosure wall, Fill	Yes	45	4.07
2007	**125**	1999	Eq2	11	2	Inside	Structural	Enclosure wall, Fill	Yes	20	0.30
2007	**126**	1999	Eq2	12	2	Inside	Structural	Enclosure wall, structural debris	Yes	23	0.28
2007	**127**	1999	Eq2	13	2	Inside	Habitation	Enclosure wall, habitation-floors	Yes	57	1.20

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**128**	1999	Eq2	14	2	Inside	Habitation	Enclosure wall, habitation-floors	Yes	68	1.15
2007	**129**	1999	Eq2	15	2	Inside	Habitation	Enclosure wall, habitation-floors	Yes	195	4.28
2007	**130**	1999	Eq2	16	2	Inside	Structural	Enclosure wall, structural debris	Yes	90	1.90
2007	**131**	1999	Eq2	17	2	Inside	Habitation, Structural	Enclosure wall, habitation-floors	Yes	75	2.15
2007	**132**	1999	Eq2	18	1	East	Habitation, Structural	Habitation-floors, structural foundation wall	Yes	48	0.78
2007	**133**	1999	Eq2	19	1	East	Habitation	Fire-clearing?/ Habitation-floors	Yes	80	2.00
2007	**134**	1999	Eq2	20	1	East	Habitation	occupation debris/fill	Yes	30	0.84
2007	**115/116 /117**	1998	Eq2	1/2/3	2	Inside		mixed pottery	Omit	6	0.10
2007	**135**	1999	Es3/4	1	4	South	Habitation	occupation debris/trash	Yes	61	0.80
2007	**136**	1999	Es3/4	2	4	South	Structural	Rubble structure, occupation debris/trash	Yes	483	11.66
2007	**138**	2003	Eh3	2	3	Outside	Habitation	occupation debris/fill	Yes	799	16.01
2007	**143**	2003	Eh3	pit sealed by 2	3	Outside	Other	Pit	Yes	42	1.42
2007	**139**	2003	Eh3	3	3	Outside	Habitation	occupation debris/fill	Yes	146	2.82
2007	**140**	2003	Eh3	4	2	Outside	Craft Production	craft production debris	Yes	88	2.62

Analysis Year	Lot	Excavation Year	Trench	Layer	Phase	Location	Context Type	Context Identification	Include/ Omit from analysis	Count Total	Weight Total (kg)
2007	**141**	2003	Eh3	5	2	Outside	Craft Production	craft production debris, structural debris/fill	Yes	97	3.10
2007	**142**	2003	Eh3	6	2	Outside	Craft Production	craft production debris	Yes	0	0.00
2007	**147**	2004	Ei15	3	3	Outside	Structural	Structural collapse/fill, occupation debris/trash	Yes	261	7.35
2007	**144**	2004	Ei15	6	2	Outside	Habitation	habitation-floors, occupation debris/fill	Yes	51	1.63
2007	**145**	2004	Ei15	7	2	Outside	Habitation	habitation-floors, occupation debris/fill	Yes	88	2.53
2007	**146**	2004	Ei15	8	2	Outside	Other	Unknown	Yes	104	3.90
2010	**200-225**	1996	Ek5	1-6	3	Inside	Craft Production	craft production-floor, structural collapse, trash	Yes	2373	64.72
2010	**226**	1999	Em9	3	4	Outside/ Wall	Habitation	occupation debris/trash	Yes	715	11.60
2010	**227**	1999	Em9	2	4	Outside/ Wall	Habitation	occupation debris/trash	Yes	290	3.65
2010	**228**	1998	Eq8	3	4	East	Habitation	occupation debris/trash	Yes	88	2.10
Total										**12694**	**356.36**

Lot	Layer Comments
2	
2-3	
3	
4-5	occupation debris, layer 4 Phase 2, layer 3 Phase 3
6	7-mudbrick structural foundation, occupational debris above
7	7-mudbrick structural foundation, occupational debris above and below, 8-compact fill with stone rubble and lime concretions
8	several floors capped by compact fill, 8-compact fill with stone rubble and lime concretions
9	4A-several floors and occupational debris overlying a thick rammed clay floor, 5-structural debris/fill underneath the rammed floor
10	4-habitation deposit, 4A-several floors and occupational debris overlying a thick rammed clay floor
11	4A-several floors and occupational debris overlying a thick rammed clay floor
12	4A-several floors and occupational debris overlying a thick rammed clay floor, 5-structural debris/fill underneath the rammed floor
10-12	4-habitation deposit, 4A-several floors and occupational debris overlying a thick rammed clay floor, 5-structural debris/fill underneath the rammed floor
11-12	4A-several floors and occupational debris overlying a thick rammed clay floor, 5-structural debris/fill underneath the rammed floor
13	6-structural debris/fill, brick-bats, 7-mudbrick structural foundation
14	5A-sand and silt lens, 6-structural debris/fill, brick-bats
15	several floors capped by compact occupational fill
18	structural remains of structure Wb1 (stage 2b) with room fill
16	Loose ashy fill incorporating structural debris from Phase II (Stage 2b) shellworking structure Wb1.B. Chase says this info is from the older drawing and might be equivalent with Layer 3 in the newer drawing.
17, 19	Debris from Stage 2b shellworking structure Wb1, overlying a pile of unworked shell and a "bag" of unfinished bangles (B.Chase)

Lot	Layer Comments
20	Accumulated debris outside the Stage 2b shellworking structure. Approximately at and beneath a floor level of the structure. Overlain by Layer 3 trash. (B. Chase)
21	
22-26	Outside Phase II structure Wb1, in the "street" between it and a row of structures along the enclosure wall. Loose ashy debris. (B.Chase)
27	Outside Phase II structure Wb1a, in the "street" between it and a row of structures along the enclosure wall. (B.Chase)
28	
36	structural collapse and trash (excavation report)
37-39	Ashy fill and red burnt matrix associated with a Phase II structure, possibly inside it (B.Chase, excavation report).
40-41	Compact layers with plastered floors overlying collapse of a Phase II structure (B.Chase, excavation report), includes 5A, 5B, 5C (Ajithprasad, personal communication)
29-32	part of a large Phase II mudbrick structure with stone foundation, includes deposits both inside and outside the structure, hearth, in situ pots buried in ground, structural collapse/trash (B.Chase, excavation report)
33	Structural debris associated with levelling of a Phase I structure for the construction of a Phase II structure (B.Chase, excavation report)
34	habitation debris from within Ph.I structure, regular series of plastered floors that often have an ash lens associated (excavation report)
35	habitation debris from within Ph.I structure, regular series of plastered floors that often have an ash lens associated (excavation report)
61-62	loose ashy fill
59-60	loose ashy fill
57-58	several thick bands of ashy floor and regular habitation features, mudbrick structural remains, bricks of poor quality coarse material (excavation report); Ajith told me that layer 4 was dated to Ph.III, but report dates it to Ph.II although Sorath pottery is found in this layer
55-56	several thick bands of ashy floor and regular habitation features (excavation report)
49-54	several thick bands of ashy floor and regular habitation features (excavation report)

Lot	Layer Comments
45-48	Structural collapse spread around the wall of a Ph.II structure that was built using earlier Ph.I wall as its base (excavation report)
44	Collapse of the second Phase 1 structure levelled for the construction of a superimposed Phase 2 structure. Lots of mudbricks and pieces. (B.Chase).
43	Mudbrick structural foundation wall (plastered) measuring 1m tall so also associated with layer 8. Compact floor layers with a pot set into it. Pot excavated separately (Excavation Report, B.Chase)
42	10A - Compact floors with ashy lenses and pits (for pots?). 10 - Some brickbats and plaster (structural collapse) resulting from levelling of the first Phase 1 structure for the construction of a new Ph1 structure (excavation report, B.Chase combines 10A and 10). [is this pottery from 10A and 10 or just layer 10?]
63	not in section
64	compact occupational debris/fill (section)
65	compact occupational debris/fill resting on mudbrick wall (section)
66	structural debris, mudbricks, plaster and remains of a wall, associated with shell workshop (section)
67	general occupational debris, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
68	general occupational debris associated with shell workshop, mudbrick structure associated with layers 3 and 4, small hearth inside structure, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
69	general occupational debris associated with shell workshop, mudbrick structure associated with layers 3 and 4, small hearth inside structure, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
70	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
71	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
72	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail

Lot	Layer Comments
73	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
74	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
75	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
76	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
77	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
78	general occupational debris associated with shell workshop, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail
79	Not clear from section. Includes several thin layers, perhaps ashy floors (B.Chase)
80	Not clear from section. Probably generalized trash (B.Chase)
82	Marked as natural soil in section (B.Chase)
78-82 mix	
83-96	layers 2-3 loose ashey deposit, layers 5-8 regular clay-plastered habitation floors made of rammed brickbats, rubble structure partially exposed in southwest corner (excavation report)
97	
98-102	habitation debris (excavation report)
103	Loose ashy depression above ruined fill of the Phase II shellworking complex. Possibly later material (B.Chase)
104	Dump with Structural debris from Phase II shellworking structure (Stabe 2b) Wb1a (Section)
105	structural debris, floors (section)
106	Ashy debris inside Phase II structure Wb1a (B.Chase)
107	Inside Phase II strucutre Wb1a, not in section drawing.
108	General trash layer associated with shellworking, perhaps equivalent to Layer 2 in Ea12? (B.Chase) Loose deposit, disturbed (Section)

Lot	Layer Comments
109	Multiple irregular laminar layers of white, plasterlike material, burned layers, industrial waste from grinding and polishing shell? (B.Chase)
110	Compact debris with a few mudbricks and melt (B.Chase)
111	Compact debris with a few mudbricks and melt (section)
112	Compact debris with a few mudbricks and melt (section)
113	several floors and ashy layers (B.Chase)
114	compact clay floor (B.Chase)
115	Not in section, probably robber's pit and surface, most likely mixed with later material.
116	Loose and ashy, disturbed by a robber's trench.
117	Remnant ashy floors and structural debris from the Stage 3 enclosure. Main working level of Stage 3 wall. (excavation report)
118	Structural debris from the Stage 3 enclosure.
119	Remnant ashy floors and structural debris from the Stage 3 enclosure. Main working level of Stage 3 wall. (excavation report)
120	Ashy floors abutting the Stage 3 enclosure wall. (excavation report)
121	Construction debris associated with the Stage 3 renovation of the enclosure. Some mudbrick pieces. (excavation report)
122	Floor layer into which 2 pots were set abutting the Stage 2 enclosure. Evidence of faience manufacture and the stockpiling of lithic raw materials. Hearth feature associated with faience production.
123	Uniform clayey matrix perhaps associated with the making of mudbricks or the raising and leveling of the surface. Some stones and mudbrick pieces. Stage 2 enclosure wall. 2 storage bins were dug into layer 9. (excavation report)
124	Uniform clayey matrix perhaps associated with the making of mudbricks or the raising and leveling of the surface. Some stones and mudbrick pieces. Stage 2 enclosure wall (excavation report)
125	Uniform clayey matrix perhaps associated with the making of mudbricks or the raising and leveling of the surface. Some stones and mudbrick pieces. Stage 2 enclosure wall (excavation report)
126	Structural debris associated with the construction of the Stage 2 reconstruction of the enclosure wall (excavation report)

Lot	Layer Comments
127	Ashy floors abutting the Stage 1 enclosure wall. Evidence of burning, and stacked grinding stones. Cut by foundation trench for the Stage 2 rebuild of the enclosure. (excavation report)
128	Ashy floors abutting the Stage 1 enclosure wall. Contains a few course of bricks from a Phase II structure. Cut by foundation trench for the Stage 2 rebuild of the enclosure. (excavation report)
129	Ashy floors abutting the Stage 1 enclosure wall. (excavation report)
130	Structural debris incorporating mudbricks and mudbrick pieces from a collapsed wall. Stage 1 enclosure wall.
131	Ashy floors abutting the stone foundation of the enclosure wall (Stage 1). At the bottom of this layer is a rubble layer, which appears to be contruction debris for the base of the enclosure wall (excavation report)
132	Ashy and plastered floors, red burnt matrix, and lenses of charcoal. Mudbrick building/wall foundation. (excavation report)
133	thick deposit with lots of ash and charcoal at the base, perhaps from the fire clearing of vegetation (correlated to a layer in Er13). Ashy and plastered floors, red burnt matrix above ash/charcoal lens. (excavation report)
134	loose sandy clay deposit above natural soil, difficult to determine if this is a habitation deposit or fill leveling for construction of first P1 habitation (excavation report)
115/116/ 117	mixed pottery
135	compact deposit
136	rubble stone structure, loose ashy deposit
138	loose ashy deposit, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail (section)
143	not in section
139	compact deposit, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail (section)
140	compact deposit, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail (section)
141	compact deposit with random mudbricks, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail (section)

Lot	Layer Comments
142	compact deposit, section does not give sufficient detail to distinguish features of any layers in this trench and report does not provide detail (section)
147	rubble stone structure, occupational debris (excavation report)
144	floor layers and trash, clay-lined storage bins set into ground of either layer 6 or 7 (excavation report, section not detailed enough)
145	floor layers and trash, clay-lined storage bins set into ground of either layer 6 or 7 (excavation report, section not detailed enough)
146	known context, unclear from section and not detailed in excavation report
200-225	Trash dump incorporating remnants of a mudbrick platform (2 courses of bricks) halfway through (see report Fig. 11). Associated with craft industry, pits dug into the platform, ashy trash deposits both under and overlying the platform. No layers written on bags.
226	excavation report does not provide layer details, see section drawing - general trash deposit, no distinct features, large pit dug into layer 3
227	excavation report does not provide layer details, see section drawing - general trash deposit, no distinct features
228	Loose ashy deposit above and on the outside of the remains of the enclosure wall. No details on this trench in excavation report.

Appendix B: Recording Procedure - Pottery Recording Sheets

Bagasra Pottery Recording 1 of ____

Year _____ Layer _____ Lot _____ Weight (kg) _____

Trench _____ Count _____

Sub Sq. _____ Original Weight /Count _____

Depth _____ Phase 1 2 3 4 ? Tab _____

Rim

Number	Rim Form	Use-Alteration	Inscribed	Decoration	Slip out	Slip Color	Slip Color2	Slip in	Slip Color	Surface Treatr	Ware Texture	Ware Color	Ware Color2	Inclusion1	Inclusion %	Inclusion2	Inclusion2 %	Inclusion3	Inclusion3 %	Notes

Bagasra Pottery Recording 2 of _____

Year _____
Trench _____
Sub Sq. _____ Layer _____ Lot _____ Weight (kg) _____
Depth _____ Original Weight _____
Original Count _____
Phase 1 2 3 4 ? Tab _____

Rim

Number	Rim Form	Drawing	Vessel Type	Size	Vessel Number	ERD	IRD	Throat Dia	MBD/EBD	Height	EVES	Rim Width (mm)	Body Thickness	Carination	Manufacture	Man. Marks	Similar To	Drawn, Page	Photo	see drawing for measurements	Notes

Bagasra Pottery Recording 1 of _____

Year _____

Trench _____ Layer _____ Lot _____ Weight (kg) _____

Sub Sq. _____ Count _____

Depth _____ Original Weight /Count _____

Phase 1 2 3 4 ? Tab _____

Body

Number	Use-Alteration	Inscribed	Decoration	Slip out	Slip Color	Slip Color2	Slip in	Slip Color	Surface Treatment	Ware Texture	Ware Color	Ware Color2	Inclusion1	Inclusion %	Inclusion2	Inclusion2 %	Inclusion3	Inclusion3 %		Notes

Bagasra Pottery Recording 2 of _____

Year _____

Trench _____ Layer _____ Lot _____ Weight (kg) _____

Sub Sq. _____ Count _____

Depth _____ Original Weight /Count _____

Phase 1 2 3 4 ? Tab _____

Body

Number	Drawing	Vessel Type	Size	Vessel Number	Body Dia	Max Thickness	Min Thickness	Carination	Manufacture	Man. Marks	Similar To	Drawn, Page	Photo	see drawing for measurements						Notes

Bagasra Pottery Recording 1 of _____

Year _____

Trench _____ Layer _____ Lot _____ Weight (kg) _____

Sub Sq. _____ Count _____

Depth _____ Original Weight /Count _____

Phase 1 2 3 4 ? Tab _____

Base

Number	Base Form	Use-Alteration	Inscribed	Decoration	Slip out	Slip Color	Slip Color2	Slip in	Slip Color	Surface Treatment	Ware Texture	Ware Color	Ware Color2	Inclusion1	Inclusion %	Inclusion2	Inclusion2 %	Inclusion3	Inclusion3 %	Notes

Bagasra Pottery Recording 2 of _____

Year _____

Trench _____ Layer _____ Lot _____ Weight (kg) _____

Sub Sq. _____ Count _____

Depth _____ Original Weight /Count _____

Phase 1 2 3 4 ? Tab _____

Base

Number	Base Form	Drawing	Vessel Type	Size	Vessel Number	EBD	IBD	MBD/EBD	Height	EVES	Base Thickness	Body Thickness	Carination	Manufacture	Man. Marks	Similar To	Drawn, Page	Photo	see drawing for measurements	Notes

Appendix B: Recording Procedure - Pottery Tabulation Sheets

BSR _____ Layer _____ Lot _____
Trench _____
Subsq _____
Depth _____ Phase 1 2 3 4 ?

Count
Rim _____
Base _____
Body _____

Weight/kg
Rim _____
Base _____
Body _____

Total Kg _____

Original Weight _____

Vessel Group		RIM Jar	RIM J/P	RIM Pot	RIM Bowl	RIM B/D	RIM Dish	RIM Other	BASE Jar	BASE J/P	BASE Pot	BASE Bowl	BASE B/D	BASE Dish	BASE Other	BODY Jar	BODY J/P	BODY Pot	BODY Bowl	BODY B/D	BODY Dish	BODY Other	Total	Comments/Inscribed
PLAIN RED WARE	L																							
	M																							
	S																							
PLAIN YELLOW BROWN WARE	L																							
	M																							
	S																							
PLAIN BUFF WARE	L																							
	M																							
	S																							
COARSE WARES	L																							
	M																							
	S																							
COARSE WARES WITH SLIP	L																							
	M																							
	S																							

BSR _____
Trench _____ Layer _____ Lot _____
Subsq _____
Depth _____ Phase 1 2 3 4 ?

Count: Rim _____ Base _____ Body _____
Weight/kg: Rim _____ Base _____ Body _____
Total Kg _____
Original Weight _____

Vessel Group		RIM							BASE							BODY							Total	Comments/Inscribed
		Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other		
RED SLIP RED WARE	L																							
	M																							
	S																							
RED SLIP YB WARE	L																							
	M																							
	S																							
RED SLIP BUFF WARE	L																							
	M																							
	S																							
RED SLIP BLACK BAND	L																							
	M																							
	S																							
RED SLIP BLACK DESIGN	L																							
	M																							
	S																							

BSR _____
Trench _____ Layer _____ Lot _____
Subsq _____
Depth _____ Phase 1 2 3 4 ?

Count: Rim _____ Base _____ Body _____

Weight/kg: Rim _____ Base _____ Body _____

Total Kg _____

Original Weight _____

Vessel Group		RIM							BASE							BODY							Total	Comments/Inscribed
		Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other		
RED SLIP BLACK AND WHITE DESIGN	L																							
	M																							
	S																							
RED AND CREAM SLIP	L																							
	M																							
	S																							
RED AND CREAM SLIP BLACK BAND OR DESIGN	L																							
	M																							
	S																							
BLACK SLIPPED	L																							
	M																							
	S																							
	L																							
	M																							
	S																							

BSR _____
Trench _____ Layer _____ Lot _____
Subsq _____
Depth _____ Phase 1 2 3 4 ?

Count
Rim _____
Base _____
Body _____

Weight/kg
Rim _____
Base _____
Body _____

Total Kg _____
Original Weight _____

Vessel Group		RIM							BASE							BODY							Total	Comments/Inscribed
		Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other	Jar	J/P	Pot	Bowl	B/D	Dish	Other		
PLAIN RED WARE	L																							
	M																							
	S																							
PLAIN YELLOW BROWN WARE	L																							
	M																							
	S																							
PLAIN BUFF WARE	L																							
	M																							
	S																							
COARSE WARES	L																							
	M																							
	S																							
COARSE WARES WITH SLIP	L																							
	M																							
	S																							

Appendix B: Recording Procedure – Pottery Recording Codes

Vessel Form	0	indeterminate
	1	jar
	2	jar/pot
	3	pot
	4	bowl
	5	bowl/dish
	6	dish
	7	pedastaled
	8	ring stand
	9	lid
	10	miniature
	11	bottle
	12	perforated
Decoration	0	none
	1	black band
	2	black design
	3	red/brown band
	4	incising
	5	white band
	6	white design
	7	red design
	8	brown band/design
	9	punctate
Inscribed	0	none
	1	inscribed
	2	incised
	3	indeterminate
	4	not incised or inscribed.
Slip	0	none
	1	present
	2	multiple
	3	indeterminate
	4	present, rim only
	5	present, rim to throat only
	6	partial slip
	7	drops of slip

	8	slip on bottom of base
	9	slip to max body diameter
Surface Treatment	0	none
	1	Burnishing, exterior
	2	Burnishing, interior
	3	Polishing, exterior
	4	Polishing, interior
	5	smoothing, exterior
	6	smooting, interior
	7	scraping, exterior, horizontal
	8	scraping, exterior, wavy
	9	scraping, exterior, irregular
	10	sandy slurry
	11	impressions (specify)
	12	scraping, interior, horizontal
	13	scraping, interior, wavy
	14	scraping, interior, irregular
Paste Type	1	coarse
	2	medium-coarse
	3	medium
	4	fine-medium
	5	fine
	6	very fine
Temper/inclusion	0	none
	1	sand/black inclusions
	2	kanker/white inclusions
	3	organic
	4	mica
	5	tiny pebbles/sand
	6	grog
	7	large pebbles
Use Alteration	0	none
	1	soot/carbon
	2	charring
	3	residue

	4	polish/gloss
	5	surface abrasion
	6	pitting
	7	oxidation
	8	discoloration
Manufacture Technique	0	none evident
	1	wheel made
	2	hand made
	3	mold made
	4	paddle and anvil
Manufacture Marks	0	indeterminate
	1	wheel marks
	2	string-cut base
	3	pinched base
	4	cord marked
	5	other
	6	mold marks
	7	rim attached separately
	8	paddle marks
Carination	0	none
	1	single carination
	2	multiple carinations
Ridges	0	none
	1	single rige
	2	double ridge
	3	triple ridge

Appendix B: Recording Procedures - Pottery Recording Codes

Munsell Color Chart for Wares

	Harappan Red Ware	Red Ware	Yellow Brown Ware	Buff Ware	Brown Ware	Yellow Gray/ Grayish-Brown	Yellow Ware
TYPE COLORS	10R 5/8 2.5 YR 5/8 2.5 YR 6/6	5YR 5/6, 6/6	7.5 YR 5/4, 6/4 10 YR 5/4, 6/4	5Y 8/2, 8/3	2.5 YR 4/4; 5 YR 4/4 5 YR 5/4; 7.5 YR 5/4	10 YR 5/2 10YR 6/2	10YR 7/4 2.5 Y 8/3, 8/2 2.5 Y 7/3
RANGE	10R 5/6 2.5 YR 4/8	5 YR 5/3	10YR 5/3 7.5/10 YR value 8	5Y value 7	5 YR 4/6	5Y 5/1	2.5 Y 6/3
CORE		yellow brown black/gray	2.5Y 5/1 grey black yellowish-red	buff red	black	10R 5/1	

Appendix B: Recording Procedures - Pottery Recording Codes

Munsell Color Chart for Slips

	Red Slip		Brown Slip	Buff Slip	Cream Slip	Yellow-Grey	Light Brown
Munsell Type Color	Red 1	dark red	7.5 R 4/6;10R 5/4	2.5YR 5/4, 4/4	10R 8/2	2.5 Y 8/3, 8/4	5Y7/2	10YR 6/3
	Red 2 (also called chocolate slip)	brownish-red to red-black	10R 3/2, 4/2	5 YR 3/4	2.5Y 8/2, 8/4			10YR 5/3
	Red 3 (also called Harappan Red)	orangish-red	10R 4/8, 5/8					
	Red 4	light purplish-red	2.5YR 5/2					
	Red 5	weak red	7.5R 5/6, 10R 6/6					
	Red 6	dark reddish brown	2.5 YR 3/3					
Munsell Color Variations	Red Type 1		10R 4/4, 4/6, 5/6, 6/6	2.5YR 4/3	10YR 8/2, 8/3	7.5 YR 8/4		
	Red Type 2		7.5R 3/3, 10R 4/3		7.5YR 8/2, 8/3			
	Red Type 3		10R 6/6, 6/8					
	Red Type 4		2.5YR 5/2					
	Red Type 5		7.5R 6/6					

Appendix C: Potsherds with Post-firing Inscribed Graffiti from Bagasra

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Depth (cm)	Sherd	Type of Graffiti	Type of Inscription	Number of inscribed Signs	Number of incised lines	Location of Graffiti
5960	BSJ 100	1		Eg2	13	350	Body	inscribed	Indus script	2-5	0	exterior body
5959	BSJ 99	1		Eg2	14	385	Body	inscribed	Indus script	2	0	exterior body
5833	70	1		Eo10	8	250	Body	inscribed	Indus script	1	0	exterior body
5955	74	1		Eo10	9	290	Body	inscribed	Indus script	1+	0	exterior body
BSJ 127	BSJ 127	1		Eo3	9	220	Rim	inscribed	Indus script	1	0	rim
BSJ 126	BSJ 126	1		Eo3	8	210	Rim	inscribed	Indus script	3	0	rim
1428	BSJ 124	1		Do5	11	230	Rim	inscribed and incised	script and incised lines on rim	1	1	shoulder and rim
1424	99	1		Do5	13	NE 265	Body	inscribed	Indus script	1	0	exterior body
None	46	2	inside	Eb9	4	150	Body	inscribed	Indus script	1	0	exterior body
5963	71	2	inside	Eb13	2	70	Body	inscribed	script	1	0	exterior body
2898	136	2	inside	Eb11		SE 120	Body	inscribed	script?	1	0	exterior body
none	131-501	2	inside	Eq2	17		Body	inscribed	Indus script	1	0	exterior body
BSJ 1	BSJ 1	2	inside	Do7	5	50+65	Rim	inscribed	Indus script	2-4	0	shoulder
BSJ 81	BSJ 81	2	inside	Ea8	2	40	Body	inscribed	Indus script	1	0	exterior body
2055	113	2	inside,wall	Eq2	6	130	Body	inscribed	script	1-2	0	exterior body
1487	114	2	inside,wall	Eq2	3	30	Body	inscribed	script	1	0	exterior body, lower?
7378	10	2	outside	Ei5	4	100	Body	inscribed	Indus script	1	0	exterior body
7393	17	2	outside	Eo11	5	155	Body	inscribed	Indus script	1	0	exterior body
7424	27	2	outside	Eo6	6	155	Body	inscribed	script	1	0	exterior body
5946	57	2	outside	Eo10	6	190-200	Body	inscribed	script	1	0	exterior body
4956	68	2	outside	Eo10	5	140	Body	inscribed	Indus script	1	0	exterior body
1982	BSJ 25	2	outside	Er13	12	580cm	Body	inscribed	script	1-2	0	exterior body
7406	6	2	outside	Eo2	5	145	Body	inscribed	Indus script	1	0	exterior body, mid-low

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Depth (cm)	Sherd	Type of Graffiti	Type of Inscription	Number of inscribed Signs	Number of incised lines	Location of Graffiti
BSJ 101	BSJ 101	2	outside	Eo10	7	235cm	Body	inscribed	Indus script	2-3	0	exterior body
7033	1	2	outside	Eo11	6	175	Rim	inscribed and incised	script and incised lines on rim	1	1	rim + exterior shoulder
5321	64	2/3	outside	Eo15	2	65	Rim	inscribed	Indus Script	1	0	exterior upper body
7430	21	2/3	wall	Eh5 & Eh6	none	80	Body	inscribed	script or drawing	1+	0	exterior body
5420	65	3	inside	Eg3	2	42	Body	inscribed	Indus script	1-2	0	exterior body
969	82	3	inside	Do8	3	65-70	Rim	inscribed	script	1	0	upper exterior body/shoulder
75	83	3	inside	Do8	2	30	Rim	inscribed	Indus script	1	0	upper exterior body
232	85	3	inside	Do8	2A	69-94	Body	inscribed	script	1	0	exterior body
971	87	3	inside	Do8	4	NE 105-115	Body	inscribed	Indus script	1	0	upper exterior body
972	88	3	inside	Do8		65-70	Body	inscribed	Indus script	1	0	exterior body
930	91	3	inside	Ek5		NE 50-60	Body	inscribed	script	1+	0	exterior body
34	92	3	inside	Ek5	2	SW 20-30	Body	inscribed	Indus script	1	0	exterior body/lower body
3089	128	3	inside	El9	2	30	Body	inscribed	script	1	0	exterior body
2860	131	3	inside	El9	2	15	Body	inscribed	Indus script	1	0	exterior body
2931	133	3	inside	El5	3	85	Rim	inscribed	Indus script	1+	0	rim
3093	137	3	inside	Ek4	2	42	Body	inscribed	Indus script	1	0	exterior upper body
none	145	3	inside	Ek5		NW 160-170	Rim	inscribed	script	1+	0	exterior body
none	146	3	inside	Ek5		SW 130-140	Body	inscribed	script	1+	0	exterior body

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Depth (cm)	Sherd	Type of Graffiti	Type of Inscription	Number of inscribed Signs	Number of incised lines	Location of Graffiti
none	143	3	inside	Ek5		NE 20-30	Base	inscribed	script	1-3	0	bottom of vessel
none	144	3	inside	Ek5		NE 80-90	Body	inscribed	script	1+	0	exterior body
7401	15	3	outside	Eo2	3	102	Body	inscribed	Indus script	1	0	exterior body
6340	16	3	outside	Eo11	2	65	Body	inscribed	Indus script	1	0	exterior body
7417	18	3	outside	Ei1	3	135	Body	inscribed	Indus script	1	0	exterior body
7416	19	3	outside	Ei1	3	105	Rim	inscribed	Indus script	1	0	exterior shoulder
7422	25	3	outside	Eo6	4	130	Body	inscribed	script	1	0	exterior body
7388	26	3	outside	Ei11 & Ei15	Baulk 3	50	Body	inscribed	Indus script	1	0	exterior body
6606	30	3	outside	Eo11	4		Body	inscribed	script	1	0	exterior body
5995	39	3	outside	Eh4	2	10	Body	inscribed	script	1	0	exterior body
7400	41	3	outside	Eo2	3	90	Body	inscribed	Indus script	2	0	exterior body (lower?)
5940	52	3	outside	Eo10	4	95	Body	inscribed	script	1	0	exterior body
5542	53	3	outside	Eh3	2	75	Body	inscribed	script	1	0	exterior body
5941	61	3	outside	Eo10	3	80	Body	inscribed	script	1	0	exterior body
2054	109	3	outside	Er13	6	305-315	Body	inscribed	script	1	0	exterior body
5272	56	3	outside	Eh3	2, dump	NW 30	Body	inscribed	script	1	0	exterior body
6606	2	3	outside	Eo11	4	105	Rim	inscribed	Indus script	2	0	exterior body, mid
7387	33	3	outside, wall	Em5	4	123-151	Body	inscribed	Indus script	1	0	exterior body
6932	37	3	outside, wall	Eh2	Dump 1 resting on 2	NE 48-80	Rim	inscribed	Indus script	1	0	exterior body
1000	94	3	wall	Do5	2		Body	inscribed	script	1-2	0	exterior body
1120	96	3	wall	Do5	2	20	Body	inscribed	script	1+	0	exterior body
1145	98	3	wall	Do5	2	NW 55	Body	inscribed	script	1+	0	exterior body

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Depth (cm)	Sherd	Type of Graffiti	Type of Inscription	Number of inscribed Signs	Number of incised lines	Location of Graffiti
2061	MSU Drawn 297	3	wall	El16	3	NW 45	Body	inscribed	script	1	0	
2642	130	3/4	inside	El9	Pit sb 1	10	Body	inscribed	script	1	0	exterior body
7395	8	3/4	outside	Ei11	2	25	Rim	inscribed	Indus script	1	0	exterior shoulder
2146	125	3/4 mix	outside, wall	Em9	2	NE 45	Rim	inscribed	script	1+	0	interior body
2586	126	3/4 mix	outside, wall	Em9	2	NE 10	Body	inscribed	script	1	0	exterior body
7414	13	4		Eo2	Pit 1 sb 1	30	Body	inscribed	script	1-2	0	exterior body
7415	14	4		Eo2	Pit 1 sb 1	30	Body	inscribed	Indus script	1-2	0	exterior body
7375	40	4		Eo2	2	18-26	Body	inscribed	Indus script	1	0	exterior body
2052	110	4		Er13	2?	30	Body	inscribed	script	1	0	exterior neck/shoulder
2051	111	4		Er13	2?	30	Body	inscribed	Indus Script	1	0	exterior neck/shoulder
2053	112	4		Er13	2; ashy dump	50-60	Rim	inscribed	script	1+	0	exterior upper body
2057	115	4		Ew1		SW 100-120	Body	inscribed	script	1	0	exterior body
2126	117	4		Es3/4	2	51+22	Body	inscribed	script	1	0	exterior body
2128	118	4		Es3/4	2	51+26	Body	inscribed	Indus script	1	0	exterior body
2374	120	4		Et1	2; ashy	NE 19+15-25	Rim	inscribed	script	1	0	exterior upper body
5966	69	4		Em1	2	60	Rim	inscribed	Indus script	1	0	exterior body
2158	123	4		Em9	3	NE 60	Body	inscribed	script	1	0	exterior body
2194	124	4		Em9	3	NE 80	Body	inscribed	script	1+	0	exterior body

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Depth (cm)	Sherd	Type of Graffiti	Type of Inscription	Number of inscribed Signs	Number of incised lines	Location of Graffiti
1851	116	4		Eq8	3	NE 55	Rim	inscribed	script	1+	0	exterior upper body
5965	62	4		Fk9	2	35-75	Body	inscribed?	script	1+	0	exterior body
7373	3	4		Eo2	Pit 1 sb 1	90	Body	inscribed	script	1	0	exterior body, mid
6360	4	4		Eo2	Pit 1 sb 1	80	Rim	inscribed	Indus script	1	0	interior body, mid
7399	7	4		Eo2	Pit 1 sb 1	30	Body	inscribed	Indus script	1	0	exterior body
62	MSU Drawn 244	4		Et1	2	50	Rim	inscribed	script	1	0	rim
1728	MSU Drawn 292	4		Er13	2	20-30	Body	inscribed	script	1	0	exterior body
7078	9	unknown	wall	Eb4	4	140	Body	inscribed	Indus script	2	0	exterior body

Appendix C: Potsherds with Post-firing Inscribed Graffiti from Bagasra (continued)

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
BSJ 100	1	inside	Indus script		Black Slipped Jar	Jar	L			dark grey slip		
BSJ 99	1	inside	Indus script		Black Slipped Jar	Jar	L			dark reddish brown slip		
70	1	outside	Indus script		JarPot?, plain	JarPot (?)	M-L	MS	YB	none		
74	1	outside	Indus script		Plain vessel	Indeterminate	M	C	YW/YB	indeterminate		
BSJ 127	1	outside	Indus script		Black Slipped Jar	Jar	L	Fine		dark chocolate slip		
BSJ 126	1	outside	Indus script		Black Slipped Jar	Jar	L	Fine		dark chocolate slip		

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
BSJ 124	1	wall	script and incised lines on rim	inscription is too fragmentary to identify; incised line on rim	Black Slipped Jar	Jar	L			dark grey slip		
99	1	wall	Indus script		JarPot, red slip black band and design	JarPot	M	FS	RW	red1 slip, black band and design		
46	2	inside	Indus script		JarPot?, Reserve Slip	JarPot (?)	M	MS	5Y8/1 (gray)	reserve slip		
71	2	inside	script	possible Indus sign	Large Storage Jar, red slip	Jar	L	MS	RW	none		
136	2	inside	script?	inscription is too fragmentary to identify	JarPot?, plain	JarPot (?)		FS	RW	none		
131-501	2	inside	Indus script	possible Indus sign	Red slipped vessel	Indeterminate	M	MS	Buff	red1 slip		
BSJ 1	2	inside	Indus script		Black Slipped Jar	Jar	L			very dark grey slip and reddish brown slip		
BSJ 81	2	inside	Indus script		Black Slipped Jar	Jar	L			dark grey slip and dark reddish grey slip		
113	2	inside, wall	script	possible Indus sign	JarPot, red slip	JarPot		FS	RW	red1 slip		
114	2	inside, wall	script	possible Indus sign	JarPot, red slip?	JarPot		FS	YB	red slip?		
10	2	outside	Indus script		Jarpot, red slip black band	JarPot	M-L	FS	RW	red1 slip, black band		
17	2	outside	Indus script		JarPot?, plain	Indeterminate	M	MS	RW	none		
27	2	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot	S-M	FS	RW	red1 slip		
57	2	outside	script	inscription is too fragmentary to identify	Red slipped vessel	JarPot (?)	M	FS	RW	red1 slip, black band?		
68	2	outside	Indus script		Jarpot, red slip black band	JarPot	M-L	FS	RW	red1 slip, black band		
BSJ 25	2	outside	script	inscription is too fragmentary to identify	Black Slipped Jar	Jar	L			very dark grey slip		

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
6	2	outside	Indus script		Jarpot, red slip black band	JarPot	M	FS	RW	red1 slip, black band		
BSJ 101	2	outside	Indus script		Black Slipped Jar	Jar	L			black slip		
1	2	outside	script and incised lines on rim	possible Indus sign and incised line on rim	Jarpot, red-slip black band	JarPot	M	MS	RW	red slip, black band	3A1b	12
64	2/3	outside	Indus Script		Sorath Bowl, red slip black band	Bowl	M	FS	RW	red1 slip, black band	5A2c	19
21	2/3	wall	script or drawing	possible Indus sign or drawing	JarPot, red slip	JarPot	M	FS	Buff	red6 slip		
65	3	inside	Indus script		Red slipped vessel	Indeterminate	S-M	FS	RW	red1 slip		
82	3	inside	script	inscription is too fragmentary to identify	JarPot, red slip black band	JarPot	M	FS	RW	red1 slip, black band	3C5a	16
83	3	inside	Indus script		Sorath Bowl, red slip black band	Bowl	M	F	RW	red1 slip, black band	5A2c	24-25
85	3	inside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot		FS	RW	red1 slip		
87	3	inside	Indus script		JarPot, red slip black band	JarPot	M	FS	YB	red1 slip, black band		
88	3	inside	Indus script		JarPot, red slip	JarPot	M	FS	Buff	red1 slip		
91	3	inside	script	possible Indus sign	JarPot, red slip	JarPot	M	FS	RW	red2 slip		
92	3	inside	Indus script		JarPot?, plain	JarPot (?)	M	FS	RW	none		
128	3	inside	script	possible Indus sign	JarPot?, red slip	JarPot (?)	M-L	MS	YB	red1 slip		
131	3	inside	Indus script		Red slipped vessel	Indeterminate		MS	RW	red1 slip		
133	3	inside	Indus script		Nageshwar Bowl, red slip	Bowl	M	FS	RW	red1 slip	2E2d	20
137	3	inside	Indus script		Ridged JarPot, red slip	JarPot	M-L	FS	RW	red2 slip		
145	3	inside	script		possible Nageshwar Bowl	JarPot or Bowl	M	FS	RW	none		17-19
146	3	inside	script		Vessel with Red Slip Black Bands			F	YB	red slip, black band		
143	3	inside	script		Plain vessel		M	FS	RW	none	2C	
144	3	inside	script		Coarse ware vessel			MS/C	YB	none		

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
15	3	outside	Indus script		JarPot, red slip black band	JarPot	S-M	FS	RW	red1 slip, black band		
16	3	outside	Indus script		JarPot, red slip	JarPot	S-M	FS	RW	red1 slip		
18	3	outside	Indus script		JarPot, red slip (Jar?)	Jar (?)	S-M	FS	RW	red1 slip		
19	3	outside	Indus script		JarPot, red slip	JarPot	M	FS	YB	red6 slip	2D1a	10
25	3	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot	M	FS	RW	red1 slip		
26	3	outside	Indus script		Bowl?, red slip	Bowl (?)	M	FS	RW	red slip		
30	3	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot	M	FS/MS	RW	red1 slip		
39	3	outside	script	possible Indus sign	JarPot?, red slip	JarPot (?)	M	FS	YB/YG	red2 slip		
41	3	outside	Indus script		JarPot, red slip	JarPot	M-L	FS/MS	YB	red1 slip	2B	
52	3	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot	M	FS	RW	red2 slip		
53	3	outside	script	inscription is too fragmentary to identify	JarPot?, red slip	JarPot (?)	M	FS	YB	red1 slip		
61	3	outside	script	inscription is too fragmentary to identify	Red slipped vessel	JarPot (?)	M	FS	YW/BF	red1 slip		
109	3	outside	script	possible Indus sign	JarPot, red slip	JarPot		FS	RW	red1 slip		
56	3	outside	script	inscription is too fragmentary to identify	Vessel with red slip, black bands?	Indeterminate	M-L	FS	YB	red1 slip, black band?		
2	3	outside	Indus script		Sorath bowl, red slip black band	Bowl	M	FS	RW	red1 slip, black band	1A7a	15-17
33	3	outside, wall	Indus script		Bowl?, red slip	Bowl (?)	M	FS	RW	red5 slip, black band?		
37	3	outside, wall	Indus script		Sorath bowl, red slip black band	Bowl	M	FS/MS	RW/YB	red1 or red3 slip, black band	5A2c	18-19
94	3	wall	script		Red slipped vessel	Indeterminate	S-M	FS	RW	red1 slip		
96	3	wall	script	inscription is too fragmentary to identify	JarPot?, red slip	JarPot	M	FS	YB/YW	red6 slip		
98	3	wall	script	possible Indus sign	Red slipped vessel	JarPot	M	FS	YW/BF	red1 slip		
MSU Drawn 297	3	wall	script		Jar, red slip	Jar	M	MS	RW	red1 slip		

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
130	3/4	inside	script	inscription is too fragmentary to identify	Red slipped vessel	Indeterminate		FS	RW	red1 slip		
8	3/4	outside	Indus script		JarPot, plain	JarPot	M-L	MS	YB	none	3A3b	24
125	3/4 mix	outside, wall	script	possible Indus sign, inscription is too fragmentary to identify	Pedestaled Bowl, red slip	Pedestalled Bowl		FS	RW	red1 slip	2A1c	21-26
126	3/4 mix	outside, wall	script	possible Indus sign, inscription is too fragmentary to identify	Grey Ware Vessel, plain	Indeterminate		MS	gray	indeterminate		
13	4	outside	script	possible Indus sign	Jarpot, red slip	JarPot	M	FS	YB	red1 slip		
14	4	outside	Indus script		Jarpot, red slip	JarPot	M	FS	RW	red6 slip		
40	4	outside	Indus script		Jarpot?, plain	JarPot (?)	M	MS	RW	none		
110	4	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot		FS	RW	light red-brown slip		
111	4	outside	Indus Script		JarPot, red slip	JarPot		FS	RW	red1 slip		
112	4	outside	script	inscription is too fragmentary to identify	Sorath bowl, red slip	Bowl		FS	RW	red1 slip	1B1a	
115	4	outside	script	possible Indus sign	JarPot, red slip	JarPot		FS	RW	red2 slip		
117	4	outside	script	possible Indus sign	JarPot, red slip	JarPot		FS	RW	red1 slip		
118	4	outside	Indus script		JarPot, plain	JarPot		FS	RW	none		
120	4	outside	script	possible Indus sign	Nageshwar Bowl, red slip	Bowl	M	FS	YB	red1 slip	2E5m	18
69	4	outside, wall	Indus script		Sorath Bowl, red slip	Bowl	S-M	FS	RW	red5 slip, black band?	1A2a	11
123	4	outside, wall	script	possible Indus sign	Red Slipped Vessel	Indeterminate		MS	YW/BF	red slip		
124	4	outside, wall	script	possible Indus sign	JarPot?, red slip	JarPot (?)		VF/FS	RW	red2 slip		
116	4	wall	script	inscription is too fragmentary to identify	Bowl, red slip	Bowl		FS	YW/YB	red1 slip	2B1c	11
62	4	outside	script	inscription is too fragmentary to identify	JarPot, red slip	JarPot	M	FS	YB	red2 slip		
3	4	outside	script	possible Indus sign	Sorath Bowl, red slip	Bowl	M	FS	RW	red1 slip		
4	4	outside	Indus script		Sorath Bowl, red slip black band	Bowl	M	MS	RW	red1 slip, black band	5A2c	18

Graffiti Study Number	Phase	Location	Type of Inscription	Inscription Notes	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
7	4	outside	Indus script		JarPot, red slip	JarPot	M-L	FS	RW	red1 slip		
MSU Drawn 244	4	outside	script	possible Indus sign	Perforated Jar, red slip	Jar	M	FS	YB	red slip	3A3b	22
MSU Drawn 292	4	outside	script	possible Indus sign	Jarpot, red slip black band and design	JarPot	M	VF/FS	RW/YB	red slip, black band and black design		
9	unknown	wall	Indus script		Jarpot, red slip black band	JarPot	M-L	FS	RW	red1 slip, black band		

Potsherds with Post-firing Incised Graffiti from Bagasra

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Sherd Type	Inscribed	Type of Inscription	Number of incised lines	Location of Graffiti
1427	97	1		Do5	14	Rim	incised	incised lines on rim	2	rim
2582	121	1?		Et1	8	Rim	incised	incised lines on rim	3	rim
7021	29	2	inside	Ea12	5	Rim	incised	incised lines on rim	2	interior rim
3194	43	2	inside	Ea8	2	Rim	incised	incised lines on rim	1	rim
3802	44	2	inside	Ea8	3	Rim	incised	incised lines on rim	1	rim
4274	47	2	inside	Eb10	3	Rim	incised	incised lines on rim	1-2	rim
3230	50	2	inside	Ea8	2	Rim	incised	incised lines on rim	3	rim
8861	51	2	inside	El14	4	Rim	incised	incised lines on rim	1+	rim

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Sherd Type	Inscribed	Type of Inscription	Number of incised lines	Location of Graffiti
2849	135	2	inside	Eb11		Rim	incised	incised lines on rim	2	rim
None	138	2	inside, wall	Eq2	10	Rim	incised	incised lines on rim	7	rim
4296	42	2	inside, wall	Eb5	5	Rim	incised	incised lines on rim	1	interior rim
2345	119	2	inside, wall	Eq2	15	Rim	incised	incised lines on rim	1	rim
2478	127	2	outside, wall	Em9	6	Rim	incised	incised lines on rim	2	rim
989	75	2	wall	Do6	1	Rim	incised	incised lines on rim	1	rim
2593	122	2	wall	De3	2	Rim	incised	incised lines on rim	2	rim
7425	28	2	outside	Eo6	5	Rim	incised	incised lines on rim	3	rim
7405	31	2	outside	Eo2	5	Rim	incised	incised lines on rim	1	interior rim
7385	38	2	outside	Ei15	7	Rim	incised	incised lines on rim	4-8	interior rim
5943	54	2	outside	Eo10	5	Rim	incised	incised lines on rim	3	rim
5724	59	2	outside	Eo10	6	Rim	incised	incised lines on rim	2	rim
5954	72	2	outside	Eo10	7	Rim	incised	incised lines on rim	2	rim
4991	73	2	outside	Eo10	6	Rim	incised	incised lines on rim	1	rim
17	139	2	outside	Eo10	6	Rim	incised	incised lines on rim	1	rim
none	22	2/3	wall	Eh5 & Eh6	Pit1	Rim	incised	incised lines on rim	7	rim

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Sherd Type	Inscribed	Type of Inscription	Number of incised lines	Location of Graffiti
974	86	3	inside	Do8	2	Rim	incised	incised lines on rim	2	rim
934	89	3	inside	Ek5	2	Rim	incised	incised lines on rim	3	rim
941	90	3	inside	Ek5		Rim	incised	incised lines on rim	2	rim
2934	129	3	inside	El5	3	Rim	incised	incised lines on rim	1	rim
2916	134	3	inside	Eg15	1	Rim	incised	incised lines on rim	1	rim
none	140	3	inside	Ek5		Rim	incised	incised lines on rim	6	rim
non	141	3	inside	Ek5		Rim	incised	incised lines on exterior body	4	exterior upper body
none	142	3	inside	Ek5		Body	incised	incised lines on exterior body	4	exterior body
920	76	3	inside, wall	Do7		Body	incised	incised lines on exterior body	2	exterior body
945	79	3	inside, wall	Do7	3	Rim	incised	incised lines on rim	4	rim
6	80	3	inside, wall	Do7	1	Rim	incised	incised lines on rim	1	rim
1248	105	3	inside, wall	Do12	1	Rim	incised	incised lines on rim	1	rim
6404	12	3	wall	Eh9	Pit	Rim	incised	incised lines on rim	3	rim
4476	48	3	wall	Ec3	3	Rim	incised	incised lines on rim	1-2	rim
1107	102	3	wall	Do11	1	Rim	incised	incised lines on rim	5	rim

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Sherd Type	Inscribed	Type of Inscription	Number of incised lines	Location of Graffiti
1108	104	3	wall	Do11	1	Rim	incised	incised lines on rim	2	rim
1092	107	3	wall	Ek13	1	Rim	incised	incised lines on rim	2	rim
1123	108	3	wall	Ep1	Pit	Rim	incised	incised lines on rim	3	rim
7410	11	3	outside	Eo6	3	Rim	incised	incised lines on rim	1	rim
7374	20	3	outside	Eo2	3	Rim	incised	incised lines on rim	2	rim
7392	24	3	outside	Eo11	4	Rim	incised	incised lines on rim	1	interior rim
5273	55	3	outside	Eh3	2	Rim	incised	incised lines on rim	2	rim
5276	58	3	outside	Eo16	2	Rim	incised	incised lines on rim	4+	rim
BSJ 129	BSJ 129	3	outside	Et1	3	Rim	incised	incised lines on rim	5	rim
1876	MSU Drawn 293	3/4	outside, wall	Eq8	4	Rim	incised	incised lines on rim	4	rim
7389	23	4		Ei11 & Ei15	1	Rim	incised	incised lines on rim	4	rim
7371	32	4		Eo2	2	Rim	incised	incised lines on rim	4	interior rim
5983	34	4		Eo2	1	Rim	incised	incised lines on rim	3+	interior rim to throat
5964	63	4		Fk9	2	Rim	incised	incised lines on rim	2	rim
6164	5	4		Eo6	2	Rim	incised	incised lines on rim	2	rim

MSU Number	Graffiti Study Number	Phase	Location	Trench	Layer	Sherd Type	Inscribed	Type of Inscription	Number of incised lines	Location of Graffiti
1618	MSU Drawn 294	4		Er13	5?	Rim	incised	incised lines on rim	4	rim
1595	MSUDrawn295	4		Er13	5?	Rim	incised	incised lines on rim	2	rim
none	MSU Drawn 296	unknown		Eq6	2	Rim	incised	incised lines on rim	9	rim

Potsherds with Post-firing Incised Graffiti from Bagasra (continued)

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
97	1		incised lines on rim	JarPot, red slip, black band?	JarPot	M	FS	YW	red2 slip, black band?	3C2a	17
121	1?		incised lines on rim	Nageshwar bowl, red slip	Bowl	M	FS	RW	red1 slip	2E2a	20
29	2	inside	incised lines on rim	Coarse ware JarPot? plain	JarPot?	M	C	YB	none	1D2d	17
43	2	inside	incised lines on rim	Coarse ware Jarpot, red slip	JarPot	M	C	YB	red1 slip	3A4a	15
44	2	inside	incised lines on rim	Jarpot, red slip	JarPot	M	MS	YW	red2 slip	1D3a	10

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
47	2	inside	incised lines on rim	JarPot, red slip	JarPot	M	FS	RW	red1 slip	3C5a	16
50	2	inside	incised lines on rim	Coarse ware Jarpot, plain	JarPot	M	C	RW	none	1D3a	8.5-9
51	2	inside	incised lines on rim	Red slipped vessel	indeterminate	M	MS	RW	red1 slip		
135	2	inside	incised lines on rim	Red slipped? Vessel	indeterminate	M-L	FS	RW	indeterminate		
138	2	inside, wall	incised lines on rim	Large Ledged JarPot, red slip	JarPot	L	FS	RW	red1 slip	3D4a	40
42	2	inside, wall	incised lines on rim	Coarse ware Jarpot?, red slip	JarPot?	M	C	RW	red1 slip	3A4a?	19
119	2	inside, wall	incised lines on rim	JarPot, red slip	JarPot	M	FS/MS	RW	red1 slip	1D3b	13-15
127	2	outside, wall	incised lines on rim	JarPot?, red slip	JarPot?	M	MS	BF	red2 slip	1D3a	9-10
75	2	wall	incised lines on rim	JarPot, red slip	JarPot	S-M	FS	Buff	red1 slip	1A2a	10-14
122	2	wall	incised lines on rim	JarPot, red slip	JarPot	S-M	FS	YW/YB	red1 slip	1D2h	7

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
28	2	outside	incised lines on rim	JarPot, red slip	JarPot	S-M	FS	RW	red1 slip	1D3a	9
31	2	outside	incised lines on rim	JarPot, red slip	JarPot	M	FS	YB	red2 slip	3C4c	17
38	2	outside	incised lines on rim	JarPot, red slip	JarPot	M	MS	BF	red3 slip	1D3a	10
54	2	outside	incised lines on rim	Nageshwar Bowl, red slip	Bowl	M	FS	RW	red1 slip	2B2b(2)	15
59	2	outside	incised lines on rim	Coarse ware Jarpot, plain	JarPot	M	MS/C	RW	none	3C5a	17
72	2	outside	incised lines on rim	Coarse ware JarPot, red slip	JarPot	M	MS/C	YW	red slip	3A4a	17
73	2	outside	incised lines on rim	Bowl, red slip	Bowl	M	FS	YB	red1 slip	7C1g	28-38
139	2	outside	incised lines on rim	JarPot, red slip black band and design	JarPot	M-L	FS	RW	Red1 slip, black band and design		17
22	2/3	wall	incised lines on rim	JarPot, red slip	JarPot	M	FS	RW	red3 slip	3A1a	11
86	3	inside	incised lines on rim	Nageshwar bowl, red slip	Bowl	M	FS	RW	red1 slip	2E5h	21-23

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
89	3	inside	incised lines on rim	Ledged Jarpot, red slip black band	JarPot	M	FS	RW	red3 slip, black band	3D1c	13
90	3	inside	incised lines on rim	JarPot, red slip	JarPot	M-L	MS	RW	red slip	3C2a	20
129	3	inside	incised lines on rim	Jarpot, red slip black band	JarPot	M	FS/MS	RW	red1 slip, black band	3C5a	13
134	3	inside	incised lines on rim	Red slippled vessel	indetermi nate	M	FS	RW	red1 slip		
140	3	inside	incised lines on rim	Large Ledged JarPot, red slip?	JarPot	L	MS	RW	red slip?	2D6b	26
141	3	inside	incised lines on exterior body	Large JarPot, red slip	JarPot	L	MS	RW	red slip	3D4b	>35
142	3	inside	incised lines on exterior body	Plain Vessel	Indetermi nate		FS	YB	none		
76	3	inside, wall	incised lines on exterior body	JarPot?, red slip	JarPot?	M	FS	YW	red3 slip		
79	3	inside, wall	incised lines on rim	JarPot, red slip	JarPot	M	MS	Buff	red slip	3A3b	9-10
80	3	inside, wall	incised lines on rim	Nageshwar bowl, red slip	Bowl	M	FS	HRW/ RW	red1 slip	2B2b	21

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
105	3	inside, wall	incised lines on rim	JarPot, red slip	JarPot	M	MS	RW	red1 slip	1D3a	11
12	3	wall	incised lines on rim	Bowl, slip?	Bowl	M-L	MS	YB	indeterminate	3D1a	34
48	3	wall	incised lines on rim	Bowl, red slip	Bowl	M	MS	RW	red1 slip	8B2v	33
102	3	wall	incised lines on rim	JarPot, red slip	JarPot	M	FS	YB	red1 slip	2B1a	10
104	3	wall	incised lines on rim	JarPot, red slip	JarPot	M	MS	YB	red1 slip	3A1B	11
107	3	wall	incised lines on rim	JarPot, red slip	JarPot?	M	FS	RW	red1 slip		
108	3	wall	incised lines on rim	JarPot?, red slip	JarPot?	M	FS	YW	red2 slip		9
11	3	outside	incised lines on rim	JarPot, red slip	JarPot	M	MS	RW	red1 slip	1D3a	9
20	3	outside	incised lines on rim	Jarpot, black slip	JarPot	M	MS	YB	black slip	2C1a	15
24	3	outside	incised lines on rim	Coarse ware JarPot, red slip	JarPot	M	C	RW	red 1 slip	3C1b	15

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
55	3	outside	incised lines on rim	JarPot, red slip	JarPot	M	VF/FS	RW/YB	red slip	2A1a	9
58	3	outside	incised lines on rim	Sorath Bowl, red slip, black band?	Bowl	M	FS	RW	red slip, black band?	5A2c	15-16
BSJ 129	3	outside	incised lines on rim	Black Slipped Jar	Jar	L			slip not preserved		
MSU Drawn 293	3/4	outside, wall	incised lines on rim	JarPot, red slip?	JarPot	M	FS/MS	RW	red5 slip?		16
23	4		incised lines on rim	Jarpot, red slip, black band?	JarPot	M	FS	YB/YG	red slip, black band?	2D1a	15
32	4		incised lines on rim	JarPot, red slip	JarPot	S-M	FS	RW	red1 slip	2B1a	8
34	4		incised lines on rim	Coarse ware Bowl, plain	Bowl	L	C	RW	none	3C4c	37-39
63	4		incised lines on rim	JarPot, red slip	JarPot	M	FS	RW	red2 slip	3D1c	9
5	4		incised lines on rim	Nageshwar bowl, red slip	Bowl	M	FS	RW	red1 slip	2E2a	19
MSU Drawn 294	4		incised lines on rim	Nageshwar bowl, red slip	Bowl	M	MS	YB	red1 slip	2E5h	22

Graffiti Study Number	Phase	Location	Type of Inscription	Vessel Description	Vessel Type	Size	Ware Texture	Ware Color	Slip and decoration	Rim/ Base Form	ERD (cm)
MSU Drawn 295	4		incised lines on rim	JarPot, red slip	JarPot	M	MS	Buff	red1 slip	1D3a	9-11
MSU Drawn 296	unknown		incised lines on rim	Red slipped vessel	indeterminate	M	VF/FS	Buff	red slip	Indeterminate	16-23