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Hidden Agendas: testing models of the social and political organisation of the Indus Valley Tradition

Volume One

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Thesis submitted for degree of Ph.D

May 2008

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Abstract

This thesis tests existing models of the social and political organisation of the Indus Valley Tradition against an analysis of site distribution and function within Gujarat and Cholistan. It uses data form published survey undertaken in both regions, and from the Gujarat Environs Survey – a systematic archaeological survey of a 50 square kilometre block between the known sites of Bagasra and Kuntasi.

A closer examination of the distribution and function of sites within Gujarat and Cholistan suggests that none of the existing models is congruous with the archaeological evidence. Instead, the models appear to be a greater reflection of archaeologist's own social and political backgrounds. Such ethnocentrism is evident throughout Indus studies, yet many of the models have been left unchallenged, and has entered into mainstream 'textbook' archaeology.

The Gujarat Environ Survey has challenged these models, in particular Dhavalikar's model of Cultural Imperialism, and has identified that a series of contemporary settlement hierarchies may have been functioning in Gujarat at the same. Small non-urban sites, identified through the use of systematic survey methodologies, were engaged in similar activities to larger urban sites. This thesis argues that small sites were not subordinated to larger sites, and that normative views of social and political hierarchies are unfounded. Instead multiple hierarchies or heterarchies may have been in place across the same landscape.

Finally, it argues that in order to develop our understanding of the social and political organisation of the Indus Valley Tradition, we need to dispense with top-down global models, and develop bottom-up models from systematically collected archaeological data

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Chapter One - Introduction

1.1 Introduction

At its largest extent, the Indus Valley Tradition incorporated a variety of regional cultural traditions throughout modern day Pakistan, parts of eastern Afghanistan and western India (Figure 1.01). These regional cultures, although distinct archaeologically, all interacted in a manner to fashion an integrated cultural tradition covering over one million square kilometres, and lasting for several hundred years, before evolving into a number of localised archaeological traditions. The exact nature of this Integration Era of the Indus Valley Tradition (Shaffer 1992b) – often referred to as the Indus Valley, Indus-Sarasvati or Harappan Civilisation - has been the subject of intensive scholarly debate (Dhavalikar 1995, Fairservis 1971, 1986, Fentress 1976, Joshi *et al.* 1984, Kenoyer 1998, 2000, Lal 1993, Malik 1984, Marshall 1931, Mughal 1997, Piggott 1950, Possehl 1990, 1993, 2003, Rao 1973, Ratnagar 2001, Thompson 2006, Wheeler 1968), yet there is very little consensus as to its social and political organisation.

This has not stopped the projection of models within 'textbook literature', often relying on simplistic or outdated concepts and data. Maisels states "Harappan society consisted of an extensive oecumene or commonwealth, with a largely village-based population which the cities helped to integrate economically and culturally" (1999: 187). Referring to the site of Kuntasi in Gujarat, he also states "Kuntasi thus seems to represent Harappan Civilisation in microcosm... There is order and organisation, but it comes from power-imposed top-down management" (1999: 220). This apparent indication of economic integration and top-down management reflects the traditional views that the Indus was a state-level society, which had control over a vast swath of land. Yet at the same time, other archaeologists have argued that the Indus state does not exist. This thesis examines different, often conflicting, models of Indus Valley Tradition social and political organisation and tests these models against existing settlement data from Gujarat and Cholistan, and new survey data from the Gujarat Environs Survey undertaken in 2006.

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1.2 Looking For Elites

Covering an area of over one million square kilometres, the Indus Valley Tradition incorporates a vast array of ecological zones. However, this diversity in environments is matched in the multiplicity of approaches to understanding the socio-political organisation of its inhabitants. Due to the lack of decipherable texts, or even any definitive pictorial representation of any form of leadership, archaeologists have been unable to identify the ruling individual(s) in the Indus Valley Tradition. However, this has not stopped them from attempting to do so. Interpretations have ranged from theocratic Priest-Kings, to mercantile city-states, to a society within which wealth differentiation is hidden from public view.

The earliest excavators and scholars of the Indus Valley envisaged an early state-level society that was ruled over by a Priest-king who wielded absolute and autocratic power (Childe 1954, Marshall 1931, Piggott 1950, Wheeler 1959, Wheeler 1968). Such interpretations were based upon assumptions of racial or ethnic hierarchies, diffusion from the Near East, and ideas of hierarchical social classes. These ideas of class divisions and conflict have also lead many archaeologists to attribute a Vedic origin to the Indus Valley Tradition (Rajaram and Frawley 1995, Talageri 1993), and Lal has gone so far as to propose that the four-fold caste system of India has its genesis in protohistoric Indus Valley social organisation (1993). Atre (1989), Kenoyer (1994, 1998, 2000) and Possehl (1993, 1998, 2003), on the other hand, have suggested that the Indus Valley was a decentralised society, comprised of a number of mercantile domains or city-states. Each of these domains or city-states would have been ruled over by groups of elites comprised of merchants, landowners and ritual specialists, and regions and cities would have been intertwined both politically and economically. More recently Ratnagar (2001) and Dhavalikar (2002) have reasserted that the Indus Valley Tradition was indeed a centralised, state-level society, albeit in a prototypical form.

Post-processual approaches to the Indus Valley Tradition have been largely overlooked. Miller was of the opinion that power within the Indus Valley Tradition was gained through ascetic behaviour and willing subordination, rather than hereditary rite or economic dominance: "the people of the Harappan who may be said to have power may not have enjoyed privileged wealth or conspicuous consumption, and indeed are more likely to have been conspicuous through ascetism" (1985: 61). Influenced by the work of Hodder (1982), Rissman identified

discrepancies between public displays and private accumulations of wealth and suggested this was socially indoctrinated: "*if* the secular domain was characterised by some degree of inequality in value distribution, and by some degree of rigidity in status distinctions, these qualities were *concealed* in the public domain by the ideology of value" (1988: 219, italics authors). Walter Fairservis, on the other hand, suggested that the Harappan Civilisation was not a traditional state-level society, but was organised along the lines of a developed chiefdom, similar to those of the Pacific Northwest Coast Native Americans (1986). Unfortunately, these alternative approaches to understanding the Indus Valley Tradition have been neglected by archaeologists.

1.3 Aims and Objectives

In light of this, this thesis aims to challenge the existing models of the social and political organisation of the Indus Valley Tradition. It will do so through an analysis of the distribution and function of sites within Cholistan and Gujarat. This thesis will achieve this aim through the following objectives:

- *Palaeoenvironment*: It has traditionally been assumed that there has been no significant change in the climate of the Indus Valley region over the last four thousand years. The first objective of this thesis will be to test whether this statement is true. Such an objective will also allow us to assess the environmental impact upon subsistence strategies and to ascertain the impact of climatic, environmental and hydrological changes upon archaeological site visibility.
- *Chronology*: Several different chronologies exist for the Indus Valley, and are often contradictory in their phasing. In order to interrogate the existing datasets from Gujarat and Cholistan it is necessary to justify the choice of chronology and if necessary expand it. The second objective of this thesis is to establish a chronology of the Indus Valley Tradition, and assess how it will impact upon the interpretation of the archaeological record.
- *Models*: Archaeologists have proposed a wide variety of, often conflicting, models for the socio-political organisation of the Indus Valley Tradition. The third objective of this thesis is to identify the existing models, and to develop falsifiable models for them against which to test the archaeological data from Gujarat and Cholistan.

- *Settlement Distribution*: What do the settlement patterns of Gujarat and Cholistan inform us about the social and political organisation of the Indus Valley Tradition, and how does this reflect upon the existing models?
- *Settlement Function*: What does the function(s) of sites in Gujarat and Cholistan inform us about the social and political organisation of the Indus Valley Tradition, and how does this reflect upon the existing models?

The selection of Gujarat and Cholistan as the two areas of investigation is due to two main reasons. The first is that the two regions have been extensively surveyed and thus provide a large corpus of information with which to work. The second reason is that Cholistan is located centrally within the Indus Valley Tradition, whilst Gujarat is located on the periphery of the region. This allows the introduction of core-periphery relationships into the analysis, particularly with regards to the settlement distribution and settlement function objectives, but also regarding the palaeoenvironment objective.

1.4 From the "Harappan Civilisation" to the "Indus Valley Tradition"

Originally considered a distinct and abrupt cultural phenomenon, the "Harappan Civilisation," as it was traditionally known, was thought to have centred upon the Indus River Valley in Pakistan. Its earliest excavators and scholars (Mackay 1938, Marshall 1931) assumed it to have emerged through diffusion from the Near East and Sumeria. However, despite numerous Harappan artefacts being uncovered during the late nineteenth and early twentieth centuries, it was not until two events coincided that the scale and significance of the materials was fully recognised. The first of these was the excavation of the sites of Harappa in Punjab and Mohenjo-daro in Sindh (see Figure 1.01) during the 1920s. These two sites appeared to demonstrate clear similarities in design, manufacturing techniques and material culture with each other. The second was that seals excavated from Mohenjo-daro were also discovered within dated sites from Mesopotamia and Iran, identifying the Harappan Civilisation as a contemporary third millennium B.C. Bronze Age society. This prompted Sir John Marshall, then Director-General of Archaeology in India, to announce the discovery of the Harappan Civilisation on the twentieth September 1924 in the *Illustrated London News*. In the decades succeeding the announcement, a number of additional sites – Sutkagen-dor (1928 and 1932), Adatjo-daro (1930), Chanhu-daro (1930 and 1935-36), Jhangar (1930), Kot Diji (1935), Rangpur (1935-37) – were excavated and identified as

contemporary. Additionally, major surveys by Sir Aurel Stein in Waziristan (1927), Baluchistan (1927-28), Punjab (1931), south-eastern Iran (1932-36), the Ghaggar-Hakra Valley (1940-41), and Las Bela (1943) and Majumdar in Sindh (1927-31 and 1938-39) (Possehl 2002) not only identified a number of new sites, but also reinforced the idea that the Harappan Civilisation was a major Bronze Age urban civilisation. This not only created a South Asian equivalent to the Near East and Egypt, but also effectively pushed back the beginnings of Indian history by almost two thousand years from Alexander the Great's expedition of 326 BCE.

At this time most of the known sites (especially the large urban centres) were located within the Indus Valley and Ghaggar-Hakra river valleys, with smaller settlements identified throughout the surrounding foothills. Consequently, the riverine aspects of the civilisation were emphasised, and the two largest settlements and type-sites, Harappa and Mohenjo-daro, were heralded as the twin capitals of a single unified Harappan empire (Piggott 1950: 136). The Act of Partition in 1947 placed all of the major Harappan urban centres in Pakistan – Harappa, Mohenjo-daro, Chanhu-daro, Kot Diji and Sutkagen-dor lay on the Pakistan side of the border - along with 31 other sites (Possehl 2003). Only Kotla Niahang Khan and Rangpur lay within India's borders, and even so, Rangpur's Harappan affinities were under question at the time (Possehl 2002a). Mortimer Wheeler had already hinted that India's history was ensconced along the Ganges River, whilst Pakistan's was embedded within the Indus. (1959). As a response, Rangpur was re-excavated and its affiliation with the Indus Valley was confirmed (Rao 1963). The Archaeological Survey of India undertook a number of surveys to try to locate Harappan sites within India, beginning with explorations of the dry bed of the Ghaggar river system from 1950-53, which located amongst others, the site of Kalibangan, excavated between 1960-69. At the same time, Rao undertook survey in Gujarat, again locating a number of sites, and Lothal, the largest of which, was excavated for eight seasons beginning in 1958 (Rao 1979).

This escalating knowledge of sites has proliferated over the last forty years, to the point where, in 2002, at least 1,022 settlements have been located and recorded, over 600 of which are in India (Possehl 2002a). Not only has the geographical extent of known sites increased, but also the variety of sites and the timescale of their existence. Recorded sites now extend from the foothills of the Himalayas in the north to the Gulf of Khambat in the south, from the Ganges-Yamuna doab in the east to the hills of Afghanistan and the Iranian plateau in the west. Moreover, excavations at Kili Gul Muhammed (1950-51) (Fairservis 1956) and Mehrgarh

(1974-86) (Jarrige *et al.* 1995, Jarrige 1986, 1990) have provided evidence of cultural sequences stretching from the aceramic Neolithic (c.6500 BCE) through to contemporary Indus Valley material, suggesting an indigenous emergence of society in South Asia. Despite this growing corpus of information regarding the emergence and development of settlements in the Indus Valley, many scholars still perceive the "Harappan Civilisation" as an entity separate from the developments preceding and following its existence, if not in theory then certainly in terminology.

Shaffer identified the need to develop a broader chronology (see Figure 3.01) for the region that encompassed the regional and temporal variations evidence with the archaeological record (1992a, 1992b). His concept of an "Indus Valley Tradition" aimed to eliminate the tendency to adopt terminologies based upon pre-conceived ideas of civilisation and state-hood, by suggesting that the development of the Indus Valley was fluid and dynamic, requiring a more flexible chronological framework, as opposed to unilinear chronologies. Previous interpretations of the Indus Valley tended to rely heavily upon the "Classical" or "Mature" Harappan phases, particularly those of the large urban centres, typically Harappa and Mohenjo-daro. Few approaches have taken into account the lengthy developmental sequence of the Indus Valley Tradition, but instead were more concerned with the identification of elites within these urban centres (section 1.2).

1.5 Chapter Breakdown

This initial chapter has provided some of the background to the Indus Valley Tradition, its discovery, the origin of its name and a brief outline of the models of social and political organisation for it. It has also detailed the aim and objectives of the thesis. Each of these objectives will be tackled in separate chapters, with the exception of the third objective, regarding the models, which will be spread across two chapters.

Chapter Two will examine palaeoenvironmental reconstructions of the Indus Valley Tradition and attempt to ascertain how these would have impacted upon settlement and subsistence during this period, and how modern human activity has altered this landscape. In doing so, the chapter will define the spatial boundaries of the Indus Valley Tradition and detail the modern geography, topography, climate and hydrology of the region. It will also examine

palaeoclimatic and palaeoenvironmental research undertaken in the Thar Desert, the Arabian Sea and the Himalayas, as well as assess changes in the hydrology of the Indus River, and the river systems of Punjab and Gujarat. Finally, the chapter will examine archaeozoological and archaeobotanical remains from Indus sites, including Cholistan and Gujarat.

Chapter Three will outline a chronology for the Indus Valley Tradition. It will discuss the reasons behind the adoption of Shaffer's chronology over other potential chronologies, as well as refine and update the chronology to incorporate new dates and information. It will also highlight the potential problems with Shaffer's chronology, linked to the culture-historical approach that still exists within South Asian archaeology. The second half of the chapter will outline existing interpretations of the social and political organisation of the Indus Valley Tradition, and group them into a series of testable models.

Chapter Four will outline the methodology of the thesis. It will begin by examining recent theoretical developments in understanding social and political organisation, discussing broader models of empires, city-states and chiefdoms. It will then critically evaluate the models identified in the previous chapter, and outline a predictive model of archaeological indicators that one would expect to see from the results of the fourth and fifth objectives. This chapter will also outline the methodology used in the Gujarat Environs Survey, and detail how the Gujarat and Cholistan datasets were developed. It will finish by providing the methodologies to be used in achieving the fourth and fifth objectives – analysing settlement distribution and function.

Chapter Five will form the results of the fourth objective, looking at the spatial distribution of sites with both Gujarat and Cholistan. It will concentrate upon changes in size, location and phasing of sites, reflecting the tendency of archaeologists to use these criteria in their models. It will also look at rank-size analysis for the two areas, as well as assess the potential for identifying central places in the landscape.

Similarly, Chapter Six will present the results of the fifth objective, looking at patterns of site functions and their changes over time. This data is less quantitative than the previous chapters, and as a consequence this chapter is somewhat more descriptive. The Results of the Gujarat Environs Survey will be spread across chapters Five and Six.

Finally, Chapter Seven will discuss the results of chapters Five and Six, and how they relate to the predictive models outlined in Chapter Four. It will also consider ho the results and conclusions drawn from Chapters Two and Three, regarding palaeoenvironmental reconstructions and chronologies. It will bring together all of the results and try to identify which, if any, of the models are viable for the Indus Valley Tradition. Chapter Eight will conclude the thesis, highlighting the key results of each chapter, review the aim and identify areas for future research.

Chapter Two – Palaeoenvironment

2.1 Introduction

It has traditionally been assumed that there has been no significant change in the climate of the Indus Valley region over the last four thousand years (Dhavalikar 1995, Mughal 1997, Possehl 1999a). The first objective of this thesis is to test whether this statement is true. This objective will also allow us to assess the environmental impact upon subsistence strategies and to ascertain the impact upon archaeological site visibility. This chapter will examine palaeoenvironmental reconstructions of the Indus Valley Tradition and attempt to ascertain how this would have impacted upon settlement and subsistence during this period, and how modern human activity has altered this landscape. In doing so, the chapter will define the spatial boundaries of the Indus Valley Tradition and detail the modern geography, topography, climate and hydrology of the region. It will also examine palaeoclimatic and palaeoenvironmental research undertaken in the Thar Desert, the Arabian Sea and the Himalayas, as well as assess changes in the hydrology of the Indus River, and the river systems of Punjab and Gujarat. Finally, the chapter will examine archaeozoological and archaeobotanical remains from Indus sites, including Cholistan and Gujarat.

The chapter will begin by defining the extent and modern geography of the Indus Valley Tradition, concentrating on elements such as modern climate, topography, flora, fauna and agricultural statistics. It will do this for the Indus Valley region as a whole, but also for Cholistan and Gujarat individually. Crucial to this is the identification of areas where landscapes have been artificially altered by recent human activity (water management schemes etc, deforestation etc.) to ensure that this does not influence our analysis. The chapter will then move on to the second theme – examining palaeoclimatic and palaeoenvironmental research into the Indus Valley Tradition. It will examine diverse datasets from the Thar Desert, the Arabian Sea and the Himalayas in order to ascertain the wider palaeoclimatic impacts upon the Indus Valley. It will also examine hydrological changes of the Indus and Ghaggar-Hakra Rivers and river systems in Punjab and Gujarat. Finally, the chapter will examine archaeozoological and archaeobotanical data from the Indus Valley Tradition as a whole, as well as both Gujarat and Cholistan.

2.2 Extent and geography of the Indus Valley Tradition

The Indus Valley Tradition incorporates a rich diversity in terms of its ecological constitutes. Sites have been identified as far north as the Swat and Kashmir Valleys, west within the Sulaiman Range on the Pakistan-Afghanistan borders, and east as far as the Ganges Valley. To the southwest, Sutkagen Dor lies on the Pakistan-Iran border, whilst Bhagatrav lies east of the Gulf of Cambay. The area is traversed north-south by the Indus River and its alluvial plain (Figure 2.01). The following sections will examine in detail the modern climate and subsistence strategies adopted for the area encompassed by the Indus Valley Tradition as a whole, and then for Gujarat and Cholistan in more detail.

2.2.1 Modern climate

The regional climate of South Asia is dominated by two main climatic systems, the winter cyclone from the west, and the summer monsoon from the east. However, throughout the region rainfall can vary from 50 to 600 mm per year, and temperatures can fluctuate from below freezing in the northern valleys, to almost 50°C in the Thar Desert and Sindh. Consequently, there are a wide variety of ecological zones within the area encompassed by the Indus Valley Tradition. Climatically, there is a cold and dry season between November to April and a warm and wet season between May and October. During the cool season, the Indo-Gangetic region has mean temperatures of 21°C, with mean afternoon temperatures of 27°C – however, this can often fall to below 0°C at night at higher altitudes (Spate and Learmonth 1967: 49f) and between 4-5°C in coastal areas (Allchin et al. 1978: 31). The hot season is dominated by the summer monsoon, which typically arrives in early to mid June. The period from March up until the arrival of the monsoon is characterised by increasing heat and humidity. The mean daytime temperatures in May for coastal regions are 41.8°C and 45.6°C for Porbander and Surat respectively, and for inland stations – Alwar 50.6°C, Agra 48.3°C, Hissar 48.3°C, Bikaner 49.4 °C, Barmer 48.9°C (*ibid.*).

Rainfall patterns across the region comprising the Indus Valley Tradition also vary throughout the year. In Rajasthan and Gujarat over 95% of the annual rainfall can fall between June and September (Allchin *et al* 1978: 28). Table 2.01 and Figure 2.02 demonstrate the variability in precipitation patterns across the region. Annual rainfall varies from 178.5mm in Jaisalmer, to 1071.1mm in Surat on the coast of southern Gujarat. On average, during the wettest month of the year (usually June)

almost two and half times as much rain falls in Surat as Jaisalmer receives in an entire year. In fact, a total of 459mm of rainfall has been recorded during a 24-hour period at Surat – equating to 43% of its mean annual precipitation and 257% of that expected at Jaisalmer annually. Conversely, during the dry season, on average most regions receive less than 2mm of rain per month. During the monsoon season in 1918, Jaisalmer only recorded 34mm of precipitation - all of which fell during the second half of July (*ibid*: 30). This unreliability of rainfall is supported by the work of Jagannathan (1963) analysis of rainfall patterns in Rajasthan. He demonstrated that of the 88 study years, western Rajasthan received more than 150% of its average rainfall during eight separate years, and less than 50% in another eight separate years. Similarly, eastern Rajasthan received greater than 150% in three years and less than 50% during 4 years.

This seasonality in rainfall is reflected in the discharge of rivers in northwest South Asia. Due to the monsoon rains, the discharge of a number of rivers – particularly the Tapti, Narmada, Mahi and Sabarmati rivers of Gujarat show marked seasonal variations, as well as variation from year to year (Allchin *et al* 1978: 13f). Figure 2.03 shows the mean monthly discharge of the Narmada River in Gujarat and the Indus River at two of its measuring stations (Sukkur is located near Shikarpur; whilst Kotry is close to Hyderabad). The Narmada demonstrates the most marked seasonality, particularly in the three months between May and August where discharge can increase from 34m^3/sec to 4944m^3/sec three months later – an increase of 14,500%. This is almost entirely the result of monsoon rains. However, the discharge of the Indus River, whilst still indicating a conspicuous degree of seasonality, begins to increase two to three months before the Narmada. This is attributed to the melting of snow in the Northern Valleys and Himalayas, as temperatures begin to increase in March. When this occurs, the combined flow of monsoon rain and snowmelt can increase the width of the river to 16km in Sindh, flooding large areas (Allchin *et al.* 1978: 17).

2.2.2 Modern agricultural systems

The region encompassed by the Indus Valley Tradition is characterised by seasonality in terms of temperature and rainfall, and this manifests itself in the subsistence patterns of its modern inhabitants. The modern agricultural communities of Pakistan and north-western India adopt a bi-annual system: *rabi* crops which are sown during winter and harvested in spring, and *kharif* crops sown in summer and harvested during autumn. *Rabi* crops are dominated by

wheat, although include mustards, rapeseed and gram. *Kharif* crops, on the other hand, rely on the monsoon rains and are predominantly rice and millets – *bajra* (Pearl millet – *Penisetum typhoides*), *jowar* (Large millet – *Serghum bicolor*) and *ragi* (Finger millet – *Eleusinbe corocana*) – with maize, groundnuts, jute and cotton also utilised (Johnson 1981: 48ff). The patterns of agriculture vary significantly throughout the region, and the two key areas of study for this thesis – Gujarat and Cholistan – will now be looked at in more detail.

2.2.3 Gujarat

For the purpose of this thesis, Gujarat will refer to the modern boundaries of the Indian state of Gujarat, covering an area of roughly 150,000 sq km (Possehl 1999a: 327) and encompassing a variety of natural environments. With temperatures varying from 5°C in the winter to 45°C in the summer, and an annual average rainfall of between 300mm per annum in the north to 2000mm in the south, it is clear that Gujarat's annual climate is highly variable. Climate records from Ahmedabad (Figure 2.04) reveal the seasonal variation within temperature and rainfall, principally a consequence of the summer monsoon and winter cyclone. However, Gujarat is also highly susceptible to drought and famine conditions due to the annual variability of rainfall – 100% or more – resulting in scant rains some years and excessive downpours in others. For example, in 1890 Bhawaniganj in Rangpur district recorded 685.8mm and in 1891 Jalalpur in Surat recorded 656.9mm, of rain in just 24 hours (Imperial Gazetteer of India 1909: 144). To examine the geomorphology of the region, Gujarat can be subdivided into four smaller sub-regions that form both environmental and geographical subunits: Kutch, Saurashtra, North Gujarat Plain, and South Gujarat (Figure 2.05)

2.2.3.1 Modern geography and climate

The Great and Small Ranns form the boundaries of Kutch, and separate the main landmass from Sindh to the north and Saurashtra to the southeast. These Ranns are vast desert-like expanses of sand and silt, whose surface is hardened through evaporation to the consistency of asphalt (Chitalwala 1993: 197). With an average annual rainfall of between 380-510mm (Dhavalikar 1995: 12) falling almost exclusively within the monsoon season, large tracts of Kutch, especially the Ranns, remain waterlogged for many months. Conversely, from November to March the region is mostly dry. However, Kutch sits atop of sandstone that acts as underground water storage and the region can survive severe droughts due to

its reserves of subsoil water (Chitalwala 1993: 198). There are no perennial rivers flowing through Kutch; however, the monsoon produces floods between July and October caused by both rainfall and the waters of the Arabian Sea being forced up onto the land by the monsoon winds. Due to the lack of natural drainage courses, as the monsoon season ends, the water recedes by evaporation, leaving a thick crust of salt behind (Figure 2.06) (Dhavalikar 1995: 13). Away from the marshy Ranns there are a few pockets of rich soil found on higher ground in Kutch known as *Khadirs* where fresh water deposits are located (*ibid*).

Saurashtra is a large peninsula projecting into the Arabian Sea, located between Kutch and mainland Gujarat. The Saurashtra peninsula is one of the most fertile regions of modern-day India, partly due to the abundant "black cotton soil" or regur - a Vertisol, characterised by a high content of fine clay and a low amount of organic matter. These soils are renowned for their ability to retain moisture in warm, dry climates (http://www.fao.org/ag/AGL/agll/prosoil/verti.htm). The average rainfall in the region is 350-650mm, although some areas on the southern coastline can receive in excess of 850mm per annum (Dhavalikar 1995: 14). The volcanic origin of Saurashtra has resulted in a series of small hills throughout its interior. The subsequent drainage pattern of Saurashtra is radial, with perennial rivers flowing to the sea and the Ranns in all directions. Botanical studies within Saurashtra indicate fauna primarily of shrub-savannah vegetation of the *Acacia-Capparis* community - trees of *Acacia nilotica* and shrubs of *Capparis decidus* and *Zizyphus nummularia* are found throughout the region, along with grasses, sedges and herbs (Weber 1991: 36). Present day cereal crops in Gondal Taluka region of Saurashtra are wheat, rice, jowar and bajra , along with legumes (chickpea, black gram, green gram), oil crops (mustard and sesame), herbs (cumin, coriander, garlic fenugreek, chillies), and cash crops (nuts, cotton and sugarcane) (*ibid.*).

The North Gujarat Plain and Southern Gujarat form a contiguous strip of land to the north and east of Saurashtra, and forms part of the Indian mainland. The North Gujarat Plain is a flat alluvial plain, bounded by the Little Rann of Kutch to the west and mountainous areas to the north and west. Its rainfall fluctuates between 400 and 800mm per annum, and its floral assemblages are almost identical to Saurashtra (Possehl 1999a: 327). The plain consists of almost entirely recent alluvium with very few topographical features. The largest river – the Sabarmati – crosses the plain before discharging into the Gulf of Cambay. The Sabarmati, along with the Banas, Rupen and Mahi rivers are fed mostly through

monsoon rains, and are therefore seasonal in nature (Bhan 1994: 73). The prominent vegetation on the North Gujarat Plain is tropical thorn forest, however, towards the western boundary with the little Rann of Kutch are monsoon fed grasses: bokna (*Cressa cretica*), kharidhar (*Aeluropus flariddum*), lapdi (*Aristada redaets*), soma (*Enimochloe colonum*), jinko soma (*Panicum flaridum*), mancho (*Dhetyloclemium egyptium*), mano (*Chlaris montani*), dhaman (*Cenchrus ciliaris*) and zinzvo (*Andropogan pumlis*) (*ibid.*).

Southern Gujarat represents the narrow coastal strip east of the Gulf of Cambay. The wettest region in Gujarat, Southern Gujarat receives on average 800-1000mm per annum. Rivers flowing westwards from the mountainous regions to the east frequently dissect the coastal strip. Southern Gujarat is densely populated by *Acaccia Capparis* thorn forest, whilst the mountainous zones to the east are covered in thick teak forest (Possehl 1999a: 328).

2.2.3.2 Modern subsistence

There are two broad agricultural schemes practised within Gujarat: *rabi* crops, which are sown during winter and harvested in spring, and *kharif* crops sown in summer and harvested during autumn (Meadow 1989: 61). The inhabitants of modern-day Gujarat are mostly farmers and herders, practising a subsistence lifestyle. However, these agriculturalist-herders can often maintain significant numbers of domesticated animals, in particular cattle and goats, with a limited number of sheep (Possehl 1999a: 328). Table 2.02 and Figure 2.07 highlight the variation between the four regions of Kutch, Saurashtra, North Gujarat Plain and Southern Gujarat in terms of agriculture and animal husbandry. Bajra (Pennisetum typhoides), a millet that can be grown within sandy soils under rain fed conditions, is grown during the *kharif* season; whilst wheat is mostly grown during the *rabi* season. Jowar (Sorghum bicolor), on the other hand, can be grown during both seasons, however, is generally considered as a *kharif* crop.

Table 2.02 and Figure 2.07 demonstrate the varied subsistence practices within modern-day Gujarat, indicative of the cultural and ecological integration of farmers and herders. The predominance of *kharif* crops, excepting Southern Gujarat, within the region is partially due to the strength of the summer monsoon, and the consequential lack of winter precipitation (Possehl 1999a: 339). Southern Gujarat, however, receives enough winter rainfall to allow *rabi* crops to also be economically viable. During the 1970s, Chitalwala undertook an examination of

modern settlements within the Rajkot district of Saurashtra (1979). He identified a hierarchy of settlements ranging from tiny hamlets up to villages and towns. The vast majority of these settlements nestle close to the banks of rivers and streams, occupying positions accessible to a dependable supply of water, good soil, and a commanding view of the countryside. However, above all else, it is access to a clean and perennial water supply that determines settlement location in Gujarat (Chitalwala 1979: 14).

2.2.4 Cholistan

For this study, the boundaries of Cholistan (within the District of Bahawalpur, Punjab Province, Pakistan) shall be those defined by Mughal (1997), as it is his settlement survey that forms the vast majority of the data to be utilised. Centred upon the dry bed of the Ghaggar-Hakra River, Cholistan is bordered on the north by the Sutlej River, on the northwest by the Punjab River, and to the west by the Indus River (*ibid*: 20). The India-Pakistan border delineates the eastern side – although in reality if the border did not exist then the region would extend several hundred kilometres into India along the dry bed of the Ghaggar-Hakra River. There is no natural southern boundary, as the rivers floodplain gradually blends into the Thar Desert. Cholistan measures roughly 1300 km from northeast to southwest, and varies between 64-290 km in width, forming a total area of 25,617 sq km (*ibid*: 20).

2.2.4.1 Modern geography and climate

The climate of Cholistan is arid, with summer temperatures reaching a maximum of 51.6°C and dropping to 0°C in winter (Figure 2.08). The average annual rainfall is only 137mm, and is very unreliable, and consequently the region suffers from frequent and severe droughts (Mughal 1997: 20). Despite this aridity, a large number of herds of camel, goat, cattle and sheep can be maintained, surviving on desert plants and rainwater collected in community ponds or *tobas*. These freshwater ponds can only survive close to the dry riverbeds. Away from the riverbeds, the groundwater is too salty either for irrigation purposes, or animal or human consumption (Possehl 1999a: 384). The flora of Cholistan is heavily dependent upon seasonal rainfall. During the summer, especially in years of relatively heavy monsoon rains in the Siwaliks, the areas alongside the riverbeds is rich, lush grassland and heavily utilised by nomads. The principal flora is *Prosopis spicigera* (khejra), *Salvadora oleiodes* (jhal), *Acaccia catechu* (khair),

Acaccia arabica (babul), whilst onager, wild pigs, blackbuck, and Indian gazelle are all plentiful in number (*ibid*: 384f).

2.2.4.2 Subsistence

The subsistence regime in Cholistan is somewhat varied, attributed to the extensive spread of irrigation in the region. However, 67% of the region remains uncultivable, and so agricultural activity is limited to the now extinct riverbeds, where the principal crops are bajra (*Pennisetum typhoides*), *kharif* pulses, jowar (*Sorghum bicolour*), and sesanum (*ibid*: 385). Cholistan can be divided into three agricultural zones: pure desert in the south; a central tract that is mostly desert and incapable of being cultivated and higher than the river valleys; and an alluvial tract along the Sutlej and Indus River (*ibid*). Table 2.03 and Figure 2.09 reveal the extent of different agricultural and pastoral traditions within Cholistan. Both bajra and jowar are *kharif* crops, whilst wheat is a *rabi* crop. It is interesting to note that there has been a decrease in the area of land that is under cultivation between 1903/4 and 1960. This downsizing in crop acreage could be the result of the expansion of modern towns and cities through industrialisation. There has also been a substantial decrease in the number of sheep and goat, although this is tempered by an increase in cattle and water buffalo.

2.2.5 Summary

The previous section has examined the extent and modern geography of the Indus Valley Tradition, which is characterised by a series of diverse ecological zones. The modern climate of the region is dictated by the winter and summer monsoons, which creates a high degree of seasonality in rainfall and river flow. This seasonality is reflected in modern subsistence strategies, where a bi-annual cropping system is utilised. *Rabi* crops (including wheat) are sown in winter and harvested in spring, whilst *kharif* crops (including millets and rice) are sown in summer and harvested in autumn.

Gujarat has been subdivided into four geographical regions – Kutch, Saurashtra, North Gujarat and South Gujarat. Kutch is an arid area bounded by the Great and Little Ranns, with no perennial rivers. Saurashtra, on the other hand, is a fertile peninsula of volcanic origin. It is renowned for its "black cotton soil", a vertisol that has the ability to retain moisture. North Gujarat borders both Kutch and Saurashtra. Its climate and topography is similar to Saurashtra, and two major

rivers – the Sabarmati and Luni flow through it. South Gujarat is the wettest part of Gujarat, with rainfall reaching over 1000mm per year. Its topography ranges from coastal estuaries to the Deccan Plateau to the east. Modern subsistence strategies in Gujarat incorporate both herders and farmers. *Kharif* crops predominate, except in South Gujarat where the rainfall is sufficient to support *rabi* crops as well.

Cholistan is much hotter and drier than Gujarat. The major topographical feature of Cholistan is the bed of the now dry Ghaggar-Hakra River, which dissects the region from northeast to southwest. Average rainfall is only 137 mm per year, whilst summer temperatures can reach over 50°C. As 67% of the land is uncultivable, pastoralism plays an important role in the subsistence strategies of Cholistan. The following section will develop the second theme of this chapter, examining palaeoclimatic and palaeoenvironmental research into the Indus Valley Tradition and the areas it encompasses.

2.3 Palaeoclimatic and palaeoenvironmental research into the Indus Valley Tradition

Having defined the extent and modern geography of the Indus Valley Tradition, this section of Chapter Two will deal with the first objective defined in section 1.3 – what were the environmental conditions during the period from 8000 to 1000 BCE, how will this impact upon human settlement and subsistence, and how have changes over the last four thousand years affected modern archaeological visibility? It will do this through two main avenues of investigation. The first is to examine palaeoclimatic research into the region, and second to trace hydrological changes in the rivers of the Indus Valley Tradition.

2.3.1 Palaeoclimate

The protohistoric climate of the Indus Valley has been a subject of much debate and conjecture. The first excavators of Indus Valley Tradition settlements presumed the ancient climate to have been much wetter than the present-day (Marshall 1931, Stein 1942). This inference was based upon the high density of archaeological sites located in areas that are now considered marginal, such as Baluchistan or Cholistan, the presence of elaborate drainage systems within urban centres and the large quantity of burnt bricks implying higher quantities of

fuel. Both Piggott (1950) and Wheeler (1959, 1968) based their assumptions of a wetter protohistoric climate on depictions of exotic fauna – rhinoceros, elephants and tigers - on ceramics and seals. Raikes and Dyson (1961) systematically refuted this four-fold evidence put forward by early Indus Valley scholars for a wetter climate. They suggest, "the available evidence simply does not demonstrate that climatic change of any major proportion has occurred" (*ibid*: 279). Furthermore, Fuller and Madella dispute the presence of exotic animals as an indicator of a wetter climate, suggesting that the presence of riverine forests where such animals would inhabit is reliant upon local climatic conditions, as opposed to more general climatic conditions (Fuller and Madella 2002: 356) - this will be expanded upon later in the chapter.

The hypothesis of a wetter climate was reintroduced by palynological studies undertaken by Singh (Singh 1971, Singh et al. 1974), based upon three salt lakes (Sambhar, Didwana and Lunkaransar), and one freshwater lake (Pushkar) in Rajasthan. Singh concluded that there were severe fluctuations in rainfall during the period 8000 to 1000 BCE (Table 2.4), and that these related not only to the growth and decline of the Indus Valley Tradition, but also to the origins of agriculture and the later intensive development of agriculture in the fourth and third millennium BCE (Misra 1984: 461). The following sections will test whether this hypothesis – that the climate was wetter during the Indus Valley Tradition – is supported by more recent work. Later chapters will deal with the second aspect of Singh's hypothesis – whether this wetter climate stimulated the development of agriculture and social complexity in the region. It will examine, in turn, palaeoclimatic research in the Thar Desert, The Arabian Sea and The Himalayas.

2.3.1.1 The Thar Desert

The salt lakes of the Thar Desert were the subject of palaeoclimatic research by Allchin, Goudie and Hegde (1978) who were interested in ascertaining the nature and origin of the salt in the lakes. The largest of the lakes – Sambhar – is 35km in length and covers a total area of 233km^2. However, even immediately after the monsoon rains it is only 1m deep, and can dry out entirely during the dry season. Two lakes – Didwana and Kuchaman – lie to the north of Sambhar, and share a similar chemical composition (86% sodium chloride, 10% sodium sulphate, 4% sodium carbonate). The study also included Lunkaransar, a 5km^2 lake in Bikaner, and a series of lakes in the Nal Depression in Gujarat (*ibid*: 11). They hypothesised that the salt could have accumulated by one of three ways: (1) the salts are blown inland from the Rann of Kutch by the southwest monsoon, and

then concentrated by the evaporation of the water accumulated during the wet season; (2) the salts are a relict of the Tethys Sea – which is said to have covered a large section of western Rajasthan until the late Tertiary. The authors dismiss this option for two reasons: first, there is no evidence of marine sediments to support the hypothesis; second, there are no similarities between the chemical compositions of the salts with that of seawater (*ibid*: 12f). (3) The depressions and salt accumulations are the result of Holocene or Late Pleistocene disruption of drainage by dunes or desiccation (*ibid*: 13). The authors tend to favour this hypothesis over the previous two.

These early studies into the palaeoclimate of the Thar Desert have been built upon during the last 25 years. Further work by Singh, in conjunction with Wasson and Agrawal (Singh et al. 1990) has built upon his earlier model of fluctuating rainfall patterns. They suggest that between 18000 and 11000 BCE the lakes were hypersaline, and that steppe vegetation grew prominently - indicative of a weakened summer monsoon, but with higher winter precipitation than at present. After 11000 BCE, gradual increases in precipitation lead to the intermittent filling of the lakes with freshwater, followed by virtual freshwater conditions between 7000 and 4000 BCE (concurrent with periods II, III, and IVa from Fig 2.11). From 4000 BCE onwards precipitation, and therefore lake levels, begins to decrease, until 2000 BCE the lake becomes ephemeral (*ibid*). However, Kajale and Deotare's palynological and palaeoenvironmental study at three salt lakes not covered by earlier studies have suggested that fluctuations in pollen data may be the result of local hydrological adaptations, and not necessarily the consequence of general climatic changes (Kajale and Deotare 1997). Instead, they emphasise that climatic change need not be generalised for the whole region, but that geomorphological, topographical and tectonic factors can be responsible for local changes (*ibid:* 409). It should also be noted that Singh's studies (Singh 1971, Singh et al. 1974, Singh et al. 1990) are reliant on only a small number of radiocarbon dates, and as such the dates put forward should be considered carefully.

To the south of Rajasthan on the fringes of the Thar Desert, palaeoclimate studies have been carried out at the Nal Sarovar – a salt lake situated within a low-lying belt of land running from the Rann of Kutch to the Gulf of Cambay. No major river drains into the lake, leaving surface runoff from the monsoon rains as its only water source. During the summer monsoon (July-September) the lake is at its deepest and contains fresh water. As precipitation begins to decline after October,

the lake becomes increasingly saline, and in some years will dry out completely during winter (Prasad et al. 1997b). Carbon/Nitrogen ratios and $\delta^{13}C$ analysis on the organic matter from a 3m core taken from the lake allowed the authors to construct a climatic pattern for the immediate area. They suggest a fluctuating climate over the 7000 years contained within the core:

- Period 5 (4600 – 4000 BCE). Dominance of C_4 (plants which favour aridity and low soil moisture) vegetation and a higher proportion of sand at the onset of the period indicates that the surrounding sediments had not yet been stabilized by vegetation, resulting in their erosion and deposition in the lake. A continual decrease in C/N ratios and depletion of $\delta^{13}C$ suggests that the climate during the early part of this period was dry, followed by a period of increasing precipitation.
- Period 4 (4000 – 2800 BCE). High C/N ratios and an escalation of $\delta^{13}C$, combined with a lack of aquatic plants is indicative of a dry or shallow lake bed with evenly distributed short wet spells – capable of sustaining terrestrial organic matter, but not aquatic vegetation. It is likely that the even distribution of rainfall was a consequence of increased winter rainfall and decreased summer rainfall [relative to today's climate]. The Lake environment was one of shallow freshwater, with periods of aridity and desiccation.
- Period 3 (2800 – 1000 BCE). C/N levels and $\delta^{13}C$ values decrease, and increasing aquatic plant material suggests a higher lake level. The authors interpret this as an indication of a wetter climate.
- Period 2 (1000 BCE – 1000 CE). A balanced mix of terrestrial and aquatic plant matter and a gradual enrichment of $\delta^{13}C$ values indicate lower precipitation. The overall climate was wetter than today's, but begins to show a trend towards aridity.
- Period 1 (1000 CE - present). $\delta^{13}C$ values are stable throughout this period, and C/N ratios indicate mixed vegetation, although there are periods of aquatic dominance perhaps indicating short spells of high water levels. Overall, the climate in this period is similar to the modern climate of the region (Prasad et al. 1997b: 157).

The authors acknowledge that this periodisation may be a localised entity, as the Nal Sarovar lies in an area where the climate is dominated by the southwest monsoon. In turn, they recognize that snow cover and glaciation in Eurasia influence the southwest monsoon. Expansions of Eurasian glaciers circa 3000

BCE and 1000-200 BCE representing cold periods correlate with dry periods at the Nal Sarovar, supporting their interpretations (*ibid*: 157f). Finally, Kar *et al.* (2001: 67) identify a period of increasing aridity and desiccation beginning circa 2200 BCE. Jain and Tandon (2003) remark that:

> "The changes in fluvial pattern and phases of incision in western India [Thar Desert] can be explained in terms of changes in discharge and sediment supply, which were forced by changes in the monsoonal strength, and routed through vegetation cover. There seems to be a continuum of processes between the desert and the desert-margin rivers that are linked through a precipitation-gradient"

2.3.1.2 The Arabian Sea

Kumar *et al* (2005) analysed fifteen sedimentary cores taken from the western continental margin of India in the Arabian Sea in order to extract late Quaternary palaeoclimatic signals. Through measuring magnetic susceptibility, acid-insoluble residues and organic carbon, $CaCo_3$ and $\delta^{18}O$ levels within the cores they were able to identify key climatic developments relating to the southwest and northwest monsoons. First, they identify a strengthening in the southwest monsoon from 8800 BCE, concurrent with a decrease in the prominence of the northwest monsoon which had previously proved to be dominant in the area, transporting large amounts of aeolian material on stronger and colder winds (*ibid*: 77f). Secondly, this intensified southwest monsoon continued until 3000 BCE, and brought increased precipitation within the Indus Valley and large amounts of fresh water (*ibid*: 78f).

Work by Staubwasser *et al.* (2003) suggests that during the mid-Holocene summer-winter rainfall was not only higher than today, but was more evenly distributed throughout the Karakorum mountains and upper Indus Valley. Through the analysis of $\delta^{18}O$ (surface dwelling planktonic foraminifer *Globigerinoides ruber*) records from Arabian Sea cores, they identified a positive shift to heavier $\delta^{18}O$ levels, indicative of cooler sea surface temperatures and higher salinity circa 2200 BCE, which the authors suggest represents a reduction in the Indus discharge at this time. This coincides with reductions on rainfall within northern Arabia, Mesopotamia and the Mediterranean suggestive of a wider climatic development stemming from altered tropical airflow and changes in monsoon seasonality (*ibid.*). Finally, Staubwasser *et al.* postulate that in the period prior to

2200 BCE summer and winter rainfall over the northern Indus Valley was not only higher, but also more evenly distributed throughout the year (2003).

2.3.1.3 The Himalayas

In their analysis of loess deposits within the Central Himalayas, Pant *et al.* (2005) have linked episodes of loess deposition and soil formation to changes in the strength of the southwest monsoon over the last 20000 years – see Table 2.5. Further work on aeolian and fluvial deposits along the River Luni in the Thar Desert, lends credence to this phasing, and in fact builds upon it (Kar et al. 2001). Analysis of the river sequences highlights a period of monsoon instability between 11000 and 6000 BCE, followed by a period of pedogenesis (soil formation) as opposed to aeolian deposition. In addition, they highlight two periods – 11000-1050 BCE and 8000-7500 BCE – of exceptionally vigorous monsoon activity.

Palynological studies on Central Himalayan peat profiles develop this reconstruction of monsoon strength within South Asia. Samples from two peat bogs within the Dokriani Glacier in the upper catchment of the Ganges Valley, extending back eight thousand years were analysed for indicators of climatic change. Phadtare (Phadtare 2000) identified six broad climatic stages through the fluctuations in certain pollen types, primarily *Quercus* and *Pinus*. *Quercus semecarpifola* is a sub-alpine evergreen oak, and is indicative of a cold or dry climate. *Pinus wallichina* (Himalayan Blue Pine), on the other hand, requires a relatively warm and moist condition (*ibid*: 124). Both of these species are present in the present day Himalayas, albeit existing at different altitudes. Throughout the pollen cores taken *Quercus* and *Pinus* show opposite trends in terms of percentage curves, and as such Phadtare identifies the Q/P ratio as a bioclimatic indicator for climate trends (*ibid*: 124). Dry episodes can also be supported by the presence of *Ephedra*, whilst local hydrological developments can be inferred from the percentage of algal spores (*ibid*).

Phadtare's (2000) analysis showed a high Q/P ratio c.5800 BCE indicating a cool climate, and this ratio increased until c.5200 BCE suggesting a decreasing trend in rainfall. At c.4600 BCE, there is a rapid increase in *Pinus* and *Abies* at the expense of *Quercus* and *Alnus* coupled with increasing percentages of grasses is indicative of warming and increased rainfall. By c.4000 BCE a higher Q/P ratio and decrease in *Abies* suggests a drying of the climate, a lower numbers of grasses suggest a decrease in moisture. Between 4000 and ~3000 BCE there is a steady decrease in the Q/P ratio implying progressive warming, and at the same

time the decreasing abundance of ferns and Cyperaceae suggest a wetter climate. During 3000 to ~2500 BCE the pollen record is dominated by conifers and grasses, and coincides with the Holocene climatic optimum and denotes a significantly warmer and wetter climate. An increasing Q/P ratio combined with a decline in *Abies* pollen during the subsequent period, 2500-2000 BCE, points towards a gradual cooling of the climate. From ~2000 to 1500 BCE the pollen analysis is characterised by the highest abundance of *Quercus* in the sample record and an abrupt decline in *Pinus* and grasses. Phadtare identifies this as the coldest climate phase, and a rapid increase in algal spores indicates a rapid drying in conjunction with the cooling (2000).

The period between 1500 and 1 BCE is characterised by significant fluctuations of *Quercus*, *Pinus* and grasses and is suggestive of an unstable but overall increasingly warmer climate. A steady decline of the Q/P ratio between 1 and 1000 CE suggests that rainfall was gradually increasing, until an increased Q/P ratio c. 1200 CE - possibly relating to the Little Ice Age. Since then there has been a gradual increase in the Q/P ration indicating a warming climate. Phadtare (2000) links the oscillations of the ratio of *Quercus* and *Pinus* to fluctuation in the strength of the southwest monsoon that somewhat mirrors that of Pant *et al.* – see Table 2.5. Monsoon strength increased from ~5200 BCE, reaching its maximum at c.3000 BCE, followed by a gradual decrease in intensity until 2500 BCE. The period between 2500 and 2000 BCE was characterised by a steep decline in monsoon strength, with its minimum intensity reached ~1500 BCE. Following this the monsoon was unstable until 0 BCE, but showed a gradual strengthening until ~1000 CE (*ibid.*).

2.3.1.4 Summary

The palaeoclimatic reconstructions from the Thar Desert, Arabian Sea and Himalayas, outlined above, share a number of common themes. They all demonstrate a pattern of fluctuating precipitation, mostly commonly attributed to changes in the strength and frequency of the southwest monsoon. However, diametrically opposed to the original hypotheses of Marshall (1931), Stein (1942), Piggott (1950) and Wheeler (1959, 1968) who attributed the emergence of the Indus Valley Tradition to a substantially wetter climate at the time, palaeoclimatic research in the Thar Desert, Arabian Sea and The Himalayas suggests that even before the Integration Era (see the following chapter) there was a decrease in precipitation and monsoon strength. From the Early Holocene, all of the palaeoclimatic reconstructions identify a significantly intensified southwest

monsoon, often referred to as the Holocene Climate Optimum, and therefore increased precipitation, in the Indus Valley lasting until 3000 to ~2500 BCE (Singh *et al* 1990, Phadtare 2000, Kumar *et al* 2005, Pant *et al* 2005), although Prasad *et al* (Prasad et al. 1997a, Prasad et al. 1997b, Prasad et al. 1998) place this boundary at 4000BCE.

Kumar *et al* (2005) identify a shift towards a semi-arid climate as early as 3000 BCE, whilst Phadtare (2000) places it at 2500 BCE. Both Kar *et al* (2001) and Staubwasser *et al* (2003) situate the change at 2200 BCE, as does Pant *et al* (2005). However, it has been realised that such climatic changes are not abrupt singular events, but are spread out over hundreds of years, and as such the combined evidence from the three regions indicates a period of decreasing monsoon strength and regional precipitation in the period between 3000 and 2200 BCE. The only contradiction to this hypothesis is the work by Prasad *et al* (1997a) at the Nal Sarovar, who identified the period 2800-1000 BCE as the wettest in their study, although they attribute this to local rather than regional phenomena. The period from 2000 BCE onwards is more difficult to interpret. Many authors describe the climate as unstable (Schuldenrein *et al* 2004, Pant *et al* 2005); and Phadtare (2000) identifies a minimum in the southwest monsoon intensity c.1500 BCE, whilst Staubwasser *et al* (2003) describe the period from 2200 BCE as a "drought" that is linked to inter-regional Holocene climate change.

The above interpretations suggest that Singh's (1971, Singh *et al.* 1974) hypothesis that the climate during the Indus Valley Tradition was wetter than the present day is unfounded. Despite this, many Indus Valley scholars still assert that there is little evidence to suggest any change between the present day climatic conditions of the Indus Valley region and that of the pre- and protohistoric period (Dhavalikar 1995, Mughal 1997, Possehl 1999a). Possehl asserts that:

> "[T]here was no significant difference in the rainfall regime in the period from ca. 7000 to 1000 [BCE] as compared to today's long term pattern.. Rainfall is dynamic, like other features of the environment and this position admits differences in yearly patterns, as well as longer term 'cycles' of drought and rainfall abundance, in the range of scores or even a hundred years or so...[C]hanges in rainfall, or climate, should not be seen as an explanation for major historical events, such as the eclipse of the ancient cities of the Indus" (Possehl 1999a: 265).

Whilst Possehl is correct to suggest that a change in climate should not be seen as a prime mover in either the emergence or demise of a society, it has been documented elsewhere in archaeology that environmental factors can play important roles in societal development. Within northern Africa and western Asia, the period between 3500-2200 BCE (Mid-Late Holocene) has been documented as a regional shift towards dryer conditions, and has been put forward as a major contributor to decreasing societal complexity in Mesopotamia and Egypt (Cullen *et al.* 2000, deMenocal 2001, Haug *et al.* 2003, Staubwasser *et al.* 2003, Weiss and Bradley 2001). Conversely, in northwest China, An *et al.* (2004) have identified that the Majiayao and Qijia societies flourished in the period 3300-2200 BCE, described as semi-arid, despite earlier periods being warmer, wetter and generally more suited to agricultural activity. They also identified a distinct climatic shift c.2000 BCE, followed by a rapid period of diminishing settlement density that the authors link directly to climatic deterioration (*ibid.*). The following section will examine hydrological changes within and since the Indus Valley Tradition.

2.3.2 Hydrological changes within and since 8000 BCE

Piggott (1950) identified the Indus River as a major source of both irrigation water for agriculture, and the main source of communications and trade between the two main cities of Mohenjo-daro and Harappa. Along with other major Bronze Age societies – in Egypt, Mesopotamia and China – their associated rivers have always been perceived as one of the main driving forces behind their emergence and continued existence. Certainly, many Indus Valley archaeological surveys have focused upon existing or ancient river beds (Dimri 1999, Dimri 2001, Mughal 1971, Mughal *et al.* 1996). From these, a broad understanding of how settlements correlate with watercourses is beginning to emerge (Mughal 1997), as is the role they played in internal and external trade routes (Kenoyer 1998).

There are, however, a number of issues with these approaches. Firstly, due to the transient nature of the rivers and the fluctuating climate of the region, the location and dimension of the main rivers in the region may have been altered over the last several thousand years. Second, modern developments such as dams, irrigation diversion and canal construction will have had an impact on the flow of the river. Finally, by concentrating upon river surveys, it is possible to fall into Wylie's interpretative dilemma (1995), of identifying a relationship between sites and rivers if one sets out to look for such an affiliation.

This section of Chapter Two aims to address the first two points raised above. It will examine the rivers of the Indus Valley Tradition in five geographical segments: the upper Indus River, the Punjab Rivers, the lower Indus River, the Ghaggar-Hakra River and rivers in Gujarat. For each of these areas, the modern course of the river will be described, evidence for modern manipulation of the river highlighted, and evidence of past changes in the course, flow and discharge of the river discussed. However, before beginning this discussion, the following section will discuss the work of Flam (1976, 1982, 1999) who has worked extensively on hydrological changes within the Indus Valley Tradition.

2.3.2.1 Flam's hypothesis

Flam identified that links between ancient sites and the environment have been based upon present-day configurations of the river, rather than palaeoenvironmental reconstructions (1999). Flam states:

> "[C]ontinuing geomorphological transformations as well as human interactions with the environment throughout the Holocene have greatly altered the pristine environment which may have first attracted human settlement to the region in prehistory. The prehistoric configurations of soil, relief and hydrology, as well as potential land use would have induced considerable consequences on prehistoric populations settling in the Lower Indus basin" (*ibid*: 36).

This is not a case of environmental determinism, but rather, as stated in the objectives (section 1.4), trying to develop an understanding of how hydrological change has impacted upon human settlement and subsistence. Through his analysis of historical accounts, aerial photography as well as field data, Flam postulates that during the fourth and third millenniums BC, there were two river systems flowing throughout the Indus Valley. The *Sindhu Nadi* flowing to the west of the modern Indus and fed by the Chenab, Jhelum and Ravi Rivers, and the *Nara Nadi* supplied by the Ghaggar-Hakra, Sutlej and possibly Yamuna Rivers – see Figure 2.10. This secondary river of the Indus Valley, a continuation of the Ghaggar-Hakra River has been identified by some as the ancient Sarasvati River - the holiest river within Vedic literature said to have flowed from the mountains to the sea, and surpass all other rivers in its "greatness" (Misra 1984: 475). The following sections will try to identify whether Flam's hypotheses are correct.

2.3.2.2 Upper Indus River

Almost 3000 km long, the Indus River's origins lie within the glaciers of southern Tibet, from where it initially flows northwest along the Tethyan suture zone - where the Indo-Australian and Eurasian tectonic plates meet. After this, the river cuts deeply across the Western Himalayan Syntaxis - an active margin of the above zone that contains five peaks of over 8000m (Garzanti *et al.* 2005: 288f) – at which point it flows west and experiences the steepest gradients and erosional forces along its length (Burbank *et al.* 1996). At this stage of its course, the Indus River is largely unaffected by monsoon rainfall, however during the summer snow-melts water discharge increases by between 20-50, whilst its sediment load increases 500-1000 times (Garzanti *et al.* 2005: 289). In this tectonically active region, the Indus River incises through the bedrock at the rate of 2-12 mm per year – some of the highest sustained bedrock incision rates documented in the world (Burbank *et al.* 1996: 506). Turning south, the river flows to the west of Kohistan and Chitral through a narrow gorge between 1350-915 m above sea level, with steep sides measuring up to 4500m (Spate and Learmonth 1967:28f), before emerging through the lesser Himalayas and reaching the first of many dams along its course – the Tarbela Dam. Completed in 1974, the Tarbela Dam has been shown to have caused a massive reduction in the sediment load of the Indus – from 287-323x10^6 tonnes/year to ~200-235x10^6 tonnes/year (Garzanti *et al.* 2005: 289f). South of the Tarbela Dam, the Indus flows at a much lower gradient, and begins to deposit some of the sedimentary load it accumulates. Before construction of the Tarbela Dam, the Indus was depositing 80x10^6 tonnes/year downstream of it. After its construction, this sediment flux dropped to 52x10^6 tonnes/year and slowly decreased its depositional rate as it flows downstream (*ibid*: 290). Further downstream the river enters a narrow gorge across the Potwar Plateau - a large undulating plateau covered in loessic silt. These silts are easily eroded and as such rivers and streams – the Indus included – flow through deep canyons (Spate and Learmonth 1967: 500).

2.3.2.3 Punjab Rivers

The Thal Desert separates the Indus on the west, from its major tributaries flowing through Punjab to the East – the Jhelum, Chenab, Ravi, Beas and Sutlej Rivers. These five rivers have their origins in the southern Himalayas, on the Indian side of the suture zone. From here they flow southwest from the Lesser Himalayas through the Vale of Kashmir to the Pir Panjal mountain range and Siwalik Hills. The river courses provide the few passes through these mountainous regions to the agriculturally rich Vale of Kashmir beyond (*ibid*: 430ff). Exiting the hills, the

five rivers flow into Punjab – meaning "land of the five rivers" – a huge plain measuring 565 by 725 km on its northwest-southeast and northeast-southwest axes. The region is a gently sloping (on average <1m per km) alluvial plain, falling from 366m above sea level in the north-eastern sub-montane strip to 76m asl in the southwest where the Indus flows (*ibid*: 516). The Jhelum, Chenab and Ravi Rivers unite to form the Trimab and are later joined by the Beas and Sutlej Rivers to form the Panjnab ("Five Streams"). The Panjnab, in turn, flows into the Indus River at the modern town of Attock. Schuldenrein (2002: 55) characterises the five rivers of Punjab as "high order tributaries comprising of low relief topography with mildly elevated interfluves, regionally referred to as *doabs*." The rivers are sunk into the broad alluvial plains (locally known as *khadirs*), bounded by steep sided bluffs (*dhayas*) that can be up to 6m higher than the average river level. The *dhayas* are naturally higher than the intermediate *khadirs* due to silt deposition during floods, and the *khadirs* provide agriculturally rich soils but are prone to flooding (Spate and Learmonth 1967: 517f).

The 1960 *Indus Waters Treaty* gave control of the entire flow of the Indus, Jhleum and Chenab Rivers to Pakistan, and the Ravi, Beas and Sutlej Rivers to India. Since then, the Indus and its Punjab tributaries have been engineered into the world's largest irrigation system, with a large series of dams and canals created to irrigate the arid lands of eastern Pakistan and north-western India (Garzanti *et al* 2005: 288ff). The Mangla Dam – completed in 1967 – reduced the sediment load of the Jhelum River from $45x10^6$ to $0.5x10^6$ tonnes/years. Finally, the combined discharge of the Punjab rivers has dropped from >100 to <60 km^3/year, whilst the flow of the Ravi and Sutlej Rivers can cease during the dry season (*ibid.*). It is clear that the river systems of Punjab have been drastically altered within the modern industrial era, and this will have had a significant impact upon both archaeological visibility of sites and upon reconstructions of site distributions.

2.3.2.4 Lower Indus River

Below the confluence of the Indus and Panjnab, the river flows through "almost exclusively aggradational valley terrain and thence onto the prograded delta at the mouth of the Arabian Sea" (Schuldenrein 2002: 58). The river plain of the lower Indus Valley comprises of subtly undulating alluvial sediments, representing ancient patterns of deposition (Flam 1999: 36). However, modern water management approaches have drastically altered the effects of the river on its immediate and more distant environments. In 1947, the Indus River deposited large amounts of sediment along its plain, whilst ~$250x10^6$ tonnes/year of

sediment reached its mouth leading to rapid deltaic growth. A series of barrages built along its course has caused its annual sediment load deposition in the delta to drop to <50x10^6 tonnes/year (*ibid*: 290). Similarly,

In his analysis of the landscape history of the Indus and its tributaries, Schuldenrein identifies tectonic activity as the major factor in the drainage history of the river (2002: 60ff). It has been well documented that in 1819 an earthquake created a 3m high and 80km long soil structure impeding the Nara channel - a canal leading from the Sukkur barrage on the Indus to the coast (Fuller and Madella 2002, Raikes 1965, Spate and Learmonth 1967). In addition, tectonic uplifting of the Makran Coast can cause displacements of 1.8-4.5m, and Schuldenrein suggests that tectonics rather than climatic developments have lead to hydrological changes within the Indus Valley (2002). One particular area of investigation has centred upon the buried course of the Beas River in Punjab, and two associated mounds with Indus Valley Tradition occupation associated with them (Schuldenrein *et al*: 2004). Cores extending below the base occupation levels were taken from both the sites, along with charcoal and sediment samples for dating purposes. Analysis of the cores allowed the authors to identify climatic developments, as well as identify localised environmental changes. Climatically, the cores supported the evidence from Holocene environmental reconstructions – a wetter period from 8000-5000 BCE followed by a period of desiccation between 5000 and 4000 BCE. However, during the period covering the Indus Valley Tradition the climatic evidence becomes, by the authors' own admission, ambiguous (*ibid*: 795). One particular aspect of the Beas River that is identified in the study is its tendency to avulse and migrate across the flood plain.

As mentioned earlier, large rivers have a tendency to migrate across their flood plains often bifurcating and undergoing changes in course. Flam has hypothesised a number of transitions in the course of the Lower Indus River (i.e. from the Panjnad southwards) over the last several millennia (1999). He identified that there are very few naturally occurring barriers to the flow of the Indus throughout its lower course, other than the Rohri Hills in northern Sindh and Ganjo Takar in southern Sindh (see Figure 2.11d). At present the Indus River flows immediately to the north of the Rohri Hills (through the Sukkur Gap) and to the west of Ganjo Takar – and throughout its course it is held in location by artificial embankments preventing any change in course.

However, through sedimentary analysis, fluvial geomorphology, aerial photography and historical sources, Flam has identified a number of relict courses of the river that demonstrate the meandering nature of the river (*ibid*). He summarises the river migrations from 8000BP onwards into four stages or courses: The Jacobabad Course during the Early Holocene (Fig 2.11a); The Sindhu Nadi in the Middle Holocene (Fig 2.11b); The Kandhkot Course during the Middle-Late Holocene (Fig 2.11c); and finally, the present day course of the Indus (Fig 2.11d). Flam stresses that these channels represent the main trunk of the river, and that before the advent of flood prevention controls the river would have produced numerous spill channels, bifurcations, flow diversions and avulsions (*ibid*: 56). With this in mind, many of the key sites of the Indus Valley Tradition would have been located either closer or further away from bodies of water than present. The second aspect of Flam's research is the identification of a possible second river system of the Indus Valley – the Nara Nadi – that existed during the period 4000-2000 BCE (1999). He concludes that the river flowed from the Hakra River in Cholistan, through the remnants of the Raini and Wahinda Rivers into the Nara Nadi - an ancient channel that has been re-engineered into a modern irrigation channel – before discharging into the Rann of Kutch. The existence of this second river has been a contentious issue for several decades, with several hypotheses and explanations put forward – the most common being that the now defunct Ghaggar-Hakra River was a perennial river that flowed to the sea.

2.3.2.5 Ghaggar-Hakra River

Archaeological surveys along the dry bed of the Ghaggar River in India (Ghosh 1952, 1953, 1959, Stein 1942, 1943) and its continuation, the Hakra, in Pakistan (Mughal 1971, 1997, Mughal *et al.* 1996) have revealed a high density of sites, suggesting that in the past the river had substantially greater and more permanent flow. Originally, this was seen to be evidence of substantially higher precipitation in the now arid region (Stein 1942). It is now recognised to represent developments in the catchments and allegiances of river tributaries (Mughal 1992). The present-day Ghaggar River drains south-eastern Punjab, but is almost entirely dependent on rainfall in the Siwalik Hills for its supply of water (Mughal 1971: 18). It ceases being perennial about 320km from the Hills; however there is a dry bed that runs almost parallel to the Sutlej and Indus Rivers for several hundred kilometres, ending at an inland "delta" situated near Fort Derawar. Flam postulates that in the past the Sutlej River flowed into the Ghaggar-Hakra River, vastly increasing its flow rate (1999: 64).

Abandoned river courses and avulsions support the notion of a northwest migration of Punjab drainage patterns from the Ghaggar-Hakra to the Indus River from 2000 BCE to the present (Schuldenrein 2002: 60f). In addition, there appear to be numerous avulsions and cross-divide stream captures between the Indus and Ganges catchment zones. Misra (1984, 1994) goes as far as to suggest that throughout the entire Indus Valley Tradition that the Yamuna River was a tributary of the Ghaggar-Hakra River, before finally being captured by the Ganges River sometime in the fourth millennium BP. This combined input of the Yamuna and Sutlej, according to Misra, allowed the Ghaggar-Hakra to be a "mighty river... flowing from the mountains to the sea. Its very wide bed... also shows it to have been a mighty river like the Indus" (1984: 483). However, Misra's assumptions are grounded in his equation of the Ghaggar-Hakra River of 2000 BCE with the Sarasvati River of the *RigVeda*, and are based as much upon oral tradition and folklore as they are upon geomorphological observations.

Whilst there is little disagreement that the Ghaggar-Hakra was a perennial river during the Indus Valley Tradition, there is some debate as to when, and if, both the Sutlej and Yamuna Rivers were both part of its drainage system. Flam highlights the fact that river capture and the drying of streams are not singular events, but are events that transpire over time (1999: 57):

> "The Ghaggar-Hakra-Nara was a highly seasonal stream, as were the Indus and its tributaries. Changes in the flow characteristics of the river would have had a slow and continuing impact on human settlement in the region... It is not known if the Sutlej and the Yamuna were captured at the same time or different times, and if at different times how much time passed between the two 'events'"

Flam's hypothesis is that the Sutlej most probably did flow into the Ghaggar-Hakra channel, whilst remaining non-committal regarding the Yamuna drainage. He also traces the ancient course of the river through Fort Abbas and Fort Derawar, the remnants of the Raini and Wahinda, before entering the Nara channel, skirting the edge of the Thar Desert before entering into a delta and flowing into the Rann of Kutch (1999). This is the same route that Misra (1984, 1994) postulates but with the added input of the Yamuna Rivers discharge. A number of issues arise with this potential explanation. Most prominent is that the three defunct sections of the potential river – the Ghaggar-Hakra, the Raini-

Wahinda and the Nara channel – are all unconnected. The Ghaggar-Hakra channel gradually narrows into an inland delta in the vicinity of Fort Derawar, whilst the northern section of the Nara channel extends all the way to the Indus River. Although this may reflect modern hydrological developments, the possibility remains that the Ghaggar-Hakra never reached the sea, and that the Nara channel was an overspill or diverted channel of the Indus River.

This uncertainty in terms of hydrological developments of Sutlej-Yamuna-Ghaggar-Hakra drainage structure impedes accurate reconstructions of the river system during the Indus Valley Tradition. In turn, this will lessen the accuracy of the analysis of settlement patterns within Cholistan in later chapters. For the purpose of this thesis only those assumptions that are grounded in archaeological and geomorphological reasoning will be adopted. They are:

1. That a perennial Ghaggar-Hakra was a more prominent factor in the drainage of Punjab and northern Rajasthan, and flowed as far as Fort Derawar. (Figure 2.12)
2. That the Sutlej River probably flowed into the Ghaggar-Hakra, whilst the Beas River flowed into the Chenab and ultimately the Indus.
3. In the period 2200-1000 BCE a combination of tectonic activity and climatic upheaval initiated a change in the drainage patterns from the Siwalik Hills resulting in the gradual drying of the Ghaggar-Hakra channel.

For the purpose of this thesis, it is not strictly necessary to ascertain whether the Ghaggar-Hakra flowed directly into the Rann of Kutch, ended in an inland delta or merged with the Indus or one of its spill channels. However, through the analysis of Quaternary aeolian stratigraphies of the Ghaggar Basin, Wadhawan and Kumar (1996) reject the notion of a south-westerly flowing Ghaggar River during this period. In addition, they also believe the river would have flowed much further north than the present-day dry bed would suggest. Figure 2.12 demonstrates the most likely drainage pattern of the Ghaggar-Hakra during this period.

2.3.2.6 Gujarat

The palaeohydrology of ancient Gujarat differed significantly to that of today. This is primarily the consequence of geological activities and alluvial build-up. Hydrological, archaeological and geological studies have suggested that the Great and Little Ranns of Kutch were entirely submerged during the Indus Valley Tradition (Chitalwala 1993: 199). Indeed, Gupta (1977: 205) informs us "even as late as 200 years ago, the Little Rann of Kutch was about 4m deep." In addition, the physical features of Saurashtra suggest that, rather than forming a peninsula

of mainland India, the region was in fact a coastal island. A strip of salt land – the Nal Depression - between Saurashtra and mainland Gujarat suggests that at one time a channel joined the Rann of Kutch with the Gulf of Cambay (Chakrabati 1997, Dhavalikar 1995, Merh and Chamyal 1993). The alluvial action of a number of rivers – the Sabarmati, Luni, Banas and Rupen – has caused the silting-up of the channel since prehistory. However, numerous lakes and marshes still mark the course of the old channel within the Nal Depression (Chakrabati 1997: 94). Within the Little Rann of Kutch, Merh and Chamyal identify a period of marine sedimentary deposition in the period from 4000BP to ~2000 BCE, followed by a shift to fluvial sedimentary deposition from ~2000–0 BCE onwards which they suggest indicates deposition of sediments within a low sea level environment (1993). Finally, from 0 CE onwards they identify deposition during the progressive withdrawal of a high sea, suggesting a potential timeframe for the linking of Saurashtra to the mainland.

There is less evidence of major developments in terms of shifting river courses in Gujarat since the Indus Valley Tradition. The radial pattern of drainage within Saurashtra is unlikely to have changed, other than changes in flow rate linked to increasing and decreasing levels of precipitation in the region. The larger rivers flowing into Gujarat – the Sabarmati, Narmada and Mahi – all show evidence of phases of aggradation as well as phases of downcutting of their terraces (Allchin *et al* 1978:66f). The authors suggest that this is indicative of general climatic changes rather than localised developments. Further work on these three rivers as well as the Luni basin by Jain and Tandon (2003) supports this hypothesis. They identified a period of terrace incision between 10000-3000 BCE, a phase of aeolian deposition between 3000-2500 BCE, and a pattern of meandering rivers from 2500-1000 BCE. The period of aeolian deposition identified, Jain and Tandon attribute to the eastward expansion of the Thar Desert as a direct result of a weakened monsoon. The transition to a meandering river is indicative of a more humid climate, as vegetation cover in the desert-margin areas reduces the sediment load of the rivers (*ibid*: 2232). Merh and Chamyal (1993) believe the similarities of the Narmada, Mahi and Sabarmati deposits is indicative of the prevalence of identical climate conditions all over Gujarat during the Early to Mid-Holocene.

2.3.2.7 Summary

The purpose of section 2.3.2 was to trace hydrological changes in the rivers of the Indus Valley Tradition. One of the stated objectives of this thesis was to ascertain

the environmental conditions during the Indus Valley Tradition and how landscape and climatic changes over the last four thousand years will have impacted upon archaeological visibility. This section has concentrated primarily upon the last theme of this objective – landscape changes over the last four thousand years and their impact upon archaeological visibility. In order to achieve this, the above section has detailed the modern course of rivers in the Indus Valley Tradition, evidence for modern manipulation of the rivers, and evidence of changes in the course, flow and discharge of the rivers over time. It did this by dividing the region into five geographical areas: the Upper Indus, the Punjab, the Lower Indus, the Ghaggar-Hakra and Gujarat. This section will summarise the above findings and discuss the implications of them in terms of archaeological visibility.

The Indus River has its origins in the Himalayas, and its upper course has been largely unaffected by modern water management schemes due to the difficult terrain and low population densities. However, further along its course the Tarbela Dam has had a significant impact upon the sediment load of the river. Since its construction in 1974, sediment loads in the river have decreased from $300x10^6$ tonnes/year to less than $200x10^6$ tonnes/year. As a consequence, the amount of sediment deposited on the floodplains has dropped from $80x10^6$ tonnes/year to $52x10^6$ tonnes/year. In the Punjab, the *Indus Waters Treaty* signed in 1960, has created the world's largest irrigation system. The Mangla Dam on the Jhelum River has reduced the sediment load from $45x10^6$ tonnes/year to $0.5x10^6$ tonnes/year. The combined discharge of the five rivers into the Indus River has decreased from $>100x10^6$ tonnes/year to $<60x10^6$ tonnes/year. The course of the lower Indus River has altered drastically over the last ten thousand years through a combination of tectonic movement, river avulsions and irrigation works. Modern water management schemes have caused the sediment load at its delta to drop from $250x10^6$ tonnes/year to $<50x10^6$ tonnes/year.

From the above values, it can be ascertained that pre-water management schemes, $300x10^6$ tonnes/year and $100x10^6$ tonnes/year of sediment was flowing into the Lower Indus from the Upper Indus and the Panjnab respectively. Of this combined $400x10^6$ tonnes/year, only $250x10^6$ tonnes/year was reaching the delta, suggesting that $150x10^6$ tonnes/year was being deposited on the floodplains of the Lower Indus. Over the course of four thousand years this amounts to $6x10^{11}$ tonnes of sediment (600 billion tonnes) having been deposited since 2000 BCE. This high rate of deposition means that many of the key sites within the Indus Valley may have been located either closer or further away from the river than has

previously been thought, and that only those sites that are sufficiently large enough to be visible above the deposited sediment will have been identified. There are almost certainly a large number of sites (with a possible density the same as along the Ghaggar-Hakra River) lying buried beneath the alluvium in the Indus Valley, or that migrating river channels have destroyed.

The Ghaggar-Hakra River is the centre of a contentious discussion regarding whether it was a perennial river that flowed all of the way to the sea or not. It seems clear from the evidence that the Sutlej was once a tributary of the river, although the evidence for the Yamuna as a tributary is less convincing. Without wishing to engage in a debate regarding the identification of the Ghaggar-Hakra as the Sarasvati River, this thesis has adopted three statements regarding the river:

1. That a perennial Ghaggar-Hakra was a more prominent factor in the drainage of Punjab and northern Rajasthan, and flowed as far as Fort Derawar.
2. That the Sutlej River probably flowed into the Ghaggar-Hakra, whilst the Beas River flowed into the Chenab and ultimately the Indus.
3. In the period 2200-1000 BCE a combination of tectonic activity and climatic upheaval initiated a change in the drainage patterns resulting in the gradual drying of the Ghaggar-Hakra channel.

The drying of the river during this period means that the level of deposition witnessed in the Indus floodplains is not evident along the Ghaggar-Hakra. As such, we would expect archaeological visibility to be much higher in Cholistan than on the Indus Plain. The implications of this will be discussed more in later chapters.

Conversely, there has been little change in the river systems of Gujarat over the last four thousand years that will have impacted upon archaeological visibility or site distribution patterns. Most of the hydrological debate has been regarding whether the Great and Little Rann of Kutch were extensions of the sea or not. There is little conclusive evidence to support either hypothesis, yet it is clear that during the wet season the Ranns are liable to flooding, whilst during the dry season they, unsurprisingly dry out. This seasonal shift may impact upon subsistence strategies and the movement of goods.

2.4 Archaeozoological and archaeobotanical data from the Indus Valley, Gujarat and Cholistan

Archaeozoological and archaeobotanical studies of Indus Valley Tradition sites provide us with details of not only subsistence strategies, and this section will examine the data from the Indus Valley Tradition, as well as looking more specifically at Gujarat and Cholistan.

Childe (1950) argued that large-scale agriculture was an integral part of state development. The influence of Wittfogel (1957) and his concept of "hydraulic civilisation", where irrigation and agriculture were key to the development of state-level society, have helped to shape interpretations of the Indus Valley. Elsewhere in archaeology, there is often a clear link made between modes of subsistence and social organisation (Renfrew 1973, Service 1971). As such, identifying subsistence strategies within the Indus Valley Tradition will help us test the models of social and political organisation that will be outlined in the following chapter. The following section will look at archaeozoological and archaeobotanical studies within the Indus Valley Tradition, and then Gujarat and Cholistan in more detail.

2.4.1 The Indus Valley Tradition

From the analysis of faunal remains from Indus Valley Tradition sites, Thomas (2002) reports that a huge variety of animal species have been recovered. Cattle remains are by far the most common animal remains recovered – accounting for more than 60% of the total faunal assemblage. Further analysis of the cattle bones reveals that mainly young and sub-adult males were used for human consumption (Thomas 2002: 410). Aging and sexing of the cattle remains suggests that there were two peaks in the culling of these animals. The first peak was of young animals aged 1-3 years, whilst the second peak was of adult and senile animals aged 4-8 years. This prolonged maintenance of cattle suggests that, other than food and breeding, that animal-power and cattle by-products were utilised within the Indus Valley Tradition economy (*ibid.*).

The second most common animal from Indus Valley Tradition sites was sheep and goats (often grouped together due to the difficulty in their identification) – and comprises roughly 10% of the total assemblage. Where more detailed analysis

has been undertaken, namely Shikarpur and Kuntasi, a greater number of goat remains were found than sheep – goats are more adaptable to marginal environments. Within the Indus Valley Tradition, sheep and goat were generally killed aged 1-2 years, suggesting they were utilised for meat, as opposed to wool or milk (*ibid.*). Reports of water buffalo remains at sites are infrequent; however, Thomas highlights the difficulty in differentiating buffalo and cattle remains unless specific skeletal parts are present. Consequently, many buffalo remains may have been classified as bovine. Again, at Kuntasi, where a more rigorous approach has been adopted, buffalo represents about 5% of the total assemblage (*ibid.*: 411). Throughout the Indus Valley Tradition, domesticated pig account for 2-3% of the total assemblage, and were generally killed at a very early age. Domesticated dog remains have been found at almost all sites, whereas domesticated cats remains are scarce (*ibid.*).

The wild species that formulate roughly 20% of the faunal assemblages at Indus Valley Tradition sites are comprised of: deer (sambar, barasingha, chital/spotted deer, hog deer, barking deer), antelope (chinkara, balckbuck, chowsingha/four-horned antelope, nilgai/blue bull), hare, porcupine, wild pig, cat, dog, jackal, wolf, hyena, elephant, rhinoceros, buffalo, jungle fowl, monitor lizard, crocodile, gharial, turtle, tortoise, crab, shellfish (several species), shark, stingray, marine fish (several species), freshwater fish (several species) (Thomas 2002: 413ff).

2.4.2 Gujarat

The most extensive archaeobotanical data for Gujarat comes from excavations at the site of Rojdi in Saurashtra, where 14,389 individual plant remains were recovered and identified (Weber 1991: 61 and Table 7.1). The plant types occurring most commonly were: *Trianthema* - an aggressive weed which is not cultivated and has limited uses as food, fodder or medicine; *Setaria* - a large genus of annual and perennial grasses, which are cultivated (foxtail millet), grown in the wild and used for fodder; *Eleusine* - finger millet, a tropical crop well suited to dry farming or as a rainfed kharif crop; *Euphorbia* - a large genus of lactiferous shrubs, herbs and small trees that generally inhabit dry areas; and *Panicum* - annual and perennial grasses that can be found in moist areas, sandy soils, wastelands and shaded places, as well as in cultivated fields as a weed (Weber 1991: 62-100).

The foxtail and finger millets that were so common within the archaeobotanical

sample from Rojdi are no longer used within present-day Gujarat, being replaced by rice, bajra and jowar. Foxtail millet (*Setaria italica*) is often utilised where there is uncertain and irregular rainfall patterns, and can yield 400-1300 kg/ha for grains, and up to 2200 kg/ha for straw. The grain can be parched and eaten, ground and formed into cakes, boiled and made into porridge, malted and made into beer, or used to feed birds and poultry. The straw is considered good fodder, except for cows as it reduces the secretion of milk (*ibid*: 91f). Finger millet (*Eleusine coracana*) originates from wild grasses found within Africa, and is very well suited to dry farming and can also thrive under rainfed *kharif* conditions - it yields between 600-800 kg/ha of grain, and 1500-2500 kg/ha of straw. The grain of finger millet can be stored for up to fifty years, and has nutritional values higher than rice and equal to wheat, and unlike the foxtail millet its' straw is a highly nutritious fodder for cattle (*ibid*:73f).

Hordeum vulgare (barley), present at the vast majority of Indus Valley sites, is relatively uncommon within Gujarat, having only been recovered from Kuntasi and Rojdi. In contrast, *Panicum sumatrense* (little millet) and *Setaria* sp. (foxtail millets) are almost exclusively found within Gujarat (Fuller and Madella 2002: 326-329). The reasons behind this discrepancy are not obvious, although Fuller and Madella suggest a combination of ecological and cultural reasons. Barley is a *rabi* crop whereas foxtail millet is a *kharif* crop, and the subsistence strategy of the core Indus Valley Tradition regions – the Indus and Ghaggar-Hakra valleys – was focused primarily upon *rabi* crops. However, outside of the central areas, especially within Gujarat, the primary subsistence strategy employed the use of *kharif* crops (*ibid*: 353f). This may partially be due to the presence of irrigation, which would have been vital along the Indus and Ghaggar-Hakra rivers, but unnecessary within Gujarat where people could expect greater rainfall (*ibid*: 368).

2.4.3 Cholistan

The lack of any extensive excavations in Cholistan means that there is very little archaeobotanical data available from the archaeological record. The nearest analogous sites may be Kalibangan, located on the Ghaggar River, the continuation of the Hakra River on the Indian side of the border, and Jalilpur situated on the confluence of the Chenab and Ravi Rivers. Kalibangan has yielded evidence of barley, zebu, buffalo, pig, sheep, goat, dog, barasingha, elephant, camel, domestic ass, rhinoceros, chital, fish and fowl, as well as pictorial representations of bananas and cattle (Sahu 1988: 131). Camel bones,

horse bones and antler fragments have also been tentatively identified (*ibid*: 150f). A large number of burnt animal bones have been recovered from the two mounds of Jalilpur, an early site in the central Indus Valley. Preliminary reports suggest that sheep, goat, cattle and gazelle were present, with a 75% predominance of cattle (*ibid*: 125f). There is a lack of detail regarding archaeozoological and archaeobotanical data for this region, and as such, detailed comparisons with Gujarat are not possible.

2.4.4 Summary

The aim of section 2.4 was to examine subsistence strategies of the Indus Valley Tradition, and potential changes over time. It has identified that within excavated sites of the Indus Valley Tradition, 60% of the faunal remains are domesticated cattle. From age of kill patterns these cattle were used for both food and other uses – ploughing, milk, hides. The second most frequent remains were sheep/goat, (10%) which were used for food. Likewise, age of kill patterns for domesticated pig (2-3%) indicates that they were used for food. In addition, the inhabitants of the Indus Valley Tradition exploited a large variety of wild species.

In Gujarat a vast amount of archaeobotanical data has been derived from excavations at Rojdi. It established that the primary crops utilised in Gujarat during the Indus Valley Tradition were foxtail millet and finger millet. Foxtail millet is good for growing in areas where rainfall is uncertain and irregular, whilst finger millet is good for dry farming (i.e. without irrigation) and for animal fodder. Both of these are *kharif* crops, mirroring the modern subsistence strategies of Gujarat as established in section 2.2.3.2.

There is very little archaeozoological and archaeobotanical data available from Cholistan, and so proxy data was utilised from the nearby sites of Kalibangan and Jalilpur. At both sites, cattle were the predominant faunal remain, followed by sheep/goat, buffalo and pig – mirroring the trend across the whole Indus Valley Tradition. Barley was recovered from Kalibangan – a *rabi* crop that is not found within Gujarat.

The archaeozoological and archaeobotanical data from across the entire Indus Valley Tradition is not substantial enough to identify changing subsistence patterns, or their impact upon social and political organisation. The archaeobotanical remains from both Gujarat and Cholistan indicate that both regions were utilising similar cropping techniques as are employed today. Crops

in Gujarat were almost exclusively *kharif* as today – although the millets popular in the Indus Valley Tradition have been replaced by bajra (Pearl Millet) and jowar (Large Millet). In Cholistan, the identification of barley indicates the use of *rabi* crops, similar to modern Cholistan.

2.5 Chapter summary

The purpose of this chapter was to challenge the idea that there has been no significant change in the climate of the Indus Valley region over the last four thousand years. In order to achieve this, the chapter has examined the modern geography and subsistence of the Indus Valley region, Gujarat and Cholistan, as well as examining the palaeoenvironmental data, hydrological developments and archaeozoological and archaeobotanical data from these areas.

To summarise, it first looked at the extent and geography of the Indus Valley Tradition as well as modern climate and subsistence patterns, in particular within Gujarat and Cholistan. Gujarat is a highly diverse region, comprised of the arid salt flats of Kutch, the fertile volcanic plains of Saurashtra with its' "black cotton soil", and the rain fed hills of South Gujarat. The now dry bed of the Hakra River, on the other hand, dominates the landscape of Cholistan. Climatically, both areas are heavily influenced by seasonality of rainfall, which in turn is dictated by the southwest monsoon. This aspect of seasonality is often ignored archaeological analyses even though it has a major impact on modern subsistence.

The second theme of this chapter was to review palaeoenvironmental and palaeoclimatic research into the Indus Valley region. Utilising data from the Himalayas, the Indus Valley itself, the Deserts of Northern India and the Arabian Sea, the chapter was able to demonstrate a pattern of fluctuating precipitation linked to changes in the strength of the southwest monsoon. It has demonstrated that the link between declining rainfall and the "collapse" of the Indus Valley Tradition is unfounded. Research indicates that a decline did occur, but began c.3000 BCE followed by a sharp decrease c.2200 BCE. As such, it appears that the emergence of the Integration Era (c.2600-1900BCE) occurred during a period of continually diminishing precipitation, contradicting the established viewpoint. Archaeologists have also largely ignored the highly dynamic climate and landscape (in both the past and present) of the Indus Valley region. Such a

dynamic landscape is likely to impact upon settlement patterns, subsistence strategies and issues of archaeological visibility.

The third theme of the chapter was to examine hydrological developments within the Indus region, again in order to ascertain to what extent the landscape has altered over the last four thousand years. It has been established that modern river management techniques have significantly slowed the rate of sediment deposition from the Indus River and its major tributaries. The Lower Indus, home to Mohenjo-daro, has undergone numerous migrations and has changed course drastically since the Indus period. The potentially contentious issue of the Ghaggar-Hakra has been dealt with, and it has been concluded that: 1) during the Indus Valley Tradition the Ghaggar-Hakra river was a perennial river that flowed at least as far as Fort Derawar; 2) the Sutlej was once a tributary of this river; 3) some time between 2200-1100 BCE drainage patterns shift and the Ghaggar-Hakra began to dry. Finally, there has been no significant change in the river systems of Gujarat.

Finally, this chapter examined the zoological and botanical data from excavations in Gujarat and Cholistan, and the Indus Valley as a whole. A wide variety of species – both wild and domestic – appear to have been exploited during the Indus Valley Tradition, with cattle the most prominent. Sheep and goat were the next most common species encountered. Whereas barley and wheat were the most common crops throughout the Indus Valley, in Gujarat millets are much more frequently recovered. One possible reason for this may be millets use as animal fodder. The data for Cholistan is minimal. Having examined the geography and palaeoenvironment of the Indus Valley Tradition, the following chapter will begin to explore the chronology of the region, introduce existing interpretations of the Indus Valley Tradition and finally, begin to develop the models of social and political organisation against which to test the survey data.

The following chapter will outline the chronological sequence of the Indus Valley Tradition, focusing upon Gujarat and Cholistan. It will also discuss in more detail the current interpretations of its social and political organisation, expanding upon the brief outlines provided in Chapter One.

Chapter Three - Indus Valley Chronology and Models of Political and Social Organisation

3.1 Introduction

The previous chapter demonstrated that, contrary to the established academic view, the palaeoenvironment of the Indus Valley Tradition was in fact significantly different from today's climate of the region, and shows a considerable degree of dynamism. As opposed to the original hypotheses of Piggott (1950) and Wheeler (1959, 1968) of increased rainfall, it now becomes apparent that after a prolonged period of a strengthened southwest monsoon (Kumar *et al.* 2005, Pant *et al.* 2005), the climate became increasingly arid and rainfall more seasonal c.2800-2200 BCE (Phadtare 2000). After c.2200 BCE there was an even greater downturn in rainfall (Kar *et al.* 2001, Staubwasser *et al.* 2003) until a possible monsoon minimum c.1500 BCE, after which the climate stabilises. This contradicts the established view that either there has been no significant climatic change in the last five thousand years (Dhavalikar 1995, Mughal 1997, Possehl 1999b), or that a period of increased rainfall coincided with the emergence of the so-called Indus or Harappan Civilisation (Misra 1984, Piggott 1950, Singh 1971, Wheeler 1959, 1968).

Several different chronologies exist for the Indus Valley, and are often contradictory in their phasing. In order to interrogate the existing datasets from Gujarat and Cholistan it is necessary to justify the choice of chronology and if necessary expand it. The second objective of this thesis is to establish a chronology of the Indus Valley Tradition, and assess how it will impact upon the interpretation of the archaeological record. The purpose of this chapter is to refine Shaffer's chronology of the Indus Valley Tradition. In doing so, the chapter will provide an overview of the Indus Valley Tradition, including the location, phasing and archaeological character of key sites and regions. It will also provide a framework within which the discussion of models of political and social organisation can be undertaken. To do this, the second theme of this chapter will be to examine the key arguments put forward by scholars who have attempted to develop an understanding of the social and/or political organisation of the Indus

Valley Tradition. Finally, these interpretations will be categorised into a series of models from which we can develop a methodology to test their feasibility.

3.2 Chronology

The huge geographical expanse of the Indus Valley Tradition and the diversity of its constituent parts, from the earliest aceramic levels of Mehrgarh and Neolithic Kili Ghul Muhammad to the walled cities of Mohenjo-daro, Harappa, Ganweriwala, Rakhigarhi and Dholavira to the pastoral communities of Western India require a flexible and dynamic chronological framework within which to discuss its internal organisation. Traditionally considered by its earliest excavators to be a singular and abrupt event lasting for several hundred years, most chronologies still perpetuate this concept of a linear cultural development. The most widely adopted terminology - that of an Early, Mature and Late Harappan (e.g. Cork 2005, Mughal 1997) - places the Indus Valley Tradition within a tripartite social evolutionary framework, of a birth → fluorescence → death of a society (i.e. Service 1971). Whilst such a chronological sequence may be correct in terms of its sequential progression, and reflection of the perceived complexity of the Indus Valley, it suggests the "mature" phase represents the apex of a society's development, detached from the preceding and succeeding periods.

Shaffer and Lichtenstein have suggested that there was a lack of continuity within early South Asian chronologies (such as Piggott 1950 and Wheeler 1959), and that it resulted from the culture-historical tendency to equate linguistic and artefactual change with population change through migration, diffusion or invasion (Shaffer and Lichtenstein 1995: 126ff). They also suggest that there was a concerted attempt to disassociate the inhabitants of the Indus Valley Tradition from later Indo-European speaking communities as this would have resulted in the establishment of South Asia as the earliest archaeological evidence of Indo-European society, and a possible origin for European society (*ibid.*). The chronology proposed in this section provides greater continuity both temporally and spatially.

One of the major difficulties lies in determining when and where the Indus Valley Tradition begins, ends and extends to. There appears to be a general consensus that the Neolithic occupations at Mehrgarh (Jarrige *et al.* 1995, Jarrige 1984, 1990), Kili Ghul Mohammed and Rana Ghundai (Fairservis 1971) represent the

earliest cultural and technological developments within the Indus Valley. Part of this realisation lay in the reaction to the Wheeler-Piggott paradigm in which the earlier agricultural communities of northwest South Asia were divorced from the later urbanisation witnessed within the Indus Valley (Shaffer and Lichtenstein 1995: 126ff). Recent chronologies for this period have incorporated earlier and later developments within South Asia into their framework, although they are not always congruent. For example, even within a single volume of archaeological chronologies – Ehrich's *Chronologies in Old World Archaeology (3rd Edition)* published in 1992 – two opposing and contradictory chronologies for northwest South Asia were included (Possehl and Rissman 1992b, 1992a, Shaffer 1992a, 1992b).

3.2.1 Shaffer's Indus Valley Tradition

As noted in section 3.1, the Indus Valley Tradition has traditionally been divided into Early, Mature and Late phases representing the birth, maturity and decline of the society (i.e. Fairservis 1971, Wheeler 1959). This rather simplistic chronology was based primarily upon the two sites of Harappa and Mohenjo-daro, and assumes an evolutionary sequence for the Indus Valley Tradition. Shaffer, on the other hand, recognised that there was a greater amount of fluidity within Indus Valley cultural sequences, as well as a vast amount of regional variation (1992b). Shaffer's chronology is divided into eras, a grouping of archaeological units that share a number of general cultural characteristics. These units do not represent evolutionary stages, and are not necessarily applicable to every site or region. Each of these eras is then further subdivided into phases that possess a sufficient number of characteristics, and that are bounded spatially and temporally, in order to distinguish them from other contemporary phases (*ibid*: 442). As such, Shaffer divides the Indus Valley Tradition into four eras: Early Food Producing, Regionalisation, Integration and Localisation (Figure 3.01), which will be summarised below.

The Early Food-Producing Era (pre-6000 BCE onwards) refers to the Neolithic food-producing economy seen primarily at the site of Mehrgarh. Many of the essential traits of the Indus Valley Tradition have their roots within the Mehrgarh Phase of this era: food-producing economy, sedentary villages with mud-brick architecture and the development of lapidary and shell-working techniques (Shaffer 1992b: 443-444). The Regionalisation Era, at its earliest 4000 BCE continuing until c.2500-2300 BCE, incorporates the development of distinct

cultural styles, particularly within ceramics, and the development of complex interaction networks, something that was lacking from Possehl and Rissman's (1992a, 1992b) chronology. Divided by Shaffer into four phases - Balakot, Amri, Hakra and Kot Diji - this era represents the emergence of cultural and social complexity within several discrete, but interlinked, cultural groups (1992b: 444-8). Recently, archaeologists have added further regional phases as new archaeological evidence comes to light – such as the Ravi Phase (Kenoyer and Meadow 2000). The Integration Era (2500-c.2000 BCE) relates to what had previously been referred to as the Mature Harappan, and as such is represented by a single phase - the Harappan Phase, despite numerous chronological overlaps with both the Regionalisation and Integration Eras. During the Harappan Phase, the localised cultural styles seen in the Regionalisation Era merge into a single cultural entity showing pronounced cultural homogeneity in almost all aspects of material culture. The Integration Era represents the Indus Valley Tradition in its largest and most elaborate form (Shaffer 1992b: 448-450) and is the period most scholars refer to as the Indus Valley/Harappan/Indus-Sarasvati Civilisation. The Localisation Era (c.2100-c.1300 BCE) refers to the fragmentation of the cultural homogeneity seen during the Integration Era, and the development of cultural groups that persist into the Iron Age. Rather than the decline that many early scholars referred to, it appears that the Indus Valley Tradition underwent a significant structural change, which resulted in the emergence of localised cultural traditions (*ibid*: 450-452). Each of these four Eras will be discussed in more detail below, detailing the archaeological indicators, date ranges and key sites. A summary table of Shaffer's (1992a, 1992b) Indus Valley, Baluchistan and Helmund Tradition can be found in Appendix D.

3.2.2 Early Food-Producing Era (c.6500 BCE onwards)

Only one site, Mehrgarh, has demonstrated sufficient excavated occupations relating to this era, however, Shaffer assumes this data to reflect a widespread cultural pattern (1992b: 443). Period IA (c.6500-6000 BCE) at Mehrgarh is characterised as aceramic, with evidence of bone and lithic tools, hearths, habitation debris and possible mud-brick structures. The early occupation also provides evidence of the domestication of two-row hulled and six-row barley, einkorn, emmer and bread-wheat, as well as domesticated goats (Jarrige *et al.* 1995, Jarrige 1984, 1990). Period IB (6000-5500 BCE) at the site is delineated by the appearance of ceramics, and a shift in subsistence patterns focusing upon cattle. It has been suggested that Period II (5500-4800 BCE) saw the further

domestication of zebu cattle (*Bos indicus*), as well as evidence of copper and cotton use (Coningham 2005: 524f). Excavations at Mehrgarh also revealed burials of both adults and sub-adults in simple pits, sometimes stained with red ochre and accompanied by ornaments and/or offerings. The burial inclusions included objects of marine shell, lapis lazuli and turquoise - all resources that were unavailable locally, and suggest "considerable economic investment" in non-functional objects manufactured from materials procured through some form of widespread interaction system (Shaffer 1992b: 443f). Mehrgarh is the oldest known example of a Neolithic site within the Indus Valley Tradition, and was associated with a number of village communities throughout Baluchistan dating from c.5000 BCE onwards (Figure 3.02). The earliest periods at Kili Ghul Mohammad and Rana Ghundai (c.5000-4000 BCE) were characterised by the presence of mud-brick structures, chert blades, bone points, handmade ceramics and a subsistence base centred upon domesticated sheep/goat, cattle, wheat and barley (Shaffer 1992b: 436, Coningham 2005: 525).

Additional microlithic occupations have been identified at a number of sites throughout the area encompassed by the Indus Valley Tradition - in particularly at Langhnaj in Gujarat (Clutton-Brock 1965, Ehrhardt and Kennedy 1965, Sankalia 1965) and Bagor in Rajasthan (Misra 1973). Occupied as early as 5000 BCE, Bagor is located on the west bank of the Kothari River in Rajasthan. Its earliest levels are characterised by a microlithic stone technology and a subsistence strategy based upon hunting, gathering and pastoral herding (Misra 1973: 95). However, hunter-gatherers and pastoralist communities, as well as microlithic tool use, remained important elements in later stages of the Indus Valley Tradition (see below and later chapters). The presence of microliths throughout all stages of the Indus Valley Tradition makes it difficult to place many sites chronologically.

3.2.3 Regionalisation Era (c.~4000-2500/2300 BCE)

The Regionalisation Era represents the emergence of distinct regional artefact styles within the Indus Valley Tradition, most clearly defined through ceramics. The Era is split into four phases - Balakot, Amri, Hakra and Kot Diji - each of which covers a loose geographical region (Figure 3.03) and period, although there are numerous overlaps (Shaffer 1992b: 444). Communities within the Regionalisation Era maintained many of the characteristics of the Early Food Producing Era, such as the use of microliths, the consumption of wild species and the storage of surplus (Coningham 2005: 528). However, the most significant

development of this period was the shift in population from the uplands of Baluchistan to the floodplains of the Indus Valley. In turn, this transition from one ecosystem to another impacted upon the technology, subsistence and social and political organisation of the inhabitants. The simple mudbrick architecture of Mehrgarh continued during the earliest phases of the Regionalisation Era, but was superseded by increasingly complex urban forms, with planned streets and fortifications. Ceramic technologies and craft specialisation also developed, and the subsistence base became ever more dependent upon domesticated species. The 4th millennium BCE also saw the development of trading centres within the Indo-Iranian plateau at sites such as Shahr-i-Sokhta and Mundigak, both of which facilitated the movement of goods from the Indus Valley region westwards (Coningham 2005: 530).

3.2.3.1 Balakot Phase (4000-3200 BCE)

The Balakot Phase takes its name from the site of Balakot, situated 88 kilometres northwest of the modern city of Karachi and excavated 1973-1976 by George Dales (Dales 1979). Radiocarbon dates suggest that the phase dated from c.4000-3500 BCE, whilst ceramic evidence suggests that this phase may have continued through to c.3200/3000 BCE (Shaffer 1992b: 444). Ceramics from the Balakot phase are characterised by redware pottery that is either wheel-made or a combination of wheel-made and moulded, most commonly in the form of everted rim globular jars. The standard decoration of these redware pots is a combination of simple and wavy bands, with motifs in black, brown and, occasionally red and greens, applied to a cream or white slip (*ibid.*). Towards the end of this phase, ceramics begin to closely resemble those of the successive Amri Phase – an indication of the difficulty involved in clearly delineating chronological phases. Incised and painted markings (Shaffer suggests a precursor to Indus script) on Balakot Phase ceramics also bear a resemblance to those of Amri and Kot Diji Phase ceramics (*ibid.*). Food production formed the core of the economy during the Balakot Phase, focused primarily upon domesticated cattle, sheep and goats, although wild gazelle and shellfish have been recovered from some sites (Dales 1979). Stone tools, semiprecious stone and shell beads, amorphous copper and bronze objects, and mud-brick paved areas were also present at the site of (Dales and Kenoyer 1986: 9).

3.2.3.2 Amri Phase (3600-3000 BCE)

The dating of the Amri Phase is somewhat more difficult than the Balakot Phase due to the wider range of sites and the mixture of both Balakot and Kot Diji ceramics found at the type-site site of Amri. Shaffer tentatively places the beginning of the Amri Phase at c.3600 BCE though admits that it could be as early as 4000 BCE (which would make it consistent with Balakot Phase), or as late as 3500 BCE, with the phase ending c.3000 BCE or later (1992b: 445). Amri Phase sites were primarily located within the southern portion of the Indus Valley, and Sindh, however most of the information is from excavations at Amri, excavated between 1959-1962 by J.-M. Casal (Dales and Kenoyer 1986: 7). Amri Phase ceramics were more distinctive in style than most other phases, being mostly handmade and decorated in either monochrome or bichrome, and occurring in a variety of vessel forms. Ceramic decorations include a variety of geometric motifs, and during Amri ID the first use of "fish-scale" intersecting circles, and humped bovid motifs (Shaffer 1992b: 445). Similar to the Balakot Phase, the economy was primarily based upon food production, although at Amri there was a wider variety of both domesticated and hunted animals. Additionally, the increasing presence of metal and semiprecious stone artefacts suggests involvement in a more widely developed interaction network and craft specialisation (*ibid.*).

3.2.3.3 Hakra Phase (3300-2700 BCE)

Hakra Phase sites are concentrated close to the Indo-Pakistan border, the Swat Valley and Cholistan. Shaffer dates the Hakra Phase to c.3300-2700 BCE, although suggests that it may emerge as early as 3500 BCE and notes that Hakra deposits persist until c.1500 BCE in the northern mountainous regions (1992a: 445). Hakra Phase ceramics include both hand-made and wheel-made redwares and a smaller number of greywares, which demonstrate a close resemblance to later Kot Dijian pottery. Decorations include geometric comb-incised motifs ("Hakra Incised"), external black glossy slips ("Hakra Black Burnished"), and basket impressed bases (*ibid.*). Although food production was an important feature of the Hakra Phase, craft specialisation became more prominent, with evidence of a sophisticated ceramics industry, the manufacture of rare metal objects and kilns located at smaller settlements. Mughal (1997: 33) provides further information concerning Hakra Phase sites in Cholistan, which he dates to 3500-3100/3000 BCE, slightly earlier than the dates proposed by Shaffer. As for Hakra Ware, one of the defining characteristics of the Hakra Phase, Mughal

provides additional information to aid its identification. Both hand and wheel-made, the most defining characteristics are (a) large and small vessels with a coating of mud mixed with pieces of pottery applied to the external surface; (b) thick and thin pottery with multiple incised lines, and (c) a black slip applied over the entire external surface of carinated (keel-shaped) or globular vases (Mughal 1997: 33).

3.2.3.4 Ravi Phase (3300-2800 BCE)

At Harappa, one of the most extensively excavated sites within the Indus Valley, excavations have identified a further subperiod of the Regionalisation Era, referred to as the Ravi Phase and dated from 3300-2800 BCE (Kenoyer and Meadow 2000: 55). The Ravi Phase was concurrent with the Hakra Phase, and they share many similarities. Representing the earliest identified occupation of the site, the Ravi Phase at Harappa is defined by a ceramic assemblage that closely resembles that of the Hakra and Kot Diji Phases. The earliest ceramics are handmade, and the most common forms are shallow and deep bowls, large carinated vessels, and thick-walled cooking pots. The cooking pots are covered with a coarse sandy clay mixed with pebbles and calcium carbonate, a treatment similar to that found during the Hakra phase. Ceramic decoration includes bird and net motifs similar to Sheri Khan Tarakai, geometric and floral motifs comparable to Rheman Dheri I and II, and intersecting circles and fish-scale patterns that have parallels at Amri, Kot Diji, Mehrgarh, Nausharo, Jalilpur and Rehman Dheri (*ibid*: 62f).

The later levels of the Ravi Phase see the introduction of wheelmade ceramics, and forms and decorations that are increasingly similar to the later Kot Diji Phase. Fish-scale, pipal leaf and intersecting circle motifs become predominant, and Kenoyer and Meadow (*ibid*: 68) suggest that inscribed marks on vessels could represent a formative stage of the Indus script – a defining characteristic of the Indus Valley Tradition. Increasing numbers of non-local ceramics, mostly from Baluchistan, indicate a widening interaction sphere within the Ravi Phase. In the earlier levels of the Ravi Phase terracotta beads are common, whilst in later levels terracotta bangles and bull figurines become more frequent. In addition, there is evidence of bone-working, steatite figurines, shell bangles, stone beads (steatite, carnelian, lapis lazuli, amazonite, terracotta) and copper pins and arrowheads (*ibid.*).

3.2.3.5 Kot Diji Phase (2800-2500 BCE)

Shaffer suggests a time range of c.2800-2500/2300 BCE for the Kot Diji Phase of the Indus Valley Tradition, although acknowledges there may be regional variations in both date ranges and cultural characteristics (1992b: 447). The transition from the Hakra and Ravi Phases to the Kot Diji Phase is unclear, except at Harappa, where excavations have demonstrated a sequential progression (Kenoyer and Meadow 2000). Likewise, at Jalilpur (periods I-II), there was a gradual transition from one phase to another, but at the site of Sarai Khola (I-II) the change was far more abrupt. However, the majority of sites displaying Kot Diji Phase characteristics initial occupation was Kot Dijian, suggesting a period of settlement expansion (Shaffer 1992b). Despite regional variations, Kot Diji ceramics were wheel-made redwares occurring in a wide variety of vessel forms, the most distinctive of which are "everted rim globular jars", "dish-on-stand", and "flanged/doubled rimmed jars". Decorations include monochrome, bichrome and polychrome geometric, zoomorphic and floral motifs (*ibid.*). Additional Kot Diji artefacts include a variety of stone and copper/bronze tools, and personal ornaments made from semiprecious stones, shell and ivory.

The Kot Dijian phase saw the emergence of planned urban forms, particularly at the sites of Rehman Dheri, Kalibangan, Harappa and Kot Diji itself. At Rehman Dheri a rectangular mud-brick wall enclosed an area of 22ha, and a system of planned "grid iron" roads can be seen from aerial photographs (Figure 3.04). Likewise, at Kalibangan and Harappa, walls have been identified enclosing areas of 4.5ha and 9ha respectively (Figure 3.05) (Coningham 2005: 531). Within these walls at Harappa, excavations have yielded stone beads, terracotta bangles, figurines and copper and bone tools of much greater quantity than earlier phases (Kenoyer and Meadow 2000: 71f). Within Cholistan, two sites of over 20 hectares - Gamawala and Jalwali - are the largest known Kot Diji phase sites Once again, during the Kot Diji Phase, food production was of great importance with remains of cattle, sheep, goats and gazelle found at Jalilpur. One major difference concerning the domesticated cattle, however, was that judging by their age and sex distribution they were being kept for dairy produce, traction and breeding, not just for meat (Shaffer 1992b: 447).

Shaffer interprets the existence of regional stylistic variations in ceramics within the Kot Diji Phase as the development of regional production centres, such as Rehman Dheri and Kot Diji (*ibid.*: 447). In addition, he identifies the development of regional lapidary and metalworking industries, similar to those identified by

Mughal in Cholistan (1997). Shaffer interprets the use of locally unavailable materials such as lapis lazuli, turquoise, shell and copper in the Indus Valley as evidence of a widespread interaction system (Shaffer 1992b: 447). Kot Diji style ceramics have been found at Burzahom in the Kashmir Valley, as well as throughout Sindh, Baluchistan and southern Afghanistan suggesting that this period of the Indus Valley Tradition had wide-reaching influences (Coningham 2005: 531). With reference to his work in Cholistan, Mughal refers to the Kot Diji Phase as the "Early Harappan Period", and dates it to 3100/3000-2500 BCE (1997: 33). As for the identification of sites as "Early Harappan" by Mughal, he uses Kot Diji Phase characteristics as his template (*ibid.*).

3.2.4 Integration Era (c.2600/2500-2100/1900 BCE)

To reflect the widespread cultural homogeneity of the Integration Era, it only contains a single phase. The Harappa Phase represents the Indus Valley Tradition at its maximum extent, covering over one million square kilometres, and extending its influence even wider (Figure 3.06). Perhaps the most defining feature of the Integration Era is the adoption of a widely used script, developed from the graffiti marks visible within earlier phases. Shaffer sees this adoption as implying "the ability and need to communicate information across time and space as well as a certain degree of historical and cultural continuity" (Shaffer 1992b: 443). The use of the term Integration Era reflects the continuity and merging of many of the cultural traits seen during the Regionalisation Era, and reflects the extensive circulation of resources and materials that have limited sources of origin. In reality, the process of "integration" within the Indus Valley is poorly understood, both archaeologically and theoretically.

3.2.4.1 Harappa Phase (2500-1900 BCE)

Shaffer's Harappa Phase corresponds to the period most commonly referred to as the "Mature Harappan", "Harappan Civilisation" or "Indus Valley Civilisation". By eradicating the idea of a "maturity" of the tradition, and considering this period as another phase in the development of the Indus Valley Tradition, it removes many preconceptions of the cyclical model of birth → maturity → death of society. Shaffer dates the Harappa Phase to c.2500-2000 BCE, although intimates that ceramic material recovered from many sites shows both Harappa and Kot Diji Phase characteristics and that some periods at sites such as at Kalibangan I-II, the two phases overlap chronologically (Shaffer 1992b: 448). These conditions

could create potential problems in terms of chronology, but this thesis will adopt Shaffer's premise that "some degree of chronological and stratigraphical overlap is to be expected since the Harappan phenomenon represents a phase in a continuous cultural tradition, while the absence or limited frequency, of Harappa Phase artefacts at contemporary sites with other types of occupations probably reflects varying degrees of participation in the Harappan Interaction System" (*ibid.*).

Harappa Phase pottery is identifiable through its black-on-red decorative style and extensive use of the peacock motif. It also comes in a wide variety of vessel shapes and sizes, and there is homogeneity throughout its distribution. Lapidary crafts also developed a much higher standard and etched and long-barrelled carnelian beads, cubical weights and steatite stamp seals were manufactured in quantity and distributed across a wide area (*ibid.*: 448f). Shell, chert, lapis lazuli and steatite were all utilised in the manufacture of jewellery, the raw materials for which were sourced through several regional trade networks (Kenoyer 1995: 216ff).

Shaffer suggests that one of the most important changes from the Regionalisation Era is the phasing out of lithic tools with the introduction of metal counterparts. However, this is only evident at the larger urban centres. In many smaller settlements, lithics remain in use during this period. Shaffer identifies that, during the Harappa Phase, copper, bronze, and to a lesser extent, silver and gold objects occur in a much wider variety of cultural contexts than before (1992b: 449). Copper ore deposits utilised during this period have been located in Baluchistan, Afghanistan and Rajasthan, whilst tin deposits have been located near Mundigak in Afghanistan (Kenoyer 1995: 220). It is also possible that copper was imported from Oman (*ibid.*).

Internal and external trade routes were extensive during the Harappa Phase, and the cities on the Indus floodplains were linked to the geographical peripheries as demonstrated by the widespread occurrence of lapis lazuli, carnelian, steatite, shell, chert, tin, copper and gold, and the presence of Indus Valley Tradition objects at Shahr-i-Sokhta in the Iranian plateau and further west in Mesopotamian cities (Coningham 2005). The Integration Era is largely defined through increasing homogeneity of ceramic typologies and the procurement of raw materials, and as a consequence aspects such as architecture, water management and political

control are sidelined. These gaps within the archaeological record need to be revised in order to generate a more accurate depiction of the Integration Era.

3.2.5 Localisation Era (1900-1500/1300 BCE)

The Localisation Era represents the divergence of the homogeneous Harappa Phase into a number of localised cultural styles, as Harappa Phase artefacts appear to blend with regional styles that had persisted in varying degrees. Due to the lack of radiocarbon dates for later levels at most sites; the Localisation Era chronology is primarily reconstructed from ceramic data. The general trend appears to be a transition from Harappa-related black-on-red ceramics into grey and redwares characteristic of the Painted Grey Wares (PGW) that persist into the Iron Age (Shaffer 1992b: 450). Many of the materials and artefacts characteristic of the Harappa Phase persisted, such as worked shell, semiprecious stone, metal and faience. However, stamp seals, triangular cakes, miniature cart-frames and wheels, perforated pottery, cubical weights, fired bricks and instances of scripts become obsolete, or extremely rare (*ibid.*). Most of the large core urban centres of the Harappa Phase are no longer occupied, whilst smaller localised centres become more prominent (Figure 3.07). Rather than the chronological phases of the Regionalisation Era, the phases of the Localisation Era run concurrently and are distinguished spatially not temporally.

3.2.5.1 Punjab Phase (Upper Indus) (2100-1300 BCE)

Settlements of the Punjab Phase are located within the central and northern sections of the Indus Valley, including Cholistan. Shaffer postulates a time frame of 2100-1300 BCE, the terminal date being based upon the emergence of Painted Grey Ware, although he admits that the evidence from Bhagwanpura suggests the final date could be anywhere between 1500-1000 BCE (1992b: 451). Punjab Phase ceramics are often referred to as Cemetery H style, a distinctive black-on-red slipped pottery of which vessel forms mirror those of the Harappan Phase. Sites of the Punjab Phase include Harappa (Cemetery H period), Mitathal IIB, Bhagwanpura IA-B, and Siswal C-D. At Harappa, the tradition of extended burials was replaced by pot burials of disarticulated human remains within distinctive black paint on red slip decorated vessels (Kenoyer 1998). These richer, individualistic burials found from Cemetery H demonstrate a marked change from Integration Era mortuary practices. In Cholistan, Mughal identified a sharp

decrease in the number and size of sites, as well as a shift in their general location (1997: 51) - although this may be due to the nature of surface collection than archaeological reality.

3.2.5.2 Jhukar Phase (Lower Indus) (1900-1300 BCE)

Jhukar Phase sites are located mainly in Sindh, with occupations noted at Mohenjo-daro, Chanhu-daro, Amri, and Jhukar. Despite the existence of only one radiocarbon date (of 2165-1860 BC) from an unnamed site, Shaffer tentatively dates the Jhukar Phase as contemporary with the other Regionalisation Era phases (1900-1300 BCE) (Shaffer 1992b: 451). To confuse the situation, not only is there is an overlap in Harappan and Jhukar phase pottery, but there are a great many stylistic similarities between the two, again suggesting a certain degree of continuity. Shaffer states that Jhukar Phase ceramics are characteristically black-on-red slip, with the occasional use of white paint or slip as a background and limited use of zoomorphic motifs. Stamp seals become circular in shape, are manufactured from terracotta or faience, and had geometric or zoomorphic impressions as opposed to containing script (*ibid*). In addition, a large number of artefact types, such as copper pins and shaft-hole axes, whose affinities lie within central and western Asia become more dominant in the archaeological record (Coningham 2005: 539). A characteristic of this phase was the abandonment of the urban centres in Sindh, such as Mohenjo-daro and Chanhu-daro, and the replacement by so-called "squatter occupations" (Mackay 1943). This re-occupation of sites and similarity in ceramic decoration, albeit to a much smaller scale and without many of the defining characteristics of the earlier phase, is indicative of continuity whilst newly emerging artefact styles from central Asia promotes the potentiality for change.

3.2.5.3 Rangpur Phase (Western India) (1900-1380 BCE)

Rangpur Phase sites are located solely within western India and date to 1900-1300 BCE. Unlike the Punjab and Jhukar Phases, which retained many of the Harappan Phase characteristics, during the Rangpur Phase most Harappan Phase artefacts disappeared and Lustrous Red Ware (LRW) emerges and was virtually exclusive to Gujarat (Shaffer 1992b: 451). LRW is a fine redware that is red slipped and polished to a high lustre. Although LRW is commonly decorated by black motifs that are similar to Cemetery-H pottery, the vessel forms are vastly different. The Rangpur Phase is also characterised by Black-and-Red Ware,

which has a distribution range extending to the Ganges Valley. Due to its widespread dispersal, it is not known whether Black-and-Red Ware is indigenous to Gujarat or not (*ibid*). A more detailed chronology for western India and Gujarat is detailed below in section 3.2.7.

3.2.6 Problems with Shaffer's chronology

The realisation that communities within the Indus Valley did not abruptly collapse (Piggott 1950, Wheeler 1959) or enter into a "degenerate phase", but rather underwent both regional and localised developments influenced the adoption of Shaffer's chronology, both within this thesis and by other scholars (i.e. Coningham 2005, Kenoyer 1991, 1995, 1997, Kenoyer and Meadow 2000). Likewise, the recognition of emerging communities on the peripheries of the Indus Valley suggests that there were continual social, cultural and political developments in the region, rather than the three separate phases of Early, Mature and Late. The aim of this thesis is to test existing models of the social organisation of the Indus Valley Tradition, and one of the stated objectives is to establish how these models of social and political organisation have been developed. Part of the methodology for dealing with this objective is to demonstrate that the theoretical and chronological framework within which many of them are created intrinsically weakens them.

The preoccupation with culture-historical approaches to archaeology in South Asia has lead to a one-dimensional understanding of archaeological sequences (i.e. the linear development of society, changes in the archaeological record the result of population change). Whilst the origins of culture history lie within the historical geography of Sir Alexander Cunningham (founder and Director of the ASI 1861-1865 & 1870-1885) (Cunnigham 1979 [first published 1871]), it was developed further by Gordon Childe in the 1930s (Childe 1954 [first published 1934]), and later developed by Piggott (1950) and Allchin and Allchin (1982). The culture history approach sought to define archaeological cultures as ethnic groups, and generally explained their origins through concepts of diffusion and migration (Trigger 1989: 205). Childe defined a culture as:

> "certain types of remains – pots, implements, ornaments, burial rites, house forms – constantly recurring together... we shall term a 'culture.' We assume that such a complex is the material expression of what today we would call a people" (1929: v-vi).

Likewise, diffusion has remained a viable model for explaining cultural developments. South Asian [pre-] history has been interpreted as incoming migrations of people (i.e. Ind-Europeans, Persians, Greeks, Philhellenes, Turks) who bring with them new ideas and concepts, before being absorbed into the "Indian" way of life (Chakrabarti 1982: 339). Traditional models of the Indus Valley Tradition, as well as many later developments, have relied on external stimuli for cultural developments – the rise of Indus urbanisation due to Mesopotamian ideas (Piggott 1950, Childe 1954), the collapse of urban centres due to Aryan invasions (Wheeler 1947, 1959, 1968), the emergence of Early Historic complexity from Greek and Achaemenid incursions (Narain 1965, Wheeler 1962).

Concepts such as identity and ethnicity are inevitably controversial within the realms of archaeology, and this is particularly the case in South Asia, as seen with the recent case of Ayodhya (Bernbeck and Pollock 1996, Coningham 2004, Guha 2005, Lahiri 2003) and the more distant postulated "Aryan Invasion" of the Indus Valley (Dales 1964, Leach 1995, Shaffer 1984). Whilst Shaffer's division of the Indus Valley Tradition into Eras and Phases does not explicitly equate with ethnic groupings (1992a, 1992b), in other work he draws direct correlations between the Indus Valley Tradition phases and ethnic groups. Shaffer defines a cultural tradition as

> "persistent configurations of basic technologies and cultural systems within the context of temporal and geographical continuity. This concept facilitates a stylistic grouping of diverse archaeological assemblages into a single analytical unit" (1992a: 442).

Alternatively, Shaffer and Lichtenstein define a cultural tradition as:

> "composed of one or more patterned sets of archaeological assemblages... these patterned sets are designated here as ethnic groups. An ethnic group is an analytical unit composed of archaeological assemblages with one or more traits sufficiently characteristic to distinguish it from other similarly conceived units" (1989: 119).

This explicit correlation between culture and ethnicity creates several theoretical inadequacies with regards to understanding the internal dynamics and emic

values of the Indus Valley Tradition. In adopting this static definition of culture and cultural traditions, Shaffer's theoretical stance may potentially replace the monolithic view of the Indus Valley Civilisation (as defined by Marshall 1931, and elaborated on by many others) as a singular and abrupt entity, with a series of contiguous and sometimes overlapping monolithic entities (the Indus Valley Tradition).

The second fundamental flaw of the culture-historical approach is the latent assumption that within cultural groups there is a tendency towards stagnation and conformity towards proscribed behavioural norms. Internal developments and cultural elaboration were seen to be slow processes, and any archaeologically visible changes were attributed to diffusion and migration (Jones 1997: 21ff). It would be simple for someone to assume Shaffer's chronology represents a series of discrete archaeological polities that remain in place for several hundred years before being replaced by a new static culture for the next several hundred. It must be stressed that, for the purpose of this thesis at least, the phases outlined above are merely arbitrary points along a continual line of social and political development. The phasing is continually being revised as more data enters the public domain, and as absolute dating becomes more prevalent in South Asia the phases will become tightly focused both spatially and temporally. However, until this is the case, archaeologists will have to rely on the few excavated [and published] sites from which to construct their chronology. The following sections outline a more precise chronology for first Gujarat and then Cholistan.

3.2.7 Chronology for Gujarat

Rangpur was the first Indus Valley Tradition site excavated in Gujarat (Rao 1963), and for a long time was, and to a certain extent still is, the main chronological type-site in the region. However, there are no absolute dates available from the excavations at Rangpur and as a result, the chronology of Gujarat has been developed through relative dating. This section will outline a chronological sequence for Gujarat, utilising both relative and absolute dates. Table 3.1 shows the phasing of key sites within Gujarat, although many of the boundaries between periods are arbitrary, and based upon wider chronological sequences (such as Shaffer's divisions). The one site that demonstrates continual occupation throughout all three eras is Dholavira. Unfortunately, due to the lack of a published excavation report, or any detailed annual reports it is not possible to use as a type-site. The following sections discuss the chronology of Gujarat,

incorporating newly calibrated dates (Table 3.2) using OxCal 4β, the IntCal 04 calibration curve and Bronk Ramsey (1995, 2001). Bayesian statistics were not applied due to the lack of available dates, coupled with the fact there is a lack of clarity as to the precise location of each date's sample, and that many of the samples are derived from different trenches at the same site.

Shaffer did not incorporate Gujarat into the Regionalisation Era of the Indus Valley Tradition, and it is not clear whether this was due to a lack of available data, or whether he believed that Gujarat was unaffected by the Regionalisation process. However, since then a number of new radiocarbon dates have demonstrated Regionalisation Era occupation at several sites, including Loteshwar II, Oriyo Timbo I-II, Padri II and Somnath I (see Tables 4.1 and 4.2). Excavations at Dholavira have also revealed pre-Integration Era occupation levels (Periods I-II), although these levels have not been dated scientifically (Bisht 1990, 1997). The evidence from these sites suggest that Gujarat was in fact actively engaged in the development of localised ceramic typologies, such as Padri Ware (Shinde 1998, Shinde and Kar 1992), Pre-Prabhas Ware (Dhavalikar and Possehl 1992) and Anarta Ware (Ajithprasad 2002: 135f). Ajithprasad has identified links between Anarta Ware and ceramics from the Hakra and Kot Diji Phases of the Indus Valley Tradition (2002: 145), suggesting that Gujarat, or at the very least Kutch and North Gujarat, was in fact incorporated into the Regionalisation Era of the Indus Valley Tradition. Padri Ware and Pre-Prabhas Ware are more generally confined to the immediate areas around Padri and Somnath, but they have been found in North Gujarat in small quantities (Ajithprasad 2002: 131ff).

The Integration and Localisation Era in Gujarat have both been outlined above in sections 3.2.4.1 and 3.2.5.2 respectively. The Integration Era in Gujarat is characterised by the presence of the typical indicators of the Harappa Phase as defined in section 3.2.4.1, and the Localisation is defined by the Rangpur Phase discussed in section 3.2.5.3. However, several ceramic types are found only within Gujarat during the Integration and Localisation Era. Anarta Ware remains common within North Gujarat (Ajithprasad 2002, Sonawane 2002), whilst Micaceous Red Ware is frequently found within excavations across the region. Micaceous Red Ware (MRW) is unique to Gujarat and is found within both the Integration and Localisation Eras. The fact that the majority of ceramic types persist throughout multiple eras makes them difficult to use as chronological indicators.

For the Gujarat Environs Survey (see the following chapter for a more detailed methodology) where ceramics identified on survey will be used to date sites, comparative ceramic typologies from five sites will be used. These five sites are Bagasra, Kuntasi, Rojdi, Lothal and Surkotada. Whilst an excavation report for Bagasra is yet to be published, the other four sites all have detailed excavation reports and well established chronological sequences. In addition, due to the recent excavations at Bagasra, all of the ceramics were available at the Maharaja Sayajirao University of Baroda to use as chronological indicators for newly collected material.

In summary, an absolute chronology for Gujarat is not possible, and archaeologists are currently reliant upon the use of several site chronologies based upon a small number of radiocarbon dates. Rangpur has generally been used to date sites relatively, but does not have a single radiocarbon date. Instead, the chronology of Rangpur has been reverse engineered through dated levels at sites such as Rojdi and Lothal. Consequently, this thesis is reliant upon the dates and ceramic typologies of only a few sites in order to date material found during the Gujarat Environs Survey. The following section will establish the chronological sequence for Cholistan

3.2.8 Chronology for Cholistan

The chronology for Cholistan is more straightforward than Gujarat, as Shaffer's division of the Indus Valley Tradition was partially based upon data from the region. The only major difference between the phasing used by Mughal during his survey in Cholistan (1997) and Shaffer's Indus Valley Tradition (1992a, 1992b) is in nomenclature. Table 3.3 demonstrates how the two chronologies correlate with each other. In terms of archaeological indicators, both Mughal and Shaffer utilise the same criteria. No radiocarbon dates are available for any of the sites in Cholistan, so all of the dating undertaken by Mughal has been based upon relative criteria, principally with sites found within the Indus Valley itself. This thesis will not deviate from the dates attributed to the sites in Cholistan provided by Mughal (1997) – see following chapter for more details.

3.2.9 Summary

This section has examined the chronology of the Indus Valley Tradition. It began by outlining the reasons behind adapting Shaffer's (1992a, 1992b) chronology

over those proposed by Possehl and Rissman (1992a, 1992b) and Possehl (2002). The main reasons behind this decision were that a) Shaffer's chronology allows for greater geographical diversity within phases; b) there is a greater scope for continuity and overlap between phases; and c) it rejected notion of social evolution and the idea that societies go through a birth→fluorescence→death. However, Shaffer's chronology is not without its problems, which were discussed within section 3.2.6. It noted the links between Shaffer's chronology and culture-historical concepts of archaeological assemblages or "cultures" equalling ethnicity, and the problems of making such assumptions. This section also considered the role of culture-history in the development of archaeology in South Asia, and how it pervades archaeological thought even now.

Sections 3.2.2 to 3.2.5 detailed the specific dates, extant and archaeological indicators of the Early Food Producing, Regionalisation, Integration and Localisation Eras, and their various sub-phases. Section 3.2.7 looked at the chronology of sites within Gujarat, and argued that for many years sites in Gujarat have had to rely upon relative dating, primarily based upon the site of Rangpur. Furthermore, despite excavations at several sites since, including Lothal, Surkotada, Rojdi and Kuntasi, there is still a lack of reliable absolute dates in the region. The calibration of existing dates using OxCal 4β did not produce any significant alterations to the existing date ranges. Finally, it outlined the sites and ceramic typologies to be used to date sites within the Gujarat Environs Survey. Section 3.2.8 outlined how the chronologies of Mughal and Shaffer correlate with the other.

The purpose of section 3.2 was to complete the second objective of this thesis: what was the chronological sequence of sites during the Indus Valley Tradition, particularly within Gujarat and Cholistan. This was necessary to provide a frame of reference for the remainder of the thesis, including the discussion of existing interpretations of the socio-political organisation of the Indus Valley Tradition. In addition, establishing a compatible chronology is critical for establishing changes in settlement patterns and functions over time in both Gujarat and Cholistan. Having established and discussed a chronology for the Indus Valley Tradition, the following section will move onto the third objective of this thesis, and outline some of the existing interpretation of the socio-political organisation of the Indus Valley Tradition.

3.3 Current interpretations of Indus political and social organisation

One of the objectives outlined in section 1.5 was to ascertain what are the existing models of social and political organisation for the Indus Valley Tradition, how have these models been developed and how can they be tested in relation to settlement distribution and function. The purpose of this section is to outline existing interpretations of political and social organisation of the Indus Valley Tradition that were briefly introduced in the opening chapter (section 1.3). The intention of this section is not to critique or deconstruct these interpretations, but to provide a basic overview of the arguments put forward by archaeologists. The following chapter will present a critical discussion of these interpretations, group them into models and provide a methodology for testing them. However, the following section will present the arguments put forward by archaeologists. These interpretations have been loosely grouped together in terms of similar theoretical backgrounds and schools of thought. It begins with the traditional interpretations.

3.3.1 Colonial interpretations

The earliest excavations of the Indus cities – Mohenjo-daro (Mackay 1938, Marshall 1931), Harappa (Vats 1940) and Chanhu-daro (Mackay 1943) – were primarily concerned with large-scale horizontal excavations and identifying the cultural affiliations of the sites. Although the "Indus" or "Harappa" culture was identified as an independent entity, archaeologists naturally looked west to the more famous and spectacular cities of Mesopotamia, Egypt and the Mediterranean littoral for their analogies. Fairservis has identified that European archaeologists, who had been trained at excavations in the aforementioned areas and whose academic training was focused on their history, directed the majority of the early excavations. Consequently, their interpretations consisted of "kings, urban capitals, slaves, citadels, and alien invasions in the Indus Valley" (Fairservis 1986: 43).

Concepts of kings and slaves remained prevalent within Indus Valley studies for many decades, strengthened by the writings of V. Gordon Childe and Sir Mortimer Wheeler (Director-General of Archaeology in India between 1944 and 1948). The idea of a priestly class ruling over a sprawling empire firmly placed the Indus within the same archaeological category as the Egyptian and Middle Eastern

Bronze Age "Civilisations". The influence of oriental despotism (Wittfogel 1957) and the Asiatic mode of production are clear within these early interpretations.

The theocratic basis of these early South Asian models derived from the discovery of "citadel" mounds at the major urban centres, and their identification as the seats of the ruling class (Marshall 1931). However, Marshall's earliest interpretations of society within Mohenjo-daro used a heavily racially oriented approach. He viewed society as a dichotomy between "Eurasian", "Sumerian" or "Indo-Aryan" people at the top and a subjugated "Proto-Australoid" or "Dravidian" population (1931: 107ff), although he struggled to identify who were the "authors" of the civilisation. However, this racial structure of society was to manifest itself in later interpretations, although a closer examination of its use appears to link it more closely to modern political ideals than any archaeological reality.

3.3.2 Imperial interpretations

The concept of the Indus Empire stems from the earliest excavations of Mohenjo-daro and Harappa, when Sir John Marshall first recognised the similarities between the two sites (Marshall 1931). These two sites, significantly larger than any other known site at the time, became the focal points of all socio-political interpretations of the Indus Valley. In their reconstructions of Indus society, both Sir Mortimer Wheeler (Director-General of Archaeology in India 1944-1947 and later Archaeological Adviser to the Government of Pakistan) and Stuart Piggott (Abercromby Chair in Archaeology at the University of Edinburgh 1946-1977) identified Mohenjo-daro and Harappa as the "twin capitals" of an empire. Wheeler drew attention to the methodically planned cities with rectangular blocks dissected by well-drained streets dominated by an acropolis or citadel mound. Upon these citadel mounds were ritual buildings, including the "State Granary" at Mohenjo-daro which was the "focal point of the regime", whilst at Harappa there were supplementary granaries that were "marshalled on the lower ground" (Wheeler 1959: 97). Lothal was described as a "regimented coastal township" (*ibid.*). Wheeler's use of words such as *state*, *regime*, *marshalled* and *regimented* present an image of military or political domination achieved through the use of force, similar in nature to the later Kushan, Mughal and Raj empires in South Asia. Piggott envisaged agricultural output being under municipal control through the use of "great granaries strangely foreshadowing those of the Roman Army". (1950: 138).

Wheeler's concept of an "Indus Empire" is dependent on a series of interpretations and assumptions made regarding Harappa and Mohenjo-daro (1959: 97ff):

- That the two cities were rigorously planned, and that this indicates the presence of a centralised governing power that could mobilise labour and impose its concepts of urban planning on cities;
- Both cities were separated into a 'lower town' and 'citadel' that was built upon a raised mud-brick structure. The citadel would have contained ritual and public buildings, including the State Granary at Mohenjo-daro;
- The citadels housed the rulers of the cities, whilst the Lower Town maintained a prosperous middle class;
- Both Mohenjo-daro and Harappa were capital cities that dominated a partially defined province or domain and were part of the same uniform cultural phenomenon;
- That this cultural uniformity is apparent and overriding throughout the entirety of the Indus Valley Tradition.

Central to Wheeler's argument is his assumption that the Indus Valley Tradition is not an entirely indigenous phenomenon. Whilst rejecting the concept of a full-scale colonisation of the region from Mesopotamia, Wheeler suggested that:

> "thanks to Mesopotamia, by the end of the fourth millennium [BCE] the idea of civilisation was in the air of the Middle East; and...ideas have wings... From Mesopotamia we may be sure the mature idea of civilisation, always including that of writing, later reached the Indian coast and the Indus Valley...to be adapted there to local taste and circumstance" (1959: 104).

As a result, Wheeler suggested that whilst the city of Ur evolved naturally from a fourth millennium BCE village to a third millennium BCE city, due to the diffusion of the 'urban concept' Mohenjo-daro was designed with an already fully established concept of civic form (1959:106). At Kot Diji, where there was [at the time of his writing] evidence of a substantial earlier settlement, Wheeler inferred an earlier "failed" attempt to colonise the river valley (*ibid.*).

Piggott heavily emphasised the agrarian character of the Indus Valley Tradition, envisaging a "considerable agricultural producing an adequate surplus beyond its immediate needs for sale to the towns" (1950: 134). In addition, he identified Harappa and Mohenjo-daro as the northern and southern capitals respectively.

Although, the idea of twin or summer and winter capitals appears to have been heavily influenced by the British Raj and Mughal Empires in South Asia, where Delhi acted as a winter capital and Simla, further north and at a higher altitude, functioned as the summer capital. Like Wheeler, Piggott stresses that despite its vast extent the Indus Valley Tradition was highly uniform:

> "the uniform products of the Harappa civilisation [sic] can be traced with the monotonous regularity of a highly-organised community under some strong system of centralised government controlling production and distribution and no doubt levying a system of tolls and customs throughout the territory under its rule...Harappa and Mohenjo-daro...seem to have been twin capitals, a northern and southern, of one united kingdom. One is reminded of historical parallels in North-West India when Sakas and Kushanas ruled from Taxila or Peshawar in the north and Muttra [Mathura] in the south, over a single state" (1950: 136).

The uniformity of artefacts and materials within the Indus Valley was explained through a rigidly enforced set of laws, a strongly established commercial code and standardisation of manufacturing techniques (*ibid*: 138). Piggott not only viewed the Indus Valley Tradition as spatially uniform, but also temporally uniform. Throughout nine phases of rebuilding at Mohenjo-daro during a seven hundred year period Piggott identified little change in the material culture of the site – something he highlights as indicative of cultural conservatism and possible cultural stagnation (*ibid*: 139f). The parallel he drew is not with the Near Eastern communities with which Wheeler identified, but with Central and Southern America polities with their "rigorously authoritarian rule and elaborate religious conceptions" (*ibid*: 140). Finally, Piggott inferred an indigenous origin for the Indus Valley Tradition, albeit with some external influence as to concepts of urbanisation and statehood. He did, however, concede that knowledge of this earlier period was minimal.

Piggott's social hierarchy within the Indus Empire was quite explicit. At the top of the social ladder was the Priest-King who wielded absolute power and resided in the citadel of Mohenjo-daro or Harappa (he resided at both the winter and summer capitals); below him were the priestly aristocracy who administered the economy and religion of the empire from the aforementioned capitals; below

these were the middle classes of the towns and villages who were involved in the production and trading of goods; and at the lower end of the social scale were the agricultural labourers and servile workers (1950). Piggott also unwaveringly adopted the racial hierarchy laid out by Marshall (see section 3.3.1) of Eurasian/Indo-Aryan > Sumerian > Proto-Australoid/Dravidian. Whilst never unequivocally linking the social and racial hierarchies, by creating two parallel hierarchies the implicit assumption is that there is congruity between the two. Additionally, the presence of two hierarchies – one "naturally" or racially defined [read scientific in the early twentieth century], and the other socially or "human" created – became a self-perpetuating argument. The division of major urban centres into "citadel" and "lower town" regions further supported this concept of hierarchy.

Piggott (1950) and Wheeler (1959, 1968) both assign a theocratic nature to the social structure of the Indus Valley Tradition:

> "It is clear that the potent forces behind the organisation of the Harappan kingdom cannot have been wholly secular, and there is, as we have already seen, more than a hint that the priesthood of some religion played a very important part in the regulation of the Harappan economy from within the walls of the citadels of the two capital cities" Piggott (1950: 201)

The partnering of the citadels with the Priest-King equated the Indus cities with the better-known urban centres of Egypt, Mesopotamia and the Mediterranean. Wheeler heavily emphasises the links between the divine ruler on the one hand and the secular control of agricultural produce on the other (1959, 1968), mirroring the temple-based economy of Mesopotamia (Pollock 1999). According to Wheeler, the lower towns of the Indus Valley cities were inhabited by a substantial middle class element financed through trade and industry, the primary economy was still agricultural in nature (1968: 84). Semi-servile workers and labourers occupied the lowest levels of this social hierarchy. Piggott identified a group of sixteen identically planned rooms in the northwest corner of HR area at Harappa, each room measuring twelve by twelve feet, with a small internal dividing wall. Piggott likened the rooms to contemporary collie-lines, and subordinate to the nearby residential areas due to their small size (1950: 169). Wheeler identified that the entranceway to these rooms was through an oblique passage designed to ensure privacy, and that they were "a piece of government

planning" (1968: 32). He agreed with Piggott, although suggested that they may have been barracks or priest's quarters as well (*ibid.*).

The theocratic elites who headed the social and political structure advocated by Piggott (1950) and Wheeler (1959,1968), who both adopt modern South Asian social analogies and European concepts of hierarchical class-based societies, differs significantly from Childe (1954) who adopted a Marxist philosophy. The following section outlines Childe's interpretations of the Indus Valley, and the influence of his work in later years.

3.3.3 Economic interpretation

Gordon Childe provided the earliest development of an economic model of political organisation for the Indus Valley Tradition. Publishing at a similar time to Piggott (1950) and Wheeler (1959,1968), Childe rejected the notion of external stimuli as the catalyst for urbanisation in the Indus Valley, citing evidence of early occupations and urbanisation at Kot Diji and Amri (1954: 187). Childe also questioned whether political rule was hereditary as had been traditionally assumed and proposed the concept of competing groups vying for political control. This concept of non-hereditary political rule pervades the more recent city-state series of models (Kenoyer 1994, 1998, Possehl 1993 – see section 3.3.4).

For Childe, the crux of the Indus Valley economy lay in the agricultural potential of the alluvial river valley, despite the self-confessed lack of archaeological evidence for large-scale agricultural practices or irrigation works (1954: 176). However the underlying Marxist credentials of Childe (Trigger 1986: 9ff), inevitably led him to adopt an economic principal in terms of social structure. Wheeler, on the other hand, proposed an authoritarian structure, loosely equating to traditional Edwardian British society. According to Wheeler, although the lower towns of the Indus Valley cities were inhabited by a substantial middle class element financed through trade and industry, the primary economy would still have been agricultural (1968: 84).

However, Childe retained and developed many of the theories developed by Marshall, in particular the concept of a racial hierarchy. Childe stated that the Proto-Australoid/Dravidian element of the population was subservient to the Sumerian/Eurasian/Mediterranean population. He also explicitly equated the

Proto-Australoid element of Indus society with modern Dravidian populations of South India, whilst the Mediterranean population were immigrants from the west who brought with them the concept of "civilisation" (Childe 1954 [1934]: 175). Furthermore, Childe equated the Indus Priest-Kings with the Sumerian "city-god" and the Egyptian pharaoh, whose power resided in control over the urban granaries and the concentration of agricultural wealth (1954). As such, this racial hierarchy became not only a social hierarchy, but also an economic hierarchy. Due to his Marxist beliefs, Childe interpreted this as a form of economic exploitation, as opposed to the benevolent dictatorship proposed by Marshall (1931) and reinforced by Piggott (1950) and Wheeler (1968). Rather than "coolie-lines" or servants quarters (see section 3.3.2), Childe interpreted the small two-roomed structures of Harappa and Mohenjo-daro as housing artisans, most likely bonded to the Indus bourgeois who inhabited the spacious two-storied houses of the lower town (1954: 175). He also maintained the citadel-lower town divide of rulers and ruled, though he suggests that wealthy merchants and traders from the largest cities supported the ruling king. However, he does not indicate whether this ruling figure would have been hereditary or if there were competing groups involved in struggles for power (*ibid.*).

Childe envisaged a society that was heavily dependent upon economic co-operation between the various cities within the Indus Valley region, and argued that political rule was mostly secular (1954). Atre, influenced by this work, adopted a heterarchical approach (see Crumley 1987, Ehrenreich et al. 1995) to Indus Valley social and political organisation in which religion was inextricably bound to the economy. Rather than a homogenised society in which cities were organised into a strict hierarchy, Atre suggested that urban centres were emerging due to specific regional necessities:

> "The fact that the granary at Mohenjo-daro was located inside the citadel, associated with religious structures like the Great Bath and not with any industrial structures, as at Harappa, suggests that the authority controlling the activities at Harappa was in all probability secular/commercial...Harappa functioned as a trading post primarily established for procuring materials from distant lands" (1989: 49).

In turn, Mohenjo-daro would have functioned as a religious and ceremonial centre, although its importance was heavily dependent on the flow of goods and

materials linked to its religious importance. As such, Atre proposed an "economico-religious" model for the emergence and development of Indus Valley urbanisation (Figure 3.08). Other sites such as Chanhu-daro, Lothal, Desalpur, Shortugai, Sutkagen-dor and Sotka-koh would have functioned as commercial centres within their respective regions. However, Atre questioned whether all these sites should be classed as urban centres, or as trading posts (1989: 50). As for urban centres, Atre believes that only Mohenjo-daro and Harappa demonstrated the necessary requirements to be classifies as such, although admits that Ganweriwala [and now presumably Rakhigarhi and Dholavira] may well fit this category.

Atre (1989) adopted a heterarchical approach in developing an "economico-religious" model for political organisation. Alliances between these ruling groups at two or more urban centres would have stimulated trade and exchange, whilst competition between cities may have lead to breakdowns in trade and the collapse of power (1998). This notion has been developed and adopted by a number of other scholars who have argued, in a manner not too dissimilar to Atre, that the Indus Valley Tradition was not a unified empire, but was comprised of a number of autonomous or semi-autonomous regions or city-states.

3.3.4 Decentralised interpretations

Some scholars have rejected the notion of a single controlling authorative individual, group or community. Instead, the Indus Valley Tradition is viewed as a number of autonomous but interrelated polities or "domains" (Kenoyer 1994, 1998, 2000, Possehl 1993, 1998, 2003). Whilst politically separate, these domains would have engaged with one another through trade, exchange, and possibly warfare. Possehl described such a political arrangement as "sociocultural complexity without the state" (1998: 261).

Whereas Childe's Marxist philosophy advocated the exploitation of the inhabitants of the "lower towns" by the "Harappan bourgeois" (*ibid*: 175), later models present a more mercantile and trade-based system of political control which, in an interview with Kenoyer, Menon refers to as *Indus Valley, Inc.* (1998). Influenced by changing perceptions of "states" and "empires" in the late 1980s (Gledhill *et al.* 1988, Kohl 1987), Kenoyer (1994) questioned the concept of an Indus Valley "state" in the traditional sense (i.e. as defined by Childe 1950, Service 1971). Instead, he suggested that the region was characterised by varying levels of

integration. At the highest level, competing classes of elites would have vied for political and economic control of the largest cities and their associated hinterlands. Whilst the largest cities may have been relatively autonomous in terms of their political direction, as a whole the elites of the Indus Valley Tradition would have shared common ideologies and economic systems (1994: 77):

> "Instead of one social group with absolute control, the rulers or dominant members in the various cities would have included merchants, ritual specialists and individuals who controlled resources such as land, livestock and raw materials"

Kenoyer suggested that whilst this political and economic control may have been enforced within urban contexts, rural communities may have been far less rigidly stratified, but still integrated into the economic sphere of the Indus Valley Tradition (*ibid*).

Kenoyer developed this model of competing elites to incorporate traders, merchants, ritual specialists and administrators as combined groups who ruled over cities through trade and religion as opposed to military power. These competing groups may be distinguished by stamp seals, which were powerful symbols of power and could identify or represent individual ruling groups (Kenoyer 1998: 81). The absence of military control was mitigated by economic and religious networks established between the major cities, with specialised objects manufactured within the cities traded with rural communities for food and raw materials. Indus Valley elites would have held control over the movement and exchange of goods through a system of taxation utilising the standardised weights and measures found extensively throughout the region. At Harappa the highest concentration of weights and measures has been found in the gateways (*ibid*: 99) supporting the idea of taxation on goods entering or exiting the site.

Kenoyer was quite explicit in his delineation of settlement patterns with regards to the political organisation of Indus Valley Tradition city-states (1997). He identified five major urban centres within the Integration Era – Mohenjo-daro, Harappa, Rakhigarhi, Ganweriwala and Dholavira– the last two of which are located within Cholistan and Gujarat respectively and therefore fall within the areas of study for this thesis. These five cities represent the highest level of a settlement hierarchy necessary to support a city-state structure. Kenoyer divided their hinterlands through an arbitrary line drawn midway between each urban centre, although he

admits that in reality trade routes on land, sea and river were more important in defining a hinterland (1997: 54f). Within each hinterland exists a five-tier settlement hierarchy. At the top is the major urban centre listed above, below which were decreasing levels of settlement importance whose size ranges from 10-50 ha, 5-10 ha, 1-5 ha and <1ha (*ibid.*).

Possehl has also differentiated the Integration Era of the Indus Valley Tradition into a series of "domains" – the Kulli, Sindhi, Cholistan, Harappa, Eastern, and Sorath Domains - and associated regional chalcolithic communities - the Northwestern Borderlands and Anarta Chalcolithic (see Figure 3.09) – based upon the location of dominant cities, geographical boundaries and cluster analysis (1993, 2002a). Possehl supposes that whilst the Indus Valley Tradition may have been integrated economically, politically it remained heavily decentralised with older tribal associations retaining power within the various domains or polities. However, the segmented populations would have been linked together through an dominant ideological structure (1998: 288ff). Within this political structure, Possehl identifies a constant source of tension in the relationship between traditional concepts of kinship, lineage, territory and ancestral remembrance with the newly emerging ideology of economy, trade and integration. However, Possehl never identifies the ideology that bound the domains to each other both economically and culturally, or in what manner the local elites held power over either the large cities or the regional domains that they represent.

Within this concept of a decentralised Indus Valley Tradition, Kenoyer suggests that each city-state is autonomous (1991, 1994, 1998, 2000); however, Possehl believes that they are semi-autonomous with a possible nested hierarchy of domains (1993, 1998, 2003), whilst Atre suggests that Mohenjo-daro was an economic and religious centre and Harappa and other key sites were trading centres (1989). However, all the authors rely upon an unknown ideological or religious superstructure that unites the disparate regions culturally and spiritually, as opposed to purely economically, to explain the perceived uniformity of material culture throughout the Indus Valley Tradition. They do however discuss the social structure of the Indus Valley, based upon groups of individuals who compete for control of the major cities.

Possehl (1998, 2003) and Kenoyer (1994, 1997, 1998, 2000) base their interpretation of social structures primarily upon Integration Era data. The roots of their interpretation can be traced back to the economically driven models of

Childe (1954), who assumed that power lay within the hands of a ruling Priest-King (see above), but was supported by a faction of wealthy merchants and aristocrats of the largest cities. Childe is unclear as to whether the Priest-King position was hereditary, or if there were competing groups involved in the struggle for power (*ibid*). Kenoyer, on the other hand, is more explicit in his model of social organisation. Rather than an individual ruler, Kenoyer envisages that:

> "the rulers or dominant members in the various cities would have included merchants, ritual specialists and individuals who controlled resources such as land, livestock and raw materials... [T]hey shared some common ideologies and specific economic systems that are reflected in styles of seals, ornaments and other artefacts" (1994: 77).

However it is the concept of an unknown ideology that holds the Indus cities together within this model of social organisation (see section 3.3.8 for more a discussion on ideological aspects of the Indus Valley Tradition). Kenoyer has suggested that the lack of evidence for any overt military control/domination would indicate that Indus Valley society was legitimised through economic and/or ideological coercion. Citing evidence from seals, ceramics and ornaments Kenoyer argues that the rulers of the Indus Valley Traditions utilised their control of the ideological and material spheres of daily life to control and legitimise the existing social order (2000: 101-109). Indeed it is in the seals that Kenoyer identifies the only viable depiction of ruling elite groups (1999: 81), and that their use was restricted to the elite groups of rulers (1994: 100). Moving away from elites, Kenoyer suggests that urban populations were more rigidly stratified than rural settlements (1994: 77). Rural communities - consisting of farmers, pastoralists, fishers, miners, hunters and gatherers – within the Indus Valley Tradition would have been more loosely organised, possibly along the lines of a developed chiefdom (see Earle 1987, 1991 for definitions).

Possehl suggests that the Indus Valley Tradition was even more loosely stratified than Kenoyer. He views the political situation as segmented and lacking a single unifying ruling figure. Possehl identifies six key facets for his model of Indus Valley Tradition society: (1) the lack of a centralised bureaucracy would suggest that older "tribal" institutions retained significant amounts of power in Indus society. (2) "a strong Harappan ideology" extended across the entire region, crossing political boundaries and uniting the inhabitants into the wider social network. (3) there were few bureaucrats and administrators, with administration

and the economy controlled by merchants, traders, ritual specialists and artisans. (4) a weak monopoly of force. (5) two levels of allegiance – one to the region or domain and one to the Indus Valley Civilisation [sic] as a whole. (6) a dichotomy between the overarching concepts of integrated trade and ideology on the one hand, and older tribal lineages, kinship, occupation and ancestor worship one the other (1998: 289f). However, Possehl acknowledges that our knowledge of Indus social and political organisation is still weak, and that it does not appear to subscribe to traditional models of "civilisations" (*ibid*).

Other authors hint at elements of traders, merchants and religious practitioners as a mode of social organisation (Atre 1989, Malik 1984), although are less explicit in their detailing of the remainder of the social levels.. Possehl does discuss the role of pastoral communities within the Indus Valley Tradition, and highlights they may be functioning outside of the proscribed hierarchies attributed to urban component (Possehl 2002b, Possehl and Kennedy 1979). The role of pastoral communities will be discussed in more detail in section 3.3.7.

3.3.5 Centralised interpretations

The recognition of an indigenous emergence of complexity within the Indus Valley, lead a number of scholars to redress the concept of the "Indus State" as defined by Piggott (1950) and Wheeler (1959, 1968). The timeless character of the Indus (Piggott 1950) was rejected in favour of a continual development, but a development that produced a centralised state-level society. Dhavalikar (2002) highlighted the likelihood that the pre-Harappan period [Regionalisation Era] would have been characterised by some form of ranking, as would the post-Harappan [Localisation Era]. There is also the suggestion that whilst there may have been state-level institutions present within the Indus Valley Tradition, they may not have necessarily been all encompassing. Ratnagar (2001: 121) viewed the Indus Valley as an early state level society that has developed from and retained many of the characteristics of tribal communities:

> "we cannot expect the bringing together of the entire Harappan area into one network to be a matter of coercion and state/administrative institutions alones. Rulers would have initiated and cemented relationships with various village communities through marriages, the bestowal of gifts, or by sending members of their own kin groups to reside amongst the various rural communities."

Jacobson (1987) suggested that the Indus Valley Tradition was organised along the lines of an early or archaic state as defined by Claessen and Skalnik (1978). He argued that the number of large urban centres – at least four others are known to equal Harappa and Mohenjo-daro in size – is suggestive of a state, whilst many smaller sites imitate the larger sites in layout (*ibid*: 145f). A conservative population estimate of 400,000 people and a geographical extent of over 1 million square kilometres would make the Indus Valley Tradition one of the largest known protohistoric polities – much larger than established archaic states (*ibid*: 147). Utilising primarily Near Eastern definitions of early state level societies (Claessen and Skalnik 1978, Isbell and Schreiber 1978, Redman 1968, Wright and Johnson 1975), Jacobson identified four key attributes to differentiate an early state from its socio-evolutionary predecessor, the chiefdom: a four-tiered settlement hierarchy, the presence of administrative artefacts, public building with no religious function, and long-distance communication and distribution systems (1987: 143f). He argued that the presence of geographically broad linguistic commonality, widespread urbanism, a four-tiered settlement hierarchy incorporating small administrative centres, notational and measurement systems, standardisation in settlement planning and seals, combined with a "culture-wide" ideology, economic stratification and an effective communication network were all indicative that the Integration Era of the Indus Valley Tradition was organised as an early- or proto-state (*ibid*: 163).

With reference to the settlement hierarchies, one of the central themes of this thesis, Jacobson was keen to differentiate between a settlement hierarchy and a decision-making hierarchy, highlighting that many people have argued for a three-tiered settlement pattern, when in fact they mean a decision-making hierarchy. A four-tier settlement hierarchy will have three-tiers of decision-making (*ibid*: 154f). Apparently, the lowest tier of settlements was not privy to the decision-making process! The wider pattern was seen as one of a centrally located capital - Mohenjo-daro, distinguishable due to its larger size, central location and the presence of public buildings on the citadel mound – and a series of other key satellite settlements such as Harappa, Lothal, Lurewala, and Ganweriwala amongst others. In turn, these settlements controlled a smaller immediate area - a hinterland - of roughly 50km radius. Jacobson identified a "satellite" model of Indus Valley settlements – where small, mostly agrarian, communities were clustered around larger commercial, religious and political centres. In turn, these

urban centres clustered around even larger urban centres, and finally around Mohenjo-daro (*ibid*).

Like Wheeler and Piggott before him, Jacobson interpreted the apparent uniformity of the Integration Era artefact suite as evidence of strong centralised regulation. Likewise, he assumes urban planning, street widths, brick proportions, stone weights and measures and systems of measurement all support the presence of a centralising political mechanism – without which such phenomena would not be adopted or developed (Jacobson 1987). Jacobson cited a series of other features that he sees as only possible through centralised control of the region – long-distance trade, internal distribution networks, settlement specialisation, labour specialisation and large-scale architecture (*ibid*: 155-158). However, in his post-script, Jacobson revealed a key theoretical bias:

> "perhaps the most striking contrast in the evolution of political organisation presented by Mesopotamia and South Asia is that the latter seems to have become politically unified while it was modestly stratified and militarily limited, while Mesopotamia did not *achieve* unification...until long after Sumerian society had become markedly stratified and strongly militaristic" (*ibid*: 164; italics my own)

The idea that societies seek to "achieve" unification portrays a one-dimensional approach to understanding social and political organisation. Through this, Jacobson suggested that unification into a single state represents the apex of a society or civilisation, even if such unification is an imposed or forced one. However, Jacobson was not alone in such theoretical biases. As the following chapter will demonstrate, the vast majority of the models proposed for the Indus Valley Tradition were derived from flawed or biased theoretical bases.

Jacobson concluded from the evidence that the Indus Valley Tradition was organised along the lines of an early state, as defined by Claessen and Skalnik (1978). They suggested that early states are characterised by:

- a sufficient number of people;
- citizenship determined through birth within the territory; a centralised government that has necessary power to maintain law and
- order through either the threat or use of force;
- an independent government with sufficient control to prevent fission and defend itself from external threats;

- a regular surplus used to maintain the state apparatus; a degree of social stratification in which the rulers and ruled are differentiated;
- a common ideology upon which the rulers legitimacy is based (*ibid*: 21).

This early state definition could easily be referred to as proto-state or pre-state, in that it refers to a form of organisation that is either a developmental stage of later state formation, or represents a community that has 'rejected' certain state-level institutions. However, in Claessen and Skalnik's volume, the only South Asian example of an early state is the Early Historic Mauryan Empire (Seneviratne 1978); indeed, the only example of a pre-first millennium BCE early state is Old Kingdom Egypt (2686-2160 BCE).

Dhavalikar's interpretation resonated with Jacobson's with regard to the presence of "a strong centralised authority" sustaining the "Harappan Kingdom [sic]" (Dhavalikar 2002: 178). The standardised brick sizes, weights and measures, town planning and drainage systems all suggest the presence of strictly enforced rules and regulations. Likewise, Ratnagar cited the presence of urban centres, exotic material, seals, planned streets, uniform brick sizes and homogenised ceramic and artefact suites as evidence of the state during the Indus Valley Tradition (Ratnagar 2001: 117ff). Furthermore, she suggested that the lack of evidence for palace or temple structures is not evidence for the lack of elites, but indicated that they may have manifested their power in ways that differ from Mesopotamia (*ibid.*: 119). However, she acknowledged that the economy of the Indus Valley Tradition may have been regional, rather than state controlled, particularly in terms of subsistence. The development of the state institutions would also have been in competition with existing tribal institutions, which continued to play an important role. Rural communities in particular may have retained kin- and clan-based social structures, and these allegiances may have been utilised by kings and elites to secure alliances and settle new areas (*ibid.*: 120f).

3.3.6 Nationalist interpretations

In his discussion of social organisation, Dhavalikar insinuated that the religious life of the Indus Valley Tradition was similar to modern Hindu religious practices (2002: 181). The presence of the caste system during the Indus Valley period had been discussed before, but was largely conjectural. Childe (1954), Piggott (1950) and Wheeler (1959,1968) all advocated certain elements of Hindu society were present within the Indus Valley Tradition, but they never suggested the presence

of a social structure based upon the caste system. Marshall (1931) hinted at the presence of some elements of Vedic worship during the Indus Valley Tradition, but stopped short of equating the two.

> "Among the Indus cults those of the Mother Goddess and Siva are prominent, and the female elements appear to be co-equal with, if not to predominate over, the male. Fire (*Agni*) ranks among the foremost deities of the Veda and the domestic hearth or firepit (*agni-kunda*) is a characteristic feature of every house. In the houses of Mohenjo-daro the firepit is conspicuously lacking. To the Indo-Aryan phallic worship was abhorrent. Among the Indus people there is abundant evidence of its existence" (Marshall 1931: 111).

Whilst he acknowledged that the Indus and Vedic periods were unrelated in terms of cultural continuity, he also suggested that many aspects of the Indus period may have re-emerged during the later Vedic [Early Historic] period (*ibid*: 110ff). Despite this, other scholars have been more explicit:

> "There is a fundamental unity in the religious outlook and philosophical conception of the Indus Valley Culture and the *RgVeda*. The entire conspectus of symbolism is common to them" (Prakash 1966: 51).

This is however a statement drawn from historical reasoning, rather than any archaeological evidence. Prakash tried to identify the Indus Valley as the homeland of the Vedic Aryans through an analysis of iconography within the Indus Valley Tradition. In particular, he identified the Vedic tripartite division of life – 3 Vedas, 3 fires, 3 worlds and the 3 deities (Vishnu, Brahma, Shiva) – as having its roots in the etic values of the inhabitants of the Indus Valley Tradition (*ibid*: 25f). There are numerous flaws in Prakash's reasoning – not least that he identified (from Mesopotamian texts) the Indus Valley region as Dilmun, now thought to be located in Bahrain (Crawford 1998, Eidem and Hojlund 1993).

This has not stopped more recent attempts to identify the Indus Valley Tradition as either Vedic or proto-Vedic. Whilst some have argued that the *Rigveda* can be traced back to 3750 BCE (Rajaram and Frawley 1995) or even "several millennia before the birth of Christ" (Talageri 1993: v-vi), most scholars place the earliest possible writing of the *RigVeda* in the latter half of the second millennium BCE

(Allchin and Allchin 1982: 298). Whilst few archaeologists would label the Indus Valley Tradition as Vedic, some have suggested that it was a precursor to Vedic society. Lal (1993) was particularly explicit in this respect:

> "The available evidence indicates that there were at least three classes in the Harappan society: a priestly class occupying perhaps the highest position; an agriculturist-cum-merchant class forming the main core; and a labour class at the lowest rung of the ladder. It is not unlikely that these same divisions may have given rise to the subsequent four-fold caste-system in India, the Ksatriyas forking out of the above mentioned second category" (Lal 1993: 63)

Although this three tier hierarchy reflects that of both Piggott (1950) and Wheeler (1959,1968), it differed significantly in that Lal did not identify a single individual ruler – i.e. a Priest-King - but instead replaced him with a group of priests with perhaps a "chief priest" (1993: 64). In Marshall's interpretation, the Priest-King was the sole ruler supported by a group of Priests who resided in the "College of Priests" located on the citadel mound of Mohenjo-daro. However, Lal rejected the notion of a single unified empire, but instead suggested that the Integration Era was characterised by a number of competing states and polities run on oligarchical lines – akin to the *janapadas* of the Early Historic period (Allchin 1995, Seneviratne 1978, Thapar 1963). Lal argued that the presence of an individual ruler would be much more visible in the archaeological record – a palace reflecting their position in life, or royal tombs reflecting their position in death (1993: 70).

Lal utilised archaeological evidence from Kalibangan, Mohenjo-daro and Harappa to support his thesis – most notably from the internal plans of Kalibangan (see Figure 3.12). Unsurprisingly, Lal identified a tripartite division of the settlement, each one representing the three divisions of society. Typically, the priestly class resided in the citadel – Lal suggested that at Kailbangan the priests resided in the northern half of the citadel, whilst the southern portion was reserved for ritual activities. The assertion of ritual activity is evidenced through the presence of a series of platforms upon which stood a contiguous row of seven "fire-altars", a brick-lined well, a brick-lined bathing floor and a possible granary (Lal 1993: 64). Through the presence of seals and sealings, Lal identified what he calls a "well-to-do community that may have been engaged in trade and commerce and also exercised control over agricultural production," that resided in the lower towns of

Kalibangan and Mohenjo-daro. Finally, the lowest rung of the social ladder comprised of unskilled labourers who "depended for their livelihood on the employment provided by the elites" (*ibid*: 65). Like Piggott (1950) and Wheeler (1959, 1968), Lal correlated the lowest levels of the social hierarchy with the barrack-like buildings or "coolie lines" of Harappa and Mohenjo-daro. He also identified a contemporary set of structures in an unfortified area to the south of Kalibangan's citadel area. Here would have lived the "poorer people who may have worked for the more affluent ones, assisting them either in their workshops or even doing the household chores" (1993: 65). Structures here were smaller than those within the citadel and lower town, and a large deposit of discarded pottery was uncovered in the southwestern corner.

3.3.7 Rural interpretations

Fairservis (1986) took the concepts of decentralisation and the lack of state-level institutions (see section 3.3.4) further by proposing that the Integration Era was organised along the lines of a developed chiefdom. Influenced by the growing number of small sites (<1ha) being identified and emerging evidence of short-term occupation of many sites – including Mohenjo-daro - Fairservis (1971, 1986, 1989) suggested a model of political organisation centred upon cattle herds and pastoralism. Recently there has been an increasing amount of literature regarding the role of pastoralist and nomadic communities within the Indus Valley Tradition (Guha 1994, Meadow and Patel 2002, Meadow and Patel 2003, Mughal 1994, Patel 1997, Possehl 2002b, Possehl and Kennedy 1979). In Fairservis' model, Indus Valley elites were not located within the major urban centres but can be found within the pastoral communities the above models presume to be peripheral in terms of socio-cultural complexity.

Fairservis presumed the Indus Valley to be an unstable climatic region (see previous chapter for discussion relating to this), and as such argued that cattle would be of equal or greater importance than agricultural crops. However, for the two to co-exist it would be necessary to adopt a pattern of transhumance. In winter, the *rabi* season, herds would be maintained in the lowlands through the production of fodder whilst in summer the cooler upland areas would provide natural grazing lands (1986: 47f). This mixed subsistence economy would provide both variation in diet and security against poor crop yields. Expansion into new areas would have necessitated planning:

> "Newly colonised areas usually had several contemporary but functionally different settlements. These included: a village and/or administrative centre that was located in or near the cultivated zone; factory sites where local resources such as metal, clay, shell, and stone could be exploited and manufactured into finished goods; and cattle camps of a temporary nature located where pasture was available in a given season. The whole was bound together by an administrative system that constructed central storage facilities gathered commodities and redistributed them" (*ibid*: 48).

Through his highly contentious decipherment of stamp seals and the Indus script, Fairservis recreated the political hierarchies of the Indus Valley Tradition. Each settlement was administered by a series of chiefs or "pirs", who could be further subdivided into "talpirs" who were the head chiefs, "marupirs" who were ritualistic chiefs and "accupirs" or elders/ordinary chiefs (1989: 209). Below the chiefs were "kavadiyars", administrators who maintained the affairs of the settlements, including storage. Newly established settlements would retain ties to chieftain polities, and agricultural produce would be centrally stored in the new administrative centres to be redistributed, and the settlement and its produce would have been under the control of the head chief and the associated administrators. Each hinterland settlement would provide a tribute to the paramount chiefs of the larger floodplain-based settlements (*ibid*: 212f), such as Mohenjo-daro (1986:49). Communities were bound together through kinship ties and ideology, although again Fairservis admitted that little is known regarding the concept of ideology or religion within the Indus Valley Tradition (1989: 215). However, Fairservis' reading of the Indus script is not accepted by any archaeologists (Coningham 2002).

Fairservis' interpretation presented an interesting dichotomy with centralised (Dhavalikar 2002, Jacobson 1987, Piggott 1950, Ratnagar 2001, Wheeler 1959, 1968) and decentralised interpretations (Atre 1989, Kenoyer 1994, 1997, 1998, 2000, Malik 1984, Possehl 1980, 1990, 1993, 1998, 2003), by incorporating elements of the two concepts into a single explanation. Whilst some archaeologists incorporated an element of pastoralism into their peripheries (Kenoyer 1998, Possehl 1993), Fairservis placed the pastoral communities core of the Indus Valley Tradition. The concept that wealth lay outside of the urban centres may explain the contradictions evident in the Indus Valley cities when compared to other contemporary communities. Finally, Fairservis suggested that

the Indus Valley's closest analogy might be with the chiefdom systems of Pacific Northwest Native Americans (1986: 50).

As mentioned in previous sections, many archaeologists have suggested that there was a substantial pastoral or nomadic community living and functioning in parallel with the urban communities of the Indus Valley Tradition. Excavations at microlithic sites in Gujarat (Sankalia 1965) suggested that there was a symbiosis between agricultural urban populations and pastoral nomadic communities. This was particularly visible in Gujarat, where sites of both communities were situated close to one another. Possehl and Kennedy (1979) suggested that the site of Lothal was a "gateway" settlement, situated to procure raw materials through trade with non-urban communities in the area. Through this interaction, there would have been a noticeable gene flow between the two populations (*ibid*: 593). Possehl has expanded on this rather simple observation after excavations at Oriyo Timbo (Rissman *et al.* 1990) had revealed even greater interaction between both urban and rural communities. Possehl suggested that rural communities engaged in hunting and herding, the products of which were traded with their settled neighbours for agricultural produce, metal and clothing (2002: 73f).

Mughal has also identified nomadic and pastoral communities in the more centrally located Hakra River in Cholistan. He has suggested that a significant proportion of the population lived a nomadic life alongside the settled communities of the river valley (1994: 56). Like Fairservis, Mughal identified that many of the sites he discovered on survey were of a small size and temporary nature – what he termed "camp sites." He suggested the relationship between the settled and pastoral communities was based primarily upon economic exchange, with the nomadic population providing services and transport to and from the settled urban centres. Mughal's model was partially derived from ethnographic parallels in modern Cholistan, where nomadic people sell animals, wool, dairy produce (especially *ghee*), *saji*, and handicrafts in the cities in exchange for processed foods and finished products (1994: 60). Mughal suggested that a similar symbiosis may have existed during the Indus Valley Tradition and that the pastoral communities, whilst retaining many of their own cultural traditions would have become inextricably interwoven into the social fabric of the settled populations (*ibid*: 61).

Guha has been critical of the archaeological recognition of pastoral and hunter-gatherer communities in the Indus Valley Tradition, and suggested that they are

generally seen as a secondary or peripheral segment of the overall population (1994). Many authors (Possehl and Kennedy 1979, Mughal 1994, Possehl 2002) focussed on the supporting role that pastoralists play in the development and maintenance of urban populations, whilst Fairservis (1986), Guha (1994) and to a lesser extent Shaffer (1993) focussed upon the inter-dependency of the two modes of subsistence. This latter group of authors viewed the pastoral elements of the Indus Valley Tradition as not just an itinerant population who have minor roles in the economy, but instead viewed them as integral core elements of the Indus Valley social fabric.

3.3.8 Ideological interpretations

A number of archaeologists have rejected normative concepts of state-level societies, and identify a number of weaknesses in interpretations of the Indus Valley Tradition (Coningham in press, Miller 1985, Rissman 1988, Shaffer 1993). These alternative approaches have concentrated upon social dynamics and human agency in explaining the social organisation of the Indus Valley, and have stressed concepts of ascetism and the deliberate manipulation of social structures to mask inequality. Shaffer provided the earliest hint towards an ascetic model of social organisation in a critical review of the position of Indus Valley studies (1993 [first published 1982]). Rejecting Piggott's (1950) concept of a strong centralised governing body, Shaffer suggested that the similarity and homogeneity in style and manufacture reflects the existence of an intensive internal distribution system (1993: 44f). He also suggested that even the smallest sites, such as Allahdino, have yielded examples of almost every known Mature Indus artefact form, even gold, silver and semiprecious stone (*ibid*.).

As for providing an alternative explanation of Indus Valley socio-political organisation, Shaffer relied heavily upon the manufacture of metal objects and excavations at Allahdino. He considered metal objects mostly utilitarian in function, a direct contradiction to Mesopotamia where metal objects were considered luxury, status items (*ibid*: 46). The fact that the presence of metal objects within graves is a very rare occurrence supports this interpretation (*ibid*: 47). The distribution and manufacture of objects of metal and semiprecious stone were not, in Shaffer's opinion, without symbolic meaning. Because they represented a conscious effort in terms of manufacturing, the possession of such items must have imparted some element of social distinction on the owner(s). However, Shaffer suggested that the inability to identify consistent contextual

associations of metal and semiprecious stone objects implies that, unlike Mesopotamia, these objects were available to a large proportion of Indus Valley society (*ibid*: 49). Their absence within burials may indicate that: (1) such wealth objects were not hereditary; (2) they were not considered particularly important indicators of social status; (3) the objects were redistributed at the time of death; (4) there was an absence of well-defined social stratification; or (5) some other cultural rule was at work designating their presence or absence in burials (*ibid*). The suggestion of non-hereditary wealth, and social rules that consciously or unconsciously subvert social structures was developed further by Miller (1985) and Rissman (1988).

In his paper, Miller concentrated mainly upon settlement data and artefactual analysis. Regarding settlements, Miller identified several major traits. All Harappan settlements, no matter how small, appear to attempt to emulate the same pattern of a citadel mound to the west, and lower town to the east. Even the 'hamlet' of Amilano conforms to a grid-plan and, in morphological terms, Miller suggested that a town-village dichotomy did not exist (1985: 46f). Consequently, unlike the suppositions of early archaeologists, Miller found no genuine evidence that supported the notion that the citadel mounds of the larger settlements were utilised for redistributive purposes (*ibid*: 50). Still concerning settlements, Miller noted that there is a distinct lack of architectural decoration and that house forms are relatively homogenous. In fact, there is a lack of evidence for any change in almost every artefactual form for the entire span of the Mature Harappan period (*ibid*: 52), although like Shaffer's statement regarding Allahdino, new evidence suggest that this may also no longer be true.

Regarding these artefacts, Miller identified that settlements were engaged in long distance trade for raw materials; however, the vast majority of artefacts were manufactured locally. This lack of imported "prestige items" lead Miller to postulate that there was some form of "embargo upon the importation of foreign manufacturers" (*ibid*: 55). These above inferences convinced Miller that there was no evidence of a class of wealthy individuals – the ruling elites of the normative approaches – and who have in no way demarcated their distinctiveness within society (*ibid*: 56). Here, Miller quoted Sarcina (1979: 186) "the quality of found objects suggest a well-distributed welfare and a comfortable standard of living, devoid of either luxury, on the one hand, or evident signs of exploitation on the other".

Miller saw such homogeneity as a tendency towards formalism, where artefacts "refer not to groups of people, regions, or other external factors, but only to the style, that is, the order within which they were created" (1985: 59). Miller envisaged a civilisation that "opposes itself at every point to nature" (*ibid*), where institutionalised principles masked social inequality. The standardisation of both artefacts and settlements ensured the reproduction of the formal order that imposed this ideology. (*ibid*: 60). Miller suggested that, "the people of the Harappan who may be said to have power may not have enjoyed privileged wealth or conspicuous consumption, and indeed are more likely to have been conspicuous through ascetism" (*ibid*: 61). Furthermore, the so-called "barracks" (Wheeler 1959) or "coolie-lines" (Piggott 1950) found within the citadel mounds were more likely to have housed monks than slaves. Consequently, Miller saw a normative tendency towards Puritanism as a more likely explanation for Indus Valley Tradition social organisation, than the normative interpretations of priests and Priest-Kings. Within the apparently timeless nature of the Indus Valley Tradition (Piggott 1950), Miller conceived a society in which an "extreme normative order was valued and combined control over the world. Such an order was antagonistic to anything which threatened it, which meant anything not generated by it" (Miller 1985: 63).

Rissman (1988) developed these concepts through an examination of the apparent correlation between grave goods and hoards. The impetus for Rissman's work was the growing corpus of work in the early 1980s that questioned whether deliberately deposited artefacts reflect social relations, but rather that there is potential for the manipulation of material culture by dominant groups who seek political legitimacy (Hodder 1982, Miller and Tilley 1984, Shanks and Tilley 1982, Shennan 1982). Integral to Rissman's methodology was Bourdieu's concept that:

> "The dominant culture contributes to the real integration of the dominant class; to the fictitious integration of the society as a whole, and hence to the demobilisation (false consciousness) of the dominated classes; and to the legitimisation of the established order by the establishment of distinctions (hierarchies) and the legitimisation of these distinctions. The dominant culture produces its function of division under its function of communication" (1979: 79f).

Rissman used this concept of ideological manipulation in his definitions of grave goods and hoards. The public nature of grave goods, offerings and other displays of wealth can be seen as deliberately misrepresenting social relations in an outright attempt to conceal domination, and therefore cannot be utilised as objective indicators of wealth (1988: 209). On the other hand, Rissman believed hoarding is a private and secular act and the pure opposite of display, and as such, hoards may be considered, archaeologically, as more objective indicators of status distinctions (*ibid*). From his analysis of hoards from several Indus Valley sites, Rissman concluded "*if* the Harappan [sic] hierarchy of secular value was characterised by some degree of inequality in value distribution, and by some degree of rigidity in status distinctions, these qualities were *concealed* in the public domain by the ideology of value" (1988: 219, italics author's).

Miller (1985), Rissman (1988) and Shaffer (1993) all challenged the normative heterodoxical models of the Indus Valley Tradition, and concluded that the archaeological record represents a deliberately distorted view of the social structure prevailing at the time. This is not due to natural transforms (survival rates or excavation techniques), but rather a deliberate attempt by elite groups to mask any inequality that may have existed. However, these interpretations derived primarily from critiques of ideology as opposed to direct archaeological investigations, and as such created numerous difficulties in establishing archaeological indicators of such a system of political and social organisation. Numerous questions have also been raised concerning the methodologies employed by both Miller (1985) and Rissman (1988), not least that they are difficult to identify archaeologically (see Manuel 2002).

3.4 Models of Political and Social Organisation

Having examined the existing literature regarding the political and social organisation of the Indus Valley Tradition it is clear that there has been a huge amount of debate and discourse regarding its political and social organisation. The following section will begin to develop the predictive models by creating falsifiable models. To enable us to test the above interpretations they will be categorised into nine models – four political models and five social models. These models have been defined solely on the grounds of the published literature and my own interpretation of it – there is no suggestion that authors consciously

subscribed to each model. These models have been developed to facilitate the creation of relevant predictive models.

Models of political organisation represent the location and role of communities, their inter-related functions and the way they interact with each other through trade, exchange, warfare etc. Social organisation relates to the way in which people on the individual level interact within the larger social sphere, or in some cases the way in which the political organisation is imposed or enforced within the community. This separation of political and social organisation allows for a greater understanding of how Indus Valley society was organised, as it may be the case that different geographic areas functioned in different manners (see following chapter for Mesoamerican examples), or that urban and rural communities had distinct social structures.

Table 3.4 shows the nine models that will be used within this thesis. However, these models are not definitive, and in some cases individual scholars work transgresses two or more models. It must be stressed that these models are constructs of this thesis, and not pre-determined schools of thought. However, as will be demonstrated in the next chapter, they are inevitably influenced by wider archaeological paradigms, as well as responses to emerging evidence. The following section will briefly outline the reasons for the co-option of the above interpretations into these categories.

The Twin-Capital Empire political model and Priest-King social model represent the works of the earliest Indus scholars. Heavily influenced by the contemporary study of Near Eastern and Egyptian societies, interpretations of the Indus were heavily influenced by concepts of strict social (and often racial) hierarchies where elites were clearly demarcated from the majority of the population. This was most clear in the larger urban centres, where there was a citadel-lower town division of society, and the ruling elites were religious and, most probably, theocratic in nature. The economy was centred upon agricultural production, which was taxed and centrally stored within the citadels. Finally, the catalyst for urbanisation in the Indus was clearly attributed to indirect diffusion from Mesopotamia – ideas and concepts of "civilisation" as opposed to individuals.

The Proto-State political model and the Caste System social model are not as synonymous as the previous pair of models. However, they do share a number of characteristics, such as rigidly defined social and religious hierarchies. The Proto-

State model, pioneered by Jacobson (1987) is based upon a four-tiered settlement hierarchy, a strong centralised authority, and social stratification. It differs from the Twin Capital Empire, in that Jacobson conceded that many institutions were not fully developed or realised. The Caste System social model advocates the presence of a social structure similar to the modern caste system of India. Archaeologists (particularly Dhavalikar 2002 and Lal 1993) have explicitly argued the Vedic origins of the Indus Valley Tradition and the three-fold division of society into *Brahmanas*, *Vaisyas* (from out of which emerged the *Ksatyira*) and the *Sudras*.

The Domain political model and Oligarchy social models are based upon the work of Kenoyer (1994,1998,2000) and Possehl (1993, 1998), who have built upon the work of others (Atre 1989, Childe 1954). The essence of the two models is the rejection of a centralised ruling individual, and strict region-wide social and economic hierarchies. In their place, cities and/or regions were semi-autonomous and ruled by groups of merchants, land-owners and ritual specialists – akin to an oligarchy. Kenoyer and Possehl differed over the exact nature of these semi-autonomous polities or domains. Kenoyer suggested that they were fully autonomous and centred around the five big cities, whereas Possehl splits them in a more geographically equidistant fashion, and suggests that there may have been a nested hierarchy of domains. Atre (1989) introduced the idea that cities developed in diverse areas for different reasons – trading posts, ritual centres, manufacturing centres – providing a heterarchical line of argument.

The Chiefdom political model and Kinship social model are inextricably bound, with the two systems seemingly co-dependent upon the other. Fairservis argued for a chiefdom-based society stems from the burgeoning evidence for small, often temporary sites and transhumant economies in the Indus Valley Tradition. The argument for wealth and power outside of the cities is a reaction to the lack of normative indicators of status within the urban centres, and reflective of ethnographic examples of chiefdom societies in East Africa (Evans-Pritchard 1940). Other scholars have argued for the presence of kin and clan lineages within the Indus Valley Tradition (Jacobson 1987, Possehl and Kennedy 1979, Shaffer 1993) although they are usually subordinate to other forms of social organisation, existing on the peripheries or as informal ties between communities. These two models present a reaction to the centralised urban-elite based models that dominate Indus studies, but they have been widely overlooked.

Finally, the Ascetism social model is not partnered with any specific political model. Rather, it represents the only attempts to introduce a human dynamic into the social organisation of the Indus Valley Tradition. Whilst other models tend to be explicit in terms of hierarchies and roles, they often lack any element of human agency. The Ascetism model tackles the concept of an Indus ideology omnipresent in so many models but never archaeologically realised. Like the Chiefdom model, Indus archaeologists have largely overlooked it due to the complexities involved in integrating it into their models.

3.5 Chapter Summary

The purpose of this chapter was to, first, develop a chronology for the Indus Valley Tradition, as defined in the second objective of this thesis (section 1.3) - to establish a chronology of the Indus Valley Tradition, and assess how it will impact upon the interpretation of the archaeological record - and second to outline the existing interpretations of the social and political models of organisation in order to achieve the third objective of the thesis in the following chapter - what are the existing models of social and political organisation for the Indus Valley Tradition, how have these models been developed and how can they be tested in relation to settlement distribution and function? This chapter has outlined the existing interpretations, and the following chapter will critically review the models developed here and outline predictive models for them.

The chapter began by outlining a chronology for the Indus Valley Tradition and discussing the reasons behind the adoption of Shaffer's chronology over other potential chronologies. Numerous chronologies have been proposed for the region during the pre- and proto-historic period, of which Shaffer's has been adopted for this thesis. Shaffer's chronology was chosen due to the greater flexibility that it affords, and the non-linear nature of its structure. The chapter then went on to refine and update the chronology to incorporate new dates and information, adding the Ravi Phase (section 3.2.3.4), and adding numerous qualifications to each of the existing phases. It also highlighted the potential problems with Shaffer's chronology. Section 3.2.6 identified that there remains a strong culture-historical element within South Asian archaeology, and this is most easily identified through chronologies, including Shaffer's. Most significant is the tendency to view the archaeological record as the representation of a culturally stagnant group, and that Shaffer's chronology may be interpreted as the a series

of overlapping but culturally stagnant archaeological "cultures". However, the greatest problem with developing any chronology in South Asia remains the lack of absolute dates from securely excavated sequences.

Chronologies for Gujarat and Cholistan were then discussed in more detail. It was established that Gujarat had been overlooked by Shaffer when developing his chronology. This may partially be a result of editorial restrictions – Shaffer (1992a) was asked to provide a chronology for Pakistan, whilst Possehl and Rissman (1992a) were asked to compile a similar chronology for Western India. However, in trying to rectify this omission it was established that no site has been sufficiently dated from which to develop an absolute chronology. The error ranges on existing radiocarbon dates from sites within Gujarat were too large, even using Oxcal calibration, to refine this any further. As such, the chronology for Gujarat has been constructed from ceramic typologies and relative dating methods. There have been no excavated sites in Cholistan, and as such no radiocarbon dates. Mughal's chronology has been adopted unchanged for the purpose of this thesis.

The second half of the chapter outlined the current interpretations of the social and political organisation of the Indus Valley Tradition, and grouped them into a series of testable models. These interpretations ranged from early colonial interpretations, nationalist interpretations to post-processual interpretations. These interpretations were then grouped into four models of political organisation, and five models of social organisation, based upon the arguments that archaeologists have used. These models will be examined in more detail in the following chapter, and predictive models outlined for them. Furthermore, the next chapter will outline the methodology used in the Gujarat Environs Survey, and detail how the Gujarat and Cholistan datasets were developed. It will finish by providing the methodologies to be used in achieving the fourth and fifth objectives – analysing settlement distribution and function.

Chapter Four - Methodology

4.1 Introduction

The previous chapter interrogated and revised Shaffer's (1992a) chronology of the Indus Valley Tradition, and provided more detailed chronologies for both Gujarat and Cholistan. It also introduced current interpretations of the socio-political organisation of the Indus Valley Tradition, and created nine models of social and political organisation (see section 3.4 and Table 3.3) against which to test the data from Gujarat and Cholistan. As such, Chapter Two defined the modern geography and climate of the Indus Valley Tradition and countered the established view of the palaeoenvironment and palaeoclimate of the region. Chapter Three challenged the use of traditional chronologies, and refined Shaffer's chronological sequence of sites in the region, and also introduced existing interpretations of its socio-political organisation. As such, Chapters Two and Three have completed the first and second objectives (as defined in section 1.3) and begun to complete the third objective – to identify the existing models. This chapter complete this objective by examining the nine models of social and political organisation in more detail, and creating falsifiable models for each. It will then outline the methodology for testing them. Finally, this chapter will discuss the methodology used in the Gujarat Environs Survey, and how both the Gujarat and Cholistan datasets were established.

The chapter will begin by examining recent theoretical developments in understanding the social and political organisation of archaeological communities, and discuss broader models of empires and city-states providing a broader overview of global models that will then be utilised in the development of falsifiable models. The second theme of the chapter will then discuss the nine models of social and political organisation with reference to this earlier discussion, and outline archaeological indicators for each. The third theme of the chapter is to discuss the methodologies utilised in undertaking the Gujarat Environs Survey. It will then examine survey methodologies used in Gujarat and Cholistan, and discuss the advantages and disadvantages of different approaches to archaeological survey that have been used. Finally, the fourth theme of the chapter is to outline the methodologies for testing the falsifiable models through the analysis of site distribution and function.

4.2 Defining social and political organisation

Many of the models outlined in section 3.3 were developed during earlier archaeological paradigms, and consequently are outdated in relation to more recent archaeological theories and techniques. This section will introduce recent archaeological concepts of empires and city-states, and how our understanding has developed from the frameworks of culture-historians such as Childe (1929, 1950, 1952, 1954). It will then examine more general models of social and political organisation.

The rejection of models of social evolutionary (i.e. Sanders and Marino 1970, Service 1971) and the onset of post-processual theories regarding the understanding of how ancient societies were organised (Alcock *et al.* 2001, Barrett 2001, Burke 2006, Dowson 2005, Fleming 2006, Gurven *et al.* 2004, Holtorf 2005) has led to the development of alternative explanations for the social and political organisation of many ancient societies. Whilst this has been most notable in Mesoamerica (Fox *et al.* 1996, Inomata 2006, Smith and Schreiber 2005, 2006, Smith 2005, Urban *et al.* 2002, Wells 2006), it has also manifested itself in Andean South America (Vaughn 2006) and the Western Mediterranean (Knappett 1999).

In Mesoamerica, Balkansky has argued that Teotihuacan is considered an archetypal site, even though it is the most unique urban form in the region. This "hyperurbanisation" consists of a largely monumental and commercialised urban centre, coupled with a sparsely populated rural hinterland largely devoid of any other settlements (Balkansky 2006: 78). Other regions in Mesoamerica display markedly different settlement patterns and spatial organisation, suggesting that complex societies within the same cultural and geographical area grow and evolve in very diverse manners (*ibid.*). Furthermore, Balkansky questions the "single-point-of-origin and spread" model of urbanisation in Mesoamerica, instead highlighting the simultaneous development of urban centres in different regions (2006: 79f). This certainly has resonance in the Indus Valley, where Harappa and Mohenjo-daro are still considered to be type-sites, and where urbanisation in marginal/peripheral areas is explained through colonisation and migration of people from the Indus core regions (Dhavalikar 1995). However, this thesis will try not to impose external models upon the Indus Valley Tradition. The significance of

these developments elsewhere will be addressed further in Chapter Seven. The following sections will examine broader models of social and political organisation, particularly empires, city-states and chiefdoms. This will provide archaeological analogies from which to draw upon when developing the predictive models later in the chapter.

4.2.1 Primary Empires

It is now recognised that models of imperial rule are more complex than a simple checklist of features. A number of the above conditions are equally likely to feature in alternative forms of political organisation. Indeed, the presence of large urban centres, full-time specialists, monumental buildings, a ruling class or section of society, artists and craftspeople, long-distance and luxury trade, ethnic or common identities and the establishment of an ideological or religious framework are common features of many pre-, proto- and historic societies who all function under widely different forms of political organisation. It is the way in which these factors manifest themselves within a society that identifies an imperial form of political organisation. Fundamentally, empires support themselves through the taxation or tribute of its citizens and constituent parts, and maintain a large and permanent military presence to protect its delineated frontiers and to preserve its internal order (Barfield 2001: 29). In order to achieve this dominance, Barfield identifies five common internal aspects of, what he labels 'primary' empires:

- "*Empires were organised both to administer and exploit diversity, whether economic, political, religious, or ethnic.*" It is the empires' ability to absorb different identities, ethnicities and religions that separates them from alternative forms of political organisation (i.e. city-states, tribes) that rely on a form of common similarity to maintain continuity. Empires often thrive on ethnic diversity, although this is not the result of cosmopolitan libertarianism, but a method of increasing potential revenue streams within their borders. Groups that oppose politically, ideologically or economically are likely to be destroyed or disbanded throughout the empire. Once these groups are eradicated, empires show a tolerance for local variation, as this allows the freeing of troops for frontier control (*ibid*: 29f).

- "*Empires established transportation systems designed to serve the imperial centre militarily and economically.*" Sophisticated and well-maintained

transport links were necessary within empires to ensure that nowhere was beyond the reach of the military centre, and military supplies were located throughout the empire. Roads, canals, ports, river crossings and staging posts were invested in to facilitate the movement of goods and troops. This network allowed empires to support populations far beyond the capabilities of their own hinterlands. In areas where water transport (river, marine, canal or lake) trade links could support populations of immense proportions. Far-reaching trade links, coupled with conditions of peace allowed areas and communities to focus on investment and the production of goods with a guaranteed, and increased, market for them. In return, luxury goods were available in greater quantities to local elites. These economic links could bind and empire together to far greater a degree than military occupation or ideological empathy (*ibid*: 30f).

- "*Empires had sophisticated systems of communication that allowed them to administer all subject areas from the centre directly.*" As policy decisions were taken at a centralised location, the dissemination of information to the outer edges of the empire was critical to the empire. Roads that transported goods and troops were also utilised to relay information, whether it be through horse relay stations, runners or fast boats - all empires had an official method of swift communication. This communication relied upon a recording system, a permanent bureaucracy and a common administrative language. Of equal importance were standardised measures and numerical systems, although localised methods may have co-existed alongside these official impositions (*ibid*: 31f).

- "*Empires proclaimed a monopoly of force within the territories they ruled and projected their force outwards.*" Successful empires controlled their internal affairs through the implementation of a common legal system and a centralised system of government administrators responsible for carrying out imperial policy. Local officials were constrained in their actions by centralised bureaucracy. In terms of expansion, empires aimed to expand until it became unfeasible to expand any further. This could be because of a) reaching the frontiers of an equally strong empire; b) reaching an ecological frontier (desert, steppe, mountain or jungle) that they could not effectively control; c) further advancement was forsaken in order to establish an overwhelming defensive frontier; or d) the cost of advancement outweighed the benefit of controlling it. Imperial frontiers were long-lived

and permanent. An empire's army would be stationed on its frontier, rather than at its centre (*ibid*: 32).

- *"Empires had an 'imperial project' that imposed some type of unity throughout the system."* Empires were tolerant as they expected their own cultural system to become dominant. This could be reflected through common systems of measurement, architectural styles, cosmology, ritual, art and fashion. This concept of unity is often interpreted as a "civilisation". Empires that did not develop long-term cooperation were not as long-lived as those who did.

These five features of an empire clearly differentiate an empire from other forms of complex political organisation in a way that Childe's (1950) (see also Coningham 1995) checklist of urban revolution do not. The vast majority of Childe's list are common within all forms of political organisation that are, in a social evolutionary sense, more complex than segmented societies. Barfield (2001: 33) suggests that archaeological examples of primary empires would be Assyria, Achaemenid Persia, Rome, Han China, the Inka and the Aztec. All of these demonstrate the five salient features listed above, as well as meeting the ten points on Childe's checklist (as do a number of other documented empires throughout history). However, recent research into Achaemenid Persia has demonstrated that different parts of the Empire were organised along very different lines depending upon local customs and traditions (Dusinberre 2003: 2ff) If the Indus Valley Tradition was organised as an Empire, as suggested by Piggott (1950) and Wheeler (1959, 1968) amongst others, it would have to fulfil the criteria listed above (Barfield 2001: 33ff).

4.2.2 City-States

Charlton and Nichols define city-states as:

"small, territorially based, politically independent state systems, characterised by a capital city or town, with an economically and socially integrated adjacent hinterland. The whole unit, city plus hinterlands, is relatively self-sufficient economically and perceived as being ethnically distinct from other similar city-state systems. City-states frequently, but not inevitably, occur in

> groups of fairly evenly spaced units of approximately equivalent size" (1997: 1).

Essential criteria for defining a city-state include a state-system centred in a capital city or town; a small integrated territory or hinterland; a small overall population; political independence; relative economic self-sufficiency and perceived ethnic distinctiveness (*ibid*: 5). In terms of size, Charlton and Nichols suggest that city-states are characterised by their small-scale and compactness, and are generally a radius of one-day's walk from the central town (between 10km and 30km), although topography and ecology alter this (*ibid*: 8). Additionally, ideology is an important aspect of any city-state structure. The capital cities symbolise elite power, political autonomy, ethnicity, and religious ideology, whilst the relationship with the hinterland is conceived of as a tightly integrated unit. They talk of the need for an ideological transformation of loyalty to kin groups to loyalty to the city-state (*ibid*: 13).

Archaeologically, the traditional concept of a city-state derives from the Greco-Roman world, and Aristotle's concept of the *polis*. Within this context, the city-state is viewed as a unit of people who a) occupied a territory in which an urban centre was the focal point; and b) had autonomy in their government and positions of power were gained from within their own community (Jeffreys 1976). However, Maisels adds a further qualifier to this definition, in that the city-state is not merely an autonomous urban unit but a self-sufficient entity incorporating both urban centre and hinterland (1990: 12). The urban centres tend to be relatively large in terms of settlement size hierarchies, and the cities would have supported craft production, and commercial exchange between urban and rural communities as well as between neighbouring urban centres. It was this competition with regards to craft specialisation and access to raw materials that provoked competition between neighbouring city-states to obtain supplies of exotic raw materials (Trigger 1993: 8ff).

In terms of identifying city-states archaeologically – and specifically without the aid of a deciphered script detailing the names and locations of political centres – there are a number of variables to consider. In areas of intense warfare, city-state capitals tend to be much closer together, and settlements within them cluster close to the capital. In Mesopotamia capitals were on average 40km apart, and in the Valley of Mexico they averaged 7km apart. However, within the Yoruba of West Africa and the Maya city-states the capitals were anywhere between 40 and

70km apart. In these more dispersed city-states, secondary administrative centres would be necessary, and were roughly 11-12 km from the capital city (Trigger 2003: 100). Some of the best data regarding protohistoric city-state organisation derives from Mesopotamia. Analysis of settlement patterns, both spatially and temporally, provides a model for the development of a city-state system in a similar alluvial environment to the Indus Valley Tradition. The settlement patterns in Mesopotamia also show a distinct geographical difference between the southern region (Uruk-Larsa) and the northern region (Babylon-Kish), reflecting slightly differing political arrangements (Stone 1997).

In the southern region there is a greater density of primary centres (>40ha) combined with a comparatively lower number of secondary centres (20-40ha), whilst in the northern region there are fewer primary centres and a higher number of secondary centres (Figure 4.01). Textual data suggests that during the Late Early Dynastic Period (2700BCE ~), the northern region was unified under a single city (Kish), whilst the southern region was divided into a number of city-states (*ibid*: 22f). In this southern region, settlement hierarchies reveal a high number of primary centres (>40ha) in comparison to secondary centres (10-40ha). The northern region, on the other hand, has very few primary centres and a higher amount of secondary centres. By the Late Isin-Lara/Old Babylonian period (~ 1600BCE) settlement patterns in the north adopt a more fragmentary pattern with increasing numbers of primary centres and decreasing secondary centres, whilst in the southern region a decrease in primary centres is complimented with an increase in secondary centres – although this reversal is less drastic than the developments in the north (*ibid*: 24f).

As such, settlement hierarchies from southern Mesopotamia provide a comparable city-state model for creating a predictive model for the Domain model. City-state political organisation is characterised by high numbers of primary urban centres within the landscape (often only 7km apart), combined with few secondary urban centres. Small agrarian communities settled nearby support these primary centres, which were economically, politically and culturally tied to them. Unified political states, such as northern Mesopotamia, are typified by a few primary centres, a higher number of secondary centres and a more dispersed agrarian settlement pattern. The archaeological model from the early periods of the northern region is analogous with the Proto-State model, and provides a dynamic model of changing political organisation over time presenting an analogous model for the Indus Valley Tradition.

4.2.3 Territorial Empires

The previous section demonstrated that the data from northern Mesopotamia provides us with an initial settlement pattern against which to build our predictive model for the Proto-State model. Typified by a single (or small number of) primary centre(s) supported by a larger number of secondary centres, the city-state model has a more dispersed rural settlement pattern. Archaeologically, its closest analogy is Trigger's concept of a territorial empire developed as a rejoinder to traditional concepts of city-states and empires (1993). Territorial-states are typified by a hierarchy of administrative centres at the local, provincial and national level, although these centres tend to have relatively small populations – even national capitals would be no larger than a large city-state capital. These urban/administrative centres were inhabited almost exclusively by the ruling class and the administrators, craft specialists and retainers who served them. The security afforded by state infrastructure allowed agriculturalists and pastoralists to reside in rural contexts away from the urban centres. Internal settlement patterning also tended to be decentralised.

Within Trigger's model of a territorial empire (1993), the economy was two-tiered representing urban and rural spheres. Agricultural and pastoral communities would manufacture their own tools and belongings from locally available raw materials, and exchange goods at local markets. The only significant economic link between rural and urban communities in territorial states would be the payments of rents and taxes. Elite craftsmen were employed by the state either in provincial centres or national capitals to manufacture luxury goods for the king and elite groups, often from imported raw materials. Territorial states adopted large bureaucracies to supervise the collection of taxes. Rural communities, whilst being absorbed into the state hierarchy, tended to retain many of their traditional cultures and beliefs, as there was little need to integrate into urban contexts. In these non-urban contexts manufacturing was less specialised, there were fewer full-time specialists and the materials were of a lower quality and invariably locally available. Farming may also have been less intensive than in states or city-states as there were fewer urban dwellers to feed (Trigger 1993: 10ff).

The Mesopotamian data (Stone 1997; see section 4.2.3) demonstrated that territorial states are not permanent forms of organisation but can develop into alternative forms of social organisation, a key facet of this thesis. Comparative

archaeological examples would be Old and Middle Kingdom Egypt (2700-1800 BCE) and Shang China (1750-1100 BCE). Again, the concept of the territorial empire provides us with another analogous model against which to test the data from Gujarat and Cholistan. Settlement patterns within a territorial empire would be dictated by the presence of primary centres not identified through size but through function. There would be less variation in settlement sizes, but a hierarchy of site functions based upon administration and craft specialisation. Rural or non-urban sites would lack craft specialisation and focus primarily upon subsistence strategies and/or the procurement of resources. Craft and manufacturing industries would be restricted to the national and provincial capitals. The concept of the territorial empire provides an archaeological template for the Proto-State model.

4.3 Creating the Predictive Models

Having examined recent archaeological developments in understanding the social and political organisation of ancient societies and reviewed recent interpretations of empires and city-states, this section will examine the theoretical framework of the models outlined in the previous chapter and develop predictive models for each. To recall, the models were divided into two groups: political and social. The political models were Twin Capital Empire, Proto-State, City-State and Chiefdom, whilst the social models were Priest-Kings, Caste System, Oligarchy, Kinship and Ascetism. The section will begin with the four political models, and then move onto the five social models.

4.3.1 Models of Political Organisation

The models of political organisation represent the interpretations of site interactions and economic relationships within the Indus Valley Tradition. They are based upon the location, size and relationships between sites within the region. In many ways the models of political organisation are inextricably linked to specific models of social organisation, yet at the same time some of the social models transgress the political models. With this in mind, within this thesis, the two types of model have been separated. This separation allows the thesis to test whether the same models of political and social organisation were are applicable to both Gujarat and Cholistan, or whether there are varying degrees of evidence from a core and peripheral region.

4.3.1.1 Twin Capital Empire

The Twin Capital Empire model incorporates the work of several early scholars (Mackay 1938, 1943, Marshall 1931, Piggott 1950, Vats 1940, Wheeler 1947, 1959, 1968) and to a lesser degree Childe (1952, 1954). The main focus of this model is that the Indus Valley was organised along the lines of an empire – Piggott suggests that it was reminiscent of the later South Asian empires of the Sakas or Kushans (1950: 136) or even the Roman Empire (*ibid.*: 136) – and that this empire was administered from the two capitals of Mohenjo-daro and Harappa. The dual capital theory can be traced to the Kushan Empire (60-375 CE) where Taxila and Mathura were joint capitals administering two different regions, the Mughal Empire (1526-1857 CE) with the twin capitals of Agra and Delhi, or even to British imperial rule in South Asia (1858-1947) with its winter capital at New Delhi and summer capital at Simla.

Fairservis identified that the earliest excavators of sites (invariable British or American) within the Indus Valley were trained in the classical world, and consequently their interpretations leant towards analogies with Greece, Rome and the Near East (1986: 43). Later scholars (i.e. Wheeler and Piggott) looked more towards later South Asian analogies in order to explain the archaeological data they were unearthing. However, both groups of archaeologists relied upon external stimuli in their explanations regarding the emergence of urbanisation in the Indus Valley, whether through direct colonisation or indirectly (Piggott 1950: 141, Wheeler: 1959: 100ff). The identification and subsequent excavation of sites such as Mehrgarh (Jarrige *et al.* 1995, Jarrige 1984, 1990), Rehman Dheri (Durrani 1988) and Kot Diji (Khan 1965) (see section 3.2.2 and 3.2.3) have demonstrated an internal continuum for the emergence of urbanism in the Indus Valley. Concepts of diffusion and migration have been widely discarded as viable explanations for developments within the archaeological record.

Many archaeologists have questioned the theoretical and archaeological arguments of these early South Asian scholars (Chadha 2002, Chakrabarti 1997, Coningham 1995, Coningham and Hardman 2004, Dales 1964, 1968, Kenoyer 1994, Leach 1995, Raikes 1965, Shaffer 1984, 1993, Shaffer and Lichtenstein 1989, 1995), but despite this many of their interpretations - the concept of a twin capital empire included - are still retained (see Dhavalikar 2002, McIntosh 2001, Ratnagar 2001). Concepts of Aryan invasions have been widely muted (Dales

1964, Leach 1995, Shaffer 1984) through linguistic and archaeological reasoning. Leach also suggests that early interpretations of South Asian history was linked to British Imperialism in the region, an attempt to portray South Asia as culturally stagnant and that colonial administration was revitalising a "morally corrupt" society (1995: 243).

In terms of developing a predictive model, the original concept of a twin capital empire has already been widely muted throughout the archaeological community. Additionally, the model was developed within a theoretical framework (culture-history) that has been widely discredited by modern archaeologists, and with a dataset that has been drastically altered over the last fifty years. Finally, as has been demonstrated above, our understanding of empires in an archaeological sense has changed significantly (Barfield 2001, Morrison 2001). The predictive model for the Twin Capital Empire model will divert from the Wheeler/Piggott concept of an empire to incorporate these new interpretations.

The presence of an empire in the Indus Valley (whether it is the twin capital empire or a primary empire) will be dependent upon meeting the criteria stipulated by Barfield (2001: 29-33). These are: (1) empires were organised both to administer and exploit diversity, whether economic, political, religious or ethnic; (2) empires established transportation systems designed to serve the imperial centre militarily and economically; (3) empires had sophisticated systems of communication that allowed them to administer all subject areas from the centre directly; (4) empires proclaimed a monopoly of force within the territories they ruled and projected their force outwards; (5) empires had an 'imperial project' that imposed some type of unity throughout the system. Identifying these factors archaeologically may prove difficult given the nature of the data utilised within this thesis.

Rank-size analysis may prove useful in this respect (see section 4.4.2), as an empire would expect to demonstrate a clear hierarchy of sites, organised in such a way that maximum control can be exerted across a landscape. In terms of distribution, the empire predictive model should demonstrate a clear hierarchy of sites. If, as assumed by all the proponents of the Twin Capital Empire model, that Mohenjo-daro and Harappa were the capitals, then the settlement patterns witnessed in Gujarat and Cholistan will be missing their primary centres. However, it should be possible to identify regional centres and a clear hierarchy of sites below them. A retinue of sites engaged in agriculture and/or manufacturing

industries to support these large regional centres and urban elites. In terms of site function, Wheeler (1959: 97ff) suggests that cultural uniformity is apparent and overriding throughout the entirety of the Indus Valley Tradition. As such, we would expect the settlement patterns of Gujarat and Cholistan to be similar in terms of both distribution and function.

4.3.1.2 Proto-State

The Proto-State model is difficult to analyse due to the vague definition afforded to the concepts of early states (Claessen 1978, Skalnik 1978) – the primary theoretical model used by Jacobson (1987). However, the territorial empire and northern Mesopotamia settlement data provide us with material from which to develop a predictive model. The Proto-State model is primarily derived from the work of Dhavalikar (200), Jacobson (1987) and Ratnagar (2002), but there is also scope to include the work of Joshi (2000), Lal (1993) and Malik (1984) who hint at similar political structures but are less explicit in their work. The Proto-State model represents a trend amongst scholars to argue once again for the presence of a single unified society present within the Indus Valley. The 1960s and 1970s witnessed a major shift in archaeological thinking regarding the Indus Valley Tradition, with many archaeologists questioning the validity of earlier interpretations of archaeological remains, whilst new survey was revealing a much wider variety of sites.

This identification of smaller rural sites through surveys undertaken throughout the region (Ghosh 1959, Mughal 1971, Possehl 1980) had lead many scholars to begin arguing for a larger rural and nomadic component to the "Indus Civilisation" (in particularly Fairservis 1971, but also Flam 1976, Hoffman and Shaffer 1975, Possehl and Kennedy 1979). The Proto-State model represents a shift back towards a concentration upon the urban centres and concepts of centralisation, albeit to a lesser degree than the earlier Twin Capital Empire model. Dhavalikar (2002) and Ratnagar (2001), in particular, heavily emphasise the urban nature of the Indus and a strong centralising authority. The development of this political model can be mirrored in the introduction of caste as a model of social organisation, an issue that will be addressed below in section 4.3.6.

Jacobson – the main proponent of the Proto-State model – lists several key criteria in his argument: a shared language, widespread urbanisation, a four-tiered settlement hierarchy, notational and measurement systems, standardised

planning, economic stratification and a culture-wide ideology (1987: 163). However, not all of these features will be possible to identify archaeologically – at least through an analysis of site distribution and function. It will however, be possible to test both Jacobson's model of a four-tiered settlement hierarchy and Trigger's (1993) concept of a territorial empire.

As discussed in the previous chapter, Jacobson advocated a satellite structure to Indus Valley settlements: Mohenjo-daro at the top, secondary centres such as Harappa, Lothal and Ganweriwala controlling a hinterland, and then small agrarian settlements clustered around a slightly larger regional centre. Such a model would be clearly visible within both Gujarat and Cholistan where these secondary centres – Jacobson (1987: 154f) lists Lothal (Gujarat), Ganweriwala and Lurewala (both Cholistan) – are located. However, this site distribution pattern does not differ significantly from the Twin Capital Empire model, other than identifying only a single capital. It is the mechanisms for how these sites interact that separate the two models. Jacobson suggests that these smaller secondary centres controlled a smaller immediate area or hinterland of roughly 50km radius (Figure 4.02).

Testing the concept of Trigger's territorial empire (1993) should also be possible through both settlement distribution and function. The distribution of settlements within a territorial empire, as defined by Trigger (1993), is very similar to Jacobson's Proto-State model (1987). In terms of function, there should be a visible dichotomy between urban and rural sites in both regions, representing the economic division that is apparent within a territorial empire. For example, urban sites should be engaged in craft specialisation and manufacturing industries, as well as providing markets for goods. Rural sites should be primarily involved in subsistence activities such as herding, farming, fishing and possibly the procurement of raw materials. This division should be visible within the Integration Era only, as this is the period Dhavalikar (2002), Jacobson (1987) and Ratnagar (2001) identify as being a proto-state or early state. The three authors largely ignore the Regionalisation and Localisation Eras. However, this thesis will test all three Eras to ascertain whether such a division of sites is present throughout time, or is, as they suggest, only visible during the Integration Era.

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4.3.1.3 Domains

There are two approaches to analysing the Domain model. First is to test the arguments put forward by both Kenoyer (1994, 1997, 1998, 2000) and Possehl (1993, 1008, 2003), and the second is to examine the feasibility of city-states as defined by Charlton and Nicholls (1997) and Stone (1997). However, before outlining the predictive model, it is prudent to examine the theoretical background to the Domain model.

The Domain model represents a shift away from concepts of a single unified empire (see 4.3.1 Twin Capital Empire and 4.3.2 Proto-State), and takes into account the lack of *traditional* evidence for a centralised authority (i.e. Childe 1950, Service 1971). However, Kenoyer does not completely reject concepts of a unified state, opting to suggest a society that was "characterised by different levels of integration" (1994: 77). He argues that larger cities may be independent of any central authority and were largely self-sufficient. Rural settlements, on the other hand, may have been organised more along tribal boundaries, and were less rigidly segregated than urban centres (*ibid.*). In this way, Kenoyer is distancing himself from the traditional concepts of empire, but at the same time not neglecting the important role urban centres play. Possehl's work follows a similar pattern, although he places a greater emphasis upon smaller sites (1993).

Kenoyer's and Possehl's stance midway between the concept of a single empire (i.e. Wheeler 1959) and that of a chiefdom (Fairservis 1986) is not problematic in itself, but both archaeologists fail to identify how such an arrangement would function. Possehl suggests that despite the lack of an identifiable leader, "the whole was held in place through a strong Harappan ideology" (1998: 285). However, he neglects to identify this ideology, or any form of human agency. Likewise, Kenoyer states: "the order and legitimation of the Indus state were maintained through the creation of wealth items that had strong ideological associations" (2000: 108), with very little further elaboration. However, neither author provides any real argument or archaeological reasoning behind their model.

In terms of settlement distributions and function, both Kenoyer and Possehl are vague. Possehl (1998: 268f, Table 8.1) presents some rudimentary figures that demonstrate a gradual increase in average site sizes from 7000 BCE up until 1900 BCE, after which there is a steep decrease. There is, however, very little qualification of this data. Possehl detaches the Integration Era from the period's

preceding and succeeding it, and attempts to identify evidence of disruption between periods (*ibid.*: 272f, Table 8.2). Kenoyer suggests the presence of a five-tiered settlement system with sizes ranging from >50, 10-50, 5-10, 1-5 and <1 hectares in size (1997: 54f). He does not qualify this statement, nor state how these size categories were arrived at.

Creating a predictive model for Possehl and Kenoyer's work is difficult due to the indistinct definition of their work. Consequently, this thesis will utilise the concept of a city-state, as defined by Charlton and Nicholls (1997) and Stone (1997), as an archaeological analogy. However, a major discrepancy arises in the scale of the two models. Possehl and Kenoyer's Domain models centre on four or five large cities – Mohenjo-daro, Harappa, Ganweriwala, Rakhigarhi and Dholavira/Lothal. Each of these cities are between 280km (Harappa to Ganweriwala) and 448km (Dholavira to Mohenjo-daro) away from the nearest, with consequent hinterlands ranging between 106,000 to 170,000 square kilometres (Kenoyer 1997: 54, Table 4.2). Charlton and Nicholls, on the other hand, suggest that city-states are by their very nature small scale, often less than 30km in radius (1997: 8), although this is based upon later Greco-Roman models.

Larger city-states have been recorded elsewhere, such as West Africa and Mesoamerica (Trigger 2003: 100), but none to the degree for which Kenoyer suggests. These larger city-states contained secondary centres, and such a model would be expected in any Indus city-state. As both Dholavira and Ganweriwala are posited as city-states they can be tested to see whether they fit into the city-state model defined by Charlton and Nicholls (1997), Stone (1997) and Trigger (2003), favouring the more dispersed larger city-state model. We would expect each region to have a single primary centre (>40ha); several secondary administrative centres that are located at a relatively equal distance from the centre (10-40ha); a remaining series of smaller agricultural and/or pastoral sites engaged in mostly food production and/or raw material procurement (<10ha). Admittedly, these size boundaries may be different within the Indus Valley Tradition. The alternative would be a high number of primary centres (>40ha), no or very few secondary centres (10-40ha) and high numbers of small settlements (<10ha). These two models represent the difference between a unified city-state society and a highly competitive fragmented city-state. In fact, there may well be overlap between the former city-state model and the Proto-State model discussed above.

In terms of settlement function, we would expect the city-state centres to be engaged in manufacturing and services, whilst smaller outlying sites support them both agriculturally and through the procurement of raw material. Secondary centres may play some kind of dual role of manufacturing and administration – functioning as a "middle-man" between the sites on the fringe of the city-state and the primary centre. Whether the same pattern would be evident in both Gujarat and Cholistan is not clear. Both Possehl and Kenoyer advocate a large degree of autonomy for each domain, so there may be variation between each of the two regions.

4.3.1.4 Chiefdom

The chiefdom model, predominantly derived from the work of Fairservis (1971, 1986, 1989) takes into consideration the growing awareness that the Indus Valley Tradition was not as agrarian in nature as other protohistoric riverine societies (Tigris-Euphrates, Nile, Yangtze). Instead, pastoral communities appear to have played a much more important role (Guha 1994, Meadow and Patel 2002, 2003, Mughal 1994, Patel 1997, Possehl 2002b, Possehl and Kennedy 1979), much like they do in modern South Asia. However, pastoral communities are difficult to identify archaeologically due to their nomadic lifestyle. We would expect to be able to identify large numbers of what Mughal terms "camp sites" – small, temporary settlement sites (1994: 60). Most authors advocate the presence of chiefdoms within a larger socio-economic system, rather than the Indus Valley Tradition being a chiefdom *per se*. This duality in settlement systems may only be visible through rank-size analysis, which is capable of identifying two settlement systems interacting within the same region (see below).

Fairservis does provide us with an idealised settlement landscape against which to test his model. He suggests that surrounding the major sites was a hinterland consisting of cattle camps, dispersed agricultural households, industrial sites and administrative centres. The first three categories were engaged in primary activities relating to subsistence and craft, whilst the latter undertook grinding, storage and provided central processing and redistribution (Fairservis 1989: 213). As such, we would expect to see this pattern manifest itself in both Cholistan and Gujarat. Larger sites would be surrounding by a series of satellite "support" sites as part of a redistributive network. These networks would range in size from a handful of sites into the hundreds dependent upon local conditions (Figure 4.04). However, being able to separate each redistribution network may prove difficult.

4.3.2 Models of social organisation

Having critiqued the models of political organisation and outlined the predictive models for them, this section will do the same for the models of social organisation. It was Hawkes in 1954 who, in the infamous "ladder of inference", suggested that understanding the technology and subsistence of past societies was possible through archaeological investigation, but that social, political and religious institutions and beliefs are considerably harder to infer (1954: 161), particularly within pre-literate societies. The culture-historical milieu within which Hawkes was writing assumed humans naturally conservative and uninventive and that cultural/social change came about through the result of migration and diffusion (Trigger 1986: 2). Hawkes was interested in describing the social and religious institutions of past societies, rather than understanding the dynamics of human interaction. This subtle difference resonates in Indus Valley studies, where many of the current interpretations seek to describe social structures, rather than try to understand them.

The emergence of "New Archaeology' during the 1960s and 70s questioned this pessimistic view of archaeology (Binford 1962, 1965, Clarke 1973, Hodder 1978), and the advent of post-processualism (Crumley 1987, Hodder 1982, Miller and Tilley 1984, Shanks and Tilley 1987) witnessed a proliferation of theories too vast to discuss within this thesis, and the impact of these post-processual theories has had upon South Asian archaeology is minimal. However, despite this plethora of theories relating to social theory, there is some truth to Hawkes' initial statement – that it is difficult to ascertain the social and religious beliefs of past societies. With the possible exception of Miller (1985) and Rissman (1988), all of the models of social organisation are examples of descriptive, static, one–dimensional structures of society, with little scope for understanding human dynamics. Consequently, testing the models of social organisation is going to prove inherently difficult. The following section will critique the existing models of social organisation and detail their predictive models where possible.

4.3.2.1 Priest-Kings

The Priest-King model, characterised by the dominance of society by a theocratic ruler, has been widely criticised by Indus scholars. Whilst most criticisms of the Wheeler-Piggott school of thought have concentrated upon discrediting concepts

of Aryan invasions and Indo-European language spread (Dales 1964, Leach 1995, Shaffer 1984), the theoretical background of the Priest-King model has received less attention. The rigid social structure proscribed by Piggott – Priest-King; priestly aristocracy; "middle classes"; agricultural labourers – has a certain resonance with idealised Edwardian concepts of social hierarchies. Likewise the imposition of a complimentary racial hierarchy has Edwardian parallels. The upper and middle classes tended to identify themselves as the spiritual and hereditary heirs of the Normans; the English as a whole were equated with the earlier Saxons; the fringes and lower classes were viewed as Celtic (Trigger 1989: 168). Thus, the equation of the priestly aristocracy and middle-classes with people of Mediterranean origin, and the agricultural labourers with Proto-Australoid embodied the racial and cultural understanding that typified archaeological theory in South Asia at the time. Piggott was transposing Eurocentric views of social and racial hierarchies onto Indus society, and at the same time, was equating the elite individuals with light-skinned outsiders from the west, and the subordinated communities with dark-skinned autochthons.

The issue of racial hierarchies in the Indus Valley Tradition will be dealt with below in the section on the Caste System model. There are, in fact, many similarities between the Priest-King model and Caste System model. So much so, that they could be incorporated into the same model – where caste is the system by which the middle-classes and the servile labourers were organised. These multiple-model situations will also be discussed in a later section.

Testing the Priest-King model relies upon being able to identify rigid social hierarchies, and class division between the priestly aristocracy, the middle classes and the agricultural labourers. It would also require the identification of the "Priest-King" or primary ruler himself (it is always a "he" in Wheeler and Piggott's work). Childe argued that the Indus Priest-King, much like the Sumerian city-god and Egyptian pharaoh, controlled the economy through the centralisation of surplus, in particularly granaries. As such, evidence for the centralisation of surplus at key sites, mostly in the form of granaries but also potentially other goods as well, should be present within both Gujarat and Cholistan. As this model is so closely tied to the Twin Capital Empire model, one would be expecting very similar results – and in particular, the presence of an 'imperial project' as defined by Barfield (2001: 29-33).

The Priest-King mode may also be tested through in terms of settlement function and morphology. Sites themselves would be expected to be internally defined – possibly through the division into citadel and lower town, or a similar less pronounced division in smaller sites. Status differentiation should also be clearly evident at sites. Within both Gujarat and Cholistan we should be able to identify a defined economic structure geared towards the exploitation of servile labour, coupled with the sustenance of elite residences and/or sites. The geographically peripheral location of Gujarat may exclude it from such a rigorously organised landscape, but external exploitation must be evident. However, if the Indus Valley Tradition was as rigidly stratified as they suggest, this must surely manifest itself throughout the whole region

4.3.2.2 Caste System

The presence of a caste system within the Indus Valley Tradition is a highly contentious issue. Within anthropology, the concept of caste has come to refer to any group that demonstrates occupational specialisation, endogamy and with little social mobility (Boivin 2005: 227f, Quigley 1993), and this is often the case in archaeology. However, within the remit of the Indus Valley Tradition, the presence or absence of caste has become a politically charged discussion. Kenoyer argues that caste did not emerge until the Early Historic period (c.1000 BCE onwards), whilst Dhavalikar (1995, 2002) and Lal (1993) argue that it was present within the Integration Era. However, it is not as simple as this dichotomy suggests. In other disciplines (notably anthropology and social sciences), debate continues as to the origins and nature of caste. Some argue that the modern manifestation of the caste system has its origins during the British colonial period in South Asia (Lahiri 2000, Lahiri and Bacus 2004, Mendelson and Vicziany 1998). Both Coningham (Coningham in press) and Boivin (2005) identify that archaeological concepts of caste are steeped in culture-historical frameworks and Orientalist views, and that caste is actually more flexible and fluid than traditionally acknowledged. On the contrary, there is a growing nationalist influence in the caste debate, with some scholars arguing for not only the presence of a caste system within the Indus Valley Tradition, but fully developed Hinduism (Rajaram and Frawley 1995, Talageri 1993). Most nationalist archaeologists, however, do not subscribe to this extreme viewpoint, but still argue for the presence of Vedic precursors (Singh 2001).

Modern political issues aside, the identification of caste within archaeology is a difficult task. Coningham and Young approached the problem through a systematic analysis of the internal distribution of craft debitage and faunal remains at Early Historic Anuradhapura in Sri Lanka (Coningham and Young 1999). They concluded that there was little evidence of caste distinction present within the citadel, or any evidence of caste *per se* at Anuradhapura. Instead, they suggest that caste-based models are not evident in past societies simply because they did not exist, and that the modern manifestation of caste was a British imperial enforcement of a previously largely symbolic division (*ibid.*: 92). If this is the case, creating a predictive model may prove problematic. Lal (1993) argues for a three-tiered division of society at Kalibangan due to the internal division of the site, whilst Dhavalikar (1995) identifies a four-fold division of society at Dholavira using the same criteria. In addition, Dhavalikar suggests that the perceived uniformity of material culture is the result of hereditary craftsmanship and occupational specialisation (1995: 168). The obvious methodology for testing the caste system model would be to analyse the distribution of craft debitage and faunal remains in the mould of Coningham and Young (1999), but sadly no site in Gujarat and Cholistan has been either extensively or systematically excavated to a sufficient level of detail in order to undertake this. Insights may be gained from sites such as Lothal (Rao 1979), Kuntasi (Dhavalikar *et al*. 1996), Bagasra (Sonawane *et al* 2003), Surkotada (Joshi 1990) and Dholavira (Bisht 1997), but not to the same degree that was evident at Anuradhapura.

Consequently, an alternative predictive model must be proposed. This model will examine the variety of craft activities within defined regions and sites. One region will be Cholistan, possible through the systematic survey recording undertaken, and northwest Saurashtra, the area within which the Gujarat Environs Survey was undertaken. This latter region has been specified due to the juxtaposition of the new survey data, existing survey data and the presence of two excavated sites - Kuntasi and Bagasra. Additional analysis at Surkotada will also be utilised. In terms of survey data, the presence of a caste social structure advocated by Lal and Dhavalikar would expect to demonstrate clear spatial differentiation of craft activities within cities. In order to ascertain whether different craft activities (shell-working, ceramic manufacture, bead-making etc.) were undertaken in separate locales, this thesis will examine the internal plans of key sites. The predictive model would suggest the separation of sites into citadel and lower town, with defined areas of different craft activities. Additionally, one may find satellite settlements within the region to be dedicated to each individual craft activity.

4.3.2.3 Oligarchy

The Oligarchy model is derived primarily from the work of Atre (1989) Kenoyer (1994, 1998, 2000), Lal (1993) and Possehl (1993, 1998), who were in turn influenced by the earlier work of Childe (1954). The model is based upon the concept that major cities and their hinterlands were controlled by groups of individuals comprised of merchants, ritual specialists and landowners, as opposed to the more traditional concepts of hereditary rule by individual kings and/or religious leaders. The impetus behind the development of this model derives from Childe's work emphasising the economic structure of the Indus, as opposed to the religious autocracy of Piggott (1950) and Wheeler (1959, 1968). One of the major stimuli for this model was the recognition that aside from Mohenjo-daro, the majority of sites within the Indus Valley Tradition lack the monumental architecture associated with earlier hereditary-rule models. Childe's (1954) focus upon the agricultural economy of the Indus Valley and secular rule created an alternative to archaeologists who were dissatisfied with the existing 'imported' models. However, Atre (1989: 52) questions the assumption of an agricultural-based economy, but insists that it was the volume of trade, rather than the items being traded, and the subsequent maintenance of this trade that stimulated urbanisation and precipitated peoples rule over Indus sites.

The theoretical groundings of the Oligarchy model are not overtly obvious, beyond Childe's Marxist interpretations. Atre's concept that sites emerge for different reasons and play different roles – a hypothesis that had earlier been raised by Fentress (1976) – has links to concepts of heterarchy, although this is not mentioned by Atre. Heterarchy works as a juxtaposition to traditional concepts of hierarchy, providing modes of explanation that are not reliant on hierarchical dynamics (Table 4.1). This table demonstrates the dichotomy that exists between hierarchy and heterarchy and how the Oligarchy model differs from the earlier Priest-King model. Indeed, all the models of social organisation can identify with this polarity. White suggests that any given society may be placed at varying points along each of the different axes and may move in either direction over time, and that the relationship between hierarchy and heterarchy provides a useful theoretical tool for analysis and historical trajectories (White 1995). However, despite the clear links between heterarchy and the Oligarchy model of decentralisation, non-hereditary rule and localised decision-making, none of the associated authors make mention of the concept. Whilst heterarchy provides us

with a theoretical framework of discussion, it is not an archaeological model against which to test the model. The Oligarchy model is, however, one of the more archaeologically explicit models providing us with a methodology against which to test it.

This chapter has already outlined the Domain political model, which is very closely linked to the Oligarchy model. The Domain predictive model was based upon the spatial distribution of sites across the landscape in relation to the perceived local capitals of Ganweriwala and Dholavira. In order to test the Oligarchy model we need to examine the distribution of site *functions* and the sites themselves. Within the Oligarchy model we would expect to see an even distribution of settlement functions – regions would be relatively self-sufficient in terms of subsistence strategies and basic manufacturing production. Craft specialisation would also be devolved away from the primary centres and would incorporate a wide variety of different crafts depending upon the availability of local resources. In contrast to the Priest-King and Caste System models, the internal divisions of sites should be less obvious – there may still be differentiation but it is not overtly displayed. In terms of the internal distribution of craft activities, we would again expect to see a dispersed pattern.

4.2.3.4 Kinship

The Kinship model is based primarily upon the work of Fairservis (1971, 1986, 1989), and to a lesser degree (Shaffer 1993). Additionally, numerous other scholars have mooted kinship and clan lineages as a component of a wider social structure (in particular Guha 1994, Mughal 1994, Possehl and Kennedy 1979). The Kinship model, however, states that such ties formed the basis of the Indus social structure, which would have been organised along the lines of a chiefdom (see above). However, despite Fairservis' strictly defined social structure (1989: 209ff), he does not elucidate the archaeological evidence for such a structure. In addition, his translation of the Indus script and consequent deciphering of seals is highly questionable.

The main obstacle in creating this particular predictive model is that kinship is an ethnographic model, as opposed to an archaeological manifestation. It is generally attributed to societies that are politically organised along the lines of a chiefdom, as opposed to a social structure in its own right. As such, its archaeological identification is difficult. Fairservis' (1986) claim that seals

represent clan lineages resonates with the claim by Kenoyer (2000) that seals represent different political allegiances. A redistribution network based upon kinship lines would require the presence of granaries at major centres, much in the same way as the Proto-State and Twin Capital Empire model proclaim granaries act as central storage units for taxation purposes. The presence of a Kinship model of social organisation within the Indus Valley Tradition will depend primarily upon our ability to identify the Chiefdom model of political organisation. There is nothing uniquely identifiable within the Kinship model that is not either already tackled by the Chiefdom model, or that is significantly different to any of the other models.

4.2.3.5 Ascetism

The Ascetism model is similar to the Kinship model, in that scholars are more reliant upon theoretical reasoning than archaeological deduction to argue its case. Although Rissman (1988) derived a methodology based upon the contradictions between private hoards and public burials, more recent work has found this methodology too simplistic (Manuel 2002). The work found Rissman's identification of hoards as private and secular inaccurate, arguing that the deposits may have been votive in nature, or that by their very deposition become symbolic in themselves, based upon more recent literature (Bradley 1998, Dickins 1996, Kristiansen 2002, Levy 1982, Randsborg 2002, York 2002). Rissman made no attempt to distinguish between deliberately buried deposits buried for future retention, deposits of goods for their deliberate removal from circulation or deposits of a votive or symbolic nature. In fact, many of the hoards from the Indus Valley Tradition appear to transgress one or more of these categories. Furthermore, Rissman's identification of wealth items - "the evidence of the hoards is consistent with the suggestion that Harappans categorised gold, silver, copper, semi-precious stone and perhaps shell as items of material wealth" (1988: 26) – failed to take into account recent investigations into the deposition of artefacts which have revealed that often the symbolic value of possessions far outweighs the intrinsic value of objects in determining their deposition (Kristiansen 2002, Randsborg 2002, York, 2002).

Issues were also raised with the mortuary evidence, in terms of both the small number of examples and the wide variety of mortuary practices. In terms of the small numbers of burials, many questions remained unanswered: (1) Which section of the population was buried? (2) For what reasons were these people

singled out for burial? (3) What funerary rite(s) did the remaining population undergo? (Manuel 2002: 74). The thesis concluded that Rissman's methodology was too simplistic and that the archaeological data regarding hoards and burials (mostly from the early excavations at Harappa, Mohenjo-daro and Chanhu-daro) was not of sufficient quality to rigorously interrogate.

Miller (1985) provides numerous arguments to support his hypothesis, yet they are focused primarily upon the major sites of Harappa and Mohenjo-daro. He argued that Indus settlements were constructed upon large man-made mudbrick platforms as opposed to natural ground, and were constructed upon geometric forms with grid-plan streets and cardinal orientations. Miller indicates that all sites demonstrate some form of segregation, most commonly a division of the site into a high citadel mound and a lower town. However, he also indicates that at some, particularly smaller, sites it is a more symbolic division – sometimes just a dividing wall. He suggests that the "lower towns" consisted of mainly residential and commercial buildings, whilst the "citadels" consist of public buildings and structures associated with fire and water (1985: 42). As a consequence, we should see this pattern manifesting itself throughout the Integration Era, not just reflected in the larger urban centres that Miller highlights. Miller argues that the binding feature of Indus society is the "standardisation of and around the mundane" (1985: 59), and as such there should be little scope for individualisation. The predictive model dictates that all sites within the Indus valley Tradition would conform to this highly formalised model of standardisation and normative values.

Whilst Miller's model advocates the suppression of individuality through elite restrictions upon artefacts, Coningham suggests that these elites may have been willingly subordinated. Influenced by the *Pamsukulin* sect of Buddhist monks in Sri Lanka (Coningham 1999), Coningham argues that the austerity and standardisation identified by Miller was enforced by subordinated communities (in press). However, much like the Caste system model (section 4.3.2.2) this is difficult to test archaeologically, particularly within Gujarat and Cholistan. Much like the Kinship model it is down to theoretical arguments rather than archaeological evidence to test the Ascetism model. In fact, the very essence of the Ascetism model is that the archaeological record represents a deliberately inverted form of the 'truth', and as such is an unreliable source. The Ascetism model remains more as a tool for discussing agency within other models of social organisation, rather than a model of social organisation in its own right.

4.4 Survey Methodology

The previous section has discussed the predictive models for the models of social and political organisation, and how each would expect to be reflected within site distributions and functions. Section 4.5 will detail the methodologies to be used in testing these predictive models, but first it is necessary to provide the details of how the datasets that will be used have been derived. This section will examine the methodology used in a) the Gujarat Environs Survey that was undertaken in the area between Kuntasi and Bagasra in Gujarat, India; b) a critical analysis of survey methodologies used in Gujarat and Cholistan, examining the strengths and weaknesses of the approaches; and c) what criteria were used in creating a database of published surveys undertaken in Gujarat and Cholistan. The compilation of numerous primary sources for the survey data from Gujarat has meant that several different recording systems and site definitions have been used. However, the data from Cholistan has been compiled from a small number of primary sources and as such is forms a much more coherent data set. This section will provide the details of how this data will be transformed into a comparative sample set.

4.4.1 Previous Survey in Gujarat

Previous survey work in Gujarat has taken a very different approach to the methodology outlined above. One of the key differences is the lack of any predictive element to previous survey methodologies. The principle approach to archaeological survey in Gujarat has been to ask local villagers for the location of sites. The principle methodology involves delineating a survey area, and then approaching every single modern village within the region and asking the village elders if they are aware of any dense ceramic scatters or small mounds within the vicinity of their village (i.e. Dimri 1999, Hegde and Sonawane 1986: 24f). Whilst this methodology may be appropriate for identifying larger settlements within a previously unexplored area, it will mostly identify one particular type of site – large, permanent, most likely urban settlements. Such a methodology will rarely be able to identify small, non-urban and possibly transhumant settlements. As a result, survey in Gujarat has been successful in identifying a large number of sites, but it is not a systematic representation of the Indus Valley Tradition. This was one of the main reasons behind devising the Gujarat Environs Survey – a

methodology that had as one of its key foci the ability to identify sites that would not be identified through traditional methods.

A second flaw of survey work undertaken in Gujarat is the lack of clarity in defining a) what constitutes an archaeological site and b) how sites are defined chronologically and culturally. The lack of definition of a site is not always an issue when one is identifying large urban settlements – it is quite clear that a mound with structural remains and dense scatters of ceramics is an archaeological site. However, the difficulty arises when one tries to identify smaller, non-urban sites within the landscape. The lack of methodological rigour within previous survey raises some serious questions over the legitimacy of creating a region-wide dataset from numerous primary sources. However, in order to test the models of social and political organisation it is necessary to combine these disparate datasets into a single dataset that can be interrogated. The following section will detail the process of creating this dataset.

4.4.2 Developing the Gujarat Dataset

Since excavations at Rangpur during the 1950s (Rao 1963), there have been numerous surveys undertaken in Gujarat (1986, 1989, Bhan 1994, Chitalwala 1979, 1993, Dimri 1999, 2001, Hegde and Sonawane 1986, Majumdar 1999a, 1999b, 2001, Majumdar and Sonawane 1997, Mehta 1993), as well as excavations (Dhavalikar *et al.* 1996, Ehrhardt and Kennedy 1965, Hegde *et al.* 1990, Hegde *et al.* 1988, Mehta *et al.* 1971, Mehta *et al.* 1975, Rao 1963, Rao 1979, Sonawane *et al.* 2003, Sonawane and Mehta 1985) and reassessments of chronology and ceramic typologies (Ajithprasad 2002, Choksi 1994, Choksi 2002, Dhavalikar and Possehl 1992, Herman 1997, Herman and Krishnan 1994, Krishnan *et al.* 2005, Shinde and Kar 1992, Sonawane 2002). All of these sources will be combined to create a database of sites that form part of the Indus Valley Tradition. The database will record site name, location, phasing, size, features and cultural affiliations where possible. However, due to the incongruous nature of survey methodologies and recording systems, the data is not always complete.

In terms of phasing, the initial chronological division will be made into Early Food Producing, Regionalisation, Integration and Localisation Eras. Where more detailed information is available – i.e. from excavated sites, or extensively surveyed areas – further subdivisions will be made. In terms of identifying the chronological position of each site, it varies depending upon the original survey

criteria. Table 3.1 shows the original phasing used by the survey author and the corresponding chronological phase within this thesis. The simple division into the four major phases of Shaffer's chronology is intended to compensate for the lack of clarity in survey data. Attempting to create a greater number of chronological divisions and subdivisions from the available data may actually result in a greater degree of inaccuracy. By maintaining these simple chronological divisions a more accurate and compatible dataset will be created.

A different approach to calculating site sizes has been adopted throughout this thesis. Most sites identified on survey are eroded and damaged tell sites, which no longer hold their original geometric shape. Rather than assuming a square or rectangular shape, site sizes have been calculated on the basis of an ellipse. Consequently, site size has been calculated using the formula z=(x/2)*(y/2)*3.141592 (where x and y = the length of the two axes, and z = site size). Exceptions have been made where sites are known to be square or rectangular – i.e. where the measurements are talking from a circumvallation. The concept of the Indus Valley Tradition is relatively new to South Asian archaeology, and its adoption especially so. Consequently, many sites are described and/or periodised by different criteria. The complete dataset for Gujarat can be found in Appendix B.

4.4.3 Previous Survey in Cholistan

Archaeological survey has been taking place in Cholistan since the 1940s, when the explorer Sir Aurel Stein undertook numerous surveys throughout what is now modern Pakistan (Stein 1942, 1943). Stein traced the route of the Ghaggar-Hakra for 260 miles (416 km), identifying at least 39 sites from all periods. Stein suggested that eleven of these sites related to the mature phase at Harappa [Integration Era], and a further eight with Cemetery H levels at the site [Localisation Era] (1942). Ghosh undertook survey along the Ghaggar-Hakra River on the Indian side of the border (1952). He identified 47 sites ranging from the third millennium BCE to 300 CE, including Harappan and Painted Grey Ware sites (Dalal 1980: 23-26).

However, the most extensive and recent survey was undertaken by Mughal between 1974 and 1977 (Mughal 1971, 1997, Mughal *et al.* 1996), and this survey data will form the basis of the Cholistan dataset. The Mughal survey focused upon the dry riverbed of the Hakra River, concentrating on a strip 15 to 20 kilometres either side of its course. Extending from the Indian border to Fort Derawar, the

survey identified a total of 424 sites over four field seasons. The full results of the survey can be found in Appendix C. Although the survey found sites ranging from the Indus Valley Tradition all the way through to medieval period, this thesis will only be utilising the Indus Valley Tradition data.

The survey methodology utilised by Mughal will, like the Gujarat data, have naturally identified larger more permanent sites with Cholistan, biasing the dataset towards urban sites. Systematic survey would be more likely to identify small sites, and so again, any interpretations must be tempered with the acknowledgement that the survey data is not representative of the region. However, as with the Gujarat data, Cholistan is one of the most comprehensively surveyed regions of the Indus Valley Tradition. The survey methodology used is suitable for identifying large urban settlements, but should be followed up with systematic sampling of the landscape. This is an aspect of the thesis that will be discussed further in Chapters Seven and Eight.

4.4.4 Developing the Cholistan dataset

Whilst Mughal never explicitly defined his survey strategy – in terms of number of archaeologists, field-walking strategy, definition of sites, determination of routes walked – he does state that all the material was collected from the surface of sites, although substantial clearing was undertaken at a number of sites in order to identify structures (Mughal 1997: 27f). The Cholistan dataset is taken entirely from Mughal's survey reports (Mughal et al. 1996, Mughal 1997). In terms of phasing, a similar structure of Early Food Producing, Regionalisation, Integration and Localisation is adopted within this thesis, as outlined in section 3.2.8 and Table 3.3. The dataset includes the name, location, phasing, size and function of sites as indicated by Mughal (1997: 42- 53, 139--156).

In terms of site function, Mughal categorises sites into a number of possible site functions that, within this thesis, will be referred to as 'industrial', 'residential', 'residential-industrial' and 'campsite' (Table 4.2). Industrial sites refer to those sites that are exclusively used for the manufacture of pottery and/or other items. Residential sites are sites that show evidence of habitation, but no evidence that manufacturing was undertaken at the site. Residential-industrial sites refer to sites that show evidence of both habitation and manufacturing, most often a concentration of kilns in a particular area of the site. Finally, campsites refer to sites that do not demonstrate evidence of permanent habitation. The only

deviation from Mughal's initial definition of site function is that "mostly industrial" and "partly industrial" have been merged into the residential-industrial category.

4.4.5 Gujarat Environs Survey methodology

The Gujarat Environs Survey was undertaken in early 2006, and concentrated on a small 10x5 kilometre area between Kuntasi and Bagasra, in Maliya Taluka, Rajkot District, Gujarat, India. The survey had two main aims: 1) to test the quality or resolution of existing surveys, and 2) to identify the distribution of small sites and their functions within a small area. Currently within Gujarat there is a vast number of known, excavated and published urban sites, whereas the number of small rural sites that have been extensively investigated is minimal. Where such sites have been studied – such as Oriyo Timbo – the concentration has been upon subsistence strategies (Rissman et al. 1990) – and has tended to focus upon individual sites rather than the wider relationship between sites. The first aim of the Gujarat Environs Survey intends to test whether a systematic survey strategy will identify sites that will not, or have not, been identified through the use of traditional survey techniques (i.e. section 4.4.1). The second intends to create an understanding of the relationships between small sites within the wider landscape and the larger urban centres that current archaeological studies have concentrated upon, but from a bottom up approach.

The survey mapped the location and function of archaeological sites within a randomly selected 10x5 kilometre area between Kuntasi and Bagasra – two known and excavated sites within Gujarat. There were two reasons for locating the survey area between two known sites. First, is that both Kuntasi (Dhavalikar et al. 1996) and Bagasra (Sonawane et al. 2003) have published excavation reports, and consequently provide two frames of reference for the identification and phasing of ceramics and small finds from the survey. Secondly, the combined data from the urban sites, along with the data from smaller sites identified on survey provides an urban-rural dichotomy to achieve the above aim.

The survey area was divided into systematic transects running north-south spaced one kilometre apart (see Figure 4.02). These transects were traversed by five archaeologists (the additional archaeologists were postgraduate students from the Maharaja Sayajirao University of Baroda) walking ten metres apart, using a GPS to maintain accuracy. Topography, vegetation, modern land-use, modern resources and cultural features were recorded. Sites were defined as a cultural

feature, a lithic findspot, or a scatter of more than five ceramic sherds per square metre. Sites were recorded with GPS, photographed by digital camera, sketched, and diagnostic sherds were collected. This approach allowed initial "in-field" analysis to be taken, as well as enabling multiple copies of the data to be made for safe storage and future analysis. All the information was uploaded to a laptop every evening during the survey season, and was backed up daily. The diagnostic sherds were taken to Maharaja Sayajirao University of Baroda for further analysis, and were stored there.

Information regarding modern agricultural usage, vegetation density, soil morphology and topography was recorded along each transect. This had two main purposes: first it allowed the mapping of modern landscape usage and its correspondence to environmental determinants, and second, it allowed the correlation of site visibility with vegetation density and soil types. This second aspect of vegetation recording was undertaken to ascertain whether archaeological visibility of artefacts is a determining feature of small-scale settlement survey. All of this data was then compiled into databases to allow for analysis, the results of which will be discussed in the succeeding chapters. The survey results for the Gujarat Environs survey will be detailed at the beginning of Chapter Five and available in Appendix A.

The Gujarat Environs Survey will also allow us to test Dhavalikar's Cultural Imperialism mode (1995) in which he states that the larger walled sites located on the coast of Gujarat, including Kuntasi represent an economic colonisation of the region by traders and craftsmen from the Indus Valley. They were situated to exploit locally available material – in particular, shell and semi-precious stone – which was processed and then shipped back to the major urban sites of the Indus Valley where it was manufactured into finished goods. His model is derived from the first British factory forts established on the coast of India, such as the fort at Surat in South Gujarat, during the 17th century (1995: 4), which formed the basis for the later expansion of imperial rule.

4.5 Testing the Predictive Models

The previous section has outlined the predictive models for the nine models of social and political organisation. This section will outline the methodologies that will be used to test these models, using the datasets from the Gujarat Environs

Survey, the Gujarat dataset and the Cholistan dataset. The diverse range of models means that several different approaches will be taken to encompass the wide variety of parameters. This will be divided into two main themes – site distribution and site function. The first theme will concentrate upon wider settlement patterns within the two regions, looking at the distribution of sites, changes in size and location, attempt to identify central places within the landscape and undertake rank-size analysis. The second theme, site function, will concentrate upon the function of sites and their role in the landscape, looking at the change in site function over time, the role of sites within the landscape and the interrelationship between sites.

The methodology has been divided into these two themes to fit within the predictive models. Many Indus archaeologists have based their models upon the division of sites into tiered hierarchies based upon size, or upon the internal divisions of sites and their consequent functions. This thesis does not suggest that site distributions and functions are not related. In fact, it takes the opposite stance that the two are often intertwined. It is the models that are being tested (see section 4.3) that have dictated this division of distribution and function. The following subsections will outline the methodologies to be used in this analysis.

4.5.1 Site distribution

The site distribution analysis relates to the fourth objective of the thesis – what were the settlement patterns in Gujarat and Cholistan during the Indus Valley Tradition, and how do these reflect upon the existing models of social and political organisation – as outlined in section 1.4. In order to achieve this, the thesis has combined published survey data from both Gujarat and Cholistan to create two comparative sets of data. Chronologically, the data is divided into Early Food Producing, Regionalisation, Integration and Localisation Eras (see section 3.2). The site distribution analysis will initially examine changing settlement patterns temporally, looking primarily at changes in size and location, as this is the basis for the majority of arguments put forward in the existing models of social and political organisation (see section 3.3). In Gujarat, where there are definable geographical divisions, it will also examine each sub-region separately to ascertain whether there are any noticeable differences. In Cholistan, there is less scope for such an approach due to the lack of natural geographic divisions within the landscape. However, it will consider the distribution of sites in relation to the changing hydrology of the Ghaggar-Hakra River as discussed in section 2.3.2.5.

The spatial analysis of the datasets will be undertaken using ESRI's ArcMap 9.0 and associated software suite. The site distribution analysis will be divided into three sub-objectives – site distribution, central place analysis and rank-size analysis.

4.5.1.1 Site distribution

The first sub-objective will undertake a primary analysis of changes in the size and location of sites within both Gujarat and Cholistan. In order to achieve this it will analyse the site data for each era of the Indus Valley Tradition, in order to develop diachronic discourse – such as the shifts from one socio-political structure to another. This data includes the number of sites within each Era, the number of sites that show evidence of previous occupation, the number of sites with future occupation levels, average site sizes, as well as smallest, largest, 25th and 75th percentile sizes. In order to characterise the distribution of sites of Gujarat and Cholistan, maps will be created of site size, displayed upon satellite imagery backgrounds. Where there are cultural or chronological distinctions, these features will be incorporated into maps. Discussion surrounding these maps and statistics will be undertaken in section 5.3, and will form both an initial analysis of the data and provide a platform upon which to develop more detailed and specific analyses. It will also provide an opportunity to test whether the settlement hierarchies, as argued in the models of political organisation (see section 3.3 and 4.3), are supported.

4.5.1.2 Central place analysis

The Domain model of political organisation, and to a lesser extent the Proto-State and Chiefdom models, rely on highlighting Ganweriwala and Dholavira as regional capitals or regional administrative centres. As such, the second sub-objective will be to test these hypotheses, incorporating aspects of central place theory. The concept of centralisation – a feature of many of the predictive models – dictates that the principle urban settlement will be surrounded by a series of secondary satellites settlements, which are in turn surrounded by another series of satellite settlements, and so forth. Distribution maps have been generated using GIS detailing the distance and size of sites from these primary and secondary centres. One would expect to find a relatively homogenous pattern of satellite settlements within both Gujarat and Cholistan if such models are to be supported. This thesis will also test other potential 'regional capitals' for each Era and region, as

identified in the site distribution analysis outlined in section 4.5.1.1. This initial investigation will test the possible political models, although there is very little that the settlement distribution analysis can reveal regarding the social models.

4.5.1.3 Rank-size analysis

The third sub-objective of the site distribution methodology will test the predictive models through rank-size analysis. The rank-size rule has been utilised within archaeology to analyse regional site distribution patterns for many years (Adams 1981, Falconer and Savage 1995, Johnson 1980, Kowalewski 1982). However, its use in archaeology has developed from the original economic geographical approach of Zipf (1949). The rank-size rule, especially within its archaeological manifestation, is derived from two opposing forces – unification and diversification. Zipf (1949) believed that these forces would either encourage settlement within a single area or cause it to disperse throughout a region. The rank-size rule works on the premise that any site within a ranked samples size can be calculated by dividing the largest site by its rank *r* (where *r* = the rank of the site). For example, the size of the 10^{th} site within a ranked sample would expect to be *x*/10 (where *x* = the size of the largest site).

Deviations from this expected distribution (log-normal) have been seen as a reflection of different settlement systems and social patterns. However, different settlement patterns can create very similar rank-size curves, so any interpretation must be made in conjunction with other sources of evidence. Highly integrated societies are expected to approach log-normal, however, most samples deviate from this pattern. Primate distributions are seen as an indication of minimal economic and/or political competition or of the presence of chiefly centres. Convex distributions suggest a low level of systems integration, the pooling of more than one settlement system or a peripheral sample. Primo-convex (a combination of the previous two) has been interpreted as the presence of two settlement systems – one system imposed upon another. Double-convex distributions result from the sampling of two distinct settlement systems (Drennan and Peterson 2004, Falconer and Savage 1995, Johnson 1980, Liu 1996, Savage 1997).

The decipherment of rank-size curves is dependent upon many factors. Rather than addressing all the potential outcomes here (it would need an additional chapter), will be dealt with the potential interpretations of the results in Chapters

Five and Seven. However, ranksize suggest how each of the potential models of political organisation would expect to manifest itself in a rank-size curve. The analysis was done using the RankSize Simulation Program version 3.0 (http://archaeology.asu.edu/Jordan/ranksize.html).

The centralised and imperial Twin Capital Empire model would expect to demonstrate a log-normal distribution of sites, where sites form a clear hierarchy. There may be a slight tendency towards a primate distribution, depending upon whether the imperial "armies" are focused towards internal or external threats (Kowalewski 1982). However, Rank-Size analysis for the Twin Capital Empire will be slightly flawed within our sample parameters, due to our narrow focus upon Gujarat and Cholistan. For a more truthful reflection, we should be sampling the entire settlement system of the Indus Valley Tradition – although this would in its self create more problems than it would solve. The main focus of testing the Twin Capital Empire model remains in examining Barfield's (2001) definitions of an empire and applying them to the data from Gujarat and Cholistan.

Due to the ambiguity that surrounds the definition of early states, the Proto-State model is harder to identify through rank-size analysis. Even Claessen and Skalnik have trouble defining what they mean by early states (Claessen 1978, Skalnik 1978). However, there are early state parallels from Mesoamerica from which we can draw comparative examples. Drennan and Paterson (2004: 545-548) have identified rank-size curves for sites within the Oaxaca Valley (southern Mexico) for ten periods dating from c.1500 BCE to 1520 AD. Moving from a highly convex curve to a primate curve to primo-convex before finally reaching close to log-normal, this data charts the development of the Oaxaca Valley from the establishment of sedentary villages, through the establishment of chiefdoms, the emergence of an early state, it's development into the Zapotec State, and finally to the Spanish conquest (Balkansky 1998, Drennan and Peterson 2004). By plotting the development of the Gujarat and Cholistan rank-size curves over time and drawing comparisons with Oaxaca, we can begin to establish whether there is any evidence for early state development within the Indus Valley Tradition. In fact, the Oaxaca data provides us with a set of analogous data from which to draw many conclusions regarding the Indus Valley Tradition rank-size analysis. The Rosario phase within the Oaxaca (700-450 BCE) is characterised as a chiefly society (Balkansky 1998: 458f), and as such provides us with a comparable dataset for the Chiefdom model.

4.5.2 Settlement Function

The settlement function analysis relates to the fifth objective of this thesis – what were the function(s) of sites in Gujarat and Cholistan during the Indus Valley Tradition, and how do these reflect upon the existing models of social and political organisation – as outlined in section 1.4. In order to achieve this, the thesis has combined published survey data from both Gujarat and Cholistan to create two comparative sets of data. Chronologically, the data is divided into Early Food Producing, Regionalisation, Integration and Localisation Eras (see section 3.2). However, as the data available for each site within Gujarat and Cholistan is different, the methodology for each region is slightly different. The following subsections will detail said methodologies.

4.5.2.1 Cholistan

The Cholistan dataset is taken entirely from Mughal's survey data (Mughal 1971, 1997, Mughal *et al.* 1996), and as such the data collected is consistent throughout the entire survey. Section 4.4.4 has already partially outlined the methodology used by Mughal within his survey. He categorised sites as settlement, industrial, partly industrial, mostly industrial and camp sites. This thesis has revised these categories into four: residential, residential-industrial, industrial and campsites (see Table 4.2). This thesis has not altered any of the site function assessments made by Mughal, with the exception of combining partly industrial and mostly industrial into the same category.

The site function analysis of Cholistan will examine the changing number, size and distribution of each of the four categories of function through each chronological phase of the Indus Valley Tradition. It will examine the overall relationship between sites of the 'same' function, and between sites of different functions. It will also provide an opportunity to expand the central place analysis of Ganweriwala, incorporating site function into the analysis, and establish whether there are visible patterns in terms of the distribution of site functions around the postulated 'regional capital'. However, the Cholistan data provides quantitative data regarding site function, yet it provides no qualitative data. It allows the statistical analysis of site function, but does not provide any information regarding the reasons behind any observable changes. However, the data can still be used to test the predictive models outlined in section 4.3.

4.5.2.2 Gujarat

The dataset from Gujarat is very different in nature to that from Cholistan. Over 75% of the sites within the dataset have no published information regarding their site function. It would be possible to confidently assign a function – as defined by Mughal – to roughly 10% of the sites. However, these are sites that have been excavated, and as such are generally larger and urban in nature. Consequently, to only use these sites as exemplary would heavily skew any analysis (using the same methodology as Cholistan) of site function within Gujarat. As a result, the quantitative data for Gujarat is lacking, but qualitative data is more abundant.

The site function data analysis for Gujarat will be reliant upon excavation reports and interpretations of survey data for its results, and will consequently be more descriptive than analytical. It will examine the evidence for site functions from excavations reports for each of the Eras of the Indus Valley Tradition, and incorporate the wider implications of the various surveys. For each Era, the data will initially be subdivided into geographical phases to maintain consistency with the site distribution analysis. It will also, where possible, incorporate the results of the central place analysis and build upon the initial findings. These interpretations can then be tested against the predictive models outlined in section 4.3. The site function analysis for Gujarat will be presented in section 6.4. The predictive models themselves will be thoroughly reviewed in Chapter Seven, incorporating all of the results from Chapters Five and Six, the methodologies for which have been discussed in this section.

4.6 Chapter Summary

This chapter has examined recent theoretical developments in understanding the social and political organisation of archaeological communities, and discussed broader models of empires and city-states. It then discussed the nine models of social and political organisation with reference to this earlier discussion, and outlined archaeological indicators for each one. It then examined survey methodologies used in Gujarat and Cholistan, and discussed the advantages and disadvantages of different approaches to archaeological survey that have been used. Developing from this, it reiterated the need to utilise systematic survey methodologies such as those undertaken in the Gujarat Environs Survey – techniques that will be able to identify small sites often overlooked by traditional methodologies, and methodologies that eliminate much of the biases that exist

within the current datasets. Finally, it outlined the methodologies to be used for testing the predictive models through the analysis of site distribution and function.

In discussing recent theoretical developments in understanding the social and political organisation of archaeological communities, this thesis argued that the Indus Valley, as well as other contemporary societies, studies have been overly influenced by culture-historical approaches. As such, section 4.2.1 discussed how these culture-historical approaches have been overturned within Mesoamerica, allowing archaeologists to move beyond social evolutionary theories and incorporate post-processual concepts into their interpretations.

Section 4.3 outlined the predictive models, developed from the existing models of social and political organisation for the Indus Valley Tradition in section 3.4. First, it critiqued the existing interpretations, detailing the theoretical frameworks within which they were developed and examined the archaeological arguments made to support. It then broke down the predictive models into archaeological indicators, which can be tested against the Gujarat and Cholistan datasets.

These two datasets were outlined in sections 4.4 along with the methodology used for the Gujarat Environs Survey. The Gujarat Environs Survey aimed to understand land-use and settlement patterns during the Indus Valley Tradition, and ascertain whether particular activities were restricted to urban or rural sites through a number of objectives. The survey was undertaken between the two known and excavated sites of Kuntasi and Bagasra. Section 4.4 also detailed the manner in which the Gujarat and Cholistan datasets have been developed form previous surveys undertaken in the region. The contrast between previous survey methodologies and the Gujarat Environ Surveys was highlighted, arguing that a more rigorous approach to survey was necessary to eliminate biases, and to begin to develop a model of social and political organisation from the bottom up.

Finally, the methodologies for the site distribution and site function analysis – two of the key objectives for this thesis – were outlined. It provided details of how these two sets of analyses will be undertaken, and also contrasted the approach to the two regions, necessitated by the variations in geography and survey information available. The following chapter will present the results of the site distribution analysis, and Chapter Six will present the results of the site function analysis.

Chapter Five - Site Distribution

5.1 Introduction

The previous chapter outlined the nine predictive models for current interpretations of the social and political organisation of the Indus Valley Tradition. It also provided a methodology for testing these models through the analysis of site distribution – that is the size and location of sites – as many of the current interpretations of Indus Valley Tradition social and political organisation are reliant on such arguments. In addition, it outlined the methodology for the Gujarat Environs Survey undertaken in 2006. This chapter will begin by presenting the results of the Gujarat Environs Survey, and the results of the site distribution analysis.

This chapter will concentrate upon the size, location and phasing of sites, rather than the function or role of sites. This is not to suggest that the two are not connected, but reflects the tendency amongst Indus archaeologists to base their settlement patterns based upon size and location only (see section 3.3, and in particular 3.3.3 and 3.3.4). Consequently, this chapter will concentrate solely upon these three elements, whilst the following chapter will look at function and role of sites, in collaboration with information from this chapter. As a consequence of the chapter split, the results of the Gujarat Environs Survey will be presented over two chapters. This chapter will discuss the results with regards to the modern land use, the spatial patterning and chronology of sites, and the impact of vegetation on archaeological visibility. The following chapter will discuss the function of the sites identified and the survey and their relationship with known sites in the region. The full results of the Gujarat Environs Survey can be found in Appendix A.

This chapter will then present the results of the site distribution analysis for Gujarat and Cholistan, as discussed in the previous chapter (section 4.5). It will begin with the site distribution analysis, which examines changes in site size and distribution both temporally and spatially. It will then present the results of the central place analysis, which considers the possibility that some sites acted as

central places (either economic, political or military) in the landscape. The chapter will then consider the results of rank-size analysis, and draw parallels with similar societies based upon the results. Full details of the Gujarat and Cholistan datasets can be found in Appendices B and C respectively. Finally, the chapter will consider how these different results have impacted upon the predictive models that were outlined in the previous chapter.

5.2 Gujarat Environs Survey

The Gujarat Environs Survey was undertaken in early 2006, and surveyed 50 square kilometres between the two known and excavated sites of Kuntasi and Bagasra, both in Maliya Taluka, Rajkot District, Gujarat, India. The survey had two main aims: 1) to test the quality or resolution of existing surveys, and 2) to identify the distribution of sites and their functions within a defined area. Currently within Gujarat there is a vast number of known, excavated and published urban sites, whereas the number of smaller sites that have been extensively investigated is minimal. The first aim of the Gujarat Environs Survey was designed to test whether a systematic survey strategy will identify sites that will not, or have not, been identified through the use of traditional survey techniques (i.e. section 4.4.1). The second intended to create an understanding of the relationships between small sites within the wider landscape and the larger urban centres that current archaeological studies have concentrated upon, but from a bottom up approach.

In total fifteen sites or areas of activity were identified within the survey area, three of which consisted of undiagnostic ceramics, six were identified as relating to the Indus Valley Tradition, a further three were Early Historic, and the final three were defined by lithic finds. The following sections will present and discuss the results of the Gujarat Environs Survey in relation to the spatial and temporal distribution of the sites identified. The following chapter will develop a discussion regarding the function of sites in the survey area.

5.2.1 Modern land use

The Gujarat Environs Survey area is located in Maliya Taluka, Rajkot District between the two known and excavated sites of Bagasra and Kuntasi. The survey was undertaken in a rectangular area between the co-ordinates N23.00.525 E70.34.250 and N22.54.133 E70.40.330. The land area between Bagasra and

Kuntasi is primarily agricultural land farmed by the inhabitants of several small villages. The largest of these villages, Dahisara, is located on the southern boundary of the survey zone (see Figure 4.01). The northwest corner of the survey zone borders the Little Rann of Kutch. Agriculture is not viable in this region due to the highly saline soils. However, there is a thriving salt extraction industry and shellfish economy based here, which employs many of the inhabitants of the modern village of Bagasra, alongside more traditional cotton and lentil cultivation economies.

5.2.2 Site data

Detailed information for each site and the artefacts collected can be found in Appendix A. Table 5.01 outlines the finds from each site, and Figure 5.01 shows the distribution of sites within the survey zone - most of which are concentrated within the central portion of the survey zone. The scarcity of sites within the eastern part of the survey zone is difficult to explain. The lack of sites might be due to archaeological visibility - a possible consequence of increasing modern occupation and agriculture in this area. On transects 8, 9 and 10 a very high density of modern ceramic sherds were recorded within fields, most probably a result of manuring – although this is modern manuring as opposed to ancient manuring (Wilkinson 1982, 1989). Six sites consisted of scatters of ceramics that demonstrate Indus Valley Tradition cultural affiliations (A003, A007, A010, A011, A013, A015), whilst a further three sites (A005, A006, A014) were identified on the basis of lithic debitage – chert cores specifically. This latter category of site may well be contemporary with the Indus Valley Tradition, however it is difficult to ascertain on the basis of the lithics debitage. No diagnostic lithics or ceramics were found at these sites.

5.2.2.1 A007 – Mota Dahisara

The largest site that was encountered was that of A007 – Mota Dahisara – which streched for 50x50 metres throughout a flat ploughed field. As well as ceramics, lithic debitage, a fragment of a shell bangle, an undrilled quartz bead blank (Figure 5.02), a terracotta bead or spindle whorl and 'hopscotch' (Figure 5.03), worked shell (Figure 5.04) and a grinding stone were also recovered (images of all the artefacts from all the sites can be found in Appendix A). The diagnostic ceramics recovered from the site showed similarities with ceramics from Kuntasi I

& II and Surkotada IC. Many of the ceramics were decorated with the typical black-on-red style (sf015-sf025).

The site also demonstrated unworked (sf37-sf43) and worked shell (sf31), as well as shell by-products (sf32-sf36) from the manufacturing stages of bangle production (Bhan and Gowda 2003). The *Turbinella pyrum* cores (sf32-sf33) from the site indicate that the site was engaged in the sawing of the columellas – one of the initial stages of bangle manufacturing. The remaining shell by-products – the columella apexes (sf34-sf35) are also indicators of the sawing stage in bangle manufacture (*ibid.*). Lithic cores of chert (sf44) and agate (sf45 & sf47), and a chert flake (sf46) indicate the manufacture of lithic tools on the site, despite the fact that no actual tools were found. A further two artefacts – the 'hopscotch' (sf29) and ring/bead/spindle whorl (sf30) are common throughout Gujarat. A 'hopscotch' found at Kuntasi was interpreted as a toy, although this is specualtion (Dhavalikar *et al.* 1996: 246), whilst the ring/bead may be a spindle whorl. At least five similar examples were found at Kuntasi (*ibid.*: 256-248) and the authors suggest liken them to spindle whorls used by pastoral sheep herders in modern Gujarat.

There was no observable sign of mounds or structures visible at the site, and the site had been extensively ploughed. Site A007 was the largest that was recorded on the survey, and yielded the greatest number and variety of artefacts. It was also the only site that yielded evidence of Integration Era ceramics. The artefact suite suggests that the site was well established, yet the lack of any structural remians – or indicators of structures such as brick – suggests that any structures at the site were made form perishable materials, such as wood or wattle and daub.

5.2.2.2 Other Indus Valley Tradition sites

The remaining five sites of Indus Valley Tradition affiliation were all significantly smaller than A007. Three of the sites were less than ten square metres in size, and the remaining two sites were between ten and twenty-five square metres. They are all small ceramic scatters, with some shell and lithic debitage, but no finished artefacts. They may well reflect the off-site activity of larger sites.

At A003 ceramics (sf04-sf06 & sf08) were again of the typical black-on-red style and showed similarities with ceramics from Kuntasi II, Lothal B and Surkotada IC.

A fragment of shell (sf07) was also found that showed some evidence of being worked (and then possibly discarded). Lithic finds from the site were a chert core (sf09), two quartz flakes (sf10&sf11) and a quartz noduel (sf12). Again, the indicators of lithic manufacture are present at the site, but no actual lithic tools were found.

A008 was a small site (<10 square metres) where only ceramics were found. These ceramics (sf50-sf56) were all unslipped rim sherds of large bowls that show similarities to ceramics from Kuntasi II. One sherd in particular (sf54) had an incised pattern below the rim, but all of the remaining sherds were undecorated.

A010 was another small site (<10 square metres) where only ceramics were found. However, these ceramic sherds (sf65-sf67) were all decorated, and are similar to cceramics from Kuntasi I & II, Lothal B and Surkotada IC. All of these ceramics were body sherds, and no typological comaprisons could be undertaken

A011 was also less than 10 square metres in size, and was idenitfied through ceramic finds and unworked shell. The ceramics (sf68-70) were all heavily damaged but their forms (sf69 & sf70) share similarities with Kuntasi II and Lothal B. The unworked shell (sf71-sf72) is similar to the unworked shell at A007.

A015 was a slightly larger scatter of ceramics (10-25 square metres). However, many of the ceramics collected were undiagnostic body sherds. Diagnostic rim sherds (sf82-sf88) show similarities to forms from Kuntasi II, Lothal B and Surkotada IC. Lithic finds at the site were an agate core (sf90) and flake (sf89), and a quartz flake (sf91)

The small size of these sites and the low number of artefatcs found at them suggests that they were not permanent settlements, but may represent locations utilised by communities when engaged in off-site rural activities. Aspects of this function, and the role of pastoral communties in Gujarat will be discussed in the following chapter.

5.2.3 Phasing

Phasing the sites encountered during survey proved to be the most difficult aspect of the analysis. Without the ability to undertake augur cores at the sites, the only datable material available was ceramics collected from the surface. From analysis

of the collected ceramic material, five of the six Indus Valley Tradition sites (A003, A010, A011, A013, A015) showed similarities with Kuntasi Period II, Lothal Period B and Surkotada Period IC, all Localisation Era levels. The majority of ceramics from A007 – Mota Dahisara – showed similarities with Kuntasi Period I, although Kuntasi II and Surkotada IC ceramics were also identified. A single Kuntasi I ceramic was identified at A010. Six of the remaining sites consisted of undiagnostic material or did not yield sufficient ceramic data to be able to ascertain phasing information. Three sites (A004, A009, A012) were identified as Early Historic from their ceramics, although no further investigation was made regarding more specific chronological information.

This initial analysis of phasing, suggests that there was a greater number of Localisation Era sites present within the survey zone than Integration Era sites. However, this manifestation may be dictated by localised factors, as opposed to wider developments within the Indus Valley Tradition as will be discussed in the remainder of this chapter. No evidence of Regionalisatiion Era occupatiion was found, and the only Integration Era occupations were identified at A007 (with a single ceramic also identified at A010). These results will be presented against the wider analysis of settlement distribution within Gujarat, in order ot identify whether the patterns seen here are the result of a wider development, or a consequence of localised factors.

5.2.4 Vegetation and Visibility

Details concerning modern vegetation and the subsequent visibility of artefacts were recorded along each transect to ascertain whether or not archaeological visibility was a factor in identifying sites (each transects vegetation is detailed in Appendix One). Whilst some surveys (Coningham *et al.* 2007) have identified vegetation as a significant factor in preventing or determining the identification of archaeological sites, it had very little impact upon the Gujarat Environs Survey. 75% of the survey zone was ploughed field (with roughly a 50-50 split between cultivated and uncultivated fields) that provided very good visibility even when the fields were cultivated (Figure 5.05). The scrub and thorn bushes, primarily located in the northwestern region of the survey zone also did not hinder archaeological visibility. Within this slightly more dense vegetation the main difficulty was maintaining a spread line along the transect.

Table 5.2 shows the results of the vegetation recording along each transect. As has been mentioned the vast majority of the survey zone was comprised of agricultural fields. 38.5% of the survey zone was an uncultivated field, whilst 36.5% was cultivated (Figure 5.06). Of this cultivation, the most frequently planted crop was cotton, with small areas of caster and wheat. The other major form of vegetation encountered was scrub and thorn bushes (18.4%), predominantly located in the saline soils close to the Rann of Kutch, as mentioned above. Dense thorn bushes were also utilised throughout the area as boundary markers, and to enclose areas used as cattle pens. The remainder of the survey zone (6.6%) was roadway/pathways, villages or water bodies.

5.2.5 Summary

This section looked at the initial results of the Gujarat Environs Survey, concentrating upon the size, location and phasing of sites, as per the remit of this chapter. The survey firmly identified six Indus Valley Tradition sites, all of which date to the Localisation Era, and one of which also demonstrates Integration Era occupation. The sites were small in nature, and could only have been identified through the use of a systematic survey methodology, rather than a more traditional "village-to-village" unsystematic survey approach. The largest of the sites identified, Mota Dahisara, yielded evidence of debitage shell bangle production, similar to that identified at Bagasra (Sonawane *et al.* 2003) and a finished shell bangle. Worked shell was also identified at several sites within the survey, suggesting that shell working was not only restricted to the sites of Kuntasi (Dhavalikar *et al.* 1996) and Bagasra (Sonawane *et al.* 2003). Whilst the shell found at the sites on survey may represent discarded waste from these larger sites, or artefacts "lost" whilst in transportation, it is most likely an indication that manufacturing and craft specialisation (particularly shell) was not restricted to the more permanent urban sites of Kuntasi and Bagasra. Additionally, lithic cores and flakes were identified at a number of sites, although no actual lithic tools were identified. Interestingly, the excavations at Kuntasi also noticed a lack of lithic tools within the site, despite the presence of cores, flakes and broken blades (Dhavalikar *et al.* 1996: 282): Like the lithic debitage found at the survey sites, the majority of the lithic debitage found at Kuntasi was chert – readily available about 15 kilometres south of Kuntasi (*ibid.*).

Another element of the survey was to record the impact of vegetation on the visibility of archaeological sites. The survey area mostly covered modern

agricultural land (75%), where surface visibility was very good, due to a combination of ploughing (to bring buried ceramics/artefacts to the surface) and low vegetation cover (to be able to spot them). However, the use of modern ceramics in manuring, often meant that distinguishing between archaeological and modern deposits was difficult. The function of sites identified in the Gujarat Environs Survey will be discussed in more detail in the following chapter.

5.3 Site Distribution

The following section will examine the initial analysis of site distribution within both Gujarat and Cholistan, as outlined in section 4.5.1. It will analyse the settlement patterns of Gujarat and Cholistan with regards to the size, location and phasing of site. Discussions regarding the function of sites and their role within the landscape will be dealt with in the following chapter. This section will provide an overview of sites within the two regions – looking at changes in site size and location over time. It will also provide a basis for the rest of the chapter, which deal with rank-size analysis and central place analysis.

5.3.1 Gujarat

The following section will outline the results of the settlement analysis from the Gujarat dataset. In total, 485 sites have been identified within Gujarat, throughout all eras of the Indus Valley Tradition, although this does not include the sites from the Gujarat Environs Survey discussed in section 5.2. This section will begin by looking at issues regarding the quality of data available, the survey methodologies used to obtain and consequently how representative the dataset is. It will then go on to display the results of the data analysis by each era (Regionalisation, Integration and Localisation) of the Indus Valley Tradition to look at developments through time, and then by each region of Gujarat (Kutch, North Gujarat, South Gujarat and Saurashtra) to examine changes across space.

5.3.1.1 The Dataset

In total 485 sites were recorded from surveys in Gujarat from a variety of published sources (Bhan 1986, 1989, 1994, Bisht 1999, Chitalwala 1979, 1993, Dhavalikar and Possehl 1992, Dimri 2001, Hegde and Sonawane 1986, Majumdar 1999a, 1999b, 2001, Mehta 1993, Possehl 1980, Soundararajan 1984)

and from *Indian Archaeology: a review* and *Memoirs of the Archaeological Survey of India*. This survey data was supplemented with information from excavation reports (Dhavalikar *et al.* 1996, Ehrhardt and Kennedy 1965, Hegde *et al.* 1990, Mehta *et al.* 1971, 1975, 1980, Rao 1963, 1979, Sonawane *et al.* 2003, Sonawane and Mehta 1985). However, due to the varied survey methodologies involved and variation on information recorded there is some discrepancy in the final data. Discussion on how the data was compiled can be found in the previous chapter in section 4.4.2.

One of the key discrepancies with the data is the lack of vital information for some sites. Of the sites, just over half of them (262 out of 485) have reliable information regarding the size of the site. However, there are 31 sites that do not have northing or easting data from which to ascertain an accurate location. Further information regarding occupation levels, chronology, inter- and intra-site relationships vary from site to site and from survey to survey. All the necessary information has been transposed onto the dataset that can be found in Appendix B.

As discussed previously, methodologies utilised on archaeological surveys in Gujarat are often unscientific in nature and therefore likely to be unrepresentative in their findings. However, it would take an inordinate amount of small-area targeted systematic surveys to achieve a representative sample of the entirety of Gujarat. Large-scale surveys are often required to be able to develop an understanding of regional settlement patterns. However, the weakness of such surveys is that they will naturally concentrate on the larger, more archaeologically visible sites within a landscape. These sites represent a particular aspect of a community – the agrarian and sedentary elements. Any conclusions drawn from the results below must be tempered with the acknowledgement that future systematic survey may produce a very different set of results, and strengthen our understanding of settlement patterns within Gujarat.

Despite these weaknesses, there have been a huge number of surveys undertaken covering virtually every district of Gujarat. The principal method of survey has been to travel to modern villages in the area, and asking the village leaders, and other elderly people whether any archaeological sites exist in the surrounding area (Dimri 1999: 31). Such village-to-village survey can provide highly skewed results. Hegde and Sonawane's (1986) survey of the Rupen Valley adopted this approach, and in their distribution maps, the distribution of Indus

Valley Tradition sites mirrors that of modern villages. It then becomes difficult to ascertain whether this is a distribution map of Indus sites or modern villages. It could be that modern villages have developed in prime locations that were also utilised during the Indus Valley Tradition, or it could be that Indus Valley sites exist throughout the entire landscape, but we are only seeing those sites that are a short distance from modern villages. This highlights the need for a more systematic approach to archaeological surveys - one of the aims of the Gujarat Environs Survey (section 5.2) was to ascertain how representative previous surveys in Gujarat are. The following section will display and discuss the results of the analysis of the Gujarat dataset.

5.3.1.2 Gujarat - by period

This section will examine the Gujarat data through time, looking at how settlement numbers, location and size have changed throughout the Indus Valley Tradition. For simplicity and clarity, the data has been divided into Early Food Producing, Regionalisation, Integration and Localisation Eras. All 485 sites have data regarding their chronological phasing available. Within Gujarat, six sites have been attributed to the Early Food Producing Era, 52 sites to the Regionalisation Era, 141 sites to the Integration Era and 343 sites to the Localisation Era (n=542 due to many sites being multi-period).

Initial observations show that there is a significant increase in the number of sites through time. Table 5.03 demonstrates that this is mostly due to an increase in sites within Saurashtra during the Integration and Localisation Eras. The vast majority of sites are located within Saurashtra, which is the largest of the four regions. South Gujarat, generally seen as peripheral to the Indus Valley Tradition has very few sites in all Eras. An interesting dichotomy can be seen between North Gujarat and Kutch during the Integration and Localisation Era. Kutch witnesses an increase in the number of sites during the Integration Era, whilst North Gujarat sees a decline. These issues will be discussed within their relevant sections later in the chapter. The following section will discuss each Era in sequence

5.3.1.2.1 Early Food Producing Era

Only six sites have been identified as Early Food Producing in Gujarat (Figure 5.07), five situated within Jamnagar District, Saurashtra and one in Mehsana

District, North Gujarat. The five sites in Saurashtra were all identified from survey undertaken in the 1980s (Bhan 1986). Their classification as early food producers is questionable, primarily a result of microlithic tool finds, and a lack of accompanying material remains. The lack of systematic survey has failed to identify sites that represent the origins of sedentism. Survey along the Sabarmati and Mahi rivers in Gujarat has identified Palaeolithic and Microlithic occupation levels dating from 130,000 to 6,000 BCE (Khadkikar and Krishnan 2004). However, the succeeding period up until the emergence of permanent settlements and the beginnings of the Indus Valley Tradition in Gujarat is poorly understood. None of these five early food sites have size data, and none of the sites have evidence for later occupation levels. The other Early Food Producing site, Langhanj, has been identified as Early Food Producing due to the presence of microlithic tools at the site. The site was first excavated between 1944-57 and then re-assessed in 1959 and 1963 (Clutton-Brock 1965, Ehrhardt and Kennedy 1965, Sankalia 1965). A single radiocarbon date exists from these excavations (sample TF0744 3930±115 BP) recalibrated to 2581-1976 BCE at 95.4% significance, although it is unclear whether this sample is derived from Phase I or II at the site.

5.3.1.2.2 Regionalisation Era

A total of 52 Regionalisation Era sites have been identified within Gujarat. Of these 32 sites are located in North Gujarat, 17 in Saurashtra, two in Kutch and one in South Gujarat (Figure 5.08). 30 of the 52 sites have size data available (57.7% of them) allowing some preliminary observations to be made. The average size of Regionalisation Era sites 1.70 hectares, although there is one significantly larger site during this period – Dholavira, measuring 31.8 hectares in Kutch. In contrast, the second largest site, Alidhar in Bhavnagar District in Saurashtra, is only 3.5 hectares significantly smaller than the largest site. Only six of the sites with size data are over 1 hectare in size suggesting that the majority of sites during the Regionalisation Era were small in size.

Figure 5.09 shows the distribution and size of Regionalisation Era sites in Gujarat. There are three distinct clusters of sites – to the east of the Little Rann, on the southeast coast of Saurashtra, and in the western region of Saurashtra. However, these three clusters also represent concentrations of surveys, and are a greater reflection of where more detailed surveys have been undertaken rather than concentrations of sites. However, it does provide evidence that occupation during

the Regionalisation Era was widespread throughout Gujarat. Only Dholavira is present within Kutch, although there may be smaller pastoral sites present that have not been identified by traditional survey methods.

The Regionalisation Era in Gujarat is not a homogenised cultural area. In fact, there appear to be several competing spheres of interest – defined as Anarta (Ajithprasad 2002), Early Padri (Shinde 1998) and Amri-Nal (Fairservis 1971, Possehl 2003: 40-44). These groupings are defined primarily on ceramic typologies, although there seems to be some overlap. Anarta ceramics are concentrated in North Gujarat to the east of the Rann of Kutch. Padri ceramics are common in the area surrounding the site of Padri on the southeastern coast of Saurashtra. Amri-Nal ceramics are most frequently found within Sindh and the lower Indus Valley, although they have been identified at some sites in North Gujarat and Kutch. This last geographical distribution has been used to argue for the movement of people from the Indus Valley into Gujarat (Dhavalikar 1995, Soundararajan 1984), whilst the first two ceramics have been cited as evidence for an indigenous emergence of complexity in Gujarat (Shinde 1998). This thesis does not intend to examine the minutiae of these ceramic traditions which have been extensively discussed elsewhere (most notably Ajithprasad 2002). However, it is necessary to consider the importance of indigenous versus external dichotomies when considering settlement patterns.

Of the 52 Regionalisation Era sites in the dataset, five are designated as having Amri-Nal deposits (including Dholavira), six are Early Padri and eight are classified as Anarta. However, Microlithic tools were identified at 30 of the sites suggesting that they are either a) a major feature of the Regionalisation Era, or b) that the discovery of microliths as opposed to metal tools on survey suggests that sites are 'pre-urban' or 'pre-Harappan.' One of the defining features of the Integration Era, according to Shaffer, was the wholesale replacement of lithic tools with metal counterparts (1992a: 448). However, as we shall see later, lithic, shell and bone tools have all been found in association with Integration Era material elsewhere in Gujarat.

In terms of site size, we have already seen the two largest sites are significantly larger than the remainder. Whilst the average size of all Regionalisation sites is 1.70 hectares, this is heavily skewed by the presence of Dholavira. Excluding this major site, the average size drops to 0.67 hectares. Consequently, the overwhelming majority of Regionalisation Era sites are very small in size. The

presence of this obviously larger site poses some difficult questions. The most simplistic view would be to confer upon Dholavira the title of 'capital' or 'central place'. However, Dholavira is somewhat isolated from the remainder of the Regionalisation Era sites, with the possible exception of Surkotada, the only other Regionalisation Era site in Kutch. The relationships between these sites will be discussed in more detail in the following chapter.

None of the Regionalisation Era sites have evidence of previous occupation, whereas fifteen sites have later occupation levels. Of these fifteen, ten sites develop into Integration Era sites with Dholavira developing into a major urban centre during the Integration Era. The remaining five have Localisation Era occupations, but not Integration Era. This apparent jumping of occupation levels is difficult to explain from purely size and location data.

5.3.1.2.3 Integration Era

141 Integration Era sites have been found within Gujarat, just over a third of the total number of sites (Figure 5.10). Of these 141 sites, 33 are located in Kutch, 83 are to be found in Saurashtra, 20 in North Gujarat and 5 in South Gujarat. However, only 68 (48.23%) of these sites have adequate size data making it the least representative of the three Eras (excluding the Early Food Producing Era). The average size of an Integration Era site is 4.47 hectares, and they range in size from 0.02 to 94.84 hectares. There are two significantly larger settlements within Gujarat during this period – Dholavira in Kutch (94.84 hectares) and Kotada (56.55 hectares) in Jamnagar District in Saurashtra. Within this thesis, this Kotada shall be referred to as 'Kotada (Jamnagar)' to distinguish it from the site of the same name in Kutch. The third largest site is Taraghada in Rajkot district, Saurashtra measuring 15.71 hectares.

Integration Era sites are distributed evenly through Gujarat. Figure 5.11 shows the size and distribution of sites within Gujarat. The two largest sites are located 187 kilometres apart either side of the Gulf of Kutch. There are no sites between 20-40 hectares. Sites within the next size bracket (10-20 hectares) are found within Saurashtra and Kutch. These four sites are Kotara in Kutch (11.57 hectares), and Targhada (15.71 hectares), Vagad (10.6 hectares) and Lothal (10.25 hectares) in Saurashtra. Kotara is located 74.17 kilometres from Dholavira, whilst Taraghada, Vagad and Lothal are located 50, 160 and 203.5 kilometres from Kotada (Jamnagar) respectively.

Sites falling into the 5-10 hectare site are again distributed throughout North Gujarat and Saurashtra, although there is a small concentration to the north and west of the Gulf of Khambhat. Sites within this rank are on average 170.4 km from one of the highest order (40+ hectares) sites (ranging from 135 to 222 km apart) and 82.8 km from a second order (10-20 hectares) site (ranging from 29 to 117 km).

The average Integration Era site is 4.47 hectares in size, with the largest – Dholavira – covering 94.84 hectares. However, Figure 5.11 clearly demonstrates that the vast majority of sites were less than 5 hectares in size. However, there were more 'middle-order' sites (5-20 hectares) than in the Regionalisation Era. 59 of the 68 sites with size data were less than 5 hectares in size, with five sites between 5-10 hectares, 4 sites between 10-20 hectares and 2 sites over 40 hectares. Excluding the two largest sites, the average size of Integration Era sites was 2.31 hectares (n=66). Finally, only nine of the Integration Era sites showed evidence of earlier occupation levels, whilst 63 sites demonstrated later occupation at the site.

5.3.1.2.4 Localisation Era

A total of 343 sites are present during the Localisation Era, the largest of any Era (Figure 5.12). Twelve of these sites are in Kutch, 218 are in Saurashtra, 101 in North Gujarat and twelve in South Gujarat. In addition, 201 of the sites has size data available – 58.6% of the total number. The sites range in size from 0.01 to 47.12 hectares, and the average size of the sites was 2.52 hectares. One site is significantly larger than the rest, Tarana III (47.12 hectares) in Jamnagar District, Saurashtra. The second largest site is Budhel in Bhavnagar District, Saurashtra and measures 18.8 hectares.

Figures 5.13 shows the size and distribution of sites during the Localisation Era.. There are two distinct clusters evident, in North Gujarat to the east of the Rann of Kutch and in central Saurashtra located around the site of Rangpur. However, this is coupled with a dispersal of sites and site sizes in Kutch. Dholavira drops in size from 94.84 hectares to 9.62 hectares. On the whole there is a general shift of sites from Kutch into Saurashtra and North Gujarat.

The average site size during the Localisation Era was 2.09 hectares. However, the largest site, Tarana III, is over twice the size as the second largest site, Budhel. Only one site falls into the 20+ hectare size bracket, whilst four sites are between 10-20 hectares – Budhel (18.8 hectares), Pasegam (12.75 hectares), Madhadevio (10.37) and Lothal (10.25 hectares). Fifteen sites are between 5-10 hectares and 181 sites are less than five hectares is size. Finally, 58 Localisation Era sites show evidence of earlier occupation levels and 11 demonstrate occupation into the historic period.

5.3.1.2.5 Summary

All three Eras in Gujarat exhibit both similarities and differences. One of the most striking similarities is the presence of one or two significantly larger sites during each period – Dholavira during the Regionalisation Era, Dholavira and Kotada (Jamnagar) during the Integration Era and Tarana III during the Localisation Era. Figure 5.13 demonstrates that in all three Eras there is a large increase in size from the 75th percentile to the largest site, suggesting a primate distribution of sites. However, such distributions will be examined further in section 5.5 through rank-size analysis. Figure 5.15 demonstrates that within all three Eras, the vast majority of sites are less than 5 hectares in size. The Integration Era demonstrates the emergence of 'middle-order' settlements in the 10-20 hectare range, between the large primate sites and the small <5 hectare site. However, these sites become less apparent within the Localisation Era. Table 5.03 demonstrates an increase in site size from the Regionalisation to the Integration Era, before it drops again during the Localisation Era. However, at the same time, there is a continual increase in the number of sites during each Era. So, although site sizes drop from the Integration to Localisation Era, the actual number of sites increases. Figure 5.16 shows that this growth in most clearly evident in Saurashtra, whilst there are fluctuations in the number of sites in Kutch and Gujarat. This variation will form the basis of the following section, examining the four different regions of Gujarat.

There also appears to be a lack of occupational continuity between Eras, although this may be a result of poor survey recording and/or the difficulties in ascertaining multiple periods of occupancy from surface survey alone. Surface survey tends to only highlight the latest levels of occupancy – possibly a factor behind the high number of Localisation Era sites. However, the results of the Gujarat Environs Survey mirrored this pattern,

5.3.1.3 Gujarat - by region

This section will examine the Gujarat data on a regional basis. Looking at Kutch, Saurashtra, North Gujarat and South Gujarat in turn, it will examine changing settlement dynamics over time. It is hoped that this will provide more of a spatial understating of Indus Valley Tradition sites within Gujarat, and compliment the temporal results outline in section 5.3.1.2. The section will look at changing site sizes, density of sites and cultural developments in each area. This data will compliment the succeeding chapter on settlement function and morphology.

Within Gujarat the highest number of sites are found within Saurashtra (369), followed by North Gujarat (154), Kutch (61) and South Gujarat (17). When one factors in the relative sizes of the four regions, site density retains the same order: Saurashtra (0.0039 sites per sq km), North Gujarat (0.0033), Kutch (0.0009) and South Gujarat (0.0004). In contrast, South Gujarat is the most densely populated area today, followed by North Gujarat, Saurashtra and then Kutch (see Table 5.4). The following sections will look at each region in turn, examining how settlement dynamics have changed over time

5.3.1.3.1 Kutch

43 sites have been identified within Kutch, two during the Regionalisation Era, 33 during the Integration Era and 12 during the Localisation Era (n=47 due to multi-period sites). Dholavira is the largest site during the Regionalisation Era (31.81 hectares) and Integration Era (94.84 hectares), whilst Kotara is the largest Localisation Era site (11.27 hectares). However, ongoing excavations at this site may demonstrate a similar reduction in the area of the site occupied during this period. There is limited size data available for the majority of sites within Kutch, despite the presence of Dholavira, one of the largest Indus Valley Tradition sites. This site heavily skews any size analysis for Kutch. However, the size and presence of Dholavira in Kutch raises some interesting questions. Chapter Two demonstrated that Kutch was (and still is) the most inhospitable region of Gujarat, and is less suited to agriculture and/or pastoralism. Modern population densities in Kutch are significantly lower than in other areas: 14 times lower than South Gujarat and 10 times lower than Saurashtra (Table 5.4).

The fact that only two sites have been identified that relate to the Regionalisation Era suggests that the area was of less significance during this period, or that it was occupied by less archaeologically visible inhabitants (i.e. pastoral as opposed to sedentary communities). However, by the Integration Era the number of sites had increased to 33 – including the largest site in the region. Many of these sites have been defined by archaeologists as "Sindhi Harappan", indicating that their material remains have more in common with Indus Valley Tradition sites from Sindh and the Indus Valley itself, than with the remainder of Gujarat (Dhavalikar 1995, Joshi 1990, Possehl 1980). The key question is establishing whether this was an attempt at colonisation (Dhavalikar 1995) or an adoption of "culture" by local elites in order to strengthen their own position. These issues and questions will be addressed after examining the other three regions.

5.3.1.3.2 Saurashtra

Saurashtra is by far the most populated region of Gujarat during the Indus Valley Tradition with a total of 284 sites. Four of the six Early Food Producing Sites are located within Saurashtra, although as stated earlier, very little information is available regarding them. 17 Regionalisation sites exist with an average size of 1.9 hectares (n=5). 83 Integration Era sites can be found in Saurashtra with an average size of 4.08 hectares (n=42). Finally, there are 218 Localisation Era sites with an average size of 2.87 hectares (n=116). Figure 5.16 shows the distribution of site sizes for Saurashtra through all phases. Whilst the Regionalisation Era appears to be quite homogenous in terms of site size, there is a more pronounced distribution during the Integration and Localisation Eras.

This shift in distribution patterns is primarily due to the establishment of the substantially larger sites of Kotada (Jamnagar) during the Integration Era and Tarana III during the Localisation Era. Additionally, a larger number of small sites (<1 hectare) have been identified. Again, this may be due to archaeological visibility and/or less scientifically rigorous survey methodologies. Saurashtra demonstrates a greater degree of cultural continuity than the other regions. 11 of the 17 Regionalisation Era sites demonstrate later occupancy, as do 36 of the 151 Integration Era. At least 10 sites from the Localisation Era are occupied during the historic period.

5.3.1.3.3 North Gujarat

A total of 144 sites have been located in North Gujarat, predominantly dating to the Localisation Era (101). However, North Gujarat has the highest number of Regionalisation Era sites (32). Figure 5.16 shows that North Gujarat is the only region that shows a decline in site numbers during the Integration Era (20). In fact, it is inverse in its relationship with Kutch, which sees an Integration Era peak in sites. Like all other regions, the average size of sites in North Gujarat was at its highest during the Integration Era, with an average size of 1.37 hectares, an increase from 0.41 hectares in the Regionalisation Era, before dropping to 0.91 hectares in the Localisation Era. There is no site in North Gujarat that stands out as significantly larger than any other, and no site during any Era is over 10 hectares.

There is no evidence for occupational continuity between the Regionalisation and Integration Eras in North Gujarat. However, ten of the 23 Integration Era sites show evidence of later occupancy, suggesting that there was some degree of continued occupation into the Localisation Era. North Gujarat is noted for its microlithic occupation levels throughout all periods. 27 Regionalisation Era sites, four Integration Era sites and nine Localisation Era sites demonstrate the widespread use of microlithic tool use, suggesting that Shaffer's contention that the Integration Era witnessed the widespread replacement of lithic tools with metal counterparts (1992a: 448) is not wholly correct.

5.3.1.3.4 South Gujarat

Only 15 sites have been identified in South Gujarat, and there is little information regarding them. One site dates to the Regionalisation Era, five to the Integration Era and 12 to the Localisation Era. There is some evidence of occupational continuity between the Integration and Localisation Eras, and two sites are occupied into the historic period. Only three sites have size data available disallowing any size data analysis.

5.3.1.3.5 Summary

The regional analysis of the Gujarat data demonstrates that the patterns identified in the temporal analysis are not necessarily applicable to the whole region. In particular, Kutch seems to follow a different pattern to Saurashtra and North Gujarat, whilst there is not enough data to confidently say anything regarding South Gujarat. Kutch appears to have been most densely occupied during the

Integration Era, whilst Saurashtra and North Gujarat were most densely occupied during the Regionalisation Era. This depopulation in Kutch is mirrored by the decrease in size of the largest site in Gujarat, Dholavira. However, despite the growth in the number of settlements in Saurashtra and North Gujarat during the Regionalisation Era, there is a corresponding decline in the average size of such sites – suggesting a less nucleated landscape.

Continuity is suggested in the number of sites that demonstrate multi-period occupation. The evidence from this analysis appears to contradict most archaeologists assertions that the post-Integration period relates to a decline or collapse (Misra 1984, Possehl 1997a, 1999b, Rao 1973, Wheeler 1968; see also Coningham 1995). Instead, the data suggests that there was both continuity and change underway at the same time. The function of sites (next chapter) will build upon this notion. The following section will examine the dataset from Cholistan.

Table 5.4 also shows an interesting relationship between modern and prothisotric settlement/population densities. The two most densely populated regions during the Indus Valley Tradition were Saurashtra and North Gujarat, whilst today South Gujarat is the most densely populated region. Kutch has remained sparsely populated due to the large areas of uninhabitable land and poor agricultural potential. The high modern population density in South Gujarat may be masking or even destroying possible Indus Valley Tradition sites, or there may be a more fundamental archaeological region for the low number of sites. Certainly the higher rainfall enjoyed by South Gujarat would have been attractive to agricultural settlers in the past, and the lack of identified sites in the region could be a result of modern occupation density.

5.3.2 Cholistan

Having looked at the Gujarat data, this section will examine the second dataset from Cholistan. It will follow the same format as the Gujarat section, looking at the quality of the data available, the survey methodologies used and how representative the dataset is. It will then go on to display the results of the size and distribution analysis. It will look at this data period-by-period only. However, geographical distinctions will be drawn. The Cholistan data from Mughal (1997) was initially divided into five phases – Hakra, Early Harappan, Mature Harappan, Late Harappan and Painted Grey Ware. These distinctions have been maintained, but where comparative samples and analysis is needed, Hakra and Early

Harappan have been combined to create a Regionalisation dataset and the Late Harappan and Painted Grey Ware data has been combined into a Localisation group to provide comparative data.

5.3.2.1 The Dataset

In total 385 sites were recorded by Mughal (1997, Mughal *et al.* 1996) on survey in Cholistan. Unlike the Gujarat data, the same survey teams working in consecutive seasons compiled all the information. As a result, the information is much more consistent creating a tighter regulated dataset (see section 4.4.4). All 385 sites have location information for mapping purposes, and all but eight sites have size information. The full dataset can be found reproduced in Appendix C.

Beginning in 1974, the Cholistan survey initially re-examined sites identified by Sir Aurel Stein in the 1940s (Stein 1943). In the following three years the survey continued to identify sites within Cholistan. However, it is unclear as to what the exact methodology adopted by the Cholistan survey teams was. Mughal (1997) states that the survey was concentrated along a 24-32km wide strip on both sides of the dry Hakra riverbed and extended for over 480km, but when necessary they surveyed into the stabilised sand desert areas. This would mean a surveyed area of at least 11500-15500 square kilometres. However, it does not state whether there was any systematic approach to covering this area. It is highly unlikely that the entirety of this area was covered in the survey, so we are looking at a sample of sites within Cholistan. Mughal does state that the survey relied primarily upon surface collections, but in some cases test pits were dug to ascertain depth of occupations (Mughal 1997: 28). Sites themselves were systematically surveyed to ensure a representative sample of pottery was collected, and some soil clearance was undertaken to identify cultural features (*ibid*).

Due to the likely unsystematic nature of the survey it is assumed that this is not an entirely representative sample. The most likely survey would have involved unsystematic walking/driving of the riverbed trying to identify tell sites (i.e. sites that are raised from ground level) and/or relying on information from villagers, herders and locals. Either way, both methodologies naturally introduce bias into any sample, in this case an over abundance of large, sedentary sites that are highly visible. Smaller, transhumant communities will be extremely difficult to identify in such a survey, even though the role of such communities is acknowledged as an integral part of modern Cholistan (Meadow and Patel 2002,

2003, Mughal 1994). Consequently, it is assumed that this sample is unrepresentative of Cholistan as a whole. However, as the methodological bias for Cholistan is similar to that of Gujarat the comparative analysis will not be overly distorted. All conclusions must be tempered with the acknowledgment that the sample data may be biased as a result of methodological choices.

5.3.2.2 Cholistan - by period

This section will examine the Cholistan data within each period. As stated earlier, the data from Mughal has been divided into five periods, which have been retained for this section. In later sections, where comparisons with Gujarat are drawn, they will be combined to fit Shaffer's chronology (1992a, 1992b). Within Cholistan there are 93 Hakra Phase sites, 39 Kot Diji Phase sites, 166 Harappa Phase sites, 47 Punjab Phase sites and 13 Painted Grey Ware sites (see Table 5.05 and Figure 5.17). Each phase will now be looked at individually.

5.3.2.2.1 Regionalisation Era: Hakra Phase

The survey teams in Cholistan identified a total of 93 Hakra Phase sites, the average size of which was 5.29 hectares. The smallest site was 0.03 hectares, whilst the largest site, Musafarwali, covered 21.71 hectares. The majority of sites (63) were less than five hectares in size, although there was a greater abundance of sites in the 10-20 hectare range than the 5-10 hectare range – the only period where this is the case.

Sites are located along the length of the Hakra riverbed, although there is a much higher density of sites near to the inland delta (see section 2.3.2.5) to the west (Figure 5.18). The majority of larger sites (10-20 and 20-40 hectare sites) are located near to the delta, although one site - Theriwala - lies at the western end of the river near the international border. Small sites (0-5 hectares) are distributed evenly throughout the region. There do appear to be gaps of 45-50 km between some sites in the central portion of the river, whilst in the west the sites are often less than one km apart.

5.3.2.2.2 Regionalisation Era: Kot Diji Phase

40 Kot Diji Phase sites have been identified in Cholistan, with the majority falling into the less than five hectares category (29 out of the 40). The smallest site is

0.01 hectares and the largest, Lathwala, is 31.57 hectares. The average size of Kot Diji Phase sites in Cholistan is 5.14 hectares, slightly smaller than the Hakra Phase.

The distribution of Kot Diji Phase sites (Figure 5.19) is noticeably different to the Hakra period. During the Kot Diji Phase there is a greater concentration of sites in the central portion of the Hakra River – the area that remained less densely populated during the Hakra phase. The largest site of this group – Gamanwala (21.4 hectares) – is located 122 km from the largest Kot Diji Phase site of Lathwala situated close to the inland delta. The smaller sites cluster into three recognisable groups – close to the inland delta and the site of Lathwala, along the central part of the river to the west of Gamanwala, and in the eastern segment of the river close to the international border.

5.3.2.2.3 Integration Era: Harappa Phase

Harappa Phase sites are the most numerous in Cholistan with a total of 167 sites. Again the majority of these sites are less than five hectares in size, the smallest being less than two by two metres square. The largest site in Cholistan dates to the Harappa Phase, Ganweriwala, which covers 64.03 hectares, and is the only site over 40 hectares. Two other large sites exist: Derawar Ther (27.65 hectares and Butewala (24.38 hectares). Despite these three large sites, the average site size in the Harappa Phase is 4.4 hectares, the smallest average size in Cholistan during the Indus Valley Tradition.

Integration Era sites are almost exclusively located along the western section of the river and in the inland delta (Figure 5.20). They extend further west than sites from any other period. The largest site – Ganweriwala – is located to the south of the Hakra riverbed, and although located centrally on an east-west axis, is not central on a north-south axis. The two other large sites – Derawar Ther and Butewala – are located 24 and 36 km from Ganweriwala respectively. The majority of sites lie within 100km to the east and 75km to the west of Ganweirwala. However two sites – Chapuwala (9.6 hectares) and Sandhanawala (7.9 hectares) – are 124 and 180 km east of Ganweriwala, and the site of Wariyal-G (12 hectares) is located 56 km to the south with no other site in between. Smaller sites tend to cluster around the larger sites and are most abundant in a 50km radius hemisphere to the northwest of Ganweriwala.

5.3.2.2.4 Localisation Era: Punjab Phase

47 Punjab Phase sites have been identified in Cholistan. The largest of these sites is Kudwala covering an area of 29.92 hectares. The smallest site measures 0.01 hectares, and the average size of a Late Harappan site is 4.81 hectares. Punjab Phase sites create a distinct cluster in the central portion of the Hakra River (Figure 5.21), no more than 100km long. The largest site – Kudwala – is situated at the eastern end of this cluster. The remaining sites are all located close to each other, no site being more than 11 km from its nearest neighbour.

5.3.2.2.5 Localisation Era: Painted Grey Ware Phase

Only 13 Painted Grey Ware sites were identified in Cholistan, twelve of which were less than 5 hectares in size. The largest site is Satwali measuring 10.78 hectares, whilst the average site size is 2.12 hectares. Painted Grey Ware sites are located predominantly in the eastern section of the Hakra River (Figure 5.22), with the exception of Rahatwala which is located 50 km to the west of its nearest neighbour. The site of Satwali is located at the western end of this cluster 83 km from the easternmost site and 51 km from the westernmost. The sites form a highly linear pattern, extending eastwards from the area of occupation witnessed during the Punjab Phase (Figure 5.21). If the Ghaggar-Hakra was drying during this phase (see Chapter Two), this shift in settlement could represent the movement of people to areas of remaining water sources.

5.3.3.2.6 Summary

The most interesting element of the site distribution analysis of Cholistan is the apparent shifting of site locations from period to period. There is not a continual consistent movement of sites (i.e. from east-to-west along the river or vice versa), but instead almost an ebb and flow of sites. Hakra sites are predominantly found in the west of the river. Early Harappan sites are located in both the central and western portion of the river. Integration Era sites again predominate the western end of the river, extending even further west than Hakra sites. Late Harappan sites are found in the central portion of the river. Finally, Painted Grey Ware sites are mostly located along the eastern section of the river. Whether this movement of sites is the result of hydrological developments is difficult with our current knowledge. Mughal suggests that this shift was a consequence of the final drying of the Hakra River, and the consequent abandonment of floodplain areas (1997:

52f). The following chapter on site function may elucidate these issues, as shifting locations may also reflect shifting functions of sites.

5.4 Central place analysis

This section will present the results of the central place analysis from Gujarat and Cholistan as outlined in the methodology, section 4.5.1.2. The purpose of this analysis is to test the hypothesis regarding Ganweriwala and Dholavira as local or regional capital cities, as suggested by several of the models outlined in the previous chapter (section 3.3). It achieves this by examining the relationship between sites size and the distance from the postulated central places, supported by the distribution maps from the previous section. It will begin by examining the data from Gujarat, then Cholistan and finish by discussing the similarities and differences between the two regions.

5.4.1 Gujarat

Since the discovery of Dholavira and the recognition of its vast size (94.84 hectares), many archaeologists have suggested that the site was a regional capital controlling and administering the southern regions of the Indus Valley Tradition – see sections 3.3.4, 3.3.5 and 3.3.6. Before the discovery of Dholavira, Lothal was often postulated as a regional centre – see sections 3.3.2 and 3.3.3. This section will examine the merits of these two hypotheses. In order to do this, it will examine the distribution of sites within a two hundred kilometre radius of the two sites. For Dholavira, it will do this during the Regionalisation Era, Integration Era and Localisation Era and for Lothal during the Integration and Regionalisation. In addition, this section will undertake a similar methodology for Kotada (Jamnagar) during the Integration Era and Tarana-III during the Regionalisation Era. Both of these sites were substantially larger than other sites during their respective periods, and as such should be incorporated into this section. The following sections will outline the results of the size:distance analysis, and discuss the distribution of sites within each of the site's postulated hinterland. Comparison and discussion will be undertaken after each site has been outlined.

5.4.1.1 Dholavira

Dholavira is now recognised as one of the largest Indus Valley Tradition sites, but despite this there is a lack of information available for other sites within Kutch – see section 5.3.1.3.1. Figure 5.23 shows the relationship between site size and distances from Dholavira for the Regionalisation, Integration and Localisation Era in Gujarat. The most striking feature of the graphs is the paucity of sites within an 80km radius of Dholavira, especially during the Regionalisation and Localisation Eras. However, there are a greater number of sites located within 80km of Dholavira during the Integration Era, when Kutch was most densely populated during the Indus Valley Tradition.

Figure 5.24 suggests that one reason why the area surrounding Dholavira is devoid of sites is the Rann of Kutch. Dholavira is located upon Khadir island, an area of higher ground with fertile soil and fresh water. These locations are common within the Great Rann of Kutch (see section 2.2.3.1), and Dholavira is located on the largest in the region. However, there is an expanse of open Rann (see Figure 2.06) immediately surrounding the island, which is uninhabitable. The lack of nearby settlement could be a consequence of the poor agricultural potential of Kutch, as opposed to the more fertile plains and river valleys of Saurashtra. The second largest Integration Era site in Kutch, Kotara (also known as Juni Kuran) measures 11.27 hectares and is located in a similar position 45 km west of Dholavira, situated on the cusp of the Great Rann of Kutch and the mainland. The role of these two sites will be explored in more detail in the following chapter.

The remainder of Integration Era sites in Kutch are small – less than five hectares. The third largest site is Shikarpur (4.1 ha) located within the Small Rann of Kutch. However, a factor in this lack of sites is the lack of size data available for many of the sites in Kutch. There are, however, two concentrations of sites. The first is to the southwest of Kotari and south of Desalpur, and the second to the southeast of Dholavira between Surkotada (2.04 ha) and Jhanghar (0.07 ha). There are also a number of sites located on the opposite side of the Little Rann of Kutch – in North Gujarat to the east and Saurashtra to the south. In North Gujarat, the largest site is Amasio-no-Timbo (9.42 ha) located south of the Luni River. In Saurashtra the two sites of Kuntasi (2.6 ha) and Bagasra (1.56 ha) are prominent. It is still unclear whether these sites were incorporated into any postulated hinterland of Dholavira.

5.4.1.2 Lothal

Lothal was for a long time identified as the pre-eminent site in Gujarat (see above). Figure 5.25 shows the relationship between site size and distance from Lothal for the Integration and Regionalisation Eras. Immediately, it is apparent that there are a greater number of sites within close proximity to Lothal when compared to Dholavira. During both Eras there is a 'shadow', with no sites recorded within a 10-15 kilometres radius of Lothal.

Unlike Dholavira, there are a number of similar sized sites in the vicinity of Lothal (10.25 hectares) during the Integration Era (Figure 5.26). The two sites of Vagad (10.6 ha) and Rangpur (7.07 ha) are located 45 kilometres southeast of Lothal, and have several smaller sites clustered around them. Further to the southeast is another small cluster of sites, the largest of which is Loliana (3.9 ha). A third cluster of sites is visible on the southeast coast of Saurashtra, focusing upon the 9.2 hectare coastal site of Dakana. There are several sites about 25 kilometres west of Lothal, the largest of which are Rel (4.71 ha) and Kanewal (3.92). Further southeast is the 0.5 hectare site of Padri in the Mahi valley.

During the Localisation Era, the area around Lothal is more densely populated. There is a profusion of sites to the east of Lothal, based around the site of Kanewal (3.92 ha), and the 2.36 hectare site of Godel lies to the northeast on the banks of the Sabarmati River. However, the densest concentration of sites is along the Ghelo and Kalubhar River valleys to the east of Madhadevio (10.37 ha). Sites within this cluster include Pasegam (12.76 ha), Vaharvo (9.42 ha), Malagam (8.06 ha), Charanio (5.92 ha) and Adatala (5.5 ha) as well as smaller sites such as Oriyo-Timbo (1.98 ha). These two rivers join, and reach the Gulf of Khambhat just north of the site of Budhel (18.8 ha), the second largest site in Gujarat during the Localisation Era. Again, the immediate area around Lothal is sparsely occupied, and there are almost no sites in the flat marshy Nal area to the north of Lothal, until one reaches North Gujarat and the Rupen Valley. It is not clear whether this is a reflection of settlement patterns or survey methodologies.

5.4.1.3 Kotada (Jamnagar)

Kotada in Jamnagar District was identified as an Integration Era site during survey by Bhan (1989) and measures 56.55 hectares. As such, it is the second largest Integration Era site to be identified in Gujarat, yet it has received little attention. Figure 5.28 shows the relationship between site size and the distance from

Kotada. The largest nearby site is Taraghada (15.71 ha), located 50 kilometres to the south (Figure 5.26). Like Lothal and Dholavira, the immediate area surrounding the site is sparsely occupied, with sites becoming more prominent at about 25 kilometres from the site. Three other sites are prominent in Kotada's hinterland: Karmalkota (2.66 ha) to the southeast, Muklpadar (3.93 ha) to the southwest and Kuntasi (2.6 ha) to the north. However, in comparison to the area around Lothal during the Integration Era, the landscape is less densely occupied.

5.4.1.4 Tarana-III

Tarana-III has been identified as the largest Regionalisation Era site in Gujarat and as such has been included within this analysis. Figures 5.29 shows the relationship between size and distance from Tarana-III and Figure 5.30 shows the distribution map of sites in its hinterland. The landscape of western Saurashtra is densely occupied, as was that of eastern Saurashtra around Lothal (see Figure 5.27). There are two noticeably larger sites within a 50 kilometres radius of Tarana-III, Jaidak (5.28 ha) to the east and Wasai (7.07 ha) to the southwest. Thebachada-I (3.93 ha), Kuntasi (2.6 ha) and Bagasra (1.56 ha) are also within this zone. Further afield, the three sites of Godvari (3.14 ha), Mulpadur (3.93 ha) and Vegadi (4.71) are located between 80-100 kilometres from Tarana-III. Three middle-order sites are located on the south and west coast of Saurashtra – Kaj (9.19 ha), Somnath (7.07 ha) and Khambhadar (5.9 ha). Finally, the two sites of Dholavira (9.62 ha) and Kotari (11.27 ha) are still predominant in Kutch.

5.4.1.5 Discussion

This subsection will discuss and compare the above results. It will do so chronologically, starting with a discussion of Dholavira, Lothal and Kotada during the Integration Era, and then Lothal and Tarana-III during the Localisation Era. It will question whether the settlement patterns within the vicinity of these sites are indicative of a centralised hinterland.

The location of Dholavira on a *khadir* means that it is naturally isolated from other sites within Kutch, whilst Lothal and Kotada (Jamnagar) are located more centrally within the landscape. Kotada is situated in central Saurashtra, whilst Lothal is located within the Sabarmati valley at the head of the Gulf of Khambhat. However, all three sites demonstrate similarities in their hinterland patterns. The second largest site in Dholavira's hinterland is Kotara (Juni Kuran) located 45

kilometres to the west. At Lothal, the second largest site Vagad (and also Rangpur) is also located 45 kilometres away, and at Kotada (Jamnagar) the second, third and fourth largest sites are all located 40-60 kilometres from the centre. It is possible that these sites acted as secondary centres within the hinterland's of Dholavira, Lothal and Kotada. This pattern, evident at all three sites, suggests that there was some degree of centralisation during the Integration Era, but whether this was the result of an imposed system of political and economic control (see the Twin Capital Empire model and Proto-State model), or the result of a more localised economy (i.e. the Domain model or Chiefdom model) is yet to be determined. The following chapter will explore the function of sites within these hinterlands in more detail.

During the Localisation Era there is a similar pattern evident, and a greater number of sites have been identified. At Lothal, although the landscape was more densely populated with sites, the postulated secondary centres, Kanewal and Rangpur, are located 30-40 km away from the main site. There is however a dense cluster of sites, many of them similar in size to Lothal, within the Ghelo and Kalubhar valleys 100 kilometres to the southwest. Whether these sites are part of Lothal's hinterland, or indicative of a separate hinterland system is not. This pattern may be a greater reflection of surveyed areas, rather than a feature of the settlement pattern of the region. At Tarana-III, the secondary sites of Wasai and Thebachada are situated 50 kilometres from the main site, although others – Kuntasi and Jaidak – are located much closer. Beyond these secondary centres a possible third "tier" of sites - Godvori, Mulpadur and Vagadi ranging in size between three and five hectares – are located between 100 and 110 kilometres. At both Lothal and Tarana-III there is evidence for large coastal sites located along the coast of southern Saurashtra.

5.4.2 Cholistan

This section will present the results of the central place analysis in Cholistan. There are five chronological phases within the Cholistan dataset, although this section will not consider the Painted Grey Ware period due to the small number of sites. However, the other four phases all have sufficient data to undertake the analysis. For each phase the largest site has been utilised for the size:distance relationship. These four sites are Musafarwali (Hakra Phase), Lathwala (Kot Diji Phase), Ganweriwala (Harappa Phase) and Kudwala (Punjab Phase). However, archaeologists have postulated only Ganweriwala as the focal point of a

centralised domain – see section 3.3.2 and 3.3.3 - however, the other phases have been incorporated to provide an element of temporality to the analysis. The following subsections will examine each phase in turn. Like the previous section on Gujarat, the initial sections will outline the results of the analysis, which will then be collectively discussed afterwards.

5.4.2.1 Musafarwali

Figure 5.31 shows the relationship between site size and distance from Musafarwali for sites during the Hakra Phase of the Regionalisation Era. Immediately it is apparent that there is a distinct clustering of sites within a small region. The vast majority of sites are located within a 40km radius of the largest site Musafarwali (21.71 ha), with a small number of sites spread further afield (Figure 5.18). The identification of Musafarwali as a primary centre is weakened by the presence of two sites of a similar size less than 10 kilometres away – Lathwala-II (20.66 ha) and Chandnewala-II (19.58 ha). Also, there are a further seven sites which are between 15.2 and 17.98 hectares in size that are located between 4.99 and 27.5 kilometres from Musafarwali. As such, this represents a very tight cluster of relatively large sites. There are two relatively large sites in isolated locations. Moniwala, measuring 17.98 hectares, is located almost 70 kilometres southwest of Musafarwali, and Theriwala (14.83 ha) is located 165 kilometres to the west.

5.4.2.2 Lathwala

Figure 5.32 demonstrates that there was a very different pattern evident during the Kot Diji Phase. Instead of the clustering visible during the previous phase, the Kot Diji Phase is characterised by a dispersal of sites. However, Figure 5.19 demonstrates that there may be two clusters of sites, one based around Lathwala (31.57 ha) and a second based around Gamanwala (21.4 ha) 120 kilometres to the northeast. The majority of sites in the vicinity of Lathwala are small (<5 ha), with the exception of the 8.61 hectare site of Azimwali B six kilometres to the south. There are a greater number of sites based around Gamanwala, including Jalwali (17.7 ha), Malhalewala (14.9 ha) and Chak 341 (15.67 ha). These three sites are all less than twenty kilometres from Gamanwala.

5.4.2.3 Ganweriwala

Figure 5.33 shows the relationship between site size and distance from Ganweriwala for the Integration Era sites in Cholistan. Like the Hakra Phase, there is a clustering of sites within a 40 kilometre radius of Ganweriwala, with a decreasing number of sites beyond this (Figure 5.20). After the 64.02 hectare site of Ganweriwala, the next two largest sites are Derawar Ther (27.65 ha) located 23.6 kilometres to the northeast and Butewala (24.39 ha) located 32.3 kilometres north. Immediately south of Butewala is the 18.36 hectare site of Lunida I. Situated roughly 15 kilometres northwest of Ganweriwala are three sites – Devilawala Ther, Karowala and Kuppianwala, measuring 18.2, 17.75 and 15.74 hectares respectively. Like the Hakra Phase, there is a high concentration of large (15+ ha) within a small space. Beyond this cluster the site of Chak 121 (15.14 ha) is located 57 kilometres to the southwest of Ganweriwala, whilst the 10.57 hectare site of Tarsoolwala is 83 kilometres to the northeast. A cluster of smaller sites surrounds both of these sites.

5.4.2.4 Kudwala

The relationship between site size and the distance from Kudwala during the Punjab Phase (Figure 5.34) demonstrates a more dispersed pattern than during the Integration Era. Whilst there are a smaller number of sites, they do not cluster around the largest site Kudwala (29.92 ha). Figure 5.21 demonstrates that Kudwala is situated to the east of the majority of sites, which are all located reasonably close together. Six sites, ranging from 11.51 hectares to 15.71 hectares are evenly distributed within this western concentration of sites.

5.4.2.5 Discussion

The central place analysis from Cholistan presents very different results from Gujarat, mostly a reflection of the very different datasets (see sections 5.3.1.1 and 5.3.2.1 for discussion regarding these). During the Hakra and Harappa Phases there is evidence of sites clustering around the largest site(s) along the river. However, during the Kot Diji and Punjab Phases, the opposite is true, where sites become more dispersed and the largest site(s) are found on the periphery. During the periods of clustering (Hakra and Harappa Phases) sites tend to be concentrated within a 40 kilometres radius of the largest site, leading to a more densely packed landscape when compared to Gujarat. There is evidence of sites outside of this zone, but these sites tend to be relatively isolated. The hinterland

of Ganweriwala during the Integration Era is characterised by the presence of two large sites (20+ ha) and several other sites between 10-20 hectares, interspersed with smaller sites. However, by the Localisation Era, there is very little evidence of such a pattern persisting.

5.4.3 Central place summary

This section has examined the hypothesis that Dholavira, Lothal and Ganweriwala acted as primary centres within their respective landscapes. The two datasets have provided very different results and patterns. There is a greater degree of continuity between periods in Gujarat, particularly between the Integration Era and Localisation Era. In contrast, Cholistan is characterised by a pattern of clustered→dispersed→clustered→dispersed. During these periods of clustering, the hinterlands of the major sites – Musafarwali and Ganweriwala - are densely populated by sites. In contrast, Dholavira is located in an isolated location, and the immediate areas around Lothal and Kotada (Jamnagar) have low settlement densities. Tarana-III is located within a more densely occupied landscape, but even then the potential secondary centres are still located 40 kilometres away.

The idea that Dholavira "controlled" a southern domain centred upon Gujarat (see section 3.3.4 and 4.3.1.3) also looks unlikely. Its isolated location suggests that it, along with Kotara (Juni Kuran), acted to control access to and from the region from the Indus Valley, rather than administering the region. The two Integration Era sites of Lothal and Kotada (Jamnagar) appear to be more likely as central places within Saurashtra. The distribution of sites around these two sites is similar, with secondary centres located 40 kilometres away. However, as noted in subsection 5.4.1.5, whilst this section has established that there are certain patterns visible, it has not been able to establish the mechanisms that dictated these patterns. The following chapter, examining the function of sites, will explore these hinterlands further, looking at the differing role of sites within them. Section 5.6 at the end of this chapter will consider how the results of the central place analysis have impacted upon the predictive models outlined in section 4.3.

5.5 Rank-size analysis

This section will look at the rank-size analysis from both Gujarat and Cholistan. This chapter has already undertaken preliminary analysis regarding site sizes

within Gujarat and Cholistan, summarised in Tables 5.3 and 5.5, and the previous section regarding the central place analysis. Furthermore, rank-size analysis can be utilised to test the models discussed in sections 3.3 and 4.3. Section 4.5.1.3 outlined the methodology for rank-size analysis. The rank-size rule, especially within its archaeological manifestation, is derived from two opposing forces – unification and diversification. Zipf (1949) believed that these forces would either encourage settlement within a single area or cause it to disperse throughout a region. The rank-size rule works on the premise that any site within a ranked samples size can be calculated by dividing the largest site by its rank *r* (where *r* = the rank of the site), and deviations from this expected distribution (log-normal) have been seen as a reflection of different settlement systems and social patterns

The data for both Gujarat and Cholistan has been separated into Regionalisation, Integration and Localisation Eras to allow for greater cross-regional clarity, and the results of the rank-size analysis for both regions is detailed in the following sections.

5.5.1 Gujarat

Figure 5.35 presents the rank-size curves for Gujarat during the Regionalisation, Integration and Localisation Eras respectively. The curve during the Regionalisation Era falls midway between a primate distribution and a primo-convex distribution. During the Integration Era the curve is almost log-normal before becoming convex towards the end. Finally, the Localisation Era curve is convex with a tendency towards log-normal. The following subsections will examine each Era in turn detailing the potential interpretations of each curve, analogous models from elsewhere and their implications upon the predictive models.

5.5.1.1 Regionalisation Era

The rank-size curve for the Regionalisation Era (Figure 5.35) demonstrates a slight primo-convex distribution. Savage (1997: 234) suggests that primo-convex curves represent either a) the pooling of more than one settlement system within the survey sample or b) the simultaneous operation of two distinct settlement systems within a region - a centralised system superimposed upon a more loosely integrated or central place system (see also Falconer and Savage 1995). Both of these interpretations are possible within Gujarat during the Regionalisation Era.

It is possible that during the Regionalisation Era Gujarat was a 'frontier' zone between Indus Valley Tradition settlements and smaller, autonomous communities on its fringes, and that the dataset has identified sites from both settlement patterns. It is also possible that the rank-size curve has identified an attempted 'colonisation' of Gujarat by Indus Valley settlers and/or merchants – in an attempt to centralise and integrate a mainly rural region into a larger integrated urban network. The second of these hypotheses has been postulated before, most notably by Dhavalikar (1995). The earlier hypothesis of Gujarat as a frontier zone has not been postulated by any scholars.

5.5.1.2 Integration Era

The rank-size curve for the Integration Era (Figure 5.35) demonstrates a log-normal to primate distribution, although this becomes highly convex, giving an almost primo-convex curve. This is not as pronounced as the curve for the Regionalisation Era suggesting that the settlement pattern has become ranked. As such, much of the same rank-size arguments can be made, although acknowledging that a greater degree of ranking is present, particularly within the larger sites. The curve demonstrates similarities with Middle Bronze Age IIB/C and Early Dynastic I data from the Warka and Nippur-Adab surveys in southern Mesopotamia (see section 5.5.1.4) and Monte Alban II (see section 5.5.1.5)

5.5.1.3 Localisation Era

The rank-size curve from the Localisation Era (Figure 5.35) demonstrates a convex distribution, which is indicative of low levels of system integration (Johnson 1980), the exclusion of the primary centre (*ibid.*) or a peripheral sample (Savage 1997). The Localisation Era represents the first time that the rank-size curve in Gujarat becomes convex rather than primate suggesting a less integrated landscape. However, convex systems can also result from the pooling of two or more settlement systems (Johnson 1977) (also see section 5.5.2 on Cholistan). This could result from the pooling of several localised systems within the Localisation Era of Gujarat, a possible indication of the breakdown of widespread integration and the emergence of several chiefdoms or small interaction networks. The Localisation curve has similarities with Early Dynastic I period from Diyala in central Mesopotamia (see section 5.5.1.4) and Monte Alban IIIA-V (see section 5.5.1.5).

5.5.1.4 Comparisons with the Near East and Levant

The primo-convex curve of the Regionalisation Era has similarities with the data from the Middle Bronze Age IIA in the coastal Levant (c.2000-1800 BCE) (Savage 1997). The Middle Bronze Age IIA in the Levant represents a period of growth of both rural and urban communities (Savage 1997: 242f), a hypothesis that is supported by an increasing number of settlements from the Regionalisation to Integration Era. This early phase of the Middle Bronze Age in the Levant is characterised as a period of transition between a predominantly pastoral lifestyle to a "truly urban era, in which... fortified cities developed from smaller... towns and villages" (Falconer 1994: 320). At the same time, Falconer identifies that the Bronze Age cities of the southern Levant were neither large enough nor centrally located to develop regional urban dominance over their hinterland. The distributions suggest low degrees of vertical integration, and thus are not indicative of cohesive urban settlement systems. (*ibid.*: 321).

The Integration Era curve shows similarities with data from the Middle Bronze Age IIB/C (1800-1500 BCE) (Savage 1997: 241ff), and Early Dynastic I data from the Warka and Nippur-Adab surveys in southern Mesopotamia (2900-2600 BCE) (Falconer and Savage 1995: 47). Savage suggests that the Middle Bronze Age IIB/C in the coastal Levant is characterised by increasing urbanisation. However, at the same time the convexity visible in the lower part of the rank-size curve (also visible in the Gujarat curve) indicates that urbanisation was not the dominating force in the region and that the rural element remained consistent and strong (1997: 243). Such an interpretation is viable for the Integration Era, which witnesses the emergence of several large sites, such as Dholavira and Kotada (Jamnagar), yet the vast majority of sites are still relatively small (see section 5.3.1.2.3). The Early Dynastic I data from southern Mesopotamia is suggestive of an urbanised community, where the majority of people were residing in a small number of large settlements (Falconer and Savage 1995: 46f). This is not fully supported by the Gujarat data, although there have been no population estimates undertaken for sites within Gujarat. In terms of size ratios, the five largest sites in Gujarat account for 57.7% of the total settled area (only from the sites where there is size data available). Falconer and Savage estimate that in southern Mesopotamia it was just over 60% of the population (*ibid.*: 46).

The curve from Gujarat during the Localisation Era demonstrates similarities with the curve from Early Dynastic I period from Diyala in central Mesopotamia (2900-2600 BCE) (Falconer and Savage 1995: 48). Within the Diyala region over 90% of the settlements were four hectares or less in size, although there were at least ten sites that were ten hectares and above (*ibid.*). Within the Localisation Era in Gujarat, only 64% of the sites were less than four hectares in size, whilst only five sites were greater than ten hectares, suggesting a greater number of middle-order sites. However, Falconer and Savage suggest that although the Early Dynastic I in Diyala witnessed an integration of small cities, towns and villages, but where the urban centres failed to exert significant control or influence over the village communities (*ibid.*).

5.5.1.5 Comparisons with the Oaxaca Valley

The three curves from Gujarat demonstrate a unique similarity to the Oaxaca Valley data. The Regionalisation Era curve matches the curves from the Monte Alban Early I and Late I periods (450 – 100 BCE). The Integration Era curve is similar to the Monte Alban II curves (100 BCE – 200 CE), and the Localisation Era curve is similar to the Monte Alban IIIA, IIIB-IV and IV period curves (200 – 1000 CE) (Drennan and Paterson 2004: 546). The chronological changes in the Gujarat data match that of the chronological development of the Oaxaca Valley data from Monte Alban I to Monte Alban IV, as it moves from a primate to convex distribution. As such, the Oaxaca data provides an analogous archaeological example of how site distribution patterns develop.

Drennan and Paterson characterise the rank-size curves of the Monte Alban sequence as reflecting the founding, development and decline of a regional capital within the Oaxaca Valley (2004: 547). Balkansky suggests that Monte Alban I is characterised by ongoing chiefly conflicts fuelled by territorial expansion, and the gradual emergence of Monte Alban as a primary regional centre (1998: 461f). However, Zapotec state institutions were not evident until Monte Alban II, which witnessed the emergence of a central place hierarchy centred upon Monte Alban and the development of secondary centres throughout the region (*ibid.*: 462). Monte Alban IIIA-IV is characterised as the decline of Monte Alban as a regional centre and the emergence of a less centralised community (Drennan and Paterson 2004: 547) and the emergence of new centres in direct competition with Monte Alban (Balkansky 1998: 473f).

Thus, the Oaxaca Valley data supports the Twin Capital Empire, Proto-State and Domain models of political organisation, which both advocate the establishment of Dholavira as a regional capital within Gujarat (see sections 4.3.1.1 – 4.3.1.3). The Twin Capital Empire model dictates that the Integration Era should be characterised by a hierarchical system of sites, something that the rank-size data suggests. Likewise, the Proto-State model dictates that the Integration Era is characterised by the presence of a centralised site hierarchy, but at the same time traditional chiefly institutions persist, something that is borne out of the Oaxaca analogy. Finally, the Domain model again advocates the existence of a rigid site hierarchy within the Integration Era and suggests that this developed out of competition from pre-existing regional elites, much like the Oaxaca data. However, all of the models suggest that the patterns evident in the Localisation Era result from collapse within the Indus Valley itself, rather than the local emergence of new competitive elites. None of the Oaxaca Valley data supports the Chiefdom model of political organisation.

5.5.2 Cholistan

All three rank-size curves for Cholistan (Figure 5.36) clearly demonstrate a convex distribution, although there is a slight tendency towards log-normality over time. As the three curves show such similarity, there is no need to divide this section into chronological subsections. Instead it will examine the archaeological interpretations of convex distributions before discussing the implications for Cholistan

Convex systems are common within archaeological samples, and as such have many possible interpretations: a) settlement patterns are dictated by Central Place Theory; b) more than one settlement system has been pooled; c) there are low levels of system integration; d) it is a peripheral sample; or e) the largest site has not been found (Savage 1997: 234). Convex distributions are characteristic of regions where the largest settlements are smaller than expected, or the smallest settlements are larger than one would expect (Falconer and Savage 1995: 40). However, it should also be noted that as settlement patterns become more integrated they would shift towards log-normal and then to primate distributions (*ibid*). To establish why this is the case this section will examine the five postulated reasons for a convex distribution.

Within Central Place Theory primary centres are located equidistant from each other and are surrounded by a ring of secondary centres with their own smaller satellites. Within Cholistan, it is possible to infer some degree of Central Place Theory for the Regionalisation and Integration Eras. Within the Integration Era, Ganweriwala would be a primary centre, with Derawar Ther and Butewala functioning as secondary centres within their respective hinterlands. Such an explanation may be more feasible when we examine the function of sites within Cholistan in the next chapter.

It is also possible that the Cholistan data actually covers two distinct settlement groupings. Certainly, in the Regionalisation Era it would be feasible to suggest that there were two or three distinct groups of sites within the dataset, representing the Hakra and Early Harappan Phase distributions. Likewise, in the Localisation Era this curve may be the result of combining the Late Harappan and Painted Grey Ware data. However, if this were the case, the Integration Era curve would deviate from a convex distribution, yet it is difficult to argue for two settlement systems within the Integration Era.

The possibility of low levels of integration is again distinctly possible. Fairservis (1986, 1989), Shaffer (1993), and Miller (1985) have all suggested that the levels of integration and centralisation within the Indus Valley Tradition have been overestimated. The notion of a planned urban network of cities derives from Marshall's (1931) comparison of the Indus with Mediterranean societies and the subsequent comparisons with the Near East (Childe 1954, Piggott 1950, Wheeler 1959, 1968). Again, we must look at issues surrounding the function of sites to examine this hypothesis further.

Determining whether the Cholistan dataset is peripheral or not is more problematic. One could argue that it is a subset of a larger dataset (i.e. a small part of the whole Indus Valley Tradition). However, it would not be practical to include all the regions of the Indus Valley Tradition due to the poor quality of the data available and the discrepancies in survey approaches. It is possible that this decision has flawed our attempts to understand the social and political organisation of the Indus Valley Tradition. Likewise, the final explanation – that the primate centre is missing from the sample - could also be a result of this decision. If we were to include Harappa and Mohenjo-daro in the sample, then it is possible that the rank-size curve would change. However, in order to maintain data clarity and to keep it representative, this thesis has examined the Cholistan

data separate from the rest of the Indus Valley. The deposition of large volumes of silt along the Indus Valley (section 2.3.2) was one of the major contributors to this decision, as this would severely impair archaeological visibility of smaller sites, resulting in a sample heavily skewed towards the largest sites.

5.5.2.1 Comparisons with Near East and Levant

The Cholistan rank-size curves shares similarities with the Early Bronze Period I to Middle Bronze Age IIIB-C in the Jordan Valley (c.3100-1500 BC), (Falconer and Savage 1995: 50-54). Falconer and Savage suggest that the Jordan valley during this period was characterised by fluctuations in population numbers and shifts between and urban and non-urban settlement patterns. Overall, there was a continual decrease in rural populations (*ibid.*: 54). Section 5.3.2.2 demonstrated that there were numerous fluctuations in the size and distribution of sites between phases in Cholistan. The following chapter will explore the role of functions within Cholistan.

5.5.2.2 Comparisons with the Oaxaca Valley

The rank-size curves from Cholistan do not match any of the curves from the Oaxaca Valley data, the closest being to Monte Alban V (1000-1500 CE) (Drennan and Peterson 2004: 546). During Monte Alban V, Drennan and Peterson suggest that the Oaxaca Valley is at its least integrated since 1400-1100 BCE. However, this appears to be an unreliable analogy for Cholistan due to the massive differential in time period and political organisation.

5.5.3 Summary and discussion

This section has examined the results of the rank-size analysis for both Gujarat and Cholistan as outlined in section 4.5.1.3 It identified that the data from Gujarat generated rank-size curves that went from primate to convex over time. In contrast, the data from Cholistan generated curves that remained convex, with a slight tendency towards log-normal over time. This initial recognition suggests that settlement patterns in Gujarat underwent a greater degree of change; whilst in Cholistan they remained reasonably stable over time.

The three curves from Gujarat demonstrate a shift from a primate distribution in the Regionalisation Era, to a primo-convex distribution (although the upper part of

the curve is log-normal) during the Integration Era to a convex distribution during the Localisation Era. This suggests that the Integration Era in Gujarat witnessed the greatest degree of settlement integration, although this may have been restricted to the larger settlements in the region. The primo-convex nature of the curve suggests that this was not necessarily the case with smaller settlements in the region. Instead, smaller sites in the region may have remained relatively unaffected by urban integration (assuming that the larger sites are urban). The primo-convex curve of the Regionalisation Era also suggests the presence of two settlement systems, and may relate to the establishment of larger urban centres such as Dholavira on what was a previously rural landscape, but had not yet impacted upon smaller settlements that had retained their existing systems of organisation.

Analogies from the Levant suggest a period in which fortified urban centres emerge, but are not sufficiently large enough or developed enough to develop control over their hinterlands. The Localisation Era is also characterised by low levels of integration, but one in which there are more large sites than is expected. Analogies from Mesopotamia suggest a period in which several urban centres have control over smaller hinterlands. However, a similar curve from the Levant suggests a period of low-level hinterland integration. Comparisons with the Oaxaca Valley data support the Integration Era-based Twin Capital Empire, Proto-State and Domain models, although they all fundamentally argue for the same settlement pattern. The key question will be the mechanisms that drive such a pattern, which will form a key focus of the following chapters analysis.

The analysis from Cholistan suggests that Central Place Theory dictated site location within the region, or that two different settlement systems have been sampled. However, it also suggests that settlements within this region were not as rigorously integrated as many people have suggested. Cholistan has often been identified as a core region that shows clear signs of centralisation and settlement integration, but the rank-size analysis does not support this. Instead, it analysis suggests that, in terms of settlement distribution, Cholistan was less integrated than Gujarat (during the Integration Era), an area traditionally viewed as peripheral. Further investigation into the function of sites in Cholistan should provide us with more detail regarding Central Place Theory. The following chapter will build upon these initial finding s and hypotheses and incorporate them into the site function methodology.

5.6 Chapter Summary

The purpose of this chapter was to present and discuss the results of the settlement distribution analysis, as outlined in section 4.5.1, and to present the results of the Gujarat Environs Survey. The Gujarat Environs Survey was a small micro-survey that was undertaken with the expressed aims of testing the quality or resolution of existing surveys, and identifying the distribution of sites and their functions within a defined area. The area was chosen due to its proximity to two excavated sites, in an area that has been surveyed by traditional methods. The second element of the chapter presented the results of the analysis of published survey data from Gujarat and Cholistan. This involved identifying settlement distribution patterns – both temporally and spatially, testing whether sites acted as central places, and rank-size analysis. Chapter Seven will then discuss whether these results reflect those set out in the predictive models in section 4.3.

The Gujarat Environs Survey was undertaken in early 2006 with the expressed aim to perform a systematic survey between the two excavated sites of Bagasra and Kuntasi.. In total fifteen sites were identified, six of which were confidently identified as contemporary with the Indus Valley Tradition. These sites consisted primarily of ceramic scatters, lithics and shell debitage, and all but one date to the Localisation Era. The other site, A007 or Mota Dahisara, was the largest site encountered on the survey and covered over 50 square metres. This site yielded a large number of artefacts, although there was very little evidence of structures. The "vegetation and visibility" element of the survey demonstrated that archaeological visibility was very good in the survey zone, and that modern agricultural usage was not impacting upon the ability to identify sites on the ground. The major problem in identifying archaeological sites was the volume of modern pottery that was distributed within fields, most likely through modern manuring, as the survey area is mostly under wheat, cotton and castor cultivation nowadays.

The second theme of this chapter was to examine the distribution of sites within Gujarat and Cholistan. This characterised the distribution of sites within both regions, and second, to provide a basis upon which to build further analysis. In Gujarat there was continuity and change within the Regionalisation, Integration and Localisation Eras. In terms of continuity, Dholavira was the largest site in Gujarat during the Regionalisation and Integration Eras and there was very little change in site size patterns throughout all three Eras (Figures 5.14 and 5.15).

However, there were a significant number of changes evident through time. The most notable of these was the continual increase in the number of sites from the Regionalisation to the Localisation Era, going against the established view that the Localisation Era was a period of decline. The spatial distribution of sites within Gujarat demonstrated that the general patterns outlined are not necessarily applicable to all the regions of Gujarat. This gulf seems to be most apparent between Kutch and Saurashtra/North Gujarat – an area that is naturally divided by the Great and Little Rann of Kutch. Kutch is most densely populated during the Integration Era, whilst Saurashtra and North Gujarat are most populous (in terms of site numbers, but not necessarily people) during the Localisation Era. However, this growth in settlements in Saurashtra and North Gujarat is matched by a decline in site sizes – suggestive of a more dispersed settlement pattern.

In Cholistan there is much less continuity between periods, and the region is characterised by shifting settlement patterns between each of the five phases of survey data. Whether this is a reflection of socio-cultural motivations or a reflection of survey methodologies is yet to be determined. In terms of settlement density, Cholistan is most densely populated during the Integration Era, with a significant decrease in the number of sites in the Localisation Era – the direct opposite to Gujarat. There are, however, more Hakra Phase sites than Kot Diji Phase sites within Cholistan, and they occupy very different geographical areas. Again, this may have socio-cultural explanations, or may be a result of survey methodology. It is hoped that the site function and landscape usage chapter will expound some of these issues.

The central place analysis in Gujarat demonstrated that several central places might have existed during the Integration and Localisation Eras, rather than the assumption that Dholavira acted as a regional capital. Instead, several sites – Dholavira, Lothal and Kotada during the Integration Era and Lothal and Tarana-III during the Localisation Era – would have acted as local centres in the region. Dholavira's location appears to be more geared towards the control of trade, as opposed to an administrative centre. Cholistan, especially during the Hakra and Harappa Phases, was characterised by sites clustering close to the largest sites. However, during the Kot Diji and Punjab Phase, the opposite is true, with a dispersed pattern and the largest sites located on the periphery. The reason behind this is not yet known, and is a key question that will be addressed in the following chapter. However, it is clear that the patterns witnessed at Dholavira and Ganweriwala are significantly different.

The rank-size analysis from Gujarat suggests that the region was either a) a 'frontier zone' between the urban Indus Valley Tradition and rural agrarian communities to the south and east; or b) that the visible settlement pattern is the result of an attempted colonisation and imposition of a planned system upon a previously unplanned organic settlement. In Cholistan the rank-size analysis suggests that a) Central Place Theory dictated the settlement pattern, supporting our earlier analysis, or b) that the Cholistan dataset is actually two distinct settlement systems. Most significant was the establishment that there are lower levels of integration with Cholistan than Gujarat, again going against the established view. However, this could equally be the result of survey methodologies again as convex distributions can be caused by the absence of small-order settlements from the sample. The use of a survey methodology that will struggle to identify the smallest sites (i.e. an unsystematic survey that aims to cover a large area relying upon vehicles rather than field-walking and local informants rather than random sampling) may be the cause of this anomaly. The following chapter will develop these initial findings, and examine the function of sites in Gujarat and Cholistan as stated per the objectives of the thesis. It will also continue the discussion of site functions within the Gujarat Environs Survey.

Chapter Six - Site Function

6.1 Introduction

The aim of this thesis is to examine models of social and political organisation within the Indus Valley Tradition, through a number of key objectives. The previous chapter examined site distributions as per the fourth objective. This chapter will examine the function of sites within Gujarat and Cholistan as stated in the fifth objective – what were the function(s) of sites in Gujarat and Cholistan during the Indus Valley Tradition and how do these reflect upon the existing models of social and political organisation. As such, this chapter will discuss the function of sites within the Gujarat Environs Survey, Cholistan and Gujarat.

The site function analysis of Cholistan will examine the changing number, size and distribution of each of the four categories of function through each chronological phase of the Indus Valley Tradition. It will examine the overall relationship between sites of the 'same' function, and between sites of different functions. It will also provide an opportunity to expand the central place analysis of Ganweriwala, incorporating site function into the analysis, and establish whether there are visible patterns in terms of the distribution of site functions around the postulated 'regional capital'. The site function data analysis for Gujarat will be reliant upon excavation reports and interpretations of survey data for its results, and will consequently be more descriptive than analytical. It will examine the evidence for site functions from excavations reports for each of the Eras of the Indus Valley Tradition, and incorporate the wider implications of the various surveys. For each Era, the data will initially be subdivided into geographical phases to maintain consistency with the site distribution analysis. It will also, where possible, incorporate the results of the central place analysis and build upon the initial findings.

The chapter will begin by examining the data from the Gujarat Environs Survey, and then go on to examine the data from published surveys within Cholistan and Gujarat as outlined in section 4.5 of the methodology. It will, contrary to the previous chapter discuss the Cholistan dataset before the Gujarat dataset for reasons outlined below (section 6.3). All the site data is available in full in Appendices A, B and C.

6.2 Gujarat Environs Survey

To recount, the Gujarat Environs Survey was undertaken in early 2006, and concentrated on the area between Bagasra and Kuntasi – two excavated sites within Maliya Taluka, Rajkot District, Gujarat. The survey had two main aims: 1) to test the quality or resolution of existing surveys, and 2) to identify the distribution of small sites and their functions within a small area. The first aim of the Gujarat Environs Survey intended to test whether a systematic survey strategy will identify sites that will not, or have not, been identified through the use of traditional survey techniques (i.e. section 4.4.1). The second intended to create an understanding of the relationships between small sites within the wider landscape and the larger urban centres that current archaeological studies have concentrated upon, but from a bottom up approach.

In total fifteen sites were identified within a 50 square kilometre area, six of which were positively identified as Indus Valley Tradition sites (see previous chapter). The survey also recorded vegetation within the survey zone (see section 5.2.4) for two purposes: the first was to ascertain whether archaeological visibility was a factor in identifying sites, and second, to develop a representative sample of modern land-use in the region. This chapter will discuss the function of the sites in relation to the larger reference sites of Kuntasi and Bagasra. However, first it will discuss the modern vegetation data with reference to subsistence strategies.

6.2.1 Vegetation and subsistence

Table 5.02 shows the breakdown of the vegetation recording during the 2006 survey. In total, 75% of the survey zone was under full-time agrarian use, although roughly half of the fields were cultivated at that time of year. The principle crops of the region were cotton (25.9% of the entire survey zone), castor (6.42%) and wheat (1.38%). That half of the fields were at the time uncultivated during our survey (undertaken in March-April 2006) indicates the adoption of *kharif* food-crops in the survey zone. Cotton, the predominantly visible crop being cultivated at that time of year, is planted as early as February in the region – earlier than food-crops.

Whilst the vegetation data could be quantified upon survey, a second aspect of subsistence identified upon the survey was the role of pastoral herders. Their transhumant nature makes them difficult to identify archaeologically, but during survey we were able to record the way they interacted with agricultural communities. During the 2006 survey pastoral communities were encountered along with their herds of cattle, water buffalo and camel (Figures 6.01). However, rather than restricting their herds to open grassland, the herds move freely across agricultural land often grazing upon the remnants of harvested crops in the field. It has often been assumed that pastoral and sedentary communities occupy different areas within the Indus Valley Tradition, and that this represents a shift from a rural to urban landscape (Mughal 1994, Possehl 1980, Possehl and Kennedy 1979), yet the Gujarat Environs Survey suggests that the two communities were more closely intertwined.

One of the other key elements identified during the survey was the processing of material undertaken away from urban sites. Whilst not strictly part of the survey methodology, during a visit to Kuntasi the survey team witnessed the production of charcoal using the traditional wood-piling method (Figure 6.02). This method is performed in the open, piling wood into a conical pile leaving airshafts at the bottom and in the centre of the cone. The wood would then be covered with clay or wet vegetation and the wood slowly burnt from the bottom upwards. Such activities (consider also clay collection, fishing etc.) would have been vital to sustaining urban populations engaged in craft specialisation, yet archaeologists, due to their lack of archaeological visibility, often overlook them. Rural communities, who would sell or exchange the finished products to the urban sites, may also have undertaken these activities.

6.2.2 Site Function

Of the six sites that were positively identified that are of Indus Valley Tradition affiliation, three sites were less than ten square metres in size, two of them were between ten and 25 square metres, and one was 50 x 50 metres in size. The three sites that were highlighted as potentially of this period were all less than ten square metres. As such, these sites are all significantly smaller than other identified sites throughout Gujarat – a result of adopting a focused survey area and more rigorous and structured survey methodology. However, it is difficult to attribute a function for many of the sites due to their small nature. Using Mughal's site definitions (1997, see section 4.4.4) the majority would be campsites – small

sites that suggest temporary or seasonal occupation, whilst A007 (Mota Dahisara) would be a residential, or residential-industrial site.

However, *Turbinella Pyrum* cores were found at two of the campsites identified on survey as well as at Mota Dahisara (Figure 5.04), suggesting that craft specialisation may not have been the preserve of urban centres. Of course, it could be that pastoral communities acted as mobile traders moving unfinished goods between processing sites and manufacturing sites, or that they collected discarded shell debitage from larger sites. Mota Dahisara also yielded evidence of an undrilled bead blank (Figure 5.02), as well as a finished shell bangle. One of the key issues in understanding the social and political organisation of the Indus Valley Tradition is to understand the relationship between urban centres, rural communities and the landscapes within which they function.

Coupled with the two larger sites of Bagasra (1.55 hectares) and Kuntasi (3.3 hectares) (see section 6.2.3 and 6.2.4) which would both be classified as "residential-industrial" – that is, sites that include kilns and/or show evidence of occupational differentiation and/or specialised activities as an integral part of the site – the survey area and surrounding area provides evidence of a multitude of site types. Figure 6.03 shows the distribution of these sites across the landscape, combined with a thematic zoning of the vegetation data collected on survey. The following subsections will examine the function and morphology of Bagasra and Kuntasi detailing the evidence for craft manufacturing at the sites, and possible functions of the site. Following this will be a discussion of the relationship between the sites identified on the survey and Bagasra and Kuntasi.

6.2.3 Kuntasi

Forming the southern boundary of the Gujarat Environs Survey zone, Kuntasi is located four kilometres from the sea, and lies on the northern bank of the Jhinjhoda River. The site was established c.2400 BCE and was occupied until 1700 BCE (Dhavalikar *et al.* 1996). The initial occupation at the site was relatively small, with an expansion in size c.2200 BCE. This expansion was mirrored by a shift in the morphology and function of the site. A surrounding wall was constructed around the site, varying in width from one to one and a half metres thick. Rectangular bastions flanked the gateway on the eastern side of the site (Dhavalikar 1995). Structures within the site itself were built around open courtyards – a style common throughout the Indus Valley Tradition (Figure 6.04).

The expansion of Kuntasi in the latter half of the Integration Era (2200-1900BCE) witnessed the development of manufacturing workshops at the site. Dhavalikar postulates that in the preceding phase the site was engaged in the procurement and redistribution of raw material back to Kutch and the Indus Valley (1995: 82). However, during this later period the site developed bead-making, copper-smithing and ceramic industries. In total, almost 1800 beads have been recovered from Kuntasi, manufactured from (in order of frequency found) steatite, shell, faience, carnelian, paste, galuconite, lapis lazuli, gold, agate, jasper, feldspar, quartz and ivory (Dhavalikar 1996 *et al.* 1996: 191ff). In addition, over 1100 steatite microbeads were found in a single hoard, along with some copper objects. 118 copper objects have been found at Kuntasi, including jewellery, knives, and fishhooks to drill bits. However, no bronze (either tin or arsenic) was found at Kuntasi (*ibid.*: 212ff).

Dhavalikar identifies Kuntasi as a major bead-making centre within Gujarat. He suggests that it's location close to the sea and the identification of workshops and storage facilities indicates that Kuntasi was "an industrial centre for acquiring raw materials from the hinterland and producing finished goods ostensibly for exporting them to Sindh and West Asia" (1995: 88).

Floral analysis at the site has yielded evidence of finger millet, Italian millet, barley, wheat, shrubs and grasses, with finger millet most abundant species (Dhavalikar *et al.* 1996: 18). Faunal remains include domesticated cattle, water buffalo, goat, sheep, camel, dog, horse and ass, and wild nilgai, four-horned antelope, black buck, chinkra, hog deer, sambar, barasingha, pig, wolf, langur, ass, rhinoceros, hare, cat, peacock and crocodile. Fish, crab and molluscs were also found suggesting a varied subsistence strategy (*ibid.*).

6.2.4 Bagasra

The site of Bagasra is located 16 kilometres north of Kuntasi and forms the northern boundary of the Gujarat Environs Survey. Like Kuntasi, the site is small in size (1.56 hectares), surrounded by a wall and had an active manufacturing industry. It was excavated between 1996 and 2005 by the Maharaja Sayajirao University of Baroda (Sonawane *et al.* 2003). Occupied between 2500-1700 BCE, excavations at the site suggest that it was heavily engaged in shell working, bead making and ceramic manufacturing. Excavation of one of the structures at the site

uncovered a large deposit of unworked *Turbinella Pyrum* shells sorted into different piles (Figure 6.05). Analysis of these shell piles indicates that one pile only contained shells that were either too small or too damaged to be worked. This suggested to the excavators that the shell workers at Bagasra were not personally engaged in the procurement of the raw material, otherwise the material would have been sorted at source (*ibid.*). The associated shell workshop yielded thousands of finished and unfinished circlets and wasters from the shell working process. The principle shell products were bangles from *Turbinella Pyrum* and ladles from *Chicoreus Ramosus* (*ibid.*). Both of these species, as well as most other gastropod species utilised, are found within the Gulf of Kutch, as well as along the Jamnagar coastline, readily available to both Kuntasi and Bagasra (Dhavalikar *et al.* 1996: 345f).

Bead making was undertaken at Bagasra, although a bead workshop itself is yet to be discovered. Beads and debitage of the varying stages of manufacture have been identified at the site. The principle materials used were faience, chert, jasper, carnelian, lapis lazuli and chalcedony. Again, excavations revealed a stockpile of unworked stone, separated into groups dependent upon size and material (Sonawane *et al.* 2003). Three ceramic kilns have been identified in the southern section of the site. Faunal remains indicate that cattle, water buffalo, sheep and goat are the predominant species at the site – very much in line with other Indus Valley Tradition sites in Gujarat. In addition, shellfish and marine species have also been identified at Bagasra.

Bagasra is similar to Kuntasi in its morphology and function – a walled settlement in northern Saurashtra engaged in several manufacturing industries, principally shell working, but also bead working and ceramic manufacture. Dhavalikar suggests that the proximity of the two sites to Kutch suggests that the sites were manufacturing "colonies" whose industries were oriented towards the creation of finished objects to be shipped back to the Indus Valley urban centres (1995). However, the presence of local - "Anarta" or "Sorath" - pottery types at Bagasra suggests a localised population, taking advantage of its proximity to sites in Kutch, such as Dholavira, as a market for finished goods. The excavators of Bagasra conclude that the site was "a small coastal Harappan settlement" established due to "proximity of important resources; such as the marine gastropod shells in... the Gulf of Kachchh and the semi-precious stones of Saurashtra" (*ibid.*: 48). It is difficult to determine whether Bagasra and Kuntasi were more closely tied to Dholavira and the fortified settlements of Kutch, or with

the rural settlements of Saurashtra. They can be interpreted as manufacturing outposts of the Indus Valley cities (Dhavalikar 1995), or independent manufacturing centres catering towards the markets of Kutch and beyond.

6.2.5 Discussion and summary

Having discussed the sites of Kuntasi and Bagasra in more detail, this section will discuss the relationship between the sites identified on the Gujarat Environs survey and the two sites. It will also consider the broader 'function' or role of these sites within the wider landscape of Gujarat, in relation to how the area is currently understood. Dhavalikar *et al.* (1996: 374) suggest that Kuntasi was "an important manufacturing and trading centre... [engaged in] trade with west Asia." The inhabitants of Kuntasi would have been supported by the local non-urban population who were engaged in agricultural pursuits (*ibid.*). The excavators of Bagasra interpret the site as a "small coastal settlement" located to exploit the shell resources of the Gulf of Kutch, and the semi-precious stone resources of Saurashtra (Sonawane *et al.* 2003 :48). Bhan and Gowda (2003) suggest that sites such as Kuntasi (along with Lothal, Surkotada, Rangpur and Nagwada) were engaged in the manufacture of shell and stone artefacts to satisfy local demand, whilst sites such as Bagasra (and Nageswar) were geared towards the supply of raw shell and finished goods that would be shipped further afield. Kenoyer has identified that semi-processed shell was transported all of the way to Mohenjo-daro before it was actually worked (Kenoyer 1985). Bhan and Gowda suggest that small sites (mostly in North Gujarat) that have demonstrated evidence of shell working are the consequence of itinerant traders and craftsmen, not permanent craft specialists (2003). This established viewpoint suggests a hierarchy where small sites are subordinate to the manufacturing centres of Bagasra and Kuntasi, who are in turn subordinate to the large urban centres of the Indus Valley. Small rural sites are portrayed as passive participants in manufacturing, supporting craft specialists through the supply of foodstuffs and raw materials. However, the results from the Gujarat Environ Survey demonstrate that these small rural sites were actively engaged in the manufacturing process.

Figure 6.04 shows a schematic map of the flow of resources – all of which are available locally - in and out of the region. Excavations at Kuntasi and Bagasra have demonstrated that the sites have a substantial manufacturing industry, and that goods made there are traded over a long distance. However, the same materials that are used to manufacture these goods have been found at the

smaller rural sites in the area between them. There are three possible explanation for this: first, is that the people residing outside of Kuntasi and Bagasra were actively engaged in the procurement, processing and manufacture of shell and stone objects for their own personal use. Second, is that they are procuring the raw materials and undertaking the initial processing of them and then trading them at either Kuntasi or Bagasra. Or third, discarded material and debitage from Kuntasi and Bagasra was recycled and traded to the surrounding communities for the manufacture of smaller shell artefacts. Either way, it is clear that these communities are active participants in this trade and exchange network or are operating within a completely separate trade network.

The evidence from A007 indicates that both bead and shell processing was occurring outside of Kuntasi and Bagasra, even during the Integration Era. The other sites where indications of shell and lithic processing are found all date to the Localisation Era, when the output of the manufacturing centres had decreased significantly. However, the realisation that manufacturing takes place outside the walled manufacturing centres suggests those small sites are not subordinate or dependent upon larger centres. In fact, if they were, one would expect to find a greater number of finished artefacts at them, rather than semi-processed material. No metal objects were found on the Gujarat Environs Survey, even though Kuntasi had an active copperworking industry. However, it is possible that metal objects were highly valued, and when damaged were repaired or recycled. The lack of metal artefacts, finished beads and other luxury items suggests that goods manufactured within Bagasra and Kuntasi were not being distributed to nearby sites, as one would expect in a traditional site hierarchy.

The Gujarat Environs Survey has demonstrated that the relationship between the manufacturing centres and rural sites close to them is not a one-directional relationship, in which smaller sites are subordinate. However, it still remains unclear whether the sites of Kuntasi and Bagasra are representative of other sites in Gujarat, or what the wider pattern of site functions in Gujarat and beyond are. The following sections will examine the settlement function analysis from both Cholistan and Gujarat, and identify whether any of the trends visible within the Gujarat Environs Survey are evident elsewhere. The implications of the findings from this survey against the wider settlement patterns will be discussed in the following chapter.

6.3 Cholistan

This section will look at changes in site function within Cholistan as discussed within section 4.5.2.1 Whilst the previous chapter examined the Gujarat data before the Cholistan data, this chapter will do the reverse, due to the differing nature of the data available. The uniformity in data collection within Cholistan has created a consistent set of data from which a systematic analysis of function can be ascertained. The Gujarat data, on the other hand, is so diverse in its nature that a systematic approach to site function is more difficult. This section will begin by examining the quantative data from Cholistan before going on to examine the differing roles that these sites play.

Mughal identified a total of 385 sites during survey in Cholistan (Mughal 1997, Mughal *et al.* 1996). He and his team categorised this data into several main groupings: camp sites, settlement sites, settlement sites with kilns, partly/mostly industrial and industrial sites. This thesis revised these groupings into four more cogent categories: camp sites, residential sites, residential-industrial sites and industrial sites– see section 4.4.4 and Table 4.02 for definitions. The following sections will look at the numbers, size and distribution of these sites within Cholistan during the Regionalisation (Hakra, Early Harappan), Integration (Mature Harappan) and Localisation (Late Harappan, PGW) Eras. Table 6.1 shows the site function data for Cholistan throughout all periods.

6.3.1 Regionalisation Era

Comprised of the Hakra and Kot Diji Phases, the Regionalisation Era is characterised by an increasing number of sites with evidence of industrial functions (two residential-industrial sites during the Hakra Phase to 14 sites during the Early Harappan) and a decreasing number of camp sites (56 during the Hakra and only three during the Kot Diji Phase). There is also a slight increase in the number of purely residential sites from the Hakra (41 sites or 41.4%) to the Kot Diji Phase (23 or 57.5%). Residential sites are the largest in size at 6.26 hectares, followed by camp sites at 4.68 hectares. There are only two sites that are residential-industrial in function, and their average size is relatively smaller at 2.06 hectares.

During the Hakra phase (Figure 6.05) there seems to be no discernable patterns relating to site function. There is a clustering of sites towards the western end of

the Hakra River, as noted in the previous chapter (section 5.3.2.2.1). However, there is an even distribution of both camp sites and residential sites in this area. Sites in this densely populated area to the west do appear to be larger in size than the dispersed sites to the east, in particular the camp sites with the 21 hectare site of Musafarwali located in the centre of this cluster. Other camp sites around Musafarwali are larger than those camp sites situated a further away to the east, suggesting a degree of centralisation. Likewise the largest residential site of Lathwala II (20.6 ha) is situated within this cluster of sites, although there appears to be less of a size-distance relationship between this site and other residential sites. The only two residential-industrial sites during the Hakra Phase are located in the southwest of this cluster of sites.

By the Kot Diji Phase (Fig 6.06), the distribution of sites changed significantly. As sites become more industrialised their distribution shifts eastwards along the river. The densely populated Musafarwali-Lathwala II cluster of the Hakra Phase becomes heavily depopulated despite the presence of the 31.6 hectare camp site of Lathwala I. In fact, all three camp sites during the Kot Diji Phase are situated in this region, along with some other small residential and residential-industrial sites. The main concentration of sites is found further east, centred around the large residential site of Jalwali (17.7 ha) and the residential-industrial site of Gamanwala (21.4 ha).

Mughal suggests that the transition from the Hakra to the Kot Diji Phase represents a movement from a nomadic to sedentary lifestyle (1997: 45, 56). He suggests that the large number of camp sites and lack of industrial features, such as kilns, during the Hakra Phase is an indication of transient lifestyles and a pastoral economy (*ibid.*: 40f). During the Kot Diji Phase kilns were found on the peripheries of residential areas, although no sites were located that were dedicated to purely industrial purposes during this period (*ibid.*: 45).

6.3.2 Integration Era

The most striking feature of the Integration Era (Harappa Phase) is the high number of purely industrial sites – 74 out of a total of 172 sites or 43%. Of the remaining sites, 30.2% were purely residential and 22.7% were a mixture of residential and industrial. Finally, 4.1% of the sites were camp sites. As such, just under half of all sites during the Integration Era were purely industrial in function, whilst in other periods they are the least frequently occurring site type. The

Integration Era witnesses the lowest relative number of camp sites, and the beginnings of site specialisation.

In terms of site size, sites that were both residential and industrial in nature were the largest at 4.61 hectares, followed by residential sites (4.5 ha), industrial sites (4.24 ha) and then camp sites (2.76 ha). There is very little average size differentiation between residential and industrial sites (and those that have dual function), suggesting that the role or purpose of a site is not a factor in dictating its size. Camp sites during the Integration Era are noticeably smaller than sedentary sites, the only period where this is the case.

The distribution of sites within the Integration Era suggests a centralisation of industrial sites, but a more dispersed pattern of residential sites (Figure 6.07). Residential sites appear to be dispersed, with no major concentrations and a distribution that stretches the entire length of the riverbed. The largest residential site, Ganweriwala (64.03 ha) is situated just to the south of the main cluster of sites on the edge of the flood plain. Industrial sites are mainly situated within the central cluster of sites, with a small number stretching westward along the river. The two largest industrial sites – Butewala (24.38 ha) and Derawar Ther (27.65 ha) – are centrally located. Hybrid residential-industrial sites are widely distributed, with the three largest sites of Karowala (17.75 ha), Sanukewala (11.64 ha) and Tarsoolwala (10.57 ha) spread amongst them.

Mughal highlights the high number of industrial sites as an indication of the large-scale production of fired brick and ceramics, as well as the potential for metal-working sites (1997: 48f). He identifies Ganweriwala as a regional capital, bracketing the site with Harappa and Mohenjo-daro in terms of significance (*ibid.*: 49f). The continued existence of camp sites and the inferred role of pastoral communities is recognised by Mughal as an indication of their importance during this nominally urbanised period (1997: 49).

6.3.3 Localisation Era

The Localisation Era is the reverse of the Regionalisation Era, with a trend away from specialised industrial centres and an increase in the number of residential and camp sites. During the Punjab Phase there were 17 (33.3%) residential sites, 14 (27.5%) residential-industrial sites, 12 (23.5%) camp sites and eight (15.7%) industrial sites. By the Painted Grey Ware period there were only 14 residential

sites. Industrial sites during this period had decreased significantly in size, from 4.13 hectares to 0.48 hectares. Residential sites, on the other hand, increased in size from 3.49 hectares to 6.66 hectares, before decreasing again to 2.12 hectares. Residential-industrial and camp sites changed very little in size.

During the Punjab Phase there does not appear to be any discernable distribution patterns regarding site function (Figure 6.08). Again, camp sites are more predominant in the eastern section of the river with a focus upon the site of Gopwala (15.56 ha). Purely industrial sites are predominant in the southwest of the region, close to the four large residential sites of Mubarakawala Ther (11.51 ha), Lundewali-II (13.10 ha), Gamuwala Ther (15.05 ha) and Shahiwala (15.71 ha). However, smaller residential sites are found all along the river. Residential-industrial sites are more prominent towards the east of the occupied area, the largest being Kudwala (29.92 ha). Smaller residential-industrial sites are found all along the river.

Mughal suggests that the decrease in industrial centres coupled with an increase in camp sites is indicative of changing modes of living, and a return to exploiting the desert environment first visible during the Hakra phase (1997: 52). This shift, Mughal argues, was the result of changing environmental conditions, in particular diminishing water levels in the Hakra River. Furthermore, he suggests the general decrease in site numbers during the Localisation Era is the result of depopulation and population dispersal within the floodplains (*ibid.*). By the Painted Grey Ware Phase (Figure 6.09), Mughal suggests that there is little evidence of continuity with the earlier Late Harappan phase (*ibid.*).

6.3.4 Discussion and summary

To summarise, the Regionalisation Era is initially characterised by a high number of camp sites and residential sites that develop into a higher number of sedentary residential sites and residential sites that demonstrate some element of craft activity and/or specialisation. By the Integration Era a new type of site emerges that is entirely devoted towards the manufacture of bricks, ceramics and possibly metal. The Integration Era also witnesses the largest number and size of sites, with 172 sites identified, the largest being Ganweriwala at 64.03 hectares. Residential and hybrid residential-industrial sites are both present within the Integration Era, and persist into the Localisation Era. However, purely industrial sites decrease rapidly by the Localisation Era in both size and number, and

pastoral camp sites become more prevalent. By the end of the Localisation Era sedentary occupation is non-existent, with only camp sites – including the 10.78 hectare site of Satawali – being identified.

Examining each site type individually, camp sites tend to be located towards the western end of the riverbed, especially during the Regionalisation and Integration Eras. By the Localisation Era they are more widely dispersed. Industrial sites have a much tighter distribution pattern and, during the Integration Era when they are most frequent, are clustered in the Ganweriwala-Butewala section of the river (Figure 6.08). Purely Residential sites, on the other hand, have a more dispersed distribution pattern along the river, although clustering does occur during the Integration Era. Although the largest residential site is Ganweriwala during the Integration Era, on average residential sites are at their largest during the Punjab Phase of the Localisation Era. Finally, combined residential-industrial sites are evenly distributed in all periods and like purely residential sites they are, on average, largest during the Localisation Era.

Two methodological issues in particular arise from the analysis of the Cholistan dataset. The first, and most important, is that although the data is able to demonstrate the changing function, distribution and size of sites, it is unable to provide us with an impetus behind this change. The lack of excavation or even systematic sampling of sites means that we are reliant upon the subjective data collected by Mughal and his team (Mughal 1997, Mughal *et al.* 1996). Secondly, one of the most striking issues with the data is the apparent shift in sites between the Hakra and Early Harappan phase, without any reasonable explanation. A question remains whether this shift is the result of an actual population/political/economic/ideological shift, or whether this pattern is the result of survey methodology and/or chronological phasing. These issues, in particular the question of human agency, may be addressed through the examination of our Gujarat dataset. The data from Gujarat is very different in nature from Cholistan. There is less congruity between the various surveys; thus, it may prove difficult to ascertain the comparative function of sites. On the other hand, a greater number of excavations have been undertaken giving us a greater insight into the actual function of sites, rather than a simple designation of camp, residential, industrial etc. The following section will present the results of the Gujarat analysis.

6.4 Gujarat

This section will examine site function within the Gujarat dataset as defined in section 4.5.2.2 As stated there, the data from Gujarat is not of sufficient quality to be able to define a site function for as per Mughal's categorisation of industrial, residential-industrial, residential, camp sites (1997). Whilst it would be possible for some sites, these tend to be the larger urban centres that have been excavated, and as such would heavily skew any analysis undertaken. Consequently, this section is more descriptive than analytical. However, as stated earlier, it does provide the opportunity to examine the mechanics of continuity and change, not just the physical manifestation of it – something that was lacking within the Cholistan dataset.

In total, 485 sites have been identified in Gujarat (see section 5.3.1) – six during the Early Food Producing Era, 52 during the Regionalisation Era, 141 during the Integration Era and 343 during the Localisation Era. The vast majority of these sites have very limited data available for them, often just a size and/or location. Consequently, this section is reliant upon those sites that have been excavated and/or have been identified on more recent surveys. The following sections will examine the function of sites during the Regionalisation, Integration and Localisation Eras. Each Era will be split into geographical subsections to provide greater clarity through time and space.

6.4.1 Regionalisation Era

The previous chapter identified 52 Regionalisation Era sites within Gujarat, particularly within Saurashtra and North Gujarat (see section 5.3.1.2.1). These sites were invariably small, with an average size of 1.7 hectares. The only exception was the isolated 31.8 hectare site of Dholavira in Kutch. Most of the Regionalisation Era sites in Gujarat were so defined by the presence of microlithic, bone and shell tools found within them. The central place analysis (section 5.4.1.1) demonstrated that during the Regionalisation Era, despite its significantly larger size, Dholavira remained isolated from other sites in Gujarat. Rank-size analysis (section 5.5.1.1) suggested that the settlement pattern visible within Gujarat represents either the pooling of two or more settlement systems, or that of a 'frontier zone'. Comparisons with the Near East and Levant suggest a transition from a rural to urban-based economy, whilst the Oaxaca Valley data

implies a period of ongoing chiefly conflicts in the region and competition for political/economic control of the region.

Several Regionalisation Era sites have been excavated including Dholavira and Shikarpur in Kutch. In addition the sites of Padri and Somnath in Saurashtra have been excavated, as well as Loteshwar, Moti Pipli, Datrana-IV, -VII and -VIII and Santhli-IV in North Gujarat. Dholavira was highlighted as a possible primary centre in Gujarat during the Regionalisation Era. However, there appeared to be very little evidence to support this. The only site within 80 kilometres of Dholavira was Surkotada. The following sections will detail the evidence for the functions of the sites listed above by region. It will start with the two sites in Kutch.

6.4.1.1 Kutch

Only two sites have been identified in Kutch during the Regionalisation Era – Dholavira and Surkotada. Dholavira (or Kotadi as it is sometimes referred to) was first identified as an Indus Valley site by Joshi (Joshi 1972) during survey work undertaken between 1964-1968 (the rest of this survey will be discussed in more detail below). Excavations began at the site in 1989 and have been ongoing since (Bisht 1990, 1997, 1999). It's earliest occupation levels have been dated to c.~2650 BCE, although it is unclear from the preliminary reports as to the exact phasing of the sites. Bisht identifies the earliest settlement of the sites as "a strong fortress now lying buried in the citadel mound" (*ibid.*: 22). This occupation covered an area of roughly 250x150 metres. Initially, this early phase was characterised as "non-Harappan" or "pre-Harappan" by Bisht on the basis of ceramic evidence. The ceramics of this level consisted primarily of wheel-made red/pink wares, a variety of slips, incised horizontal grooves, although a wide variety of other wares were recovered (1990: 76). However, Bisht later revised this statement, claiming that the earliest levels of Dholavira were in fact "Harappan" on the basis of similarities between some artefacts (1999: 22). Worked copper, stone, shell and beads have been identified during Stage I at Dholavira, yet it is not clear whether they were actually manufactured at the site (*ibid.*).

6.4.1.2 Saurashtra

The only Regionalisation Era sites from Saurashtra to have been excavated are Padri and Somnath. Padri is a 0.55 hectare site located on the southeastern coast

of Saurashtra at the mouth of the Gulf of Khambhat. Period III at the site dates to the late fourth millennium BCE (Shinde 1998) and is characterised by Padri Ware – a ceramic type that is predominantly found at Padri. Although considered a Regionalisation Era ceramic type, it actually persists into the Integration Era. However, very little information is available about these early levels of Padri beyond ceramic typologies. The earliest occupation at Somnath, also known as Prabhas Patan, dates to 3000-2800 BCE (Dhavalikar and Possehl 1992: 72). Like Padri, the early level at Somnath is typified by the presence of a regional ceramic type – Pre-Prabhas Ware that is found predominantly at the site. Both sites demonstrate the development of regional ceramic styles, and supports the notion of the indigenous emergence of sedentary settlements in Saurashtra during this period.

6.4.1.3 North Gujarat

Four Regionalisation Era sites in North Gujarat have been subject to excavation and or detailed survey – Loteshwar, Moti Pipli, Datrana IV, VII and VIII and Santhli IV. Loteshwar is located on a tributary of the Rupen River, and measures 0.47 hectares. It dates as far back as 3500 BCE and is occupied into the Integration Era. Its earliest occupation levels are characterised by microlithic tools made from chert, chalcedony, jasper, agate and quartz, and the exploitation of wild animals. Two human burials were found from this period, one in an extended position, the other in a crouched position (Sonawane 2005: 209).

Moti Pipli is a 2.12 hectare site located in the Banas River valley. No structural remains have been identified at the site, but industrial debitage has been recovered. Shell, stone and terracotta debitage has been identified, along with finished products of all three materials suggesting the presence of small-scale manufacturing industries at the site (Majumdar 2001: 26). Some copper artefacts (pins and hooks) have been recovered from the site, but there is no evidence that they were manufactured at the site.

Datrana IV is a 0.02 hectare site situated on a fossil sand dune on a promontory of land between the Great and Little Rann of Kutch. The habitational occupation has been identified as Mesolithic, with lithics manufactured primarily from chert, and evidence of marine fish exploitation. There is also evidence to suggest that some small-scale bead working went on at the site, utilising agate, jasper, and carnelian. However, the small number of finds and "bad workmanship" suggests

that this was not an intensive or organised industry. Cattle, sheep and goat remains are prominent at the site, along with antelope, pig and numerous fish species (Sonawane 2005: 212f).

Geometric and non-geometric microlithic tools typify the earliest level at Santhli, although the remains have been badly disturbed. Faunal remains include wild cattle, sheep/goat, pig, gazelle and horse. Sonawane suggests that during the Regionalisation Era, Santhli was a seasonally occupied site used as a butchering and food-processing site (2005: 210).

6.4.1.4 Summary

Regionalisation Era sites in Gujarat are characterised by their small size and small-scale craft activities. These small-scale craft activities are most evident within North Gujarat at Moti Pipli and Datrana, although is evident at Dholavira in Kutch and Padri in Saurashtra as well. This was not an example of large-scale manufacturing, but suggests that some centres were working shell and beads for presumably local consumption. At this time, the only sites that would qualify as "urban" are the Kutch sites of Dholavira and Surkotada. This supports the hypothesis, derived from rank-size analysis, that Gujarat was a frontier zone between two different settlement systems – an expansion of urban centres from the Indus Valley into Gujarat. However, the existence of craft activities suggests that this was not a "colonisation" of the region, but a possible move to exploit new sources of raw material. It also supports the notion of a transition from rural to urban-based economies. However, there is no evidence to suggest that sites were dependent upon the central place of Dholavira. Instead, there appear to be several centres of craft activity – for example Moti Pipli, Somnath and Padri – possibly representing regional chiefly centres, as per the Oaxaca Valley data.

6.4.2 Integration Era

The previous chapter identified 141 Integration Era sites in Gujarat, ranging in size from 0.02 hectares to the 94.84 hectare site of Dholavira (see section 5.3.1.2.2). The average size of sites was 4.47 hectares, although there are two significantly larger sites, Dholavira and Kotada (Jamnagar) measuring 56.55 hectares. Four sites were between 10 and 20 hectares in size: Taraghada, Lothal and Vagad in Saurashtra and Kotara in Kutch. The majority of Integration Era

sites are located in Saurashtra (83) and Kutch (33), with 20 and five sites in North and South Gujarat respectively.

Central place analysis suggested that Dholavira (see section 5.4.1.1), and Kotara (11.27 ha), were located in order to control trade/movement between the Indus Valley and Gujarat. Few sites are visible in Dholavira's hinterland, the largest of which are Kotara (11.27 ha), Shikarpur (4.1 ha), Surkotada (2.04 ha), Kuntasi (2.6 ha) and Bagasra (1.56 ha). The central place analysis at Lothal (see section 5.4.1.2) identified a much more densely populated landscape, but there are no sites identified within a 15 kilometre radius of Lothal. To the south and west the two sites of Vagad (10.6 ha) and Rangpur (7.07) are located 40-45 kilometres away, and Loliana (3.9 ha) and Dakana (9.2) are noticeably larger sites located between 50-100 kilometres from Lothal. To the east, the two sites of Rel (4.7 ha) and Kanewal (3.92 ha) are located c.25 kilometres away. At Kotada (Jamnagar) the hinterland is much less densely occupied (see section 5.4.1.3), with a "shadow" of 25 kilometres surrounding the site. The prominent sites in Kotada's hinterland are Taraghada (15.71 ha), Mulkpadar (3.93 ha), Karmalkota (2.66 ha) and Kuntasi (2.6 ha).

Rank-size analysis for the Integration Era in Gujarat (see section 5.5.1.2) suggested that the settlement patterns had become more ranked, especially within the larger sites in the region. Analogies from the Near East and Levant suggest a period of increasing urbanisation with over half the population residing in only five settlements. However, this urbanisation was not an overly dominating force, and rural communities were largely unaffected by it. The data from the Oaxaca Valley suggests a period in which a primary centre is established, supported by several secondary centres in the region.

As mentioned above, the sites of Dholavira and Surkotada in Kutch have been excavated, along with Shikarpur, Kotara and Desalpur. In Saurashtra, major excavations have been undertaken at Lothal, Rangpur, Vagad, Kanewal, Bagasra, Kuntasi, Nageswar and Rojdi, but not at Kotada (Jamnagar). In North Gujarat, the sites of Nagwada, Datrana and Moti Pipli have been excavated, although no Integration Era sites have been excavated in South Gujarat. The following sections will examine the evidence for site functions in the four regions of Gujarat.

6.4.2.1 Kutch

The previous chapter demonstrated that Kutch was relatively sparsely populated during the Regionalisation and Localisation Eras, but was more densely populated during the Integration Era (see section 5.3.1.3.1). This has lead some scholars to suggest that settlement patterns in Kutch represent evidence of cultural imperialism (Dhavalikar 1995) or direct colonisation (Soundararajan 1984). Certainly, the location of Dholavira on a *Khadir* in the centre of the Great Rann of Kutch does not at first appear to be designed to control an agricultural hinterland. Chapter Two demonstrated that Kutch is the most inhospitable region of Gujarat, and is largely unsuitable for agriculture. It is however, directly between the fertile black cotton soils of Saurashtra and the Indus Valley itself. It is this geographical location that has prompted archaeologists (i.e. Dhavalikar 1995, Soundararajan 1984) to identify within Kutch evidence of population movements, through either trade or colonisation. This section will look at the function of sites within Kutch and their role within the landscape.

6.4.2.1.1 Dholavira

The layout of Dholavira is unique within the Indus Valley Tradition, not least that it was constructed primarily from stone rather than mudbrick. Bisht (1999) identifies a three-fold division of the site into an acropolis/citadel, a middle town and a lower town (Figure 6.12). The citadel has been further subdivided into a "castle" and "bailey", although this identification bears little resemblance to conventional concepts of medieval European castles and baileys. The citadel was located at the south of the site, in contrast to the eastern locale of the "citadels" at Harappa, Mohenjo-daro and Kalibangan. Between the citadel and middle town is a broad stretch of low-lying ground identified by Bisht as a "stadium" (1999: 21), which he suggests was used to host community gatherings, festivals and markets. The whole site was surrounded by a 2.5-km long circumvallation, whilst additional inner walls surrounded the citadel and middle town (Figure 6.13).

The middle town was established in Stage III (2500-2200 BCE) as well as the reservoirs to the south, west and north, marking a major expansion of the site. At least sixteen reservoirs have been identified at Dholavira, one as large as 95x10 metres and 4 metres deep. A second reservoir measuring 24x7.5x5 metres has 31 steps leading down into it. Most of the reservoirs take advantage of the natural slope at Dholavira, enlarging natural depressions in the surface. The retention of monsoon rains at Dholavira would have been vital for sustaining a large

population throughout the year, and the reservoirs would certainly have aided this. However, the presence of the steps leading into one reservoir is reminiscent of the "Great Bath" at Mohenjo-daro, where, again, water management is an integral part of the cities morphology. As we shall see, water management in Gujarat is also prevalent, particularly at the site of Lothal.

It is difficult to ascertain a *function* for Dholavira – especially utilising Mughal's criteria of residential, industrial, residential-industrial. Excavations, and particularly the excavation reports, have concentrated on elements of urban planning and fortifications rather than specific artefactual details. Despite this, it is possible to make some observations regarding the function and location of Dholavira. The most striking question is why was Dholavira built/developed in that location. Traditional notions of urban centres as redistributors of surplus from its hinterland (i.e. city-states in Mesopotamia, or Early Historic cities in the Ganges Valley) are not supported due to the paucity of contemporary sites within its vicinity from which to procure surplus, and the poor agricultural potential of the region.

Patel suggests that the economy of Dholavira was primarily based upon pastoralism, based upon taxonomic analyses (1997). One of her more compelling arguments surrounds the use of reservoirs to store the monsoon rains to supply pastoral communities all year round. Likewise, some of the 14 different gateways into the city appear to have been designed to allow herds of animals to flow through them (*ibid.*: 102). Internal distributions of animal bones within Dholavira demonstrate that bovine remains are more frequent within the middle town, in comparison with the bailey where a greater variation of animal bones have been recovered. Patel suggests that this is due to a greater access to food choices within the Bailey, and a possible socioeconomic difference between these two sections of Dholavira (*ibid.*: 108).

The previous chapter (see section 5.4.1.1) suggested that Dholavira may have had a more pronounced purpose, possibly relating to the control of trade and movement between the Indus Valley and Gujarat. There are certainly historic parallels of major forts constructed in geographically marginal areas - for example, Fort Derawar in Cholistan.

6.4.2.1.2 Other excavated sites in Kutch

Kotara, often referred to as Juni Kuran, is the second largest Indus Valley Tradition site in Kutch, measuring 11.27 hectares. Located 45 kilometres west of Dholavira, Kotara is a walled settlement also located on a *khadir* in the Great Rann of Kutch. Seven metres high and four and a half metres wide walls, constructed of mudbrick and stone, surround the site. The exterior walls extend for 220x225 metres, and an inner wall of 72x92 metres encircles the "citadel." Five gateways into the citadel, which is located in the northwestern corner of the site, only one of which provides access in and out of the site. A "middle" and "lower" town have also been identified at the site. Within these two areas, series of rectangular house structures have been excavated ranging from 1.3x1.4 metres to 6.6 to 6.8 metres in size. Very little further information is available for the site, which has only recently been excavated (ASI 2006).

Surkotada is located 78 kilometres to the southeast of Dholavira, and covers an area of 2.04 hectares. The site was not established until c.~2300 BCE, and was occupied until c.1650 BCE (Joshi 1990: 59-66). The large stone and mudbrick walls have lead many scholars to identify Surkotada as a military outpost or garrison town (*ibid.*: 18) The site is divided into two, a citadel mound to the east and a "residential annexe" to the west (Figure 6.12). Again, copper (rings, bangles, spearhead), beads (steatite, lapis lazuli, carnelian, faience, terracotta) and terracotta balls, bangles and cart frames have been identified at the site but there is no evidence that they were manufactured on site or not (Joshi 1972: 126). No lower town or city has been identified at Surkotada. The citadel was surrounded by a wall initially seven metres thick, although this was later reduced to four metres in width during Period IC (*ibid.*: 17).

Desalpur is another fortified site within Kutch, lying 110 kilometres west of Dholavira and covering 1.02 hectares. Its stone fortification wall had a basal width of four metres and rises to over two and a half metres. The wall was strengthened with towers on the corners. The stones at the base of the wall were three metres long and one metre wide (*IAR* 1963-64: 11). A substantial component of the ceramic assemblage appears to have been locally made ceramics. Buildings relating to Period II at Desalpur were constructed on top of the then defunct fortification wall, and ceramic assemblages were "non-Harappan" (*ibid.*: 12).

Surkotada and Desalpur have been interpreted as a garrison-town or fortified outpost facilitating colonisation of both Kutch and Saurashtra (Joshi 1990: 18).

Certainly, the stone fortifications and lack of evidence of craft manufacturing at either site supports the idea of Surkotada and Desalpur as outlying 'forts' or garrisons to Dholavira. Such a scenario would indicate a substantial political organisation functioning within Kutch – an issue that will be discussed later in the chapter.

Shikarpur is a slightly larger site (4.15 hectares) lying to the south of Dholavira and southwest of Surkotada. The site was excavated between 1987-1990, and shows evidence of Regionalisation and Integration Era occupation. No fortification walls, as such, were present at Shikarpur, although several habitation structures were identified (IAR 87-88, IAR 88-89, IAR 89-90). Several steatite beads and drill bits have been found at the site (IAR 88-89: 10) suggesting there may have been some small-scale craft specialisation at the site. Analysis from Shikarpur suggests that subsistence strategies focused upon domestic animals, in particular cattle. Domesticated sheep, goat, horse, pig and dog were also recovered, along with wild buffalo, nilgai, chowsingha (Four Horned Antelope), blackbuck, gazelle, sambar, chital, muntjak, hog deer, pig, ass, jackal, hare and rhinoceros (Thomas *et al.* 1995).

6.4.2.1.3 Wider Survey in Kutch

The principle survey work in Kutch has been undertaken by Joshi (1972, 1990), building upon earlier explorations by Rao and Soundarajan (Rao 1963). Joshi's principle aim was to ascertain the "movement of Harappans through [Kutch]" (1972: 105). As a consequence, the survey tended to focus primarily upon location and phasing of sites, rather than focusing upon the function and development of sites. Joshi concluded that the distribution of sites in Kutch reflects the movement of people from the Indus Valley itself into Gujarat. The principle routes went through Dholavira and Surkotada, with a second route through Desalpur and Kotada. Joshi interprets the settlement patterns of Kutch as

Dhavalikar, on the other hand, provides a more theoretically explicit model of settlement development in Kutch and Gujarat in general. He suggests that "initially the Harappans were not interested in colonising Gujarat, their sole objective being the exploitation of resources that were not available in Sindh and Punjab" (1995: 100). Dhavalikar suggests that Desalpur and Surkotada acted as both trading centres and military outposts, with Dholavira as the regional centre of "Harappan authority." He suggests a model of cultural imperialism akin to British

factory forts in 17th and 18th century AD Gujarat – where colonisation was driven by the desire to gain economic control over the region.

6.4.2.1.4 Summary

During the Integration Era several Indus Valley Tradition sites within Kutch appear to demonstrate an air of dominance and control. The imposing walls of Dholavira and Kotada, and the fortified sites of Surkotada and Desalpur suggest that economic and/or military control was a prime function of these sites. On the other hand, sites such as Shikarpur demonstrate that settlement was not restricted to fortified urban centres. The reliance of domesticated animals for subsistence at Shikarpur and Dholavira suggest that pastoralism played a key role in the economy of Kutch – a reasonable conclusion when one considers the lack of natural agricultural land in the region. Dholavira was most probably self-sufficient in terms of water, but whether it could sustain itself with food is unknown.

Understanding the function and relationship of these fortified sites in Kutch is critical to understanding the wider relationship between settlements in Gujarat. If, as some people have argued, that they represent a deliberate incursion of a political and/or economic power into the region (i.e. Dhavalikar 1995, Joshi 1972, 1990) then this will affect our understanding of the function of sites within the rest of Gujarat. One of the main problems with the Kutch data is the lack of chronological clarity. It is difficult to establish when the four main sites of Dholavira, Kotada, Desalpur and Surkotada were a) established and b) fortified. The two latter, smaller sites appear to have been established midway through the Integration Era (c. 2300 BCE). However, Dholavira was established during the Regionalisation Era, yet it is unknown whether this initial occupation was either an organic development of a regional settlement (Bisht 1990: 76) or the deliberate establishment of a settlement for the purposes of economic and/or political colonisation (Bisht 1999: 22).

6.4.2.2 Saurashtra

The previous chapter (section 5.3.1.3.2) demonstrated that Saurashtra is the most populous region of Gujarat during the Integration Era of the Indus Valley Tradition. The central place analysis discussed the distribution of sites within the hinterlands of Kotada and Lothal (Figure 5.26). This section will begin by examining the function of excavated sites within Gujarat and any notions of function that can be

ascertained from the various surveys undertaken in Saurashtra. It will begin by looking at Lothal and the sites within its hinterland, then Kotada (Jamnagar) and its associated sites, and then finally other sites.

6.4.2.2.1 Lothal

Lothal has been extensively excavated and published providing detailed information regarding site function (Rao 1973, Rao 1979). Lothal is situated on a small stream close to the Bhogava River, a tributary of the Sabarmati River that, in turn, flows into the Gulf of Khambat. Measuring 10.25 hectares, the site has been identified as a major trading centre in Gujarat. Established during the Integration Era, the site consists of three main areas: an "acropolis", a lower town, and a "dock" (Figure 6.14). The acropolis, situated in the southern area of the site, consists of a "warehouse" – a series of twelve mudbrick blocks measuring 3.6 metres square and 90 cm high arranged into three rows of four (Figure 6.15). 65 terracotta sealings were found within the area during excavations, leading Rao to identify it as a warehouse (Rao 1979: 111ff). The remainder of the citadel consists of a series of small structures, streets, drains, wells and bathing platforms. Like Dholavira, the flow of water through the site was carefully planned, and the bathing platforms indicate a

The lower town was laid out in a gridplan road system, and contained a central "bazaar" and an industrial area (Rao 1973: 66ff). The "bazaar" was an area of the site centred on a 6.7 metre wide street flanked by small structures interpreted as shops (Figure 6.16). Again, this area was served by a complex drainage system (Rao 1979: 89f). This area of the site is a later construction than the acropolis.

To the west of the bazaar is an industrial area, and in particular a bead factory (Figure 6.17). Covering an area of 500 square metres, the structure consists of store-rooms, a firing kiln, and courtyards. In total over half a million beads have been recovered from Lothal, the vast majority of these (99%+) were steatite beads recovered from Lothal Period A (c.2450-1900 BCE). Beads were also manufactured from (in order of numbers recovered) carnelian, faience, terracotta, shell, copper, agate, granite, onyx, gold, amazonite, jasper, soapstone, crystal, quartz, chalcedony, opal, bloodstone, bone, sard, chrysoprase, ivory, black steatite and chert (Rao 1973: 587). Not all of these beads were recovered from the bead factory itself, but it demonstrates the vast quantity of craft specialism that existed at Lothal during the Indus Valley Tradition. In addition to the finished

beads, several jars of unfinished and partially manufactured beads, and bead debitage were recovered. In one room, a jasper drill-bit was recovered indicating that all stages of manufacture were undertaken at Lothal. Today, the town of Khambat, 40 kilometres from Lothal, is a major centre of bead production in India (Kenoyer *et al.* 1991, 1994). A coppersmith's workshop has also been located in the northern part of Lothal's lower town (Rao 1973: 68).

The final major feature of Lothal is the "dock" situated on the eastern flank of the site. The "dock" refers to a brick-lined tank measuring 214 by 36 metres, with a narrow inlet on the southern end leading to the nearby nullah, or river (Figure 6.18). The depth of water held in the tank varies between two and four metres dependent upon the time of year and tides. It was interpreted as a dock by the original excavator (Rao 1973, 1979), although this has been questioned in recent years. Kenoyer argues that the dock was actually a reservoir (1998: 163), an argument first mooted by Leshnik (1968a). Rao argued that the investment of millions of kiln-fired bricks to construct a reservoir when a simple mud bund would have sufficed indicates that it played a more important role as a dock for seafaring ships (1979: 72). Furthermore, two stone "anchors" are visible from lying on the floor of the "dock" which Rao sees as evidence that ships docked there (Figure 6.19). Leshnik counters this argument, suggesting that the stones are part of a *shaduf* system for lifting water from the tank (1968: 917f). Whether the tank acted as a dock or a reservoir, as Rao highlights, the firing of the bricks and construction of the tank was a heavy investment in labour and resources.

Lothal was originally interpreted as a Harappan port on the southern fringes of the Indus Empire (Rao 1979: 52). However, more recently scholars have identified its position as more important for procuring land-based resources from central India (Atre 1989, Dhavalikar 1995). Possehl identifies Lothal as a "manufacturing town", situated not to exploit local raw materials but located at the centre of an exchange network from which these materials were available. Copper and steatite were available from Rajasthan, agate is found in the Narmada valley and inland Saurashtra, and shell is found throughout the Gulf of Khambat (Possehl 1980: 72f). As such, Lothal may have functioned as a centre of both manufacturing and redistribution. The following section will examine some of the sites within its hinterland as defined in the previous chapter, and the wider landscape within which Lothal sits.

6.4.2.2.2 Other excavated sites in Lothal's hinterland

Rangpur was the first Indus Valley Tradition site identified and excavated in Gujarat, and for a long time remained the type-site for the region. Originally thought to have extended for 1100 by 850 metres (70+ hectares) (Rao 1963: 7) reanalysis at the site has established that it covered roughly 7-hectares. The earliest occupation of the site is an undated microlithic deposit in the northwestern corner of the mound. The site was reoccupied during the Integration Era and remained occupied until c.1400 BCE. The chronological sequence at Rangpur has been used to relatively date many of the sites within Gujarat. The site itself is close to the Bhadar River, which flows east into the Gulf of Khambat close to the mouth of the Sabarmati. Rangpur will be examined in more detail in section 6.4.3.2.2.

Kanewal is a 4.7-hectare site situated 25 kilometres east of Lothal (Figure 5.27). Located on a flat plain, monsoon rains collect in small lakes close by and can remain filled perennially, supporting both domestic and wild animals through the dry season. There is evidence of human occupation of the plain dating back to the Neolithic (Mehta *et al.* 1980: 1f). Although no radiocarbon dates are available for Kanewal, artefactual evidence suggests the site was established in the late third millennium BCE and was occupied until the end of the second millennium BCE (*ibid.*: 19f). The principle ceramics are Lustrous Red Wares and Micaceous Red Wares, unique to Gujarat, particularly the region around Lothal. Other artefacts found at Kanewal include: microliths; chert, agate and chalcedony cores and tools; stone querns; terracotta balls, discs, lamps, bull and wheel; and triangular cakes (*ibid.*: 55-65). A total of 49 beads were recovered from the site, manufactured from carnelian, chert, agate, shell, faience and terracotta (*ibid.*: 65ff). Zoological remains from Kanewal include domesticated cattle, water buffalo, sheep and goat, and wild chital, barasingha, nilgai, monitor lizard and rhinoceros (*ibid.*: 70). A series of circular posthole structures were identified at the site measuring between 2.3 - 3.7 metres in diameter (*ibid.*: 12ff), similar to the chalcolithic communities of central India (Mittra and Shivananda 2000).

Vagad is a 10.6-hectare site dating to the Integration Era, known locally as Kedio Timbo, situated 45 kilometres southwest of Lothal. Like Kanewal, a series of circular huts were excavated ranging from 2.5 to 5.8 metres in diameter, whose floors were made from packed clay and soil, and provided evidence of a central hearth (Sonawane and Mehta 1985). Beads of carnelian, agate, jasper, chert, lapis lazuli, jade, faience, steatite, shell and terracotta have been found at the site (*ibid.*: 43). Faunal analysis indicates the presence of domesticated cattle, water

buffalo, sheep, goat and dog, and wild sambar, spotted deer, gazelle, blackbuck, nilgai, pig and mole rat. Most of the remains show evidence of cut marks (*ibid.*). The excavators interpret Vagad as a permanent rural settlement reliant upon agriculture, cattle breeding and hunting for subsistence (*ibid.*: 44). Whether or not the site was controlled or "ruled" over by Lothal is debatable. Its proximity to the site, and the presence of numerous beads, would suggest that the sites were regularly engaged in trade and exchange – possibly trading surplus food for finished goods – indicative of an active trade network.

6.4.2.2.3 Wider survey in Lothal's hinterland

Possehl has undertaken survey in the Ghelo and Kalubhar River valleys, which flow into the Gulf of Khambat at Bhavnagar (1980). Again, Possehl identified that the majority of the sites in the Ghelo and Kalubhar valleys are located close to rivers. Possehl suggest that this was not only to provide a source of water for domestic and animal use, but also for irrigation purposes (*ibid.*: 51). In total 36 sites have been identified in the Ghelo and Kalubhar Valley dating to the Indus Valley Tradition. Due to the use of Rangpur as a relative chronology, it is difficult to separate sites from the Integration Era and Regionalisation Era within Possehl's datatset. There is also little discussion of the sites other than their ceramic typologies (1980). In a further survey of Limdi Bhogava and Sukha Bhadar valleys, close to the above survey eight Integration Era sites were identified. Artefacts recovered form these sites include ceramics, terracotta objects, lithics, shell objects and stone pestles and querns (Dimri 1999: 32).

6.4.2.2.4 Kotada (Jamnagar)

Very little information is available regarding the site of Kotada, located in Kalavad Taluka, Jamnagar, as it has yet to be excavated. It was first identified by Rao (1963), and later revisited by Bhan (1986, 1989) who identified its large size. However, beyond its large size there is no other information available from the site, which was postulated as the centre of an early state module in Saurashtra in the previous chapter. In the same vein, very little information is available for the hinterland sites of Taraghada, Karmalkota and Mulpadar (see Figure 5.30). However, extensive information is available for other sites within the hinterland of Kotada – notably Kuntasi and Bagasra, but also the slightly more distant Nageswar and Rojdi. Kuntasi and Bagasra have already been discussed in detail in sections 6.2.3 and 6.2.4 respectively.

6.4.2.2.5 Other excavated sites in Kotada's hinterland

Kuntasi and Bagasra share much in common with both the fortified sites of Kutch – Surkotada and Desalpur – as well as with Lothal. The sites are relatively small in size (2.59 and 1.56 hectares), yet they were surrounded by a stone wall, and Kuntasi's gateway protected by bastions (Figure 6.20). However, unlike Surkotada and Desalpur, Kuntasi and Bagasra had active manufacturing industries, similar to those at Lothal. The notion of fortified manufacturing centres in Saurashtra formed the basis of Dhavalikar's "cultural imperialism" model, in which he advocate an economic colonisation of Gujarat occurring during the Integration Era.

Located on the western tip of Saurashtra, Nageswar has been identified as a shell- procurement and processing centre dating to the Integration Era. The presence of thousands of fragments of *Turbinella pyrum* and *Chicoreus ramosus*, fragments of bangles, inlays and ladles at the site, but very few finished artefacts suggested to the excavators that the site was primarily engaged in the procurement and processing of the material, rather than later manufacture (Hegde *et al.* 1990: 2). Bhan (1986) indicates that the western coast of Saurashtra is rich in both types of shell found at Nageswar, and is the probable reason for its location. The region around Nageswar is dry, and the soil is alkaline. However, the site is situated next to a freshwater lake, which even today draws both domesticated herds (Figure 6.22) and wild species (Figure 6.23).

No permanent structures have been identified that are associated with the earliest occupation of the site, leading the excavators to suggest that the site was initially used as temporary settlement by seasonal shell workers from further afield. In later levels, permanent structures were erected, and locally made ceramics become more prevalent, suggesting the establishment of a permanent settlement (Hegde *et al.*: 150f). They also suggest that colonists from Sindh settled the site during the Integration Era, to facilitate the exploitation of the rich marine shell deposits. However, the establishment of a permanent settlement necessitated the raising of livestock and hunting and fishing. Surplus goods would have been traded back to the larger urban centres along well established trade and exchange networks (*ibid.*: 152).

Situated in the heart of Saurashtra, Rojdi is a 5.89 hectare site occupied from 2500-1700 BCE. Unlike many sites in Saurashtra, structures at Rojdi were constructed upon stone foundations – no bricks were identified during the excavations. However, Rojdi has been identified as a village of farmers and herders. The ceramics from Rojdi are "Sorath Harappan", indicating a more indigenous origin to the site. However, there is no evidence of any manufacturing industry at the site, hence Possehl's identification of the site as a farming and herding village (2003: 82ff).

The most extensive data from Rojdi comes from floral and faunal studies. The natural vegetation within the surrounding area is primarily comprised of shrub-savannah species, primarily the *Acacia* and *Capparis* families. However, the principle crops found at Rojdi were wheat, rice, jowar and bajra, supplemented by legumes, chickpeas, black gram, green gram, mustard, sesame, cumin, coriander, garlic, fenugreek, chillies and oil crops (Weber 1991: 36). Faunal remains were predominantly cattle, followed by pig, sheep and goat. The age of death of cattle at Rojdi was: 0-1 year (5%), 1-3 years (20%), 3-4 years (50%), and 4 years+ (25%), indicating that cattle were killed at an early age for food, with only small numbers being kept for traction and other by-products.

6.4.2.2.6 Wider survey in Kotada's hinterland

Chitalwala's survey of sites in Rajkot District identified a range of sites from small hamlets to villages and towns (Chitalwala 1979). He identified that the majority of sites were located close to water (rivers and streams), and often occupying vantage points providing a view over the wider landscape. Chitalwala suggests that these settlements allowed for the facilitation of hunting, through the monitoring of wild game (1979: 116). Faunal remains indicate that domesticated cattle were an integral part of the economy of Rajkot District. The vantage points provided by settlements were just as likely to be utilised to monitor domestic herds of cattle, sheep and goat, as opposed to wild herds. Chitalwala identified that the economy of the region was based upon domesticated species, supplemented by hunting and fishing (*ibid.*: 117). He also identifies a dichotomy in terms of settlement morphology. Sites during the Integration and Localisation Era are either rectangular or circular in shape – something Chitalwala suggest indicative of two types of site planning with possible socio-economic implications.

6.4.2.2.7 Summary

The survey data from Saurashtra indicates that during the Integration Era there were a variety of site functions within Gujarat. The vast majority of sites appear to be small villages engaged in a mixture of agriculture, pastoralism and hunting. Such sites range in scale from small 0.1-hectare sites, to small "villages" such as Oriyo Timbo and Kanewal and finally to larger settlements such as Rojdi, Rangpur and Vagad. The occupants of Kanewal were using microlithic tools during the Integration Era, even though at the nearby site of Lothal copper tools were prevalent. However, the faunal remains from all sites indicate that diets were remarkably similar across the region. Structures at Kanewal, attested to by a series of post-holes arranged in a circular fashion, were presumably constructed of timber and wattle and daub. At the slightly larger site of Rojdi, structures were built upon stone foundations and were rectilinear. However, there is no evidence of any substantial craft specialisation at any of these sites. Manufacturing was restricted to sites such as Lothal, Bagasra and Kuntasi.

Bagasra and Kuntasi, both located in northern Saurashtra, are closely linked with the fortified settlements in Kutch. Both sites are walled and demonstrate clear evidence of craft specialisation and large-scale manufacturing. Kuntasi was focused primarily upon bead manufacturing, whilst shell working was more prevalent at Bagasra. However, both sites also participated in the other activity, as well as ceramic manufacture. The fact that both sites were engaged in overlapping activities contradicts the idea that they were "factory forts" established to produce finished goods for export back to the Indus Valley (i.e. Dhavalikar 1995). If this were the case, sites would expect to be almost exclusively specialised.

Lothal is one of the few sites in Saurashtra that demonstrates all the features of an urban centre. Whilst its size is not immediately noticeable (unlike Kotada (Jamnagar)), it demonstrates evidence of craft specialisation, residential structures and public areas. Bead manufacturing at the site was on a large scale, with a single bead workshop covering 500 square metres and over half a million beads recovered during excavations. The identification of a "dock" at Lothal remains a contentious issue, with many archaeologists questioning Rao's initial assumptions. The storage of water is an important element of many larger Indus valley Tradition sites, and even smaller sites are often located near natural features which will retain water during the dry season. Lothal appears to function as a trade and manufacturing centre, located to facilitate the acquisition of raw materials from southern and eastern Saurashtra, and further afield into central

India. Sites in the hinterland of Lothal have very little in the way of manufacturing industries, yet excavations there have demonstrated the presence of copper artefacts and beads, suggesting the presence of a distribution network within the region.

Kotada, located in central Saurashtra is the largest site in Gujarat, yet there is very little information available for it. As a consequence, our understanding of settlement patterns and functions in western Saurashtra are limited. Nageswar is the only site in Gujarat that could be identified as purely "industrial" – yet it was only engaged in the preliminary processing of shell. The final product was manufactured elsewhere – possibly at sites such as Bagasra and Kuntasi – or even somewhere in the Indus Valley itself.

6.4.2.3 North Gujarat

After initial explorations in North Gujarat, Leshnik concluded that no Indus Valley Tradition sites existed in North Gujarat (or Southern Rajasthan), suggesting that the rivers in the region were ill-suited for irrigation (Leshnik 1968b). However, such observations were challenged after further survey work along the Rupen Valley. Hegde and Sonawane identified 21 Indus Valley Tradition sites within the valley, characterised by a distinctive local ceramic – Anarta Ware – and evidence of shell manufacturing (Hegde and Sonawane 1986). As the previous chapter demonstrated, a total of 154 sites are now known within North Gujarat, predominantly dating to the Localisation Era. Excavations at Nagwada and Datrana, as well as at several smaller sites, have complimented this survey work. This section will begin by looking at the evidence from the main sites, before discussing the impact of wider survey in North Gujarat.

Located close to the eastern fringe of the Little Rann of Kutch, the site of Nagwada dates to all three Eras of the Indus Valley Tradition. It is spread across five mounds, each ranging from 0.05 to 1.38 hectares in size. Like Loteshwar, the earliest levels of Nagwada are characterised by human burials and Anarta ceramics. No structural remains have been identified in the Regionalisation Era (Sonawane 2005: 216). Structures during the Integration Era were constructed from moulded mud brick and stone, and were as large as 6.6x5.1 metres in size. Nagwada also demonstrates evidence of bead and shell manufacturing. Bead roughouts and blanks, defective and broken beads, drill-bits and a large number of finished beads indicate the presence of bead manufacturing processes. The

materials used include carnelian, agate, amazonite, faience, soapstone and lapis lazuli (Bhan and Gowda 2003, Hegde *et al.* 1988: 59f). The shell evidence suggests that only the cutting and polishing of shell artefacts was undertaken at Nagwada, the preliminary stages being undertaken elsewhere (*ibid.*: 60). Domesticated cattle, sheep and goat dominate the faunal assemblage at the site. Wild sambar, chital, blackbuck, gazelle, pig, nilgai, hare, hyena, camel, fowl and ass supplemented this staple (Sonawane 2005: 218f).

Located on a spur of land separating the Great and Little Rann of Kutch, several archaeological sites relating to the Indus Valley Tradition cluster around the village of Datrana. The largest of these sites, Datrana VIII relates to the Regionalisation Era, but has not been excavated. Three of the Datrana mounds have been excavated - II, IV and V. Datrana IV was discussed in section 6.4.1.3. Datrana II dates to the Integration and Localisation Eras, and is a small site located on a stabilised sand dune. Ceramics from the site relate to both Harappan Phase of the Indus Valley Tradition and local Chalcolithic Anarta tradition. The only features identified at the site are small pits up to two metres in depth that may have functioned as pottery kilns (Sonawane 2005: 214). Datrana V (0.09 hectare) is another Mesolithic and Chalcolithic site dating to the Integration Era. It is characterised by lithic assemblages very similar to Datrana IV (*ibid.*: 214).

Several other sites have been excavated in North Gujarat. Santhli is another site with multiple occupation mounds, ranging from the Regionalisation Era through to the Localisation Era. Excavations have yielded remains of cattle, sheep, goat, pig and horse; two extended human inhumations; and large quantities of lithics and ceramics (Sonawane 2005: 210).

Survey in North Gujarat has identified a large number of sites spanning all three Eras. Beginning with the Regionalisation and Integration Eras, Majumdar has identified distinct regional patterns. He has identified that sites within North Gujarat are primarily situated on top of fossilised sand dunes, which are invariably associated with small depressions that accumulate monsoon rains (Hegde and Sonawane 1986; Majumdar 1999b: 23). Ceramic assemblages from the sites indicate a combination of typical Harappan Phase ceramics combined with local Anarta ceramics. Majumdar identifies the smaller Regionalisation and Integration Era sites of North Gujarat as temporary and seasonal pastoral settlements, based upon the permanent settlement of Moti Pipli. Moti Pipli is identified as a central place due to the presence of stone, shell and terracotta debitage – suggestive of

a manufacturing industry at the site (*ibid.*: 23f). However, Majumdar explains developments in settlement patterns and artefacts through migration and diffusion, assuming that the emergence of permanent settlements is the result of migration through Kutch (Majumdar 2001). Hegde and Sonawane have identified that the larger sites in North Gujarat – Nagwada, Moti Pipli, Datrana - are located near lakes that retain water all year round (1986).

No site in North Gujarat demonstrates the same urban characteristics as those visible at Lothal, Dholavira, or even Kuntasi, Bagasra, Surkotada or Desalpur. Despite this, there is evidence of craft specialisation and manufacturing industries at several sites – Nagwada and Datrana II in particular - however, not to the same degree as witnessed elsewhere. Again, bead making and shell working are the most common industries, and finished beads and shell objects are frequently found at all sites. Shell would have been readily available within the Great Rann of Kutch, or further away in the Gulf of Kutch and Gulf of Khambat. However, Bhan and Gowda suggest that a lot of material used within North Gujarat may have been recycled shell waste from larger processing centres (2003: 77). Subsistence strategies within North Gujarat mirror those of Saurashtra – domesticated cattle, water buffalo, sheep and goat, supplemented by hunting and fishing.

6.4.2.4 South Gujarat

None of the five identified Integration Era sites in South Gujarat have been excavated, and very little information is available regarding the role or function of these sites.

6.4.2.5 Summary

There appear to be several different types of sites within Gujarat during the Integration Era, and the geography of the region influences this. In Kutch, Integration Era sites present an air of dominance and control, but this may not have actually been realised in a political, economic or military sense. The sites of Dholavira, Kotara, Desalpur and Surkotada are all fortified, yet have yielded little evidence of weapons or armies.

In Saurashtra, on the other hand, sites such as Kuntasi, Bagasra, Lothal and Rojdi are walled, but not in the same manner as the sites in Kutch. These sites

have also demonstrated a greater degree of craft specialisation, particularly Kuntasi, Bagasra and Lothal. However, the vast majority of sites in Saurashtra were small villages engaged in a mixture of agriculture, pastoralism and hunting. This category of sites, which includes Kanewal, were using microlithic tools and constructing houses from timber, wattle and daub, whilst at Lothal and Rojdi, structures were made from mudbrick and stone and copper tools were used. Conversely, many of the small sites in North Gujarat were engaged in craft activities even though they share more in common with the smaller sites in Saurashtra.

Overall, there is a variety of sites within Gujarat during the Integration Era, with the Rann of Kutch acting as a divider between the fortified sites of Kutch and the manufacturing centres of Saurashtra and North Gujarat. Several key sites emerge in Saurashtra– such as Lothal and possibly Kotada (Jamnagar) – but there does not seem to be any primary site in North Gujarat. However, these sites do not exert the hinterland control over the landscape that many of the models of political and social organisation predicted (these models will be discussed further in the next chapter). This resonates with the rank-size hypothesis that the larger sites in the region – Dholavira, Kotada, Lothal etc – were becoming increasingly more prominent in terms of size, but that they were not dominating the landscape politically and/or economically.

6.4.3 Localisation Era

The previous chapter demonstrated that there were more sites during the Localisation Era in Gujarat than any previous period, with a total of 343 sites. These sites ranged in size from 0.01 hectares to 47.12 hectares, with an average size of 2.52 hectares. The majority of Localisation Era sites were in Saurashtra (217), including Tarana-III at 47.12 hectares, and the second largest site - Budhel (18.8ha). 101 sites were located in North Gujarat; 12 in South Gujarat; and 12 in Kutch. Dholavira, the largest site during the Regionalisation and Integration Eras drops in size to 9.62 hectares.

The central place analysis focused upon the sites of Tarana-III and Lothal (see sections 5.4.1.2 and 5.4.1.4), both in Saurashtra. The area around Lothal was densely populated, with the sites of Kanewal (3.92) and Godel (2.36) prominent to the east, and the heavily populated Ghelo and Kalubhar River Valley to the southwest. Key sites within this valley were Madhadevio (10.37 ha) and Pasegam

(12.75 ha), with the rivers discharging into the Gulf of Khambhat near to the 18.8 hectare site of Budhel. The landscape around Tarana-III was also densely populated, with several prominent sites in its hinterland. Two sites – Wasai (7.07 ha) and Jaidak (5.28) – are both located c.50 kilometres from Tarana-III, whilst Godvari (3.14), Mulpadar (3.93) and Vegadi (4.71) are all located between 80-100 kilometres.

The rank size curve for the Localisation Era was convex (see section 5.5.1.3), suggesting a less integrated settlement pattern, or the pooling of two or more settlement systems. Analogies from the Near East and Levant suggest the integration of smaller sites into settlement hierarchies, but also the failure of larger urban centres to exude control over the landscape. The Oaxaca Valley data suggests the decline of a centralising authority and the emergence of new centres that were in competition for political and economic control.

The site of Lothal has already been discussed in detail above (section 6.4.2.2.1) as well as some of the sites in its hinterland that persist into the Localisation Era (section 6.4.2.2.2 and 6.4.2.2.3). However, the following section will include an analysis of the Localisation Era occupations at these sites. Very few sites of the major sites within the hinterland of Tarana-III have been excavated, with the exception of Rojdi (section 6.4.2.2.5), Kuntasi (6.2.3) and Bagasra (section 6.24). In Kutch, the two sites of Dholavira and Surkotada persist into the Localisation Era. The sites of Zekhda, Ratanpura, Datrana, Nagwada and Santhli have been excavated, as well as Jokha and Dhatva in South Gujarat.

6.4.3.1 Kutch

The largest site in Kutch during the Localisation is still Dholavira, although it had decreased in size to 9.62 hectares. Stages VI and VII at Dholavira relate to the Localisation Era, and have been characterised as a period of decline (Possehl 2003: 69). The area of occupation is reduced to the "bailey" and "castle", and new structures are raised with little resemblance or orientation to earlier ones. However, the majority of Integration Era artefacts – beads, bangles, metal tools, weights and seals – continue to be used at the site. Bisht refers to the Localisation Era inhabitants as "squatters", despite the persistence of craft manufacturing at the site (1990: 77). The Localisation Era occupation at Surkotada (Period IC) is also characterised by the establishment of new structures on top of the Integration Era levels. In addition, the walls surrounding

the site and the drainage system were both maintained and repaired during this period (Joshi 1990: 26). Like Dholavira, beads, bangles, metal tools, weights and measures were still utilised throughout the site, and two hoards of steatite and carnelian beads were recovered (*ibid.*: 27). There is very little information regarding other sites in Kutch during the Localisation Era.

6.4.3.2 Saurashtra

Saurashtra was the most densely populated area of Gujarat during the Localisation Era with 217 sites identified. The largest of these sites was Tarana-III whose hinterland has already been discussed (see section 5.4.1.4 and Figure 5.30) as well with Lothal (section 5.4.1.2 and Figure 5.27). The following sections will detail the evidence of r site functions at Tarana-III and Lothal during the Localisation Era, the sites within their hinterlands and the evidence from wider surveys in Saurashtra. It will begin with Lothal and the sites within its hinterland.

6.4.3.2.1 Lothal

A detailed review of Lothal during the Integration Era has already been undertaken in Section 6.4.2.2.1, and consequently this section will only detail evidence of site function for the Localisation Era. Whilst the emergence of Lustrous Red Ware as the predominant ceramic type at the site was the main criterion for the division of Lothal into periods A and B (Rao 1979: 34ff), there was also a significant shift in craft manufacturing at the same time. There is a reduction in the amount of copper being worked at the site, which Rao suggests was the result of a breakdown in international trade (*ibid.*: 36). However, at the same time there was a reduction in the amount of chert and steatite – both materials that are available within Gujarat, but not in the immediate vicinity of Lothal. Instead, the locally available jasper and agate becomes much more prominent at the site (*ibid.*). However, the manufacture of beads continued into this period, with steatite remaining the most commonly used material. In addition, the use of terracotta, faience and granite became more prevalent, and carnelian, copper, agate and gold became less frequently used (*ibid.*: 587). Cubical weights, typical of the Integration Era were replaced with spherical weights, and seals were much less frequently found

6.4.3.2.2 Other excavated sites in Lothal's hinterland

Due to the nature of the excavation, the majority of information available from Rangpur relates to ceramic typologies – one of the main reasons it has been used to relatively date sites in Gujarat. The excavator went to great lengths to link the ceramics from Rangpur with sites from the Indus Valley, mostly due to political reasons. After partition in 1947, all the known Indus Valley sites were located on the Pakistan side of the new international border. The Archaeological Survey of India invested time and money to identify Indus Valley Tradition sites on the Indian side of the border, and Rangpur was targeted for excavation. The desire to extend the "reach" of the Indus Valley Tradition into India led Rao to identify Rangpur as a Harappa Phase site (1963). However, Rao acknowledges that certain ceramics from Rangpur share similarities with both Harappa and Navdatoli, a chalcolithic site in Central India (*ibid.*: 16), suggesting a wider influence within Gujarat during the Localisation Era.

Aside from ceramics, terracotta animal figurines, including two horse figurines, were found at the site, although they were less intricate than contemporary examples from Lothal. Beads of steatite, faience, gold, carnelian, jasper, agate, shell and ivory were found at the site, including one jar containing over 4900 steatite microbeads. Copper and bronze tools were also discovered, although there is no evidence that either metal or beads were actually manufactured at the site itself. Copper and gold jewellery was also found at Rangpur (*ibid.*: 139-152). Faunal remains from Rangpur include cattle/water buffalo (78%), pig (8%), sheep/goat (11%) were the predominant food sources and cut marks were identified on cattle and pig bones. Other species found at the site include dog, shellfish (shank), soft-shelled turtle, ass, and sambar (*ibid.*: 155-160).

Despite its apparent size, Rangpur does not demonstrate the same urban characteristics as Lothal. There is very little evidence for manufacturing within the site, despite the presence of bronze and copper artefacts and beads. The faunal evidence suggests that animal husbandry was a key element of the subsistence strategy at Rangpur. This pattern is visible within two other sites within Lothal's Localisation Era hinterland, Kanewal and Vagad (see Figure 5.27 and section 6.4.2.2.2).

6.4.3.2.3 Wider survey in Lothal's hinterland

Further survey work has been undertaken in the river valleys west of Lothal, notably the Limdi Bhogava and Sukha Bhadar valleys. Although using the village-

to-village survey technique, as opposed to a more systematic approach, Dimri has been able to identify 48 Indus Valley Tradition sites in the area surrounding Rangpur and Vagad (Dimri 1999, 2001). The vast majority of these sites are small (<5 hectares in size) and date to the Localisation Era, mirroring the results of the previous chapter. Dimri identifies that most of the sites are situated close to rivers, or near small depressions that hold monsoon rains. In total, 44 sites dating to the Localisation Era were identified, and are characterised by the presence of ceramics, lithics, terracotta and shell objects (*ibid.*: 36). Dimri suggests that the settlement patterns indicate a "deurbanisation" and the redistribution of population over than landscape (2001: 50). Sites shift from the agriculturally fertile black cotton soils during the Integration Era, to the marshes and mud flats more suited for a pastoral lifestyle in the Location Era (*ibid.*: 52).

6.4.3.2.4 Tarana-III

Tarana-III was identified on survey by Bhan and is in Jodiya Taluka, Jamnagar District. Very little is known about the sites other than its dimensions (1000x600 metres) and that there was a substantial amount of worked stone found at the site (Bhan 1989). Only surface exploration has been carried out at the site, with ceramic and lithic finds used to date the site. Consequently, there is very little that can be ascertained regarding its function. The large size of the site may well be the result of the ploughing of a tell-site, spreading the artefacts over a wider area and leading to an over-estimation of site size. However, it is still significantly larger than any other site in Gujarat during this period. The majority of sites within Tarana-III's hinterland have also been subjected to surface examination only, and as such there is little information from which to ascertain functions. All of the sites that have been excavated also have Integration Era occupation levels; so have already been partially addressed within this chapter.

6.4.3.2.5 Other excavated sites in Tarana's hinterland

Section 6.4.2.2.6 has already detailed the Integration Era levels at Rojdi. During the Localisation Era the site was extensively remodelled, and Possehl and Raval (1989: 50) identified the construction of a large square building and circumvallation during this period (Rojdi C). There is very little change in terms of material culture and subsistence strategies from the Integration to Localisation Era. There is, however, a change in ceramic styles. The evidence from Rojdi

suggests that there was no significant upheaval between these two periods, other than stylistic developments.

At Kuntasi and Bagasra (see sections 6.2.3 and 6.2.4 for more details) there is further evidence to support the continuity between the Integration and Localisation Eras in terms of craft manufacturing and subsistence strategies. The most significant change between the Integration and Localisation Era occupations at the sites is visible through ceramic styles. However, the division of these sites is primarily reliant upon ceramic typologies, so this is to be expected. Dhavalikar *et al.* (1996: 39) describe Period II at Kuntasi as a period of decline, or more specifically that "Harappan activity begins to decline". However, excavations at the site identified clay furnaces used for copper smithing, and the manufacture of lapis lazuli and gold beads. The major reasoning for the "decline" of the sites is the disappearance of some of the archaeological indicators for the Harappa Phase of the Integration Era. However, Dhavalikar *et al.* admit that a large number of these indicators weren't present at the site during the Integration Era anyway (*ibid.*: 39ff).

6.4.3.2.6 Wider survey in Tarana's hinterland

Whilst over 100 sites have been identified within a 150 kilometre radius of Tarana-III, very few of them have detailed information. The most extensive information comes from Bhan (1986, 1989) who has undertaken numerous surveys in western Saurashtra. The vast majority of the sites he identified relate to the late Integration and early Localisation Eras. 42 sites were assigned to a period spanning the Integration Era and Regionalisation Era (Rangpur IIB-IIC c.2200-1700 BCE), including Nageswar, which has been identified as a shell-procurement, and processing centre (see section 6.4.2.2.5). Bhan also identified two sites purely on the basis of lithic debitage, with no associated pottery. He interprets these sites as specialised lithic workshops, although acknowledges at other sites such workshops are often visible at the edge of habitation structures. Fourteen sites have been identified as late Localisation Era, characterised by the presence of Lustrous Red Ware. Bhan suggests that settlement in western Saurashtra was dictated by the availability of fertile soil (mostly black cotton soil) and potable water. Sites were concentrated in those areas where black cotton soils predominate; leading Bhan to suggest that agriculture was a staple of the economy in the region (1986: 9). Sites located in areas away from these soils tended to have higher concentrations of lithics and shell artefacts, suggesting that

they may have been located for either the procurement of raw material or for processing such material. Agate and chalcedony deposits have been identified in Bhanvad, Jodiya and Lalpur Talukas, where these sites are common (*ibid.*).

6.4.3.2.7 Summary

There does not appear to be any major developments in terms of site function during the Localisation Era as compared to the Integration Era (section 6.4.2.2). Lothal remains engaged in bead and copper working, although the volume of copper being processed decreases, as well as the discontinuation of chert and steatite. Locally available materials become more prevalent. However, the site remains an important craft manufacturing centre in the region. A number of sites within Lothal's hinterland persist from the Integration Era into the Localisation Era (i.e. Rangpur, Rojdi, Kanewal, Vagad) demonstrating an element of continuity. However, there is also a profusion of small sites (<5 ha) established within the river valleys. There is no evidence of craft activity within these sites, and Dimri (2001) suggests that they are primarily pastoral in nature.

Like Kotada (Jamnagar) during the Integration Era, there is very little information available for the largest site in Saurashtra during the Localisation Era - Tarana-III – or many of the sites in its hinterland. Bagasra and Kuntasi continue as centres of large-scale craft manufacturing, and Bhan (1986) has identified dedicated lithic processing sites in Jamnagar. However, lithic processing was not restricted to these sites, but at other sites such activities were undertaken on the edges of habitation areas.

6.4.3.3 North Gujarat

Section 6.4.2.3 discussed North Gujarat during the Integration Era and acknowledged that the vast majority of the sites in North Gujarat date to the Localisation Era. Localisation Era occupation levels have been identified at the excavated sites of Datrana, Nagwada and Santhli (discussed in section 6.4.2.3.1) and Ratanpura and Zekhda. Localisation Era deposits have also been identified at Datrana-I, -II, -III, -V and –VI, although only Datrana-II has been excavated and has already been discussed in section 6.4.2.3.1. The occupation levels at Datrana-II are restricted to a series of small pits, possibly functioning as pottery kilns. No habitational structures have been identified. Santhli-V and –VI have also been identified through the presence Localisation Era deposits, although neither

of these two mounds at the site has been excavated. Similarly, mounds II, III and V at Nagwada have not been fully excavated, although surface investigation suggests that shell-working remained an important element of the site during the Localisation Era (see section 6.4.2.3.1).

Excavations at Zekhda have identified several structures from a series of post-holes, all arranged in a circular fashion. Below one of the compacted floors were two small clay pots containing approximately 34,000 steatite microbeads and two gold beads. The excavator believes that Zekhda was an industrial site established to exploit the locally available shell and mineral resources (Sonawane 2005.: 219). Ratanpura has been identified as a food-processing site due to the high volume of faunal remains and stone tools. Faunal remains include domesticated cattle (68%) and sheep/goat (11%), and wild pig (7%), sambar (2%), rabbit, chital, blackbuck, chinkara, nilgai, Indian boar and camel (all <1%) (Bhan 1994: 82f; Sonawane 2005: 220). In addition, a series of small circular pits were identified at the site, filled with ash, terracotta lumps, and charred and uncharred bones. The purpose of these pits is unknown.

Bhan suggests that there was a shift in subsistence strategy from a sedentary agricultural one during the Integration Era to a pastoral based one during the Localisation Era. The majority of sites that have been identified are small, often consisting of only a few ceramic sherds (1994: 83), similar to the sites found on the Gujarat Environs Survey. Bhan also notes that sites are all located close to depressions that hold water for four-six months after the monsoon season. He notes that during the Localisation Era there is a slight geographical shift in settlement locations inland and away from the Rann of Kutch into the Rupen Valley. These areas provide good fodder after the monsoon rains, and Bhan suggests that many of the sites in this area during the Localisation Era are temporary or seasonal camps (*ibid.*: 83f).

6.4.3.4 South Gujarat

The previous chapter demonstrated that South Gujarat was the least populated region of Gujarat during the Indus Valley Tradition, with only 17 sites identified. Sites were invariably small, although two have been excavated, providing us with information as to their function. Jokha is a small site in Surat District measuring 1.57 hectares and dating to the Localisation Era. Excavations at the site have revealed a predominantly microlithic tool using community with ties to both

Saurashtra and the Deccan (Mehta *et al.* 1971). Faunal analysis indicates the presence of cattle, sheep, goat, pig, dog, rat, hyena, river turtle, ass, barasingha and spotted deer (*ibid.*: 70ff), suggesting a subsistence strategy based upon a mixture of domesticated and hunted species. Microliths were made predominantly from jasper, chert, chalcedony and agate, all of which are available within a 30-kilometre radius within the Tapi Valley (*ibid.*: 77). Dhatva is a 1.76 hectare site, also in the Tapi Valley. Again, excavations have identified a microlithic tool using community with links to both Saurashtra and the Deccan plateau. Locally available material was used in the manufacture of microliths, with a particular preference for jasper (Mehta *et al.* 1975). Faunal analysis indicates the presence of domesticated cattle, sheep, goat, pig, water buffalo, dog and wild pig, turtle, barasingha, chital, hog deer, nilgai, crocodile, monitor lizard, hare, rat as well as marine bivalves (*ibid.*: 60).

Both Dhatva and Jokha demonstrate links with the Indus Valley Tradition and contemporary Chalcolithic communities within Central India. They are both primarily dependent upon lithic tools, although a small number of copper artefacts have been found at the sites. These lithics are almost exclusively manufactured from material available within a 30-kilometre radius of the sites. The subsistence strategies at both sites utilises both domesticated species (cattle, sheep, goat, water buffalo), and wild species acquired through hunting and fishing. As such, they do not appear to be dependent upon any larger settlement. However, this is not to say that they were disconnected from any larger trade networks. In fact, they appear to be involved within the Indus Valley Tradition networks, as well as those extending into Central India. These two sites mark the southern most extent of Indus Valley Tradition influence (but not necessarily control).

6.3.4.5 Summary

The Localisation Era in Gujarat appears to be a period of continuity and change. Many of the key sites of the Integration Era – Dholavira, Kotara, Surkotada in Kutch; Lothal, Rangpur, Rojdi, Bagasra and Kuntasi in Saurashtra; and Nagwada, Datrana and Santhli in North Gujarat – continue to be occupied. In addition, they maintain many of the characteristics and functions of the Integration Era in terms of craft manufacturing and site morphologies. However, at the same time there is the emergence of new ceramic styles and the disappearance or alteration of typical Integration Era indicators - seals, script, weights and certain ceramic forms.

This again resonates with the rank-size hypothesis that the settlement pattern in Gujarat was becoming less integrated, and that new smaller centres were beginning to emerge as competition to established centres. Certainly there is an increase in the number of large coastal settlements in Saurashtra during this period – such as Budhel, Kaj, Somnath and Khambhadar (see sections 5.4.1.2 and 5.4.1.4), suggesting a possible shift in focus from overland to seaborne trade, or a greater reliance on marine food-sources. However, there is as usual very little further information available for these sites.

6.5 Discussion

This section will discuss the similarities and differences between the Cholistan and Gujarat datasets regarding site functions. From the above results (sections 6.3 and 6.4), two clear differences are apparent: 1) there is a greater degree of industrialisation in Cholistan and industrial sites tend to cluster around the larger sites in Cholistan; and 2) that there is a greater continuity in occupation and site functions in Gujarat.

Taking the first point, the evidence from Cholistan demonstrates that almost half of the sites (43%) during the Integration Era were exclusively engaged in manufacturing activities, whilst 30% were purely residential. This separation of space into domestic and industrial represents a deliberate effort to define and separate activity zones. Within Gujarat there is separation of manufacturing and domestic spheres – but they would still be within the confines of individual sites. For example, at Lothal the bead and copper working areas are found only within the eastern section of the city, whilst at Kuntasi it was found to the west. At both sites, there was a separate "elite" section of the city also. The only evidence of a purely industrial site in Gujarat is Nageswar – although this was only engaged in the initial processing of shell, so as to lessen the amount of material to be transported to manufacturing centres. Industrial sites in Cholistan also cluster around the larger sites is particular visible during the Integration Era. In Gujarat, manufacturing centres are dispersed throughout the region, although the close proximity of Bagasra and Kuntasi is a notable exception. The lack of these intensive ceramic production centres in Gujarat is notable. It remains unclear whether the manufacturing centres that were abundant within Cholistan were producing ceramics for local use or for trading purposes. If it were to satisfy local

demands, we would expect to see a similar pattern of ceramic producing sites within Gujarat, especially near the larger urban sites. Otherwise, either the ceramics being produced at these sites in Cholistan were for trade purposes, or the unlikely concept that there was a greater demand for ceramics in Cholistan. Consequently, the question arises as to why Cholistan witnessed the development of specialised industrial sites away from residential areas, whilst at the same time in Gujarat craft manufacturing was undertaken within the boundaries of settlements, and do any of the models of social and political organisation explain this?

Addressing the second point, that there is a greater continuity in occupation and site functions in Gujarat, it is clear that many sites in Gujarat (Lothal, Kuntasi, Bagasra, Nagwada, Datrana) retain their functions and roles from the Integration Era into the Localisation Era. In particular, Lothal remains a major centre of ceramic, bead, shell and copper manufacturing during both Eras, with a series of smaller sites located within its hinterland. Other sites that have both Integration and Localisation Era occupations also retain similar site functions and occupations during both periods. The major changes that are apparent are ceramic and artefactual stylistic changes, as opposed to fundamental changes in site morphologies. The only exception to this would the site of Dholavira, which drastically decreases in size from the Integration to Localisation Era. However, even its reduced form, manufacturing industries persist at the site, even if to a lesser degree than before. On the other hand, there is very little occupational continuity between Phases in Cholistan (see section 5.3.2) and this is also the case with regards to site functions. Each successive Phase in Cholistan presents very different patterns of site function, and ratios of sites with different functions. However, the idea that no site was persistently occupied throughout more than two of the Phases of occupation suggests a methodological inconsistency, rather than a reflection of settlement patterns.

Moving onto the smaller, non-industrialised sites identified within both Cholistan and Gujarat, the evidence from the Gujarat Environs Survey suggests that A007 (Mota Dahisara) was involved within the wider integration and distribution networks that existed during the Indus Valley Tradition. It also suggests that other small settlements were not passive participants in a rural landscape. Excavations at the sites in the vicinity of Lothal have all yielded evidence of beads and copper implements – despite no evidence of craft manufacturing at those sites. This is

suggestive of a well integrated community in Gujarat, but one that has manifested itself in a very different way to Cholistan.

6.6 Chapter Summary

Rather than discussing the implications of this chapters result for the models of social and political organisation, the following chapter will combine the results of this chapter with the previous chapter and discuss each model in turn. This section will summarise the findings from this chapter. The chapter aimed to examine settlement function within the Gujarat Environs Survey, Cholistan and Gujarat. In order to do this for Cholistan the chapter examined the changing number, size and distribution of each of the four categories of function through each chronological phase of the Indus Valley Tradition. It also examined the overall relationship between sites of the 'same' function, and between sites of different functions. The site function data analysis for Gujarat was more reliant upon excavation reports and interpretations of survey data for its results, and was consequently more descriptive than analytical. However, it provided a greater insight into changes and developments of individual site functions, rather than as a group. This summary will begin by reviewing the Gujarat Environs Survey results

The Gujarat Environs Survey provided systematic coverage of a small 10x5 kilometre block of land between the two sites of Bagasra and Kuntasi. In terms of settlement function it identified a number of small, temporary, most probably pastoral sites that yielded evidence of ceramics, lithics and shell debitage. The survey demonstrated that small sites do exist within the Indus Valley Tradition; however, surveys must have a methodology that is capable of identifying them. The largest site identified on the survey was Mota Dahisara (A007). Despite its small size (0.19 hectares) the site was identified through the presence of quern stones, shell bangles, shell debitage, terracotta 'hopscotch', bead blanks, ceramics and lithic tools. Even today, the area encompassed by the survey is utilised by both agricultural and pastoral communities. Finally, the survey demonstrated that although excavations have been undertaken at urban sites, there are a vast number of activities that support urban sites that are performed outside of the urban zone. In understanding the nature of urban sites, and their relationship with rural communities and the wider landscape, such activities must

be considered. This not only includes charcoal making, but also clay collection, fishing and hunting, as well as activities such as washing and waste disposal.

This chapter also reanalysed the data from Mughal's (1997) survey data from Cholistan. The Cholistan data provided an intensive, if unsystematic, survey data from a relatively small area, defined by a natural feature – the Ghaggar-Hakra River. It ascertained that the Regionalisation Era is characterised by increasing levels of industrialisation and sedentism. Kilns and other indicators of craft manufacturing were found on the peripheries of residential mounds. The Integration Era demonstrated high numbers of purely industrial sites, coupled with very few small temporary camp sites. These industrial sites appeared to be clustered together around larger sites, and were primarily engaged in ceramic production. Residential sites, on the other hand, appear to be dispersed throughout the landscape. By the Localisation Era, there was a reversion to less industrialisation and an increase in residential and camp sites. Very little attention was paid to the wider landscape during Mughal's survey, as the primary goal was to identify sites within the river valley.

Beginning with Kutch, the major sites of Dholavira, Kotara, Desalpur and Surkotada all present an air of domination and control over their surroundings. Dhavalikar (1995) suggests that this was part of a deliberate economic colonisation of Western India by people from the Indus Valley. However, due to the lack of detailed excavation and survey it remains unclear as to whether this is the case or not. The size and scale of Dholavira during the Integration Era represents a heavy investment in material and labour for no immediately obvious reason. It had been assumed that Dholavira was developed in order to establish economic, political and military control of Kutch, and maybe mainland Gujarat. However, one must also consider the symbolic impact of Dholavira – a potent demonstration of the power and wealth of the Indus Valley Tradition, through the ability to sustain a flourishing city within the middle of salt flats. Desalpur and Surkotada are identified as military garrisons or outposts located on the major trade routes from western India to the Indus Valley. There is little evidence of craft specialisation at these smaller sites, and the evidence from Dholavira is too scarce at the moment.

Sites within Kutch also take advantage of the natural topography. Dholavira is situated on a *khadir* – a natural island within the Great Rann of Kutch – as are Desalpur and Kotada. However, low rainfall and alkaline soils mean that

agricultural potential is poor in Kutch. Consequently, pastoralism would have played an important role in the subsistence economy of Kutch, as demonstrated by the site of Shikarpur. Surveys suggest the landscape of Kutch was widely unpopulated with a dispersed settlement population, almost the opposite of the patterns witnessed in Cholistan.

In Saurashtra there is a more diverse set of site functions, however there is no information available for the largest site – Kotada (Jamnagar). Lothal, however, presents all the evidence of a regional capital, and is the only site in mainland Gujarat that has demonstrated the presence of public buildings. There is also bead manufacturing, copper-smithing and ceramic production evident at the site, which would have functioned as a major trading centre, linking Gujarat and the Indus Valley to the Chalcolithic communities to the south and east. The identification of a "dock" remains questionable. The hinterland around Lothal is more heavily populated than Dholavira's, with sites ranging from small ceramic scatters to sites such as Vagad, Rojdi and Kanewal. These sites demonstrate some small scale craft specialisation, but not the same urban characteristics of Lothal. The large repertoire of artefacts found within them suggests a high level of interaction with Lothal – a core-periphery relationship, indicative of early state modules.

The two sites of Bagasra and Kuntasi demonstrate high levels of craft specialisation and manufacturing, but do not share the same urban characteristics as Lothal. In fact, in their morphology they share more in common with the fortified sites of Surkotada and Desalpur. As such, it is unlikely that either functioned as a regional capital, but was more likely part of either Dholavira's or Kotada's (Jamnagar) hinterland, most likely the former. Nageswar was a shell processing site located at the western tip of Saurashtra whose primary purpose was to obtain marine shell – *Turbinella Pyrum* and *Chicorus Ramosus* – undertake the initial processing and then ship them to larger manufacturing centres, possibly Bagasra and Kuntasi. Nageswar is the only site to demonstrate an almost exclusively industrial/economic role in Saurashtra.

Sites in Saurashtra were almost exclusively located close to rivers or lakes, providing water for drinking, irrigation and animal herds. Some smaller inland sites are located at vantage points within valleys, to allow herders to monitor their animals. The economy of Saurashtra was geared towards exploiting the natural resources available – shell from the Gulfs of Kutch and Khambhat, as well as the

Great and Little Rann of Kutch, and local sources of jasper, chert, chalcedony and carnelian for beads. Faunal remains indicate a subsistence strategy that is heavily based upon domesticated cattle, sheep and goats, supplemented by domesticated water buffalo and numerous wild species.

No sites in North Gujarat demonstrate the characteristics indicative of an urban centre, yet many of them yield evidence of craft specialisation, particularly shell and bead manufacturing. However, shell manufacturing in North Gujarat relied upon recycled and discarded shell, possibly acquired from the larger manufacturing sites of Bagasra and Kuntasi. Craft activity is most clearly evident at Datrana, Nagwada and Moti Pipli. Majumdar (1999) suggests that Moti Pipli acted as a central place – a permanent site with temporary pastoral settlements in its hinterland. However, no individual site in North Gujarat stands out as a primary centre. South Gujarat is characterised by small microlithic sites that demonstrate links with both the Indus Valley Tradition and the chalcolithic sites of the Deccan Plateau. The following chapter will focus upon the aim of the thesis – to test whether the models of political and social organisation for the Indus Valley Tradition are supported by the analysis of site distribution and function within Gujarat and Cholistan.

Chapter Seven - Discussion

7.1 Introduction

As stated in section 1.3, the aim of this thesis is to test existing models of the social and political organisation of the Indus Valley Tradition through an analysis of the distribution and function of sites within Cholistan and Gujarat. These models were outlined in section 3.3, 3.4 and 4.3. Chapter Two examined the modern geography and palaeoenvironment of the Indus Valley Tradition, looking specifically at palaeoclimatic research in the Thar Desert, the Arabian Sea and the Himalayas. It also examined hydrological developments within the Indus Valley, the Ghaggar-Hakra River, the Punjab rivers and watercourses within Gujarat. It identified that the Indus Valley Tradition covers a wide variety of topographies, climates and environments that are heavily influenced by seasonal variations in temperature and rainfall. In terms of palaeoenvironmental reconstructions, this thesis has identified a pattern of fluctuating precipitation linked to changes in the strength of the southwest monsoon. It also established that modern river management techniques have significantly slowed the rate of sediment deposition within the Indus Valley, and that the vast majority of archaeological sites within this region will have been masked by deep alluvium. In contrast, the drying of the Ghaggar-Hakra River resulted in a period of erosion, and subsequently archaeological sites are much more visible within Cholistan. Finally, it surmised that there is no archaeological, hydrological or geological evidence to link the Ghaggar-Hakra River with the Vedic Saraswati River.

Chapter Three outlined the chronology of the Indus Valley Tradition, as per the second objective of this thesis, and discussed the potential problems with adopting Shaffer's chronology (1992a) over other viable chronologies, such as Possehl and Rissman's (1992a). However, this thesis adopted Shaffer's chronology due to the greater geographical diversity within chronological periods, it has greater scope for continuity and overlap between chronological periods; and it's rejection of the notion of social evolution and the idea that societies go through a birth→fluorescence→death. At the same time it was noted that the links between Shaffer's chronology and culture-historical concepts of archaeological assemblages, such as "cultures" equalling ethnicity are a potential problem. The reliance upon relative dating techniques throughout most of the Indus Valley

Tradition was highlighted as a potentially problematic element, and prompted the decision to use the more flexible chronology of Shaffer. OxCal calibration of existing radiocarbon dates did not yield any significant developments, mostly due to the lack of available dates, and the low accuracy of them.

The existing interpretations of the social and political organisation of the Indus Valley Tradition were introduced in Chapter Three, and developed further in Chapter Four. The existing interpretations of .the Indus Valley Tradition were categorised into four models of political organisation and five models of social organisation (Table 3.4). The theoretical frameworks of each model were discussed and predictive models outlined for each one. The chapter argued that the Indus Valley, as well as other contemporary societies, studies have been overly influenced by culture-historical approaches. It went on to discuss how these culture-historical concepts have been overturned within Mesoamerica, allowing archaeologists to move beyond social evolutionary theories and incorporate post-processual theories into their interpretations. Chapter Four also outlined the methodologies used within the Gujarat Environs Survey, and detailed how the datasets of known sites in Cholistan and Gujarat were compiled and the criteria used within them. It identified that all of the survey work undertaken thus far in Gujarat and Cholistan has been unsystematic in its approach, and as such numerous biases have been incorporated into the datasets. The Gujarat Environs Survey aimed to remedy this by adopting a systematic survey methodology, and to test whether such survey techniques are viable in the region. Finally, Chapter Four also detailed the methodologies that were used to test the predictive models against the two datasets of known sites.

Chapters Five and Six presented the results of the analysis regarding site distribution and site function for the Gujarat Environs Survey, and the datasets from Gujarat and Cholistan. Chapter Five examined the spatial and temporal distribution of sites within Gujarat and Cholistan, undertook rank-size analysis and identified potential central places within the landscape. The results indicate that there is evidence for both continuity and change over time in both Gujarat and Cholistan. In Gujarat, there was a greater degree of continuity between Eras, particularly from the Integration into Localisation Era. However, there were substantial differences between settlement patterns in Saurashtra and Kutch, two areas divided by the Rann of Kutch. Over time in Gujarat there was an increase in the number of sites, but this was matched by a decrease in average site sizes. In Cholistan there was much less continuity between each Era, but this appears to

be a greater reflection of the survey methodologies used. The Integration Era was the most populous period in Cholistan, and there was a decrease in both site numbers and size into the Localisation Era.

Chapter Six developed these findings further through an examination of the function of sites within their respective landscapes. The Cholistan data provided an intensive, if unsystematic, survey from a relatively small area, defined by a natural feature – the Ghaggar-Hakra River. It ascertained that the Regionalisation Era was characterised by increasing levels of industrialisation and sedentism. The Integration Era demonstrated high numbers of purely industrial sites, coupled with very few small temporary camp sites. By the Localisation Era, there was a reversion to less industrialisation and an increase in residential and camp sites. Gujarat presented a much more diverse set of results, due to the greater number of surveys and excavations that have been undertaken there. Sites range from the massive imposing settlements of Dholavira and Kotara in Kutch, to manufacturing and trade centres such as Lothal, to small manufacturing centres such as Bagasra, Kuntasi and Moti Pipli. In addition, Nageswar was identified as one of the few purely industrial sites in Gujarat. However, overall the site function analysis was severely hampered by the lack of systematic survey and detailed publications in the two regions, as identified in Chapter Four.

Having outlined the previous five chapters, this chapter will bring together the results from the thesis so far and discuss their role in achieving the aim of this thesis – to test models of social and political organisation of the Indus Valley Tradition. It will begin by reviewing the models of social and political organisation, and ascertaining whether their predictive models have been met or not. It will then go on to discuss the impact of the palaeoenvironmental reconstructions, chronological issues and the impact of survey methodologies upon the data used within this thesis.

7.2 The predictive models

This section will examine the impact of the results from chapters Five and Six upon the predictive models outlined in section 4.3, and ascertain whether the results match the predicted outcomes. It will briefly outline the concepts of each of the nine models of political and social organisation, the predictive/falsifiable model

for each, and then discuss whether the results of the site distribution and function analysis supports or disproves the various elements of the model.

7.2.1 Twin Capital Empire

The Twin Capital Empire model stems from the early interpretations of Marshall (1931), Piggott (1950) and Wheeler (1959, 1968) – see sections 3.3.1 and 3.3.2. The main focus of the model was that the Indus Valley Tradition was an imperial power, run from the two capital cities of Mohenjo-daro and Harappa. This initial hypothesis has been weakened by a number of archaeological discoveries (such as Mehrgarh) and has been widely discredited by several archaeologists – see section 4.3.1.1. As such, this thesis is testing a modified version of this original hypothesis, incorporating more recent work on the structure of Empires (Barfield 2001). He suggests that empires support themselves through the taxation of its inhabitants and tribute gained from its constituent parts. They also maintain a large and permanent army to protect its borders and maintain internal order. Empires were designed to exploit diversity, and as such regional variations in subsistence and economic patterns were tolerated so long as they did not oppose the ideology of the Empire. An 'imperial project' – i.e. massive monumental architecture – would be undertaken in an attempt to impose unity upon a disparate population (see section 4.2.2).

The predictive model for the Twin Capital Empire (4.3.1.1) stated that a strict settlement hierarchy should be evident, as well as sophisticated transportation and communication systems. This strict hierarchy would be evident through the presence of a log-normal rank-size curve. Regional variations in ceramic styles and subsistence strategies would be expected, especially within more peripheral areas, such as Gujarat. Any military infrastructure would be based on the frontier, not within the interior. However, a major discrepancy arises in relation to cultural uniformity. Early Indus scholars argued that cultural uniformity was evident throughout the entire Indus Valley Tradition – Piggott's concept of a spaceless and timeless society (1950). Barfield, however, argued that imperial rulers welcomed different ethnicities and regional variation.

Chapter Five demonstrated that the predicted strict settlement hierarchy was not present within either Gujarat or Cholistan (see section 5.3). The central place analysis from Cholistan suggested that there may have been some degree of settlement hierarchy in place (see section 5.4.2), and this was most evident

during the Integration Era, although there is also evidence for centralisation during the Hakra Phase. However, rank-size analysis contradicted this hypothesis suggesting that, during the Integration Era at least, Gujarat was in fact more stratified than Cholistan. As such, Cholistan's settlement pattern may have been the result of an organic development of settlement in the region, rather than the planned systematic systems expected within the Twin Capital Empire model. Likewise, Gujarat's more integrated settlement system may be influenced by other factors than a centralising authority based in the Indus Valley.

Chapter Six demonstrated that the sites within Cholistan were standardised in terms of site function, although this appears to be a greater reflection of the survey methodology adopted by Mughal than a result of archaeological analysis (see section 7.5 below). In fact, most of the evidence to support the Twin Capital Empire model is borne out of archaeological investigations that have already presumed the presence of an empire. Sites within Gujarat, such as Lothal, Kuntasi, Rangpur, Rojdi and Dholavira, have all been excavated with a view to link them to the urban sites of the Indus Valley, rather than attempting to understand them as individual sites.

Despite this, it is possible to test Barfield's concept of an empire (2001: 29-33; see section 4.2.2) from the results of Chapter Six. The first of Barfield's aspects, that "*empires were organised both to administer and exploit diversity, whether economic, political, religious, or ethnic*" is visible through the retention of local ceramic traditions in Gujarat throughout the Regionalisation, Integration and Localisation Eras. The so-called division of "Sorath" and "Sindhi" Harappan groups in Gujarat (Possehl 1980, see section 6.2.4) and the presence of "Anarta" wares in North Gujarat (section 6.4.2.3), and "Prabhas" and "Padri" Wares in Saurashtra (section 6.4.1.2) may indicate a tolerance of local/regional cultural groupings/ethnicities. However, that is not to say that pots=people, and that different ceramic styles reflect different ethnic groups in the vein of Childe or Shaffer and Lichtenstein – see section 3.2.6. On the contrary, the culture-historical framework of much of South Asian archaeology means that ceramic typologies are the only area where detailed enough studies have been undertaken in order to identify regional variations.

Barfield's second two identifiers of empire: "*empires established transportation systems designed to serve the imperial centre militarily and economically*" and "*empires had sophisticated systems of communication that allowed them to*

administer all subject areas from the centre directly" are difficult to identify archaeologically. If Mohenjo-daro and Harappa are the twin capitals, communication would most likely be along the Indus River, whilst the vast amounts of sedimentation that has occurred within the lower Indus (section 2.3.2.3 and 2.3.2.4) will have masked any overland routes. There is also the possibility that communication was water-based, utilising the Indus and Punjab Rivers, and the coast stretching from Sutkagen-dor to Lothal. Smith has argued that the Mauryan Empire, a later South Asian example, was not characterised by the imperial control of territory, but the imperial control of routes of transportation and communication. She argues, "territories and their boundaries are porous, permeable, flexible and selectively defended" (2005: 835). She suggests that empires are better understood as networks, rather than homogenous territorial entities (*ibid.*: 845). As such, any notion of an "Indus Valley Empire" may be better expressed as a network system (Figure 7.01), as opposed to a defined spatial polity with borders, armies, administrators and priests

Barfield's fourth identifier of an empire, "*empires proclaimed a monopoly of force within the territories they ruled and projected their force outwards*" can also be inferred from Chapter Six. Sites within Gujarat, and Kutch in particular, are characterised by substantial surrounding walls and strengthening bastions (section 6.4). If these are fortification walls, as suggested by Bisht (1991, 1999), Dhavalikar (1995) and Joshi (1990) this may well represent the outward projection of an Indus Empire's military might. The rank-size analysis for Gujarat has already suggested that the region was a frontier zone, and the presence of fortified settlements within the region would support this hypothesis. However, at the same time, there is no definitive evidence that the circumvallations are defensive in nature. Similarly, very little military equipment has been recovered from excavations at Surkotada – the only one of the possible sites that has been excavated and published (Joshi 1990). Finally, Barfield identifies that "*empires had an 'imperial project' that imposed some type of unity throughout the system*". Whilst there are no monumental structures on the scale of the Pyramids, the massive walls surrounding sites such as Mohenjo-daro, Harappa and Dholavira would have required massive investments in terms of person-hours, whilst structures such as the Great Bath at Mohenjo-daro, and even the "dock" at Lothal represent large-scale investments of people, time and resources.

7.2.2 Proto-State

The Proto-State model is derived primarily form the work of Jacobson (1987) – see section 3.3.5 – who suggested that the Indus Valley Tradition was organised along the lines of an early state. The predictive model is based upon a combination of Jacobson's arguments (3.3.5), Trigger's concept of a Territorial Empire (section 4.2.4) and settlement size data from northern Mesopotamia (section 4.3.1.2). The Proto-State model argues for a single unified society within the Indus Valley Tradition, with centralised political and economic systems.

The predictive model dictated a four-tiered 'satellite' settlement system focused upon several key sites, including Ganweriwala, Lurewala, Dholavira and Lothal. However, there is no indication of how large an area each of these sites would control. Small agrarian communities would have supported them in terms of subsistence and resources and provided markets for their finished manufactured items. Secondary centres would have controlled a hinterland of roughly 50km. A highly visible dichotomy should be evident between urban and rural sites. Urban sites would be engaged in craft specialisation and the exchange of goods, whilst rural sites would be primarily focused subsistence strategies and possibly the procurement of raw material.

Chapter Five demonstrated that the notion of a four-tiered settlement pattern for the Indus Valley Tradition is questionable. It would be possible to demonstrate the presence of a four-tiered settlement pattern within the Indus Valley Tradition, but at the same time it would also be possible to create a three-tiered, or five-tiered or even six-tiered pattern dependent on the selection of criteria (size, walls, kilns, etc.). Without defined parameters as to what a 'tier' represents, there are endless permutations as to defining a tiered settlement hierarchy. Despite this, there is evidence from Cholistan to suggest the existence of a 'satellite' settlement system based around Ganweriwala (Figure 5.20). Yet, rank-size analyses from Gujarat suggest that there were low levels of vertical integration, not the strict hierarchy predicted by Jacobson (1987).

Jacobson suggested that there would be a sharp dichotomy between urban and rural settlements. This is clearly evident within Cholistan where, during the Integration Era, 43% of the sites were only engaged in industrial activities, whereas 30% of the sites had no industrial activity upon them (section 6.3.2). During the preceding and succeeding Eras, this dichotomy is not as clearly defined – instead there are a greater number of hybrid residential-industrial sites.

Although, this division of sites is a greater reflection of the survey methodology adopted by Mughal than archaeological reasoning (see section 7.5 for more discussion). Within Gujarat, this dichotomy is not overly evident (possibly a reflection of the wider variety of survey and excavation techniques used), as most sites appear to be engaged in a wide variety of activities. The simple division of site functions in Cholistan was not possible in Gujarat – again this seems to be the result of different methodologies rather than archaeological differences. The data from Gujarat did provide more site-specific details regarding craft specialisation and manufacturing industries. Some sites, such as Nageswar during the Integration Era were engaged in specific manufacturing processes – in this case shell procurement and processing – whilst sites such as Bagasra, Kuntasi, Nagwada and Lothal were engaged in the processing and manufacturing of a number of different material and items (see several sections within Chapter Six). There does appear to be a distinction between sites engaged in manufacturing and those that were not. However, it remains unclear whether sites within the hinterland of manufacturing sites were supporting them in terms of food, labour and raw materials. Jacobson does not detail the relationship between such sites other than state that they were subordinate. The preoccupation with concepts of hierarchy (see section 7.6 below) intrinsically weakens Jacobson's argument.

7.2.3 Domains

The Domain model is based upon the arguments put forward by Kenoyer (1994, 1998, 2000) and Possehl (1993, 1998, 2003), and to a lesser extent Atre (1989) and Childe (1954) – see sections 3.3.3 and 3.3.4. Both Kenoyer and Possehl argue that the Indus Valley Tradition was essentially decentralised and organised politically and economically into a series of semi-autonomous domains or polities. However, both authors also suggest that there was an over-riding ideological bond between these domains, yet they do not offer an explanation as to how this would function. As such, the concept of city-states has been used as a proxy model against which to test Kenoyer and Possehl's hypotheses. The city-state is a political system centred upon a capital or primary centre, which controls a small, integrated hinterland comprised of a small population. City-states are politically independent, largely sufficient economically and ethnically distinct (section 4.2.3). City-states in Mesopotamia ranged in size from 7-40 km in radius, whereas in Africa they measure up to 70 km in size. However, Possehl and Kenoyer's postulated domains, centred upon the five sites of Mohenjo-daro, Harappa,

Rakhigarhi, Ganweriwala and Dholavira/Lothal, have radii of between 140 and 220 km. Kenoyer states that within these domains, there would be a five-tiered hierarchy of sites visible through their size - >50 ha, 10-50 ha, 5-10 ha, 1-5 ha and <1 ha.

The predictive model for the Domain model derives from Possehl (1993, 1998, 2003) and Kenoyer (1994, 1998, 2000), as well as Charlton and Nicholls (1997) and Stone (1997). It predicts the presence of large urban centres (>40 ha) that are engaged in craft production and provide markets for the exchange of goods. Their hinterlands would extend for seven to seventy kilometres if the Mesopotamian/African city-state model were to be accepted. However, there is scope for a larger hinterland. Small agrarian settlements (1-5 and 5-10 ha) would support the urban centres, and would be culturally and economically tied to them. Secondary centres (10-40 ha) would be visible within larger hinterland areas, and would be situated equidistantly from the urban centre. These secondary centres would be engaged in a combination of craft specialisation, trade and subsistence. There are however subtle differences between unified city-states and highly competitive fragmented city-states (see section 4.3.1.3).

Like the four-tiered settlement system of the Proto-State model, there is very little conclusive evidence to either support or reject the notion of a five-tiered settlement pattern – it is very much dependent upon the criteria dictated by a methodology. The central place analysis indicates that there is little evidence that sites within Gujarat were focused upon Dholavira, whilst the evidence from Cholistan indicates a much smaller and narrower distribution of sites (i.e. they cluster around Ganweriwala) than anticipated. It may be that the proponents of the Domain model have over-estimated the "sphere of influence" of the larger sites, such as Ganweriwala and Dholavira. Charlton and Nicholls (1997) suggest that city-state polities are smaller than the domains postulated by Possehl (1993) (see Figure 3.09), generally ranging from 10-30km in radius, although Trigger suggest that they may extend as far as 70km (2001: 100). The larger area of Gujarat would suggest a series of possible city-states based upon the sites of Dholavira, Lothal, Kotada (Jamnagar), Tarana-III and others, rather than a single unified domain. The central place analysis (section 5.4.1) indicates that these sites may have acted as central places that exerted some form of control over their hinterland. However, claims that Dholavira was a regional capital seem unlikely due to its isolated position. It's location, along with Kotari, suggests that the two sites may have been situated to control trade routes, rather than for

political or administrative control. Sites such as Lothal and Kotada (Jamnagar) may have actually functioned as central places within the landscape. As such, domains or city-states may have existed, but they were larger than those identified in Mesopotamia (Adams 1981, Stone 1997), but smaller than the five domains advocated by Possehl (1993). The possible pooling of sites identified within the convex rank-size curves, particularly that of Cholistan, may be a reflection of the aggregation of multiple small polities in the region. Again, this suggests that the size and control of any possible domains or polities within the Indus Valley have been largely overestimated.

The evidence from Chapter Six is less conclusive due to the difficulty in ascertaining functions for the majority of sites within the Gujarat dataset, and the oversimplified methodology used within Cholistan (see section 7.5). Whether smaller sites within Cholistan and Gujarat were subordinate to the larger urban centres is still debatable – the evidence is not conclusive either way. Relying upon size criteria to affect a settlement hierarchy does not appear to be overly reliable. In fact, Kenoyer suggests that sites under five hectares are rural in nature (1997: 54f), although the majority of sites in Gujarat that have demonstrated evidence for craft specialisation (Kuntasi, Bagasra, Nageswar, Moti Pipli, Nagwada) or have been identified as "military sites" by Joshi (1990: 18) (Surkotada, Desalpur, Pabumath) are all under five hectares in size. In contrast, larger sites such as Rojdi, Rangpur, Vagad are all c.10 hectares in size yet do not demonstrate any significant levels of craft specialisation and appear to be more "rural" in nature than those mentioned above. The simplistic hierarchy proposed by Kenoyer does not mirror the postulated site functions he attributes to each category. Recent work in Sri Lanka has demonstrated that site size can be an unreliable indicator of importance, and that often it is smaller sites that have the most prominent roles in the landscape (Coningham *et al.*: 2007). This suggests that, at least within Gujarat, there is not a simple hierarchy of sites, but rather multiple hierarchies or even heterarchies of sites.

7.2.4 Chiefdom

The Chiefdom model is derived from the work of Fairservis (1971, 1986, 1989), and is based upon the premise that the Indus Valley Tradition was organised along the lines of a chiefdom – see sections 3.3.7 and 4.3.1.4. It argued that pastoral communities played a much more important role in the region than had previously been recognised, and that power and wealth may have been based

upon cattle herds. As such, elite groups would have been based outside of urban centres and could be found within the wider landscape, which had otherwise been considered peripheral. Other authors (Guha 1994, Meadow and Patel 2002, 2003, Mughal 1994, Patel 1997, Possehl 2002b, Possehl and Kennedy 1979) have highlighted the role of pastoral communities, but they have always been identified as peripheral or secondary communities not as the controllers of wealth and power. The predictive model is derived from Fairservis' idealised landscape (see section 4.3.1.4). It predicted that the larger sites would be surrounded by a combination of cattle camps, dispersed agricultural households, industrial centres and administrative centres. The first three categories were engaged in primary activities relating to subsistence and craft, whilst the latter undertook grinding, storage and provided central processing and redistribution.

The rank-size analysis from the Gujarat (section 5.5.1) supports the notion that there were multiple settlement systems operating within the region during the Indus Valley Tradition – possibly representing the imposition of a planned urban system onto a pre-existing more organically developed system. This lends weight to the argument that chiefdoms existed on the peripheries or that the Indus Valley Tradition was characterised by multiple levels of integration. The Regionalisation Era rank-size curve suggested a lower degree of integration, indicating the earlier presence of poorly stratified societies. Comparisons between Gujarat during the Regionalisation and Integration Era with the Middle Bronze Age of the southern Levant, suggest a region that was not integrated into the larger urban cities hinterlands, and where rural growth was not precipitated through urban growth. Falconer describes this as: "rural-based growth and development, or 'rural complexity'" (1994: 326).

Chapter Six demonstrated that there were a variety of site functions within both Gujarat and Cholistan, although the identification of elites in the hinterland is still an open question. Whilst exact site functions are difficult to ascertain it is quite possible that cattle camps, dispersed agricultural households, industrial centres and administrative centres are located in both Gujarat and Cholistan. However, at the same time it is clear that several sites take on more than one of these functions, and that the relationship between sites is much more complex than Fairservis' postulates. The Gujarat Environs Survey identified that there may be a greater number of small, temporary pastoral sites than first thought, and modern observations in Gujarat indicate that pastoral and agrarian communities occupy the same landscape. This reinforces the idea raised in the previous section of

multiple heterarchies within Gujarat. The very nature of Fairservis' model is heterarchical, where power and decision-making is devolved across the landscape.

7.2.5 Priest-Kings

The Priest-King model of social organisation refers to the early interpretations of archaeologists (Mackay 1938, 1941, Marshall 1931, Piggott 1950, Wheeler 1959, 1968) who argued that the Indus Valley Tradition was dominated by a theocratic ruler, or priest-king. The Priest-King model has been widely criticised by scholars who have identified that it was a greater reflection of British colonialism in South Asia than Indus Valley Tradition social structure (see section 4.3.2.1). The model dictates that Indus society was characterised as rigidly stratified, and enforced through religious authoritarianism. At the top of the social ladder was the Priest-King who wielded absolute power and resided in the citadel of Mohenjo-daro or Harappa (he resided at both the winter and summer capitals); below him were the priestly aristocracy who administered the economy and religion of the empire from the aforementioned capitals; below these were the middle classes of the towns and villages who were involved in the production and trading of goods; and at the lower end of the social scale were the agricultural labourers and servile workers.

The predictive model relies upon being able to identify a rigid social hierarchy and class divisions between the priestly aristocracy, the middle classes and semi-servile labourers (section 4.3.2.1). It also requires the identification of the Priest-King himself, evidenced by the centralised control of economy through granaries. As this model is so closely tied to the Twin Capital Empire model, one would be expecting very similar results – and in particular, the presence of an 'imperial project' as defined by Barfield (2001: 29-33). Sites should demonstrate a clear internal division of space, reflecting the strict divisions of society. Piggott describes the Indus Valley as both spaceless and timeless, and thus there should be very little regional variation or cultural elaboration. The Priest-King model has been widely debated beforehand, and has been largely dismissed as a viable model for the Indus Valley Tradition (see section 4.3.2.1).

The results from Chapters Five and Six have demonstrated that there is little evidence of strict settlement hierarchies in both Gujarat and Cholistan. On the contrary, the settlement patterns indicate a much more organic and unstratified society. The models of social organisation have proved to be difficult to test

archaeologically, mostly due to the lack of clarity in the initial construction of each one. It has also become clear that the models of social organisation in particular, are a greater reflection of the social structure of the various archaeologists' contemporary societies rather than a systematic assessment of the Indus Valley Tradition (see section 7.2.10).

7.2.6 Caste System

The Caste System model incorporates the work of scholars who have advocated the presence of a caste or caste-like social structure in the Indus Valley Tradition. Whilst bearing many resemblances to the Priest-King model in terms of strict social hierarchies, the Caste System model does not identify a single individual ruler, but instead identifies a group of priests with a possible "chief priest" (see section 3.3.6). The Caste System has been equated with a nationalist movement within South Asian, and Indian archaeology in particular. Some scholars have argued that caste, in its entirety, was prevalent within the Indus Valley Tradition (Rajaram and Frawley 1995, Talageri 1993), whilst others have suggested that its origins lie within it (Singh 2001) – see section 4.3.2.2.

However, Coningham and Young (1999) have argued that caste cannot be identified within past societies as it did not exist. They suggest that caste-based models are not evident in past societies simply because they did not exist, and that the modern manifestation of caste was a British imperial enforcement of a previously largely symbolic division (section 4.3.2.2). As such, the identification of caste would not be possible archaeologically, and creating a predictive model is problematic. The predictive model for the Caste System model dictates that sites should demonstrate clear spatial differentiation of craft activities within cities. The predictive model would suggest the separation of sites into citadel and lower town, with defined areas of different craft activities.

- The lack of a systematically excavated (and published!) site within both Gujarat and Cholistan means that this was a difficult model to test. Despite this, the internal plans of sites in Gujarat do demonstrate spatial separation of craft activities from domestic and/or administrative functions. Whilst Dholavira was used by Bisht (1999) in his arguments for the presence of a caste system, the archaeological data from the site is too sparse to provide any conclusive evidence – the division of the site into a citadel, middle town and lower town is related primarily to the preconception that Indus urban centres are separated in this

fashion (see section 3.3.1 and 3.3.2), rather than any (identifiable) archaeological reasoning. That such a three-fold separation of the site also supports his arguments for a three-fold caste-based social structure may also be an influencing factor in his analysis.

Away from Dholavira, there is evidence from Lothal, Bagasra and Kuntasi that there is a separation of craft activities from domestic areas, although not necessarily a separation of different craft activities. At Lothal (section 6.4.2.2.1) craft activities were undertaken to the west of the main residential areas, whilst at Kuntasi and Bagasra there is also evidence that craft activities were undertaken away from residential areas (sections 6.2.3 and 6.2.4). However, the separation of craft and residential areas is different to the separation of different craft activities from one another – which is one of the key components of the Caste System predictive model. There is no evidence to suggest that different crafts – and caste groups as a proxy – were delineated within settlements. Nor is their evidence to suggest that sites were engaging in individual activities. Lothal, Bagasra and Kuntasi in particular are all engaged in several different specialisms at the same time.

7.2.7 Oligarchy

The Oligarchy model pertains primarily to the work of Kenoyer (1994, 1998, 2000) and Possehl (1993, 1998), but also incorporates the theories of Atre (1989), Fentress (1976) and Childe (1954). Childe (1954) envisaged a society that was heavily dependent upon economic co-operation between the various cities within the Indus Valley (section 3.3.3). These arguments lead scholars to reject the idea of a singular ruling individual or group, and posit the idea that the major cities of the Indus were controlled by groups of individuals comprised of merchants, ritual specialists and land owners (section 3.3.4 and 4.3.2.3). The competing groups would have vied for control of the larger settlements and the trade within which they were engaged. Different groups in different cities may have co-operated in order to establish economic and trade connections, whilst others may have competed for control over land and trade (see section 4.3.2.3).

The Oligarchy model has been heavily influenced by the earlier work of Childe, who in turn was influenced by Marxist philosophies regarding the development of market economies and social stratification. Kenoyer (1994, 1997, 2000) and Possehl's (1993, 1998) concept of ruling oligarchies is a direct response to the

theories presented by Fentress (1976) and Atre (1989), who both proposed that urban centres emerged for different reasons in different places. This model also shares many similarities with the heterarchy models, although no Indus scholar has linked the two concepts. It is difficult to identify a predictive model of the Oligarchy model due to the vague nature of the social structures proposed by the above scholars. There is very little qualification of the theories presented and as such no discernable archaeological model to test. However, as a compromise, the Oligarchy model dictates that there would be an even distribution of site functions around Ganweriwala and Dholavira – where two of the postulated oligarchies ruled from, and that the two regions of Gujarat and Cholistan should be relatively self-sufficient in terms of subsistence and manufacturing industries. The internal divisions of sites would be less overt, and may in fact demonstrate several different elite enclaves within the largest sites.

As would be expected, the Oligarchy predictive model proved difficult to test. The settlement pattern around Ganweriwala certainly presents an even distribution of site functions (see section 6.3.2), and there is little to contradict the predictive model. However, this pattern is not evident at Dholavira, which was largely isolated in its location. In terms of internal divisions, no site in Cholistan has been investigated thoroughly enough to demonstrate any internal divisions. There is some evidence from Gujarat to indicate internal differentiation of space, but this appears to be largely a reflection of domestic versus industrial space.

The Oligarchy model is based primarily upon the data obtained from excavations at Harappa, but is not overly apparent elsewhere within the Indus Valley Tradition. There is very little archaeological reasoning evident within the theoretical framework of the model. Whilst the earliest proponents of the model were influenced by Marxist frameworks regarding communality (Childe 1954), later authors have ascribed a more capitalist, almost corporate nature to Indus society – reflected in the name "Indus, Inc." (Menon 1998). The model of social organisation presented by Kenoyer could almost be federal in its structure, and is influenced by modern American concepts of consumerism and corporate economies. Kenoyer's model is suggestive of an ethnocentric approach to the Indus Valley Tradition – a theme that is common throughout these models, and one that will be discussed further below.

7.2.8 Kinship

The Kinship model is based upon the work of Fairservis (1986, 1989) and to a lesser extent Shaffer (1993). Fairservis argued that rural communities played a much more important role within the region than had been previously thought, and went as far as to suggest that the Indus Valley Tradition was organised along the lines of a chiefdom, and that kinship ties linked together the urban centres. Fairservis suggested that there was a nested hierarchy of chiefs, each paying tribute to the level above, all the way to the chief priest who resided in Mohenjo-daro. Fairservis argued that wealth lay outside of urban centres and was measured by numbers of cattle.

As kinship is an ethnographic model, as opposed to an archaeological manifestation it is difficult to create a predictive model for it. It required a redistribution network identifiable through the presence of granaries at major centres, much in the same way as the Proto-State and Twin Capital Empire model proclaim granaries act as central storage units for taxation purposes. However, the presence of a Kinship model of social organisation within the Indus Valley Tradition depends primarily upon the identification of the Chiefdom model of political organisation.

Section 7.2.4 has demonstrated the potentiality for elements of the Chiefdom model to exist upon the peripheries of the Indus Valley Tradition, in particular within Gujarat. Whether communities were bound through kinship ties is still debatable, but the wide-ranging presence of artefacts and the evident long-distance trade indicates that disparate communities were culturally tied. However, Fairservis' identification of a social structure based upon Kinship is influenced by modern South Asian village communities, where inter-village kinship ties play an important role in stimulating economic co-operation. However, rather than propagating a modern south Asian social analogy upon the Indus Valley Tradition, Fairservis is equally guilty of assuming cultural stagnation – in that he assumes that modern South Asian society is little changed form South Asian communities four thousand years ago. Such concepts of cultural stagnation, whilst normally associated with early archaeologists such as Piggott (1950), Childe (1954) and Wheeler (1959, 1968), are still evident within Indus studies (see section 7.2.10 for more discussion).

7.2.9 Ascetism

The Ascetism model is derived from the post-processual theories of Miller (1985) and Rissman (1988), and incorporates elements from Shaffer (1982) and Coningham (in press). Shaffer suggested that the absence of "luxury" items within Indus Valley burials was due to the (1) such wealth objects were not hereditary; (2) they were not considered particularly important indicators of social status; (3) the objects were redistributed at the time of death; (4) there was an absence of well-defined social stratification; or (5) some other cultural rule was at work designating their presence or absence in burials (1982: 47). Influenced by the post-processual movement in the early 1980s that questioned whether deliberately deposited artefacts reflect social relations, Miller developed this idea of a "cultural rule" arguing that Indus elites deliberately masked inequality within society through the rejection of material wealth and the suppression of ostentatious displays of it (1985). Through an analysis of hoarding and burial Rissman identified a similar deliberate masking of inequalities within Indus society, and that the archaeological record represents a deliberately distorted view of the social structure that prevailed at the time – see section 3.3.8.

However, the Ascetism model is more reliant upon theoretical reasoning, as opposed to archaeological deduction. Rissman's methodology has been questioned (Manuel 2002) and found to rely heavily upon the assumption that buried hoards are secular deposits of wealth and not votive deposits, or a combination of the two. Miller's (1985) arguments and understanding of the Indus Valley Tradition bear many similarities with Piggott's view of a timeless and spaceless society. The data from Gujarat in particular suggests that such normative views are unfounded, and that variation both temporally and spatially was a major characteristic of sites in the region. The Cholistan data is less conclusive, but this is a greater reflection of the methodology used by Mughal. The Ascetism model is exceptionally difficult to test archaeologically, and as such there is little evidence to either support or disprove the model.

Manuel (2002) demonstrated that the major issue with the Ascetism model is the transposition of post-processual concepts developed from the late European Bronze Age into a South Asian archaeological context. Rissman's methodology (1988) considered hoards to represent either personal stashes of wealth, or deposits of artisans or traders, as befitted the contemporary theories concerning Bronze Age deposits at the time (Bradley 1982, 1986; Levy 1982). Such a division was clearly found to be impractical within the Indus Valley Tradition, where many

of the hoards appeared to transgress the traditional, and rather simplistic, classifications of hoards. Similarly, Miller's idea that individuality was suppressed through elite embargoes on luxury items, and the "elimination of anything which might challenge the order that this standardisation represents" (1985: 59). During the early stages of the Integration Era, there is evidence for individualisation in terms of burial and the associated grave furniture, whereas towards the latter stages burials become communal and devoid of personal items. This trend suggests that Miller's ascetic order was not timeless, but developed and imposed itself through time (Manuel 2003).

7.2.10 Discussion

The above discussion regarding the viability of the predictive models suggests that there is little evidence to either prove or disprove any of the models of social and political organisation for the Indus Valley Tradition. This ambivalence is due to a combination of poorly constructed and argued models, and a paucity of detailed published datasets for the Indus Valley Tradition. The lack of specific information relating to the formulation of the models by their authors and specifically the archaeological evidence to support them has resulted in a series of vague generalisations regarding the social and political organisation of the Indus Valley Tradition. Developing predictive models for the four models of political organisation (sections 4.3.1.1 to 4.3.1.4 and 7.2.1 to 7.2.4) it becomes apparent that there is little variation in the archaeological arguments from which the models are derived. This is not surprising, as all archaeologists are working from the same source material – yet all of the models identify a satellite settlement pattern based around the larger sites, which does not appear to be evident when one examines the settlement patterns of Cholistan and Gujarat (see section 5.3). The repeated manifestation of the concept of the satellite settlement pattern is a possible reflection of the normative assumptions of linear hierarchies that pervades South Asian archaeology. All of the models outlined within this thesis indicate a simplistic hierarchical structure and to a certain degree assume cultural stagnation. Again, the pervading influence of culture-history within Indus studies is apparent.

It appears that many Indus sites have been excavated with a model already in mind and the utilised to reinforce said model, or that models have been constructed solely on the basis of excavations at one site. The most obvious examples here are the Oligarchy model presented by Kenoyer (1994, 1998, 2000)

and the Proto-State and Caste System models proposed by, amongst others, Bisht (1990, 1999). The first model, Oligarchy, has developed from recent work at Harappa, where excavations have identified a number of small walled mounds as opposed to the citadel/lower town divide that was originally postulated. However, this site morphology is not evident anywhere else – at least not from any published excavation reports – suggesting that this may be a feature unique to Harappa. Similarly, excavations at Dholavira appear to have been undertaken with the mindset that the Indus is an empire and this has influenced interpretation at the site. The use of nomenclature such as "Castle", "Bailey", "Middle Town" and "Lower Town" (Bisht 1999) deliberately creates an air of hierarchy, domination and subordination. This is very much in the same vein as Wheeler's use of terminology such as "state", "regime", "marshalled" and "regimented" was intended to reinforce the idea of military domination within the Indus (see section 3.3.2). As such, the presentation of research at Dholavira is subconsciously reinforcing the idea of empire and hierarchy. The division of Dholavira into three sections (see Figure 6.12) can be viewed as a deliberate partition of the site to mirror the three-fold division of Vedic society (see section 3.3.6). This tripartite site division was also identified by Lal (1989) at Kalibangan, and formed the basis of his argument for the presence of a caste system within the Indus Valley Tradition. The results, however, suggest that the internal plans of sites in Gujarat are in fact highly variable (Figure 7.02)

Another major point arising from the results from Chapters Five and Six is the use of settlement hierarchies as arguments in many of the models. Kenoyer argued that the Indus Valley Tradition was characterised by a five-tiered settlement pattern defined by site size (50+ha, 10-50ha, 5-10ha, 1-5ha, <1ha) (see section 3.3.4 and Figure 4.03). Jacobson, on the other hand, argued for the presence of a four-tiered settlement system with Mohenjo-daro at the apex, a second tier of large urban sites (Harappa, Lothal, Ganweriwala and others) which controlled a hinterland of roughly 50km, within which were the third tier of small urban centres and a fourth tier of agrarian settlements (section 3.3.5). However, testing such arguments is difficult due to the lack of clarification about what defines one tier from another. The division of sites on the basis of site size alone, especially if you narrow the size boundaries of the smallest tiers, will always provide a neat histogram demonstrating a primate distribution pattern. However, with the tweaking of the number of tiers and the boundaries used to define them, it is possible to demonstrate a three-, four-, five-, or even six-tiered settlement hierarchy (see Figure 7.03). Jacobson's definition of tiers is dependent upon a

number of criteria, although they are not defined or consistent across the board - he does not state what separates a second tier site from a third tier site, or a third from a fourth.

It becomes increasingly apparent that the models of social and political organisation postulated of the Indus Valley Tradition (as discussed in section 3.3) have not been constructed from a rigorous interrogation of the archaeological record, Instead, the models appear to be either a projection of the findings at a single site (such as Dholavira or Harappa) across the entire region, a reflection of archaeologists own cultural and social background, or the transference of a model from elsewhere in the world onto the Indus. It has been widely recognised that archaeologists often impose their own social and cultural understandings upon the societies that they study (Insoll 2007: 15). This ethnocentrism is clearly evident within the Indus Valley Tradition, ranging from the military empire of Mortimer Wheeler (section 3.3.2) – himself an officer in the British Army during both World Wars – to the imposition of the caste system (section 3.3.6) by modern Indian academics such as Bisht (1990, 1999) and Lal (1989). Furthermore, Kenoyer's model outlined in section 3.3.4 and discussed above in sections 7.2.3 and 7.2.7 shares many parallels with modern American society. The assumed economy is based upon concept of supply and demand being equalised through free enterprise and economic competition.

7.3 Survey Methodologies

The aim of this thesis has been to re-evaluate models of social and political organisation of the Indus Valley Tradition through an analysis of settlement distribution and function of sites within Cholistan and Gujarat. Naturally, the manner in which site data has been collected will impact upon the results of analyses of it. The unsystematic nature of survey (section 4.4.2 and 4.4.4) that has been undertaken within both Cholistan and Gujarat has produced datasets that are misrepresentative of the archaeological record. Traditional survey methodologies have relied upon local knowledge of sites or upon being able to identify high-visibility tell-sites. Such approaches have created biased datasets that are skewed towards large urban centres, sites that have remained undamaged by modern land management and sites close to modern occupation. The majority of sites identified on the Gujarat Environs Survey were small ceramic scatters that would be difficult to identify using traditional methodologies. The

survey also demonstrated that systematic survey is both logistically possible within Gujarat, and capable of identifying both urban and non-urban sites. Due to the systematic methodology the data collected is more representative of the area, and similar surveys undertaken throughout the rest of Gujarat will provide congruous datasets from which to draw conclusions.

The problems arising from unsystematic survey methodologies are no more evident than the data from Cholistan. Section 5.3.2 demonstrated that there has been very little occupational continuity between phases in Cholistan, whereas sites in Gujarat (and elsewhere in the Indus Valley Tradition) have shown substantial evidence of multi-period occupation. Rather than a unique archaeological phenomenon, this appears to be a reflection of the survey methodology utilised by Mughal. Sites identified upon the survey were assigned to a single period of occupation, as well as a singular function. Such simplistic designations reveal very little about the development of urbanisation and society within the region, and without access to the collected material it is difficult to reassess the data from the survey. The idea that sites represent single phases is symptomatic of the culture-historical nature of South Asian archaeology highlighted in section 3.2.6. Archaeological communities tend to be viewed as static and retrogressive, where change and development is explained through external influences (invasion, diffusion etc.). Whilst Mughal does not invoke such explanations to explain changes from phase to phase, the fact that there is no continuity within sites is suggestive of disconnected chronological phases and a lack of internal stimuli in cultural and societal developments.

Scholars have also argued that the greater density of sites that have been identified along the Ghaggar-Hakra River is indicative of the greater density of sites that would have existed there during the Indus Valley Tradition (Joshi 2000, Possehl 1997: 443). Section 2.3.2 has demonstrated that hydrological developments within the last four thousand years have resulted in increased archaeological visibility along the Ghaggar-Hakra, as opposed to the Indus and Punjab rivers. Archaeologists, often fuelled by nationalist sentiments, have claimed that the Ghaggar-Hakra is the ancient Sarasvati River named in Vedic literature such as the *Rigveda* (see section 3.3.6). They see the apparent density of occupation along this river as an indication of the importance of this river in what would have been a Vedic "civilisation". Little attention is paid to the difference in archaeological visibility of the two river systems, and the identification of the Ghaggar-Hakra with the Sarasvati has become the official line

of many nationalist Hindu groups. This thesis has demonstrated that such interpretations are unreliable for two reasons. First, archaeological visibility is much greater along the Ghaggar-Hakra, which means that a greater number and variety of sites are visible on or close to the surface, and the massive amounts of alluvial deposition that has occurred within the Indus Valley will have masked all but the largest sites, or those that are located upon higher ground. Secondly, Cholistan has been targeted for extensive survey work, whilst the Indus and Punjab rivers have only intermittently been surveyed. As such, it seems apparent that the survey data from Cholistan, far from being one of the most comprehensive datasets relating to the Indus Valley Tradition, is symptomatic of some of the key issues raised by this thesis.

The data from Gujarat is more reliable in some senses, but it has still been collected in an unsystematic manner. The major problem arises from the chronological assignation of each site. Multiple competing and contradictory chronologies – Possehl (1980, 1992a), Rao (1963) and Shaffer (1992a) – have led to a series of incongruent sites. Secondly, there are large gaps in the data, particularly in the areas surrounding excavated sites such as Dholavira and Lothal. However, it is difficult to ascertain whether these "shadows" are the result of archaeological settlement patterns or a lack of systematic survey. The methodology used within the Gujarat Environs Survey allowed sites to be identified in a systematic manner, and allow the creation of models from the bottom up. The following section will discuss the findings of the Gujarat Environs Survey and the settlement distribution and function analysis in light of the discussion regarding the existing models.

7.4 The Gujarat Environs Survey

The systematic approach of the Gujarat Environs Survey allowed us to develop a model based upon the relationship between urban and non-urban sites on an artefactual basis. It identified that even the smallest of sites were engaged in either manufacturing activities, or at the least in part of the manufacturing process. They were not restricted to agricultural or pastoral activities, nor were they subordinated to larger sites. Within Dhavalikar's Cultural Imperialism model, the small rural sites of Gujarat were portrayed as primitive pastoral communities who supplied raw material to the fortified centres in exchange for finished goods (1995: 6). The fortified centres were geared towards the acquisition and

processing of raw material in order to ship them back to the Indus Valley where they were made into the finished article. Over time, the fortified centres or colonies would have developed their own manufacturing industries, and become central places within the landscape and developed their own hinterland (see Figure 6.21).

However, the archaeological evidence from the Gujarat Environs Survey suggests otherwise. Within the sites identified on survey, worked shell and lithic debitage was identified, along with two shell bangles and an undrilled bead blank, indicating that the sites may have been involved in the procurement of raw material, as well the processing of it. Although limited in terms of sample size, this suggests that the simplistic notion of a hierarchy of sites as suggested by Dhavalikar is not reflected in the archaeological record. In fact, the sites identified were engaged in similar activities to the manufacturing centres. This suggests parallel craft specialisation, and parallel trade networks. Figure 6.04 shows a schematic diagram of the flow of resources within the Gujarat Environs Survey area. It is assumed that finished goods flowed from Bagasra and Kuntasi to non-urban sites, yet there is little evidence to support this. Instead, the archaeology suggests that dual networks of social and political organisation may have existed in the area. Non-urban sites were not necessarily subordinated to the larger sites, but may have functioned independently of them, or at least in conjunction with them. This realisation counters the established views that support a single hierarchy of sites.

7.5 Social and political organisation of the Indus Valley Tradition

The review of the predictive models in section 7.2 identified that none of the models in their current form are applicable across the entire Indus Valley Tradition. However, a number of key points stand out from the discussion. The most obvious deviation from the expected results was the lack of a strict settlement hierarchy. All of the political models (Twin Capital Empire, Proto-State, Domains and Chiefdom) highlighted the presence of a strict hierarchy of sites based around several key sites, including Ganweriwala and Dholavira. However, the results of the settlement distribution analysis (section 5.3) and central place analysis (section 5.4) indicate that such a strict hierarchy was not evident. The realisation that sites within both Gujarat and Cholistan were not part of a strict

hierarchy, suggests that a greater degree of autonomy may have existed, or that several different networks were functioning within the same landscape. This idea was supported by the results of the Gujarat Environs Survey, in which multiple contemporaneous networks were identified, rather than the static single site size hierarchy model normally presented.

This realisation indicates that the preconception of the Indus Valley Tradition as a single entity is misleading, and is a contributing factor to the vague generalisations that pervade all of the existing models. Trying to shoehorn the entire region into a single political model means that much of the specific detail gleaned from individual excavations and surveys is glossed over in favour of incorporating elements from across the whole area. It has been recognised that even within later, more archaeologically homogenous empires, there are very different systems of social and political organisation in different areas (Dusinberre 2003). However, in the discussion regarding the predictive models (section 7.2.10) it was identified that the models of social organisation, particularly the Caste System, Oligarchy and Kinship models, have been constructed from either individual sites or a small number of sites and then applied across the entire region without any corroborating evidence.

Another deviation from the expected results was the increase in the number of settlements during the Localisation Era within Gujarat (section 5.3.1.2). Whilst it has long been recognised that there was a significant increase in the number of sites (Possehl 1980), it has been largely acknowledged that this was the result of a collapse of urban centres and the subsequent dispersal of people into small rural settlements (Bhan 1989, Dimri 2001, Possehl 1997b, Sonawane 2002). Chapter Five showed that whilst there was a drop in site size, this was largely due to the significant drop in the occupied area of Dholavira. Chapter Six also demonstrated that there was significant continuity in the distribution and function of sites, particularly within Saurashtra (section 6.4.3). This suggests that the notion of collapse, as suggested by Marshall (1931), Piggott (1950), Wheeler (1959, 1968) and perpetuated by Misra (1984), Possehl (1997a, 1997b, 1999) and Ratnagar (2001) amongst others, is not rooted in archaeological evidence but on a preconceived idea that societies must go through a linear progression of birth → fluorescence → death (as discussed in section 3.2). As such, it is apparent that numerous deep-rooted assumptions have become embedded within current interpretations of the Indus Valley Tradition (outlined in section 3.3).

These assumptions – strict hierarchies, the second millennium BCE collapse, and that the whole region is one homogenous cultural and political entity – have impacted upon existing interpretations and have inherently weakened them. They highlight how many of the widely held notions of the Indus Valley Tradition are based upon outdated concepts. Yet, these notions manifest themselves within general archaeological literature (i.e. Maisels 1999), and as such enter the wider archaeological community. Maisels characterisation of the "Indus/Harappan /Sarasvati Civilisation" (1999: 186ff) reinforces many of the fallacies highlighted within this thesis – that the Indus floodplains were sparsely inhabited (p.188); that the Ghaggar-Hakra was a perennial river that flowed to the sea and was more densely occupied in the past (p.189); that the Indus collapsed due to flooding and disease, and forced the abandonment of urban centres (p.190); and that the whole region was a coherent homogenous whole (p.190). Dispelling these preconceptions is necessary in order to develop new models of social and political organisation. However, at the same time the existing datasets, ranging from established chronologies, survey data and excavation data need to be undertaken in a systematic fashion.

The notion that empires and states are reliant upon the concept of territorial control is not valid for any period of the Indus Valley Tradition. Instead, any 'empire' would have been based upon routes of communication and trade. If an Indus Empire did exist, it would have been restricted to those areas that it could control and utilise. This would have encompassed the Indus and Punjab rivers, and the coastline stretching from Sutkagen-dor to Lothal (see Figure 7.01), incorporating the sites of Bagasra and Kuntasi. Such a model would explain the rank-size curve of Gujarat that identified the presence of two or more settlement systems co-existing together and the apparent artefactual divide of Sindhi and Sorath Harappan. It would also account for the lack of Integration Era artefacts to have been found in Baluchistan, the Northern Valleys and the arid areas to the east of the Indus – these were areas away from the main arterial routes, and as such were not incorporated into any such polity.

7.6 Chapter Summary

This chapter has discussed the results of the previous five chapters and examined their implications on our understanding of the social and political organisation of the Indus Valley Tradition. It began by reviewing the impact of the

results from Chapters Five and Six upon the predictive models outlined in Chapter Four. It then went on to discuss the biases introduced by different survey methodologies detailed in Chapter Four, the impact of the Gujarat Environs Survey and discussion of the social and political organisation of the Indus Valley Tradition.

Section 7.2 identified that there is little evidence to support any of the predictive models in their entirety, mostly due to a lack of specific information relating to the formulation of the models by their respective authors. Furthermore, it established that there is very little variation in the underlying archaeological arguments, unsurprising when one considers that they are all derived from the same archaeological evidence. In particular, it identified that satellite settlement pattern and linear settlement hierarchies reflect the normative culture-historical tradition that persists in South Asian archaeology. Additionally, other models have been constructed from individual sites and applied across the whole region, and are often a greater reflection of archaeologists own cultural and social background.

Section 7.3 discussed the impact of different survey methodologies upon the existing models of social and political organisation. It identified that Mughal's survey methodology means that the dataset is misrepresentative and skewed towards urban sites. By assigning only a single chronological phase to each site, it has limited our ability to understand how sites in Cholistan have developed throughout the Indus Valley Tradition. Furthermore, it reinforces the idea that chronological phases are static, and that change, when it does occur, is sudden and wholesale. The data from Gujarat is also biased towards urban sites, but there is a greater understanding of continuity within and between sites. However, the lack of a coherent chronology supported by scientifically obtained dates has complicated this sequence. The reliance upon ceramics for relative dating, and the consequent assumption that ceramic styles are temporally consistent across the region is the basis upon which sites are phased.

Section 7.4 discussed the evidence form the Gujarat Environs Survey, in which it was identified that non-urban sites were engaged in similar activities as larger urban sites. This is contrary to the established view that they were subordinate. It argued that rather than a simplistic site hierarchy; multiple networks of sites were present within the same landscape. Section 7.5 summarised our current understanding of the social and political organisation of the Indus Valley Tradition, highlighting the key areas where it deviates from the predicted outcomes – strict

site hierarchies, centralisation and the idea of a collapse. However, these ideas still manifest themselves within 'textbook' literature, and consequently become reinforced within models. Finally, it argued that our ideas about states and empires are outdated, and based upon Near Eastern examples. A much more likely scenario is that any notion of an empire was restricted to riverways and coastlines. The following chapter will draw a number of conclusions from the thesis, and identify areas that need future work.

Chapter Eight – Conclusion

8.1 Introduction

The previous seven chapters have detailed palaeoenvironmental research into the Indus Valley Tradition, the chronological sequence of Gujarat and Cholistan, the existing models of social and political organisation, the results of the Gujarat Environs Survey, and research onto existing survey datasets from Gujarat and Cholistan. It has done so in order to re-evaluate models for the social and political organisation of the Indus Valley Tradition, through an analysis of settlement distribution and function of sites within Cholistan and Gujarat. The main objectives of the thesis were: to test whether the claim that there has been no significant change in the climate of the Indus Valley region over the last four thousand years is true; to justify the choice of Shaffer's chronology and expand it to incorporate Gujarat; to identify the existing models, and to develop falsifiable models for them against which to test the archaeological data from Gujarat and Cholistan; to ascertain the distribution and function of sites within Gujarat and Cholistan during the Indus Valley Tradition, and discuss how they reflect upon the existing models of social and political organisation. The following sections will revisit each of these objectives individually and draw conclusions from the results of Chapters Two to Six, and from the discussion in Chapter Seven.

8.2 Conclusions

This section will examine each of the objectives in turn and detail the conclusions drawn from this thesis. It will begin with palaeoenvironment, then move on to the chronology, the models of social and political organisation, settlement distribution, settlement function, and finally how valid the aforementioned models are.

8.2.1 Palaeoenvironment

As stated above, the first objective of this thesis was to examine the palaeoenvironment of the period from 8000-1000 BCE. It asked: (a) what were the environmental conditions during the Indus Valley Tradition, (b) how will this

impact on human settlement and subsistence and (c) how have changes over the last four thousand years affected modern archaeological visibility?

Taking section (a), Chapter Two examined palaeoclimatic research into the region during the Indus Valley Tradition, and hydrological developments since. The palaeoclimatic research from the Thar Desert, Himalayas and Arabian Sea demonstrate a pattern of fluctuating precipitation. However, unlike the accepted hypothesis that the Integration Era emerged during a period of increasing precipitation (Misra 1984, Singh 1971, Singh *et al.* 1974), this thesis has established that it did in fact emerge during a period of decreasing precipitation. It identified that there was a shift towards a semi-arid climate between 3000-2200 BCE, after which there was an unstable climatic regime characterised by a decrease in the strength of the southwest monsoon. This contradicts the established view of modern archaeologists who regularly state that there has been no significant change in the climate since the Indus Valley Tradition (Dhavalikar 1995, Mughal 1997, Possehl 1999a). It also raises an interesting issue, in that the Integration Era actually emerged during a period of increasing environmental stress, rather than during a period of increased rainfall and ths increased crop yields. This raises questions as to the nature of the "integration" witnessed within the Indus Valley and whether it was derived from conflict, co-operation or a combination of the two. This section also established that there is little evidence to support the idea of that the Ghaggar-Hakra was a perennial river that flowed all the way to the sea. Instead, the evidence suggests that it was a seasonal river that dissipated in an inland delta near to Fort Derawar. It also identified that there have been numerous avulsions of the Indus River, especially within its lower course, shifting its course by several hundred kilometres.

Section (b) of the objective asked how this palaeoenvironmental reconstruction would have impacted upon human settlement and subsistence patterns. One of the key elements of both the modern and palaeoenvironment of the Indus Valley is the stark seasonality that is evident – primarily a consequence of the southwest monsoon. The archaeozoological and archaeobotanical data from the Indus Valley Tradition indicates the exploitation of a variety of wild and domesticated species. Cattle were the most prominent species, with sheep and goat second. Archaeobotanical data from Gujarat suggests that subsistence strategies during the Indus Valley Tradition have not changed up until the modern day, with a reliance on *kharif* crops. The abundance of millets in Gujarat sites suggests the selection of crops that are suitable for dry farming (i.e. without irrigation) and for

animal fodder. The larger pattern suggests that there has not been any significant change in subsistence strategies from the Indus Valley Tradition to the present day. This suggests that fluctuations in climate do not have a major impact upon subsistence strategies.

The final part of the objective asked how hydrological and environmental changes would have impacted upon archaeological visibility. Chapter two established that within the lower Indus Valley over 600 billion tonnes of sediment have been deposited over the last four thousand years masking many sites that may have existed there. As it is, only the largest and most prominent sites (i.e. Mohenjo-daro, Chanhu-daro, Kot Diji) have been identified in the region. In contrast, within the Ghaggar-Hakra there has been an erosional environment. As a consequence, sites within the river valley have not been masked by alluvium, resulting in greater archaeological visibility – demonstrated by the greater number of sites found there. There does not appear to have been any major topographical or hydrological changes in Gujarat, and as such archaeological visibility will not have been as adversely affected as within the Indus Valley.

8.2.2 Chronology

The second objective of this thesis was to justify the choice of Shaffer's chronology and expand it to incorporate Gujarat. This thesis adopted the chronology and nomenclature of Shaffer (1992a) over other possible chronologies for reason outlined in section 3.2. Shaffer's chronology provides a more dynamic chronological sequence and allows for a greater degree of fluidity with regards to social and cultural interaction. However, Chapter Three also established that Shaffer's chronology is still affected by the culture-historical traditions that permeate South Asian archaeology. In particular is the concept of identity and ethnicity, as Shaffer and Lichtenstein (1989, 1995) have made explicit equations between archaeological cultures and ethnic groups. Such static views of society have weakened Shaffer's idea of a continually developing Indus Valley Tradition, and in practice the chronological sequence is viewed as a series of contiguous or overlapping monolithic entities.

The chronologies for Gujarat and Cholistan were outlined in sections 3.2.7 and 3.2.8. An absolute chronology for Gujarat was not possible due to a lack of radiocarbon dates from secure deposits. The use of OxCal to calibrate the existing dates did not provide any additional information due to the lack of

precision in the original dates. As a consequence the chronology is reliant upon a small number of dates from several sites. No sites have been excavated in Cholistan, and as a consequence no radiocarbon dates exist. The chronology for Cholistan is entirely reliant upon ceramic analogies and relative dating with sites elsewhere in the region. The chronology of the Indus Valley Tradition, and for Gujarat and Cholistan, proved to be a problematic area of the thesis, and is one of the areas that have been highlighted as a high priority for future work (see section 8.3).

8.2.3 Models

The third objective of the thesis was to establish: (a) what are the existing models of social and political organisation for the Indus Valley Tradition, (b) how have these models been developed and (c) how can they be tested in relation to settlement distribution and function? This objective was spread over two chapters – Chapter Three detailed the current interpretations of the social and political organisation of the Indus Valley Tradition, whilst Chapter Four examined them in a more critical fashion, and outlined their predictive models.

The current interpretations of the Indus Valley Tradition were outlined in section 3.3, providing an overview of the arguments put forward by archaeologists to support their interpretations. As these interpretations share many features in common, they were grouped into nine broad models: four models which relate to the political organisation of the Indus Valley Tradition – i.e. the wider location and role of communities and their inter-related functions - and five models that relate to its social organisation – i.e. the way in which people on the individual level interact within the larger social milieu, or in some cases how a wider form of political organisation is imposed upon a community. These groups were created specifically for this thesis and do not necessarily reflect particular archaeologists schools of thought. They do, however, tend to reflect larger theoretical trends in archaeology. For example, the Priest-King and Twin Capital Empire models are rooted in culture-historical reasoning, the Oligarchy and Domain models have developed out of Marxist theories, the Caste System model represents a nationalist revival within Indian archaeology after years of colonial and post-colonial archaeological teaching, and the Ascetism model reflects an attempt to apply post-processual concepts upon the Indus Valley Tradition.

In creating predictive outcomes for these nine models, Chapter Four identified that the majority of the models are still heavily influenced by the culture-historical stances of early scholars in the region – in particular a concentration upon urban sites and strict hierarchies. Archaeological indicators were difficult to establish for some models due to the lack of archaeological arguments in the original interpretations.

8.2.4 Settlement Distribution

The fourth objective of this thesis asked (a) what do the settlement patterns of Gujarat and Cholistan inform us about the social and political organisation of the Indus Valley Tradition, and (b) how does this reflect upon the existing models? This section draw conclusions from both the first part of this objective, the second half of the objective will be discussed in conjunction with the second part of the next objective.

In order to answer part (a) of this objective, this thesis examined the spatial and temporal distribution of sites with the datasets from Gujarat and Cholistan (see section 4.4 and Appendices Two and Three), attempted to identify central places within them and performed rank-size analysis upon them. The spatial and temporal analysis of site data from Gujarat demonstrated a pattern of change and continuity. Whilst there was substantial continuity in site occupation from the Regionalisation to the Localisation Era, there were also significant changes. There was a continual increase in the number of sites over time, although the average size of sites peaked during the Integration Era. However, this pattern was not consistent throughout the whole of Gujarat, as Kutch demonstrates a very different pattern to both Saurashtra and North Gujarat. In Kutch, there was a significant decrease in site density and size within the Localisation Era. The spatial and temporal analysis of site data from Cholistan demonstrated a very different pattern to Gujarat. There was much less continuity in site occupation between phases and eras, although this is most likely a consequence of the survey methodology used by Mughal rather than an archaeological phenomenon.

The central place analysis from Gujarat suggests that there may have been several "central places" within the landscape, as opposed to a single capital at Dholavira. Dholavira itself was isolated and distant from the main areas of occupation, which are more closely linked to sites such as Lothal, Kotada and Tarana-III. There was a significant decrease in the occupational area of Dholavira

during the Localisation Era, yet this was not mirrored by a "collapse" of its postulated hinterland – in fact, it appears to have flourished during this period. Dholavira's location, along with Kotara are not located centrally, but appear to have been situated to control or facilitate movement across the Rann of Kutch. In Cholistan, the evidence is less conclusive. With the exception of Ganweriwala during the Integration Era there is less evidence for the emergence of central places – sites tended to cluster in certain areas but there were often several large sites located close to each other, suggesting an inter-dependence upon each other, or intensive localised competition. It is clear that, different areas had very different trajectories of development, and research needs to focus upon establishing the reasons behind these trajectories.

The rank-size analysis from Gujarat during the Regionalisation Era indicates the presence of at least two settlement systems – a possible imposition of an urban "imperial" system on a previously rural landscape. The idea of a coastal Indus Empire would account for this discrepancy, as new sites are established or developed. By the Localisation Era the rank-size analysis indicates a less-integrated landscape, suggesting a loss of empire. In Cholistan, the rank-size curves for all three eras are remarkably similar, demonstrating a convex pattern. Convex patterns are indicative of a less well-integrated landscape, where either the largest sites are smaller than expected, or the smallest sites are larger than expected. The unsystematic methodology of Mughal (1997) may certainly account for the latter, as the smallest sites in Cholistan are unlikely to have been identified. However, the pattern does deviate from the normative view that Cholistan represents a planned urban settlement system.

8.2.5 Settlement Function

The fifth objective of this thesis asked: (a) what does the function(s) of sites in Gujarat and Cholistan inform us about the social and political organisation of the Indus Valley Tradition, and (b) how does this reflect upon the existing models? Again, this section will drawn the conclusions from part (a) of this objective, with the following section dealing with part (b) of this and the previous objective.

In order to achieve section (a) of this objective, Chapter Six examined the changing role and function of sites within both Gujarat and Cholistan, expanding upon the distribution analysis from the previous chapter. Within Gujarat there was a very diverse set of site functions, often dependent upon both period and

location. Sites during the Integration Era range from Dholavira with its massive surrounding wall, to the industrial centres of Kuntasi, Bagasra and Lothal, to material procurement sites such as Nageswar – the only site that appears to demonstrate an almost exclusively economic role. In and amongst these sites were small "rural" sites engaged in subsistence strategies. A huge investment of labour, resources and time was invested in the construction and maintenance of the surrounding walls of Dholavira, and at a number of other sites, particularly in Kutch and northwest Gujarat (close to the Rann). These sites have been interpreted variously as military outposts (Surkotada and Desalpur) or as fortified trading and manufacturing outposts (Kuntasi, Bagasra). Without further survey work, and more detailed excavations the exact function and role of these sites remains unclear.

There was a very different pattern evident in Cholistan, although like the settlement distribution data this is a greater reflection of the survey methodology used by Mughal (1997) than archaeological distinctions. However, the results showed that the Regionalisation Era was characterised by increasing levels of industrialisation and sedentary settlement, with manufacturing restricted to the periphery of sites. The Integration Era demonstrated high numbers of industrial and semi-industrial sites where manufacturing formed the core of the site. By the Localisation Era there was a reversion to fewer industrialised sites and an increase in the number of temporary pastoral camp sites, suggesting a less centralised landscape.

8.2.6 Models of Social and Political Organisation

This section will detail the conclusions drawn from the comparison of the results from Chapters Five and Six with the predictive models, as defined in the fourth and fifth objectives. The predictive models were outlined in section 4.3 derived from the outcome of the third objective, and the outcomes discussed in section 7.2. This thesis found that the archaeological evidence supported none of the predictive models. In fact, there was very little variation between the archaeological arguments from which the models were derived. The models tend to be vague generalisations and suppositions rather than specific arguments derived from the archaeological evidence. However, this is not surprising, as when one interrogates the archaeological data from excavations and survey, the lack of methodological rigour used in the collection of the data results in a series of vague datasets often based upon preconceived ideas. The models are either a

projection of one site's findings across the entire Integration Era, or an ethnocentric projection of the archaeologists' own social and cultural milieu onto the past. Normative concepts of strict settlement hierarchies, originating from the early work of scholars such as Marshall, Wheeler and Piggott still pervade all of the models. The results from the settlement distribution and settlement function analysis suggest that such concepts are not applicable to the region. In fact, trying to apply a single model to the entire region appears to be the largest flaw of most of the current interpretations of the Indus Valley Tradition.

One of the key challenges that prevent us developing a model of political and social organisation is the lack of a deciphered script. Within Egyptian and Near Eastern archaeology, deciphered script allows archaeologists to identify sites that are considered to be primary, and models are constructed from the top down. Without such information within the Indus Valley Tradition, archaeologists are left without any starting point, or frame of reference. However, this has not stopped archaeologists and philologists investing huge amounts of time and energy towards deciphering the script (Fairservis 1989, Parpola 2000), but yet there is very little consensus over any aspects of it (Coningham 2002). Rather than trying to create over-arching models with which to describe the entire Indus Valley Tradition, archaeologists need to intensively investigate smaller areas, and create models of political and social organisation from the ground up, based upon artefactual evidence, such as the recent work at Harappa by Kenoyer (2000).

The Gujarat Environs Survey has begun to do this, challenging the accepted model of Cultural Imperialism, although not rejecting it outright. It established that small sites, previously thought to have been subordinated to sites such as Bagasra and Kuntasi, were in fact engaged in the very same activities as them, not supplying them with raw materials. Again, this suggests the operation of more than one social and political structure, rather than a single all-encompassing model. Through gaining an understanding of the relationship between sites within a small focused area, we can develop models that can be tested against similar surveys elsewhere in Gujarat and then further afield. This will allow us to test whether the different ceramic typologies present within Gujarat – such as Padri Ware, Anarta Ware etc. – reflect different social, political and economic situations.

8.3 Future Work

The previous section drew a number of conclusions from the objectives identified in the opening chapter of the thesis. It is increasingly clear that the existing models and frameworks are not suitable for understanding the complexity of the Indus Valley Tradition. This section will identify the area that need to be addressed if we, as archaeologists, are to further our current understanding of the social and political organisation of the Indus Valley Tradition.

The Gujarat Environs Survey has challenged the notion of Cultural Imperialism, and has begun to develop a new model of competing or complimentary networks operating with the same region. However, this can only be achieved by focused survey undertaken in a systematic manner. Without such assurances of the representativeness of data, statistical analysis and cross-regional comparisons become unreliable and in some cases create more problems that they would solve. The dataset from Cholistan is a prime example of the problems that can result from the use of unsystematic approaches. Due to the narrow focus of the survey upon the river-bed, rather than incorporating the wider landscape the survey restricts the variety of sites that can be identified. Furthermore, without adopting a systematic approach – such as transect walking – it is unclear whether the sites identified are representative of the area, or are just a corpus of the largest and most visible sites. Wholesale acceptance of this dataset fuels the preoccupation with urban sites that has intrinsically weakened the models discussed within this thesis. The adoption of methodologies such as that used within the Gujarat Environs Survey, and undertaken throughout the entire Indus Valley Tradition will provide contemporaneous datasets that can be directly compared and provide greater assurances as to the representativity of the data, and the differences and/or similarities between them.

However, before such a widespread survey program can be undertaken, there needs to be a greater coherence regarding the chronological sequence of the Indus Valley Tradition. As it is, many of the sites and regions of the Indus (including Cholistan and Gujarat) have been constructed from a small number of radiocarbon dates and relative ceramic typologies. The reliance on ceramic typologies and artefact styles for dating purposes means that many of the nuances, such as the development or persistence of particular styles in certain areas are missed. The other major problem with using relative dating is that large areas are grouped together due to the presence of one or two key indicators. This may account for the incorporation of such a large area into a single cultural entity. It also lends itself to assumptions of cultural stagnation, as changes in material

culture are viewed as region-wide rather than resulting from individual human agents. By establishing a number of smaller regionalised chronologies based upon scientifically obtained dates from well excavated sites it would be possible to establish to what degree regions such as Gujarat and Cholistan are connected, and whether such comparative analyses such as those undertaken in this thesis are valid.

The development of models derived from targeted survey work will allow us to challenge some of the more 'textbook' views of the Indus Valley Tradition/Civilisation as a homogenous and monolithic entity – i.e. Maisels (1999). He suggested that "Harappan society consisted of an extensive oecumene or commonwealth, with a largely village-based population which the cities helped to integrate economically and culturally" (1999: 187), and that "Kuntasi thus seems to represent Harappan Civilisation in microcosm... There is order and organisation, but it comes from power-imposed top-down management" (1999: 220). Yet from the results of this thesis, it is increasingly clear that such top-down models are false. Through focused survey and excavation we can generate models that can be tested against artefactual data from different locations and regions, and adapt them to local variations. Global models need to be dispensed with in order to challenge the received wisdom of hierarchy and empire, and refocus debate onto the archaeological data.

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