

*Changing Cultural Landscapes
of the Tungabhadra Valley,
South India*

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IF YOU WERE to open any of the several textbooks on the archaeology of South Asia, you would see much of South Asian prehistory, and indeed history, portrayed as a series of discrete bounded periods, with little emphasis on the linkages between them.¹ A number of factors underlie the continued dominance of this rigid periodization of the South Asian past, and most have their roots deep in the longer than 200-year history of archaeological work in the region. Among them is the continued emphasis on migration as a major cause of cultural change and the accompanying assumption that such change is necessarily abrupt and dramatic (see also Chakrabarti 1988:18–33). Whether describing Indo-Aryans² replacing Dravidian speakers in the Ganges Basin in the second millennium BCE or megalith builders moving into peninsular India a millennium later, technological innovations and social or political changes are typically interpreted as resulting from the influx and replacement by new peoples or “cultures.” More-complex frameworks that consider local processes alongside regional and interregional dynamics seldom are considered.

The continued equation of cultures or peoples with types of artifacts is an additional problem in South Asian archaeology. Thus, in the Ganges Valley, where state societies developed in the first millennium BCE, the “ochre colored pottery ware people” were replaced by the “painted gray ware people,” who were in turn replaced by the “northern black polished ware people.” And in southern India, where our work focuses, scholars still write of a “megalithic people,” as though a mortuary practice, which itself varied quite widely, is necessarily linked to an entire array of economic, political, cultural, *and* biological attributes.

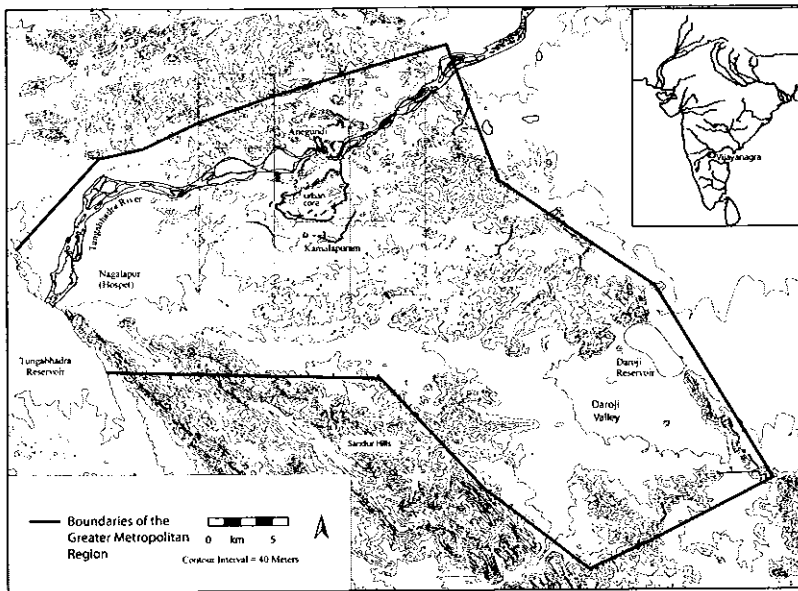


FIGURE 2.1. The greater metropolitan region of Vijayanagara. (Sinopoli and Morrison 2007: fig. 2.1)

A further source of this problematic approach to the South Asian past lies in the site- and period-specific emphasis of most archaeological projects. That is, until recently, there have been few regionally focused projects of either archaeological survey or excavation. The absence of a regional perspective and related emphases on long-term processes of change has greatly hampered our understandings of the South Asian past. This is beginning to change, as several recent projects have begun to take regional approaches (e.g., Lal 1984; Erdosy 1988; Mughal 1997; Shaw 2000; Chakrabarti 2001), though not without some methodological problems.

Our goal in this chapter is not to debate the problems of South Asian archaeology, many of which are shared in other regions of the world. Instead, we limit our focus to the last topic touched upon—the need for and potentials of regional study—and discuss our regional research in one very small part of southern India, where we are beginning to develop some understandings of long-term sequences in land use, settlement pattern, and cultural practices.

The region where we have focused our research is a roughly 650 km² area along the Tungabhadra River in south central India (fig. 2.1).

Archaeologically, the area is dominated by the extensive remains of the imperial city of Vijayanagara, capital of an empire that ruled much of southern India from the fourteenth through seventeenth centuries CE. Indeed, the entire area comprises what we have termed Vijayanagara's "greater metropolitan region" (Sinopoli and Morrison 1992, and below). While this region makes sense for the study of the Vijayanagara period, in order to take a longer temporal perspective, we will expand our focus somewhat to consider a greater portion of the Tungabhadra corridor. Using this somewhat fluid geographic lens, this chapter examines the central Tungabhadra River Valley as a focus of human habitation and landscape transformation over a period of about 5,000 years, from the south Indian Neolithic of the third millennium BCE up through and beyond the Vijayanagara period.

The Tungabhadra River and the Vijayanagara Metropolitan Survey Region

The Tungabhadra River lies on the southern edges of India's Deccan Plateau, a large and ancient mass of metamorphic and volcanic formations that comprise the upland heart of the Indian peninsula. In our region, also called the Karnatak plateau, granitic and metamorphic formations define bands of rugged hills, between which lie lower-lying, open, potentially arable zones of varying extent. In those areas, too, are found granitic outcrops—hills and inselbergs—that constrain movement and make for a visually dramatic setting.

The Tungabhadra, a tributary of the Krishna River, provides a perennial, albeit variable, source of water. It originates in the Western Ghats and flows east into the Krishna River and ultimately into the Bay of Bengal. Like other rivers of the uplands, monsoon rains feed the Tungabhadra, and water flow (at least prior to a mid-twentieth-century hydroelectric reservoir) is seasonally variable. The river is not navigable, and the major routes of movement across the peninsula in both prehistoric and historic times were over land. Because of the region's rugged topography, the floodplain of the Tungabhadra is in many areas extremely narrow; canal irrigation is limited to narrow bands of low-lying soils, such as occur in our region.

This area is semiarid; rainfall ranges between 40 and 75 cm per year, falling primarily during the southwest monsoon from June through

September. The monsoon is irregular and unpredictable, and years of little to no precipitation are not uncommon. The vegetation of the area has been greatly modified by millennia of farming, grazing, and settlement (Morrison 1995a:17, 1995b). Today, uncultivated areas are dominated by sparse thorny scrub and forest, though the Sandur Hills, to the south of our survey region, were once densely forested. The Sandur Hills are also rich in metallic ores, of which iron is most common and is still quarried on a large scale today. A number of archaeological features suggest that it is likely that gold was also present in the large quartzite veins that run through the hills, though these were quarried out in antiquity.

As noted above, our survey region was defined to incorporate the outermost boundaries of the Vijayanagara urban hinterland. The Tungabhadra runs from southwest to northeast across the northern portion of the region. To its north, we extended our survey area by 3 to 4 km to include the narrow floodplain and the southern edges of the band of high hills that quickly rise above it. These hills created an effective boundary to movement from the north, though the terrain opens up to both the southwest and northwest. To the south lie the northwest-southeast-trending ore-rich Sandur Hills. In the east are more high hills; the narrow passes through them are blocked by Vijayanagara's outermost fortification walls (see fig. 2.1). In the southeast of our survey region lies the relatively open Daroji Valley. This area became a focus of intensive agricultural activity during the sixteenth century, and the complex network of reservoirs and other features in the region are being studied by Morrison (2007). The western boundary of our research area is in large part defined by the impoundment basin of the twentieth-century Tungabhadra reservoir.

Despite its seeming inhospitality, the Tungabhadra Valley has had a very long history of human occupation. Robert Bruce Foote (1914), a colonial officer who explored this region in the late 1800s and early 1900s, reported the discovery of a number of "paleoliths," and in our survey we identified a number of rock shelters and surface sites containing a rather nondescript lithic industry of quartzite flakes and flake tools of uncertain date. It is, however, in the third millennium BCE, during the south Indian Neolithic, that the Tungabhadra region appears to have become an important focus of habitation and when we see the first evidence for large-scale human impact on the landscape.

Archaeological Research in the Central Tungabhadra Valley

There is a long history of archaeological research in the Vijayanagara region, beginning in the early 1800s (Michell 1985) and extending sporadically throughout the nineteenth and early twentieth centuries. In the 1980s, the intensity of work in the region increased, with the international Vijayanagara Research Project directed by John M. Fritz and George Michell and with excavation projects by the national Archaeological Survey of India (Narasimaiah 1992) and the state of Karnataka's Directorate of Archaeology and Museums (Nagaraja Rao 1983, 1985; Devaraj and Patil 1991a, 1991b). Most of this work has focused on the monumental architecture of the urban center of Vijayanagara, though in the early 1900s, the Archaeological Survey of Madras and Coorg (variously called the Archaeological Department, Southern Circle or Archaeological Survey, Southern Circle) conducted a Survey of Vijayanagara that also documented remains in or near rural settlements (often termed "village survey," which remains the primary methodology of regional research in Indian archaeology). Their primary emphasis appears to have been on documenting temples and sculptures, though their preliminary reports (all that we have) sometimes also record the presence of wells, reservoirs, and settlement sites (e.g., Archaeological Survey of India, Southern Circle 1908). Prehistoric work in the Vijayanagara metropolitan region has been more limited, but it includes the early contributions of Foote (1914, 1916) and more-recent work by scholars such as Sundara (1975) and Nagaraja Rao (1965, 1971; Ansari and Nagaraja Rao 1969), the latter working to the east of our survey area.

The Vijayanagara Metropolitan Survey (VMS), which provides most of the evidence for this discussion, is the first systematic regional survey project in the Tungabhadra region (indeed in southern India). The project was initiated by Morrison and Sinopoli in the mid-1980s, and field seasons took place between 1987 and 1997 (see Morrison 1991, 1995a, 2005; Morrison and Sinopoli 2006; Sinopoli and Morrison 2006a, 2006b, in press). Our primary interests in designing this research were to examine the political economy and infrastructure of the imperial city of Vijayanagara, and as noted earlier, these goals determined the delineation of our survey area. We began the project estimating that the

Vijayanagara metropolitan region was roughly 350 km² in area. Thanks to the efforts of Morrison in the Daroji Valley and of project member Robert Brubaker (2000) in tracing the fortifications, we soon realized this was a significant underestimate. As discussed above, 650 km² now seems a more reasonable estimate of the extent of the urban hinterland of imperial Vijayanagara.

Our survey was a sample survey, focused most intensively on the approximately 160 km² area immediately surrounding the Vijayanagara urban core, with more-extensive work in the outer portions of the region. Over eight seasons of systematic transect survey, we documented some 740 archaeological sites; 660 of these lay within the intensive survey zone (fig. 2.2). The vast majority of sites date to the Vijayanagara period (ca. 1300–1600 CE), though as will be discussed below, a significant number date to pre-Vijayanagara times.

The Archaeological Record

In areas with a long and complex settlement and land-use history, such as in the central Tungabhadra region, later inhabitants of a landscape may destroy, reuse, and/or reinterpret the material evidence of their predecessors. In our survey region, all of these processes are evident. Vijayanagara was a massive city, with populations of a quarter million or more, and as will be discussed below, extraordinary investments were made to enhance the region's limited agricultural potential—through reservoirs, canals, terracing, and the like. Such efforts, along with the construction of monumental buildings and fortification works, no doubt resulted in the destruction, burial, and/or transformation of many traces of earlier uses of the landscape. This appears to be particularly the case close to the river, near to and in the urban core, where Vijayanagara period habitation and construction reached their maximum intensity.

Post-Vijayanagara land use, particularly over the last few decades, has also resulted in the destruction of many archaeological features of Vijayanagara and pre-Vijayanagara periods. The rate of this destruction is rapidly accelerating, as habitation in the area is only now beginning to return to Vijayanagara period levels and as more destructive technologies (e.g., electric pumps and deep bore wells) are becoming more readily accessible to local populations.

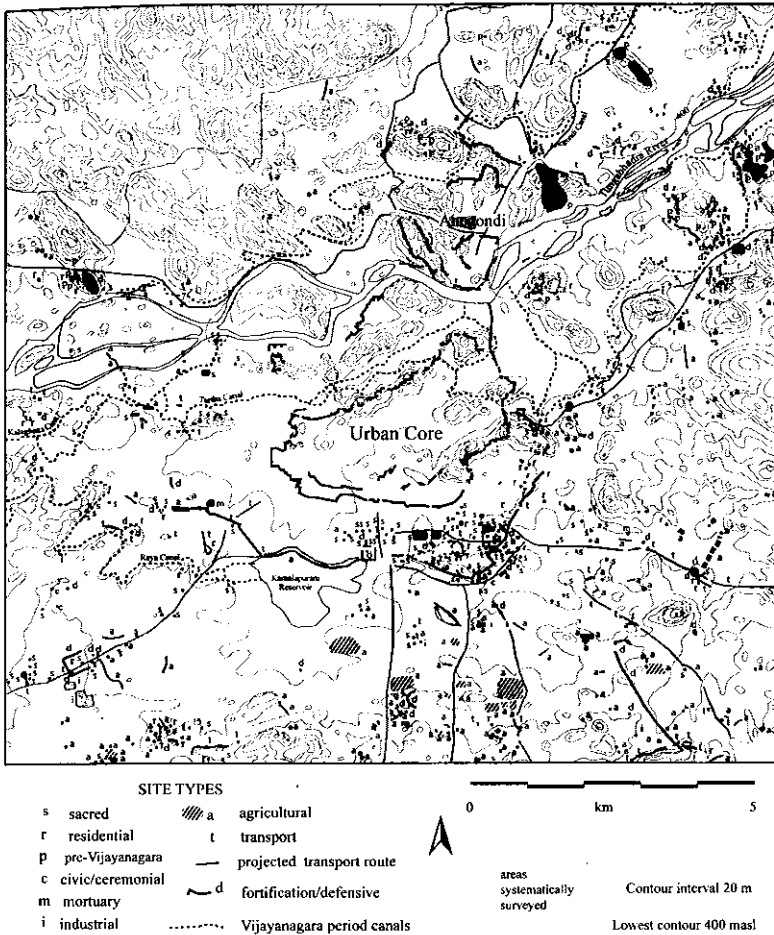


FIGURE 2.2. Site distribution in the intensive survey area of Vijayanagara. (Sinopoli and Morrison 2001:100–101)

Along with destroying archaeological remains, Vijayanagara period inhabitants of the region also reused and reconfigured earlier sites. We see this particularly in two Vijayanagara period settlements (VMS-37, VMS-643), where megalithic stone alignments of the late first millennium BCE to early first millennium CE were incorporated into mid-second-millennium domestic architecture. The earlier features were preserved, but they were both physically modified and functionally transformed—from mortuary

architecture to residential features. Such a dramatic transformation suggests that the earlier commemorative functions of these features had long been forgotten. Other examples of reuse include the repeated occupation of rock shelters, from prehistoric to contemporary times, and the conversion of an Early Historic (early centuries CE) mound of iron smelting debris into a Vijayanagara period reservoir embankment (VMS-110).

For the most part, we have little evidence concerning how Vijayanagara period people understood or interpreted prehistoric or early historic cultural remains in their region. An exception is a Neolithic ashmound (VMS-26, see below), located just to the east of the urban core. This feature, popularly known as Walighat and constructed in the third millennium BCE, was incorporated into the later Hindu sacred geography of the region. It has been interpreted as the cremation pyre of Vali, the usurper monkey-king of Kishkinda, described in the Hindu Ramayana epic. The Ramayana, or story of the divine king Rama, became prominent in southern India in general, and in the Vijayanagara region in particular, after the thirteenth century CE. During subsequent centuries, numerous places in the landscape around Vijayanagara came to be explicitly associated with Kishkinda and the events and locales of the epic as Vijayanagara's rulers (and others) drew explicit parallels between their city and the mythic landscape of the Ramayana (Dallapiccola 1994).

As many scholars have commented, the archaeological landscape is a palimpsest, and later occupants of a region inevitably inhabit a landscape modified and transformed by their predecessors. In the following sections, we build toward the archaeological landscape of the Vijayanagara period, beginning in the Neolithic and proceeding into later prehistoric and historic developments. The available archaeological evidence points to temporal discontinuities in the intensity of land use in our survey region, with peaks in the third and early-second millennia BCE (the southern Neolithic), the late-first millennium BCE to early-first millennium CE (the Early Historic), and the early-to mid-second millennium CE (Vijayanagara period). The region was certainly not uninhabited in intervening times, but the evidence is sparser and points to a lower intensity of occupation in our limited survey area and unresolved erosional and taphonomic processes that may have affected archaeological visibility (particularly a problem in the late-second and early-first millennia BCE), as well as the limitations of our current chronologies.

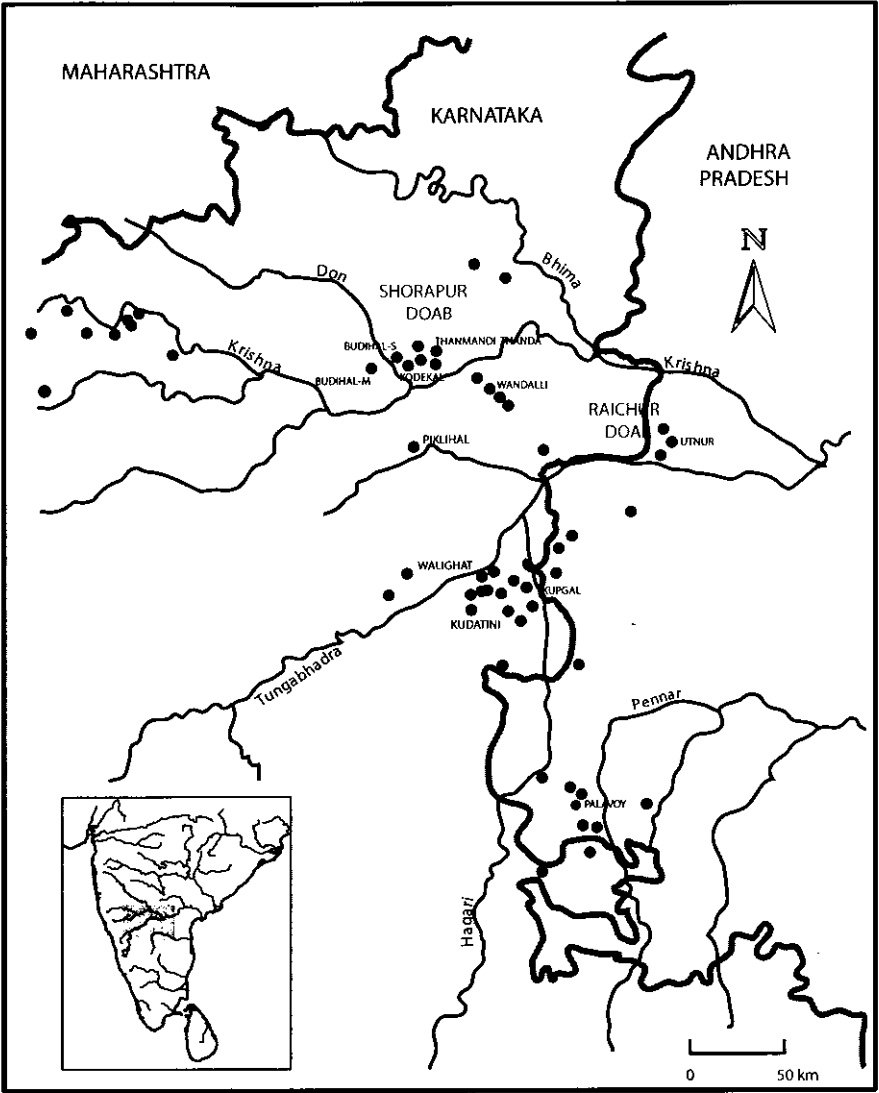
A significant limitation of our work for addressing overall population distributions and landscape use in the Tungabhadra region or in broader portions of south India over time lies in the absence of comparable survey data from nearby regions. For historic periods, we have been able to supplement the survey evidence with epigraphic data, which do provide some reasonably representative information from a broad geographic area. For earlier periods, we can only consider information from major documented sites, without clear understanding of broader settlement distributions or the full range of archaeological remains associated with them.

The Tungabhadra Region during the Third and Second Millenia BCE

Sites of the south Indian Neolithic (dated from ca. 3000–1400 BCE) have been a topic of research and discussion for the last 150 years (Newbold 1843; Foote 1916; Longhurst 1916; Allchin 1963; Paddayya 1973, 1991; Korisettar et al. 2002; Johansen 2004). Today, more than 200 Neolithic sites are known from an extensive area along the Bhima, Krishna, and Tungabhadra Rivers (fig. 2.3). Only a very small number have been excavated. Many more sites no doubt remain undocumented, and we identified at least three previously unreported Neolithic sites in our relatively limited survey region.

The ashmound is a ubiquitous feature of the south Indian Neolithic landscape in the Tungabhadra region. These mounds are extensive, largely composed of burned and vitrified cow dung. The mounds vary widely in size, ranging in surface area from a modest 28 m² to an impressive 5,000 m² and in height from 1.5 to 6 m or more (Johansen 2004). Where survey has been conducted, mound spacing averages around 5 km, though several sites contain multiple mounds. The ashmounds are typically located near water sources, on or adjacent to hills and outcrops in areas of relatively extensive open terrain suitable for pasturage. Most ashmounds are surrounded by habitation debris, including ground and flaked stone artifacts, ceramics, and faunal remains. Numerous habitation sites that lack mounds have also been identified; these occur in diverse settings, most often at the tops and bases of hills.

Subsistence remains have been recovered from about half a dozen excavated sites and include domesticated and wild resources. The most



● Ashmound Site — Modern State Border

FIGURE 2.3. The southern Neolithic of India: distribution of ashmound sites. (Modified from Johansen 2004:310)

common botanical remains are two species of domesticated millets (*Brachiaria ramosa* and *Setaria verticillata*) and pulses (*Vigna radiata*, *Macrotyloma uniflorum*) (Korisettar et al. 2002; Fuller 2005a, 2005b). Domestic cattle, not surprisingly, dominate the faunal assemblage and comprise between 50 and 95 percent of identifiable fauna, with domestic sheep/goat following a distant second. Domestic dog and a variety of wild species are also present. Several sites have evidence for sizable cattle pens, and Paddaya (1998) has documented a large butchering floor at Budhihal. The only other structural remains are small circular huts. A small number of Neolithic burials have also been excavated, including infant urn burials and extended adult burials with few or no grave goods. In sum, the available archaeological evidence is suggestive of relatively small-scale, perhaps non-hierarchical communities engaged in a mixed agro-pastoral lifeway that emphasized pastoral production.

We do not have a good sense of the nature or scale of the mobility of these communities, though it was probably relatively limited. As noted, the location of Neolithic settlements, ashmound and other, is generally on or adjacent to large topographical features. These landscape elements provide some of the lowest-risk loci for rain-fed agricultural practices. The millets and grams cultivated during the Neolithic were drought-resistant crops that thrive in environments with low precipitation and grow well in the region's sandy red and black soils with use of simple rain-fed agricultural technologies that took advantage of seasonal runoff from surrounding hill slopes. The location of southern Neolithic settlements suggests that some of the extra-site landscape around them may have been used for pulse and millet cultivation. The physical contexts of Neolithic settlements with and without ashmounds differ only slightly. The primary factors considered by Neolithic agro-pastoralists in selecting settlement and/or ashmound locations appear to have been the availability of water, abundant pasture, and topographical features conducive to rain-fed agriculture.

That the primary monuments of the southern Neolithic, the prominent ashmounds, were constructed of dung provides further evidence of the importance of cattle to Neolithic economy and ritual practice. Ashmounds were constructed in multiple stages and are composed of stratified deposits of cow dung intermixed with lenses of soil and cultural debris. Some ashmounds appear to have been terraced and include a

corral area and zone with regularly prepared floors and features (Allchin 1961; Paddayya 1998). Most were subject to multiple firing episodes, and analyses of the vitrified dung suggest that temperatures as high as 1,200°C were reached (Zeuner 1960; Mujumdar and Rajaguru 1966). Sections of excavated ashmounds demonstrate the differential and episodic nature of their construction. At times, burning occurred frequently, as small-scale deposits of dung and dirt were burned at low temperatures. At other times, large-scale accumulations of dung and debris were amassed and fired in a single event. Very high temperatures were reached during these large firings, and vitrification of dung commonly occurred. Evidence for the capping of ash layers with a thin layer of culturally sterile soil or clay is also found.

The largest fires no doubt burned a long time and could have been seen and smelled from considerable distances. While some scholars have argued that the mounds were merely a way of disposing of surplus dung (e.g., Paddayya 1991), there were certainly far easier and more effective ways for agriculturalists to do this. It is difficult to envision these burnings and the large sites that resulted as *not* having had a broader symbolic, and presumably sacred, meaning to the people who constructed them (see also Boivin 2004).

In this regard, it is important to note that the location of mounds was not random. As noted earlier, mound spacing appears to be fairly regular, with intervals of approximately 5 km. Ashmounds were constructed incrementally, synchronized with the social rhythm of cattle keeping. Within years or generations, many of these mounds acquired the dimensions of monumental architecture, dominating the built landscape. Within settlements, the massive proportions of these features would have been visually unavoidable. Beyond settlements, the mounds were visible from considerable distances, as they were located either on hilltops or, most often, in low-lying areas along major routes of movement and adjacent to prominent landscape features. Whatever their precise meanings to the region's inhabitants, it is apparent that the Neolithic communities of the southern Deccan were marking and altering their landscape in dramatic ways.

The south Indian Neolithic lasted for 1,400 years, and the internal chronology is not at present well understood. We can say little about either the contemporaneity of sites or how long individual sites were in use. Further, there is a paucity of radiocarbon sequences from sites with

multiple ashmounds (though see Paddayya 1999 for a notable exception), and as a result, we cannot determine whether multiple ashmounds were in use simultaneously or sequentially within individual settlements. Understanding the temporality of ashmound use *within* sites will greatly enhance our understanding of the social processes and parameters involved in their construction and use.

Much clearly remains to be learned about the Neolithic in the Tungabhadra region. Nonetheless, the available data suggest that these mounds and the rituals involved in their construction may have played a role in defining and reinforcing community identities and territorial boundaries that were operative at a relatively small social and spatial scale.

The Tungabhadra Valley in the First Millennium BCE through Early First Millennium CE

Limited available climate data indicate that beginning at about 1500 BCE, peninsular India became hotter and drier, approaching contemporary conditions. It was around this time also that the construction of distinctive ashmounds appears to have largely (though perhaps not entirely) disappeared. Archaeological data from the succeeding centuries provide evidence for the continued importance of cattle husbandry, perhaps coupled with more-extensive pastoralist ranges. Well-documented settlement sites are sparse from the lengthy “Iron Age” period that, according to traditional archaeological chronologies, spans from ca. 1100 through ca. 300 BCE. This period is also conventionally associated with the construction of megalithic mortuary features of a variety of forms, and it is often inappropriately referred to as the “Megalithic period”.

If the Iron Age is not long enough, we can extend this discussion into the first several centuries CE. Typically, these later centuries are described under the rubric “Early Historic,” which in the southern Deccan is associated with the expansion of northern imperial states (i.e., the Mauryan empire) and ideologies, including Buddhism, Jainism, and Vedic beliefs. The line between the end of prehistory and beginnings of history is difficult to demarcate precisely in the southern Deccan. Conventionally, the advent of the historic period in peninsular India is marked by the appearance in the third century BCE of inscriptions associated with Aśoka,

ruler of the Ganges-based Mauryan empire. Aśoka's rock edicts, several of which have been documented in a radius of about 100 km around our survey area, proclaimed Mauryan authority and Aśoka's adherence to Buddhist religious beliefs and practices (*dhamma*; e.g., Thapar 1997). Nonetheless, the nature, intensity, and impact of the Mauryan presence in peninsular India are much debated (see, for example, Habib and Habib 1989–90; Fussman 1990; Thapar 1997; Sinopoli 2001). Few diagnostic artifacts can be definitively associated with the Mauryans (other than the edicts themselves and distinctive carved-stone columns and sculptures that are restricted to northern India). The inscriptions do suggest an imperial infrastructure based around regional administrative centers, including two in Karnataka (*Suvarnagiri*, possibly Maski, and *Isila*, possibly Brahmagiri; Allchin 1995:198), though exactly how these centers were integrated into the broader imperial polity remains unknown.

As in most periods of south Indian archaeology, the chronology for the Iron Age and Early Historic periods is problematic. Several “diagnostic” ceramic wares were produced for very long periods, rendering them virtually useless for chronological interpretations (and there are, at present, few absolute dates available). Thus, black and red ware vessels were manufactured from the late Neolithic through at least the early centuries CE (more than 1,500 years), and Morrison (2005) has recently suggested that russet-coated painted ware, long thought to be more restricted temporally, may well have been produced throughout most of the first millennium CE. We expect that detailed attribute studies will allow us to develop a more refined ceramic chronology in the future; however, at present, our discussion is necessarily quite general.

Despite these caveats, archaeological evidence indicates that significant social, political, and economic changes occurred throughout this broad period and that the rate of change accelerated in the later centuries BCE through the early centuries CE, as centralized territorial polities emerged in several areas of southern India. The foundations for these transformations in the Early Historic period no doubt lay in the emergent social inequality, economic specialization and intensification, and intra- and interregional dynamics of earlier south Indian Iron Age communities and polities (e.g., Seneveratne 1981; Moorti 1994; Rajan 1997). In addition, the above-mentioned expansion of northern states, religious ideologies and religious practitioners, and merchant communities in the

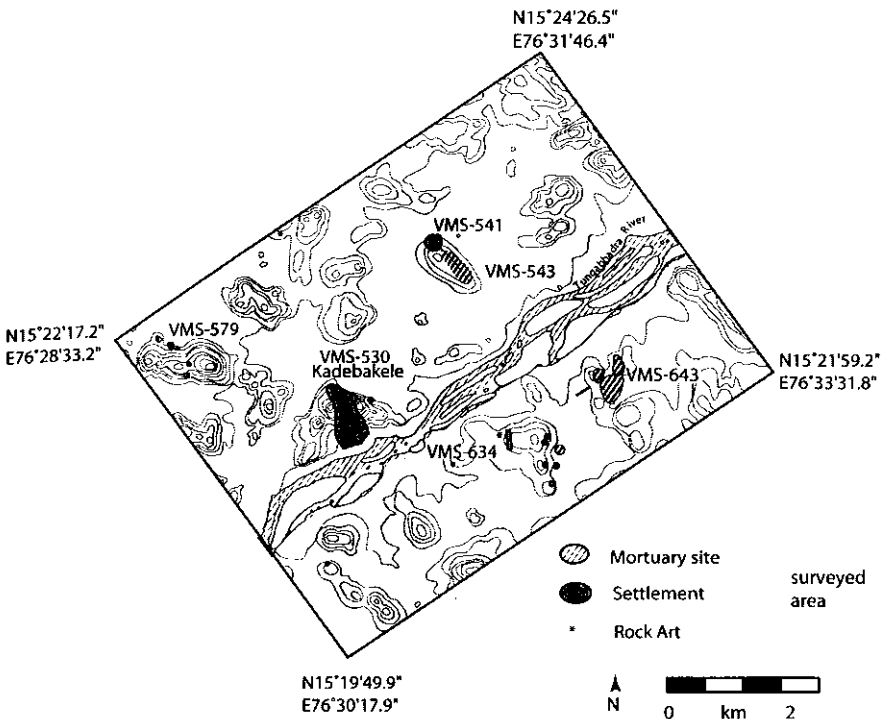


FIGURE 2.4. Early historic landscapes of the Tungabhadra Corridor: project area.

Early Historic period for the first time brought the southern areas of the peninsula into an extensive pan-Indian cultural and economic sphere. The exploration of the interplay of local, regional, and interregional dynamics in the cultural transformations of the Early Historic period is the focus of our new project begun in the central Tungabhadra region in 2003.

In the Vijayanagara survey, we identified a number of sites of the later Iron Age/Early Historic period (based on two calibrated radiocarbon dates from a site where we conducted text excavations). These include seven megalithic mortuary sites and six settlements, as well as several rock art sites and water catchment features. Our current work focuses on five of these sites located within an approximately 35 km² region within our larger survey area (settlements VMS-530, VMS-541, VMS-579, and VMS-634; cemetery VMS-543; fig. 2.4). This work is at a preliminary

stage, and here we merely summarize the contexts of settlement and mortuary sites in the broader central Tungabhadra region.

As noted earlier, ashmound construction largely disappeared after ca. 1400 BCE, as the inhabitants of the Tungabhadra developed new ways to mark their landscape. We also see the appearance of a pronounced settlement hierarchy. Kadebakele (VMS-530), the largest settlement in our region, is at least 40 ha in extent and is situated on multiple terraces draped across a high outcrop that overlooks the Tungabhadra. The other four settlements appear roughly contemporaneous, based on surface artifacts, and range from less than 1 ha to approximately 5 ha in surface area. Wheel- and handmade ceramics and debris from shell working and iron smelting (including a specialized smelting site on the southern edges of the Vijayanagara metropolitan region) provide evidence for occupational specialization. The presence of marine shell and lapis lazuli beads (at VMS-530 and VMS-634)³ provide evidence that the inhabitants of these sites participated in long-distance exchange relations. It is also in this period that paddy cultivation first appears in the region (Mittre 1984:128; Kajalè 1989:123; Fuller 2003:167), a technology that requires sophisticated hydraulic control and results in major transformations of low-lying irrigable areas.

Further survey and excavation are necessary to allow us to understand the nature and organization of political, economic, and social relations and the processes of their formation in the region around Kadebakele. At this point, we prefer to employ the rather vague terminology of “regional polities,” rather than refer to state formation or other restrictive socio-evolutionary “types.” It is worth noting that Kadebakele as an emergent regional center was not unique. Several comparable centers are known, including Tekkalakota, approximately 45 km northeast of Kadebakele, on the southern bank of the Tungabhadra, and Brahmagiri, approximately 120 km to the south, which was excavated by Sir Mortimer Wheeler in the late 1940s and is being reanalyzed by Morrison (Wheeler 1948; Morrison 2005). It is likely that regional survey in intervening areas would yield several more such sites and reveal a network of regional polities that were linked by a variety of relations, including both trade and conflict.

Monuments continued to be constructed throughout the Iron Age and Early Historic periods, but of stone rather than of ash. South Indian megaliths have been studied for nearly 200 years, and more than 2,000

megalithic sites are known (Moorti 1994; Brubaker in press). The highest density of such sites occurs in the state of Karnataka, where our study region is located. They have typically, though we think wrongly, been believed to date exclusively to the Iron Age, and in much South Asian literature, *Iron Age* and *Megalithic period* are used synonymously (see also Chakrabarti 1988:238–39). In our region, the common association of megalithic features and sites with Early Historic settlements (e.g., VMS-543 with VMS-541 in fig. 2.4) suggests that stone mortuary features were constructed at least into the early centuries CE, and probably later (see also Wagoner 1995:466). On the opposite end of the spectrum, a radiocarbon sample from Megalith 6 at the site of Brahmagiri, approximately 120 km south of our survey area, excavated by Wheeler (1948), has produced a calibrated date of between 2140 and 1940 BCE (two-sigma range, Morrison 2005). Although additional dates are needed to confirm this unexpectedly early date, it does at least bolster our conviction that megalith construction had a much longer span in southern India than most scholars have suggested.

Published studies suggest that megalith construction was primarily associated with mortuary practices and with the burials of individuals. A number of studies (e.g., Leshnik 1974; Moorti 1994; Brubaker in press) have convincingly argued that burial in stone circles, or other megalith types, was limited to only certain social segments (i.e., elites), and excavated graves in several regions contain weapons and horse trappings, suggesting an association with conflict and prestige. However, it is important to keep in mind that the south Indian megaliths vary widely in physical form, with both regional and temporal differentiation. Site size also varies considerably, from one to a few features to many hundreds of features.

Undoubtedly the most dramatic megalithic site in the central Tungabhadra region is Hire Benkal, which lies about 12 km north of Vijayanagara, beyond our project area. This site is located in high hills and even today is distant and inaccessible from roads and settlements. It contains an estimated 400 to 500 of these large, houselike megaliths, built of flaked granite slabs that were quarried from the nearby bedrock (fig. 2.5). Also present are numerous smaller features—miniature versions of the large structures, other megalithic forms (stone circles, passage chambers, etc.), stone alignments, and rock art. At the center of the site, between

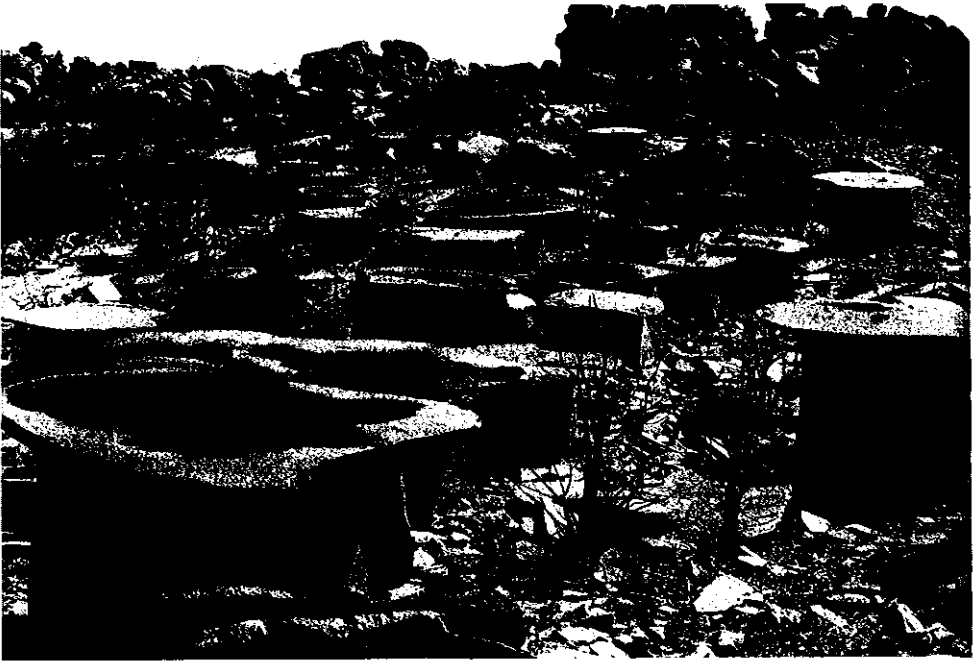


FIGURE 2.5. Hire Benkal, overview of megalithic tombs. (Photograph by Vijayanagara Metropolitan Survey)

clusters of the large megaliths, lies a reservoir or terraced water catchment basin. These features are characteristic of many of the larger megalithic sites throughout the region, including those identified in our survey area. No habitation remains are evident, and few artifacts are visible on the site surface.

The megalithic sites documented in the Vijayanagara survey region are quite different in construction and layout than Hire Benkal, and they are far subtler in their features. We recorded sixteen megalithic sites recorded in our survey area. As at Hire Benkal, the seven large sites result from the cumulative construction of large numbers of individual features. Several also contain central facilities, including reservoirs, large enclosures, and platforms. Nine of our sixteen sites consist of only one to two isolated features, often set on the edges of high hilltops. The other seven are much larger and range from a few hectares to 60 ha in extent. Common features include stone circles, cairns—referred to as “passage chambers” or “dolmenoid cists” in the south Indian literature—and a

variety of other stone alignments and enclosures. Also present are countless smaller features of kinds not previously reported by south Indian archaeologists. These include what we have called “crack features,” in which small boulders and cobbles, some of them shaped, were deliberately placed in gaps between sheet rock outcrops and boulders, and what we have called “wedge features,” in which cobbles were wedged underneath naturally situated boulders. Rock paintings, petroglyphs, and small bedrock cupules are also common. The chronology of these sites remains problematic, but there is good reason to believe that they are at least in part contemporaneous with the settlement sites that lie nearby.

Like the ashmounds discussed earlier, megaliths were linked to natural landscape features, though their placement and visual impact were quite different. The ashmounds were clearly intended to be seen from long distances. In contrast, the builders of large and small megalithic sites favored high and secluded locations, often involving difficult and circuitous access. Also, while the ashmounds were artificial hills that stood out from the surrounding terrain, the megaliths blended in—incorporating, accommodating, and altering the granitic hills and boulders on and of which they were built. Finally, while the ashmounds were the product of collective and perhaps corporate labor, the construction of the megalithic features involved both the building of large-scale “public” features, probably related to collective ritual, and the accumulated construction of countless small-scale features related to social action and commemoration at the individual or family level.

The Tungabhadra Region in the Early- to Mid-Second Millennium CE

As noted earlier, the end of megalithic construction in our region is at present not clearly delineated, and it probably extended well into the first millennium CE. Similarly, the ending of the Early Historic period and the beginnings of the subsequent Middle or Medieval era can also be debated. After ca. 400 CE, epigraphic sources become more abundant throughout southern India, although in the central Tungabhadra region they remain scarce until the eighth or ninth centuries CE. The historical records point to the existence of a large number of regional polities competing in a fluid and volatile political landscape across the south (B. Stein 1998).

The central Tungabhadra region lay at the fringes of a number of these polities, and in the four centuries before the founding of Vijayanagara, the Chalukya (of Kalyani), Yadava, Kakatiya, Hoysala, and Kampili dynasties each claimed a short-lived hegemony over the region, as did several lesser, subsidiary dynasties (Patil 1992:11–12). Excluding the very small and short-lived state of Kampili (based just to the north of Vijayanagara), major population centers during these centuries lay well outside our survey area. Documented archaeological features of the ninth through early fourteenth centuries in this region include the town of Anegondi, located on the northern bank of the Tungabhadra just across from Vijayanagara (Purandare 1986; Tobert 2000). The pre-Vijayanagara extent of the town is not well understood, since during the Vijayanagara period, Anegondi was incorporated in the capital's urban core, and many of its fortification walls and structures date to the Vijayanagara period. However, a number of pre-Vijayanagara temples are found within the inner walls, suggesting a sizable pre-Vijayanagara settlement. Other pre-Vijayanagara features in the region are largely restricted to a number of temples and hilltop forts. Inscriptions found at several of these sites provide evidence for numerous small agricultural villages; for the most part, their precise locations are unknown, and we identified only a small number of pre-Vijayanagara Middle period settlements in our survey.

For the remainder of this chapter, then, we address the most significant period of human occupation of the central Tungabhadra—from the early-fourteenth through the mid-sixteenth centuries—when the region became the seat of Vijayanagara, south India's most extensive precolonial empire (fig. 2.6). The empire's legendary founders, brothers of the Sangama family, established the city of Vijayanagara on the southern bank of the Tungabhadra River in the early 1300s. Over the next two and a half centuries, the capital's prosperity and extent roughly paralleled the political fortunes of the empire as a whole. A rapid period of growth occurred under the empire's first Sangama rulers, and by the early 1400s Vijayanagara had become south India's major center of population, home to at least 100,000 inhabitants drawn from throughout southern India. The later fifteenth century witnessed the decline of the Sangamas and the emergence of the short-lived Saluva dynasty. There is little evidence for significant urban growth in this period, though equally, there is no evidence for substantial decline at the capital. The city and its hinterland reached

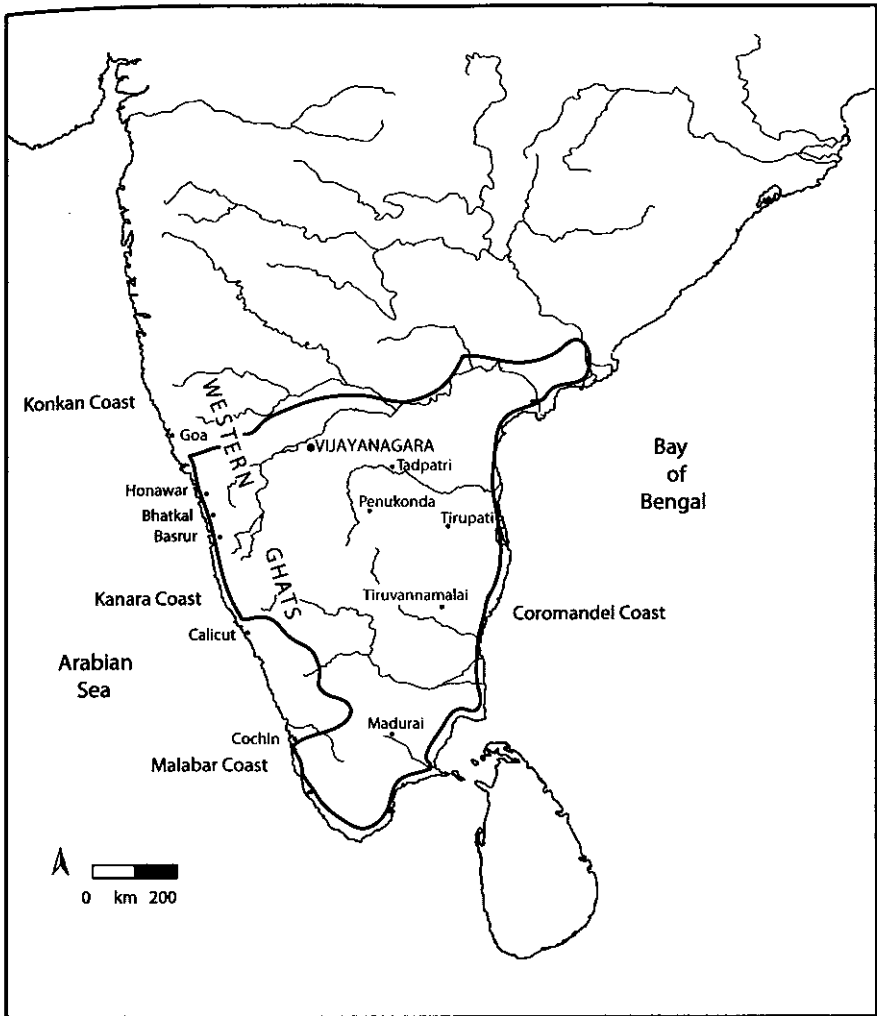


FIGURE 2.6. The Vijayanagara empire (Sinopoli and Morrison 2007: fig. 1.1)

their maximal extent in the early sixteenth century, under the powerful and successful Tuluva dynasty. Populations may have reached a quarter million or greater during this period. However, in 1565, during a time of internal political crisis, the Vijayanagara military was defeated in a major battle against the combined forces of a confederacy of northern enemies, and the capital was abruptly abandoned. The imperial seat shifted south

and, while a limited rural population likely remained in Vijayanagara's agricultural hinterland, the core of the city was largely deserted.

To complement the archaeological research being conducted in the Vijayanagara urban core by the Archaeological Survey of India, the Karnataka Directorate of Archaeology and Museums, and Fritz and Michell's Vijayanagara Research Project (Fritz et al. 1985), in the late 1980s Morrison and Sinopoli designed the Vijayanagara Metropolitan Survey project. Our goal was to examine the city's hinterland and specifically to understand the economic infrastructure of this vast urban landscape throughout its approximately 250-year history. As discussed earlier, our survey, conducted over 10 years, documented more than 700 archaeological sites. The vast majority date to the Vijayanagara period and provide detailed evidence demonstrating the transformation of this region into a densely utilized landscape.

The walled urban core of Vijayanagara lay in the approximate center of our survey region (fig. 2.1). By the early fifteenth century, the city core had reached approximately 20 km² in extent; an outer ring of walls was added in the sixteenth century, and the core area expanded to approximately 30 km². This core region was the most heavily occupied portion of the metropolitan region, containing dense residential, administrative, and sacred architecture. Moving out from the city core, population became less dense and focused on some two dozen nucleated towns and villages (Sinopoli 1997), the largest of which were less than 100 ha in area (and most were less than 5 ha). The nature and distribution of settlement and other features across the metropolitan region varied with topography, the presence of arable soils, and distance from the urban core. The locations of major functional categories of sites are illustrated in fig. 2.2.

As discussed earlier, the outer edges of the metropolitan region were defined by the presence of fortification walls and topographic features that formed effective boundaries to movement into (or out of) the region. These walls were part of an elaborate network of defensive features that protected the capital and its hinterland. Hilltop forts occur throughout the metropolitan region and are most densely clustered on the high hills that border the northern banks of the Tungabhadra, where they defined both the boundaries of the metropolitan region and, for much of its history, the northern boundary of the empire itself. Hilltop forts were also associated with settlements (which were often themselves walled)



FIGURE 2.7. Road system (VMS-470). (Photograph by Vijayanagara Metropolitan Survey)

and overlooked major routes of movement. Bastions and lookout points also occur within settlements and along major roads. Given the highly militarized nature of south India during the Vijayanagara period, it is not surprising that considerable effort was invested in protecting the imperial capital and monitoring movement into and out of the metropolitan region.

Such movement took place along a transport network that included broad major roadways that ran across low-lying regions, as well as numerous smaller roads and footpaths (Morrison 2001b). The major roads through the metropolitan region were enormous, as much as 30 m across, and were identified by the remains of low walls that bordered them and by the alignment of wells, temples, and settlements and by other roadside features. Most of these large roads lie beneath the modern paved roads in the region. Smaller routes include rock-cut stairways and areas of worn sheet rock or pavement among outcrops (fig. 2.7), as well as narrow terraces that border the edges of outcrop hills above

agricultural land. Gates occur at the intersections of roads and fortification walls. Some of these are quite simple—narrow gaps in the walls wide enough to allow a single individual to pass. Others, particularly in major fortification walls or along large roads, are more elaborate, with corbeled roofs, sculptures, and subsidiary chambers and platforms, perhaps used by soldiers and tax collectors.

Not surprisingly, there was an intensive focus on expanding and assuring agricultural production in the region, and more than a quarter of the sites we documented were associated with a broad array of irrigation and dry-farming technologies (see Morrison 1995a). In low-lying areas near the river, canal irrigation was possible. A major canal ran through the core of Vijayanagara, which foreign visitors and contemporary poets described as containing abundant and beautiful flower gardens and orchards. Rice, sugarcane, and other crops with high water demands were grown in the canal-fed region. A number of inscriptions indicate that most of the canals were built relatively early in the capital's history, in the late fourteenth and early fifteenth centuries, often with royal sponsorship (Morrison 1995a; Davison-Jenkins 1997). The construction of agricultural features was emphasized from the very beginnings of the city, with high investment in construction occurring in the decades immediately after the empire's founding, declining somewhat in the later fifteenth century and expanding again in the sixteenth century, with the construction of several major reservoirs and reservoir systems (see below).

The rugged topography of the metropolitan region necessarily limited the feasibility of canal irrigation over broad areas. Beyond the Tungabhadra, a variety of agricultural technologies were employed, most oriented toward capturing and channeling seasonal runoff from monsoon rains and retaining soil moisture. Numerous reservoir embankments were documented throughout the metropolitan region. These stone-faced earthen embankments ranged from approximately 20 m to more than 3 km in length. While a small number were canal fed and thus perennial, the majority were fully reliant on runoff. Water stored behind the embankments was fed to nearby agricultural fields through sluice channels that passed under the embankments or, in small embankments, through simple boulder-lined channels near embankment edges that could be blocked by earth, brush, and boulders. Areas behind the

embankments were probably also farmed as water levels declined in the months after the monsoons. In our survey, we soon discovered that the location and nature of embankments was highly predictable. These features occurred in virtually every possible context where even a quarter hectare of potentially arable land was present. In more-open areas, such as in the Daroji Valley on the southeastern edge of the urban core, Morrison has documented a complex network of several dozen interconnected reservoirs. Such systems required careful and regular maintenance to control silt accumulation in reservoir beds, to limit dangerous water flows and breaches during periods of abundant rainfall, and to assure access to water during drier years or periods. The majority of reservoirs in the Daroji system were constructed during the sixteenth century, when the metropolitan region expanded to include this outlying zone.

Other agricultural features recorded in the metropolitan region included wells and erosion-control walls. Extensive terrace systems and gravel-mulched fields were also documented in dry-farmed areas. Various domestic millets and pulses, and perhaps cotton, were the major crops grown in these areas. Small single-room structures and inhabited rock shelters often occur near agricultural zones, and they probably were the focus of short-term occupation and provided storage facilities and shelter from the hot sun.

After agricultural features, the next most numerous category of remains documented in the metropolitan region is sacred sites—temples, shrines, and sculptures. Vijayanagara temples range in size. Enormous walled complexes covered several hectares (fig. 2.8) and included residential zones, markets, and craft production areas as well as major and minor sacred structures (see Mack 2002). Construction of the largest temple complexes often involved royal sponsors. At the opposite extreme are the numerous small one- or two-room temples and shrines found across the metropolitan region—along roads, within settlements, near reservoirs, and on prominent points in the landscape, such as atop high hills. Also found in abundance are isolated images, carved on bedrock or on quarried slabs. These images are dedicated to a range of deities. Most common is Hanuman, the monkey-god hero of the Ramayana, though a broad array of Śaivaite and Vaiṣṇavite deities are depicted, as are numerous lesser deities such as *nagas* (cobras), whose worship is often associated with female ritual and powerful local goddesses. The Vijayanagara metropolitan region

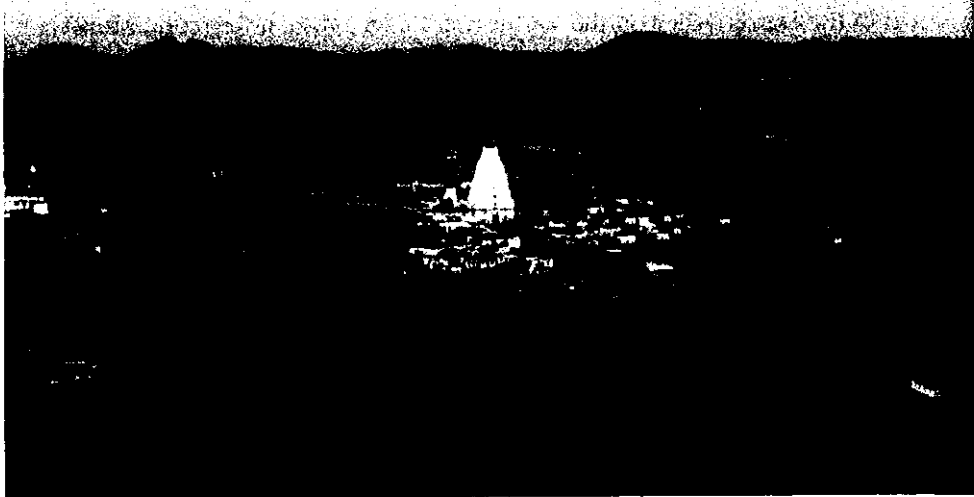


FIGURE 2.8. The Virupaksha temple complex, Vijayanagara. (Photograph by Vijayanagara Metropolitan Survey)

thus included multiple sacred landscapes associated with orthodox Hinduism (as well as Jainism and Islam), Rama worship, and a complex and varied array of local beliefs (Sinopoli 1993; Dallapiccola 1994).

Discussion and Conclusions

The limited description presented above provides only a pale reflection of the archaeological richness of Vijayanagara period remains in the metropolitan region, which itself is an even paler reflection of the teeming metropolis that thrived in the region for two and a half centuries. Some of that dynamism is captured in the words of the sixteenth-century Portuguese merchant, Domingo Paes, who resided at Vijayanagara from 1520 to 1522:

In this city you will find men belonging to every nation and people, because of the great trade which it has. . . . The size of this city I do not write here, because it cannot all be seen from any one spot, but

I climbed a hill whence I could see a great part of it. . . . What I saw from thence seemed to me as large as Rome, and very beautiful to the sight. . . . The people in the city are countless in number, so much so that I do not wish to write it down for I fear it should be thought fabulous; but I declare that no troops, horse or foot, could break their way through any street or lane, so great are the numbers of people and elephants. (Sewell 1900:256-57)

A few decades later, the Italian Cesari Federici described a very different city. Writing two years after Vijayanagara's 1565 military defeat, he observed: "The Citie of Bezeneger (Vijayanagara) is not altogether destroyed, yet the houses stand still, but emptie, and there is dwelling in them nothing, as is reported, but Tygres and other wild beasts" (Sewell 1900:208).

Archaeological evidence suggests that while the urban center of Vijayanagara was abandoned, a number of the rural settlements in the metropolitan region were not fully emptied. Some population remained in the region (though we do not have a good assessment of how much), and a number of settlements founded in the Vijayanagara period remain occupied up to the present. However, while limited settlement and small-scale agriculture and craft production persisted, the urban infrastructure of Vijayanagara did not. With it no longer a center of wealth and commerce, peninsular India's major trade routes shifted away from the Vijayanagara region toward powerful polities to the south and north; many skilled artisans and warriors no doubt also migrated to these emergent or expanding capitals. The delicate agricultural infrastructure of the metropolitan region, particularly of reservoir irrigation, was no longer maintained, and with the exception of a small number of canal-fed reservoirs, most reservoirs fell out of use. (Though several still maintain moisture behind them and their beds are used for agriculture, most have been breached, and desilting and regular maintenance have ceased to take place.) Most of the large temple centers at Vijayanagara were destroyed, as conquering armies briefly occupied and looted the city. A number of smaller temples and shrines throughout the area no doubt remained in worship, though many of these also were neglected or abandoned. With the exception of some later defensive architecture (forts and bastions), we find little evidence for major construction of the post-Vijayanagara period, up until the arrival of the British.⁴

Much work remains to be done in understanding processes of landscape transformation during the Vijayanagara period, much less to fully understand the longer timescale that we have begun to address in this chapter. In the research reported on here, our focus has necessarily been on surface remains, and only very limited test excavations were conducted in two of the more than 700 documented sites. In the future, more attention needs to be paid to geological processes and taphonomic factors affecting site visibility and preservation. A better understanding of paleoenvironmental conditions and their change through time is also crucial. Morrison (1994, 1995a, 1995b) has begun such efforts through a program of pollen coring in several Vijayanagara period reservoirs, and this will be expanded in our new project focusing on pre-Vijayanagara periods. Also, as elsewhere in South Asia, improved understanding of long-term sequences in the central Tungabhadra region requires a much more refined chronology, supported by large numbers of absolute dates.

Caveats aside (and every region requires many), this chapter has demonstrated that the forbidding landscape of the central Tungabhadra corridor has a rich and complex history of human occupation and transformation. The people of the small-scale Neolithic villages of the third and second millennia BCE raised crops and grazed their cattle and began the process of significantly transforming both the natural vegetation and the cultural landscape of the area.⁵ Part of these transformations involved the construction by Neolithic communities of imposing monuments of dung that likely provided visual markers of social action and clearly indicated the human presence in the landscape.

Landscape transformation continued and accelerated in the subsequent Iron Age and Early Historic period. Populations expanded, and new technologies such as iron smelting required large quantities of charcoal, contributing to changing vegetation distributions. Agricultural production and demands also must have expanded considerably, as large nucleated settlements such as Kadabakele were founded. The addition of rice cultivation would have dramatically transformed low-lying regions. Political and social hierarchy developed and became increasingly complex, and the region was linked to the rest of South Asia and beyond in extensive long-distance trade networks. The large megalithic complexes of the period represent both a new mortuary treatment and a new kind of relationship to the landscape. Hire Benkal, the largest of these sites,

which is probably earlier than the megalithic sites documented in our survey area, is located in a difficult and inaccessible location in an area with little potentially arable land and little evidence for significant nearby settlement (though the region has not been systematically surveyed). Given its size and setting, it likely was a ritual center serving a considerable region, and its difficulty of access may have been a key factor in its location. The cemeteries that we documented in our survey area were also located on high hilltops, but access was much easier and they were typically associated with individual nearby nucleated settlements.

The next and most dramatic major period of landscape transformation in our region occurred in the two and a half centuries when the central Tungabhadra region was an imperial seat. It was during this period that populations in the central Tungabhadra region reached their maximal extent. The enormous demands for foodstuffs, particularly in a highly militarized environment where trade routes could be easily disrupted, placed great demands on the region's agricultural potential. Agriculturalists moved to the area in considerable numbers, and virtually all potentially arable land in the region was farmed, using a wide array of irrigation and dry-farming techniques. The many monuments constructed in the Vijayanagara period also transformed the landscape in dramatic ways. The gateways, or *gopura*, of the largest temple centers stood ten or more stories tall and were visible from considerable distances. Countless additional smaller temples, shrines, and sacred images constituted multiple, embedded sacred landscapes constructed and used by the many religious, ethnic, and linguistic communities that inhabited the metropolitan region. The bands of fortification walls that protected the capital extend more than 30 km from the urban core, and their impressive scale and beautiful dry-stone masonry announced the presence and the power of Vijayanagara authority to travelers, merchants, and invaders alike.

After 1565, the central Tungabhadra region reverted to a sparsely populated rural landscape. Colonial officers of the Archaeological Survey of India, writing in 1908, attempted to explain why Vijayanagara failed to be repopulated after the 1565 battle:

It is locally thought that, although the city was previously devastated by the Muhammeden onslaught, it would, in other circumstances, have remained a fairly populous place, shorn of its previous greatness

probably, but still a populous town, like many others now in existence in Southern India. It is however, as far as habitations are concerned, a rocky unpopulated desert. The climate, it is said, completed the work of the former invaders. (Archaeological Survey of India, Southern Circle, 1908:12)

While climate is not the sole answer to this conundrum, it is indeed the case that this is a region where it is difficult to support a large population in the absence of a larger infrastructure geared toward enhancing the region's limited productivity and assuring a secure flow of subsistence and other resources from outside the region. The Vijayanagara empire was not a managerial polity that either produced or controlled this infrastructure (Morrison and Sinopoli 1992; Sinopoli and Morrison 1995). It did, however, create the contexts—of wealth, security, and high demand—in which temples, agricultural communities, craft producers, and merchants could operate effectively to support a vast urban infrastructure. Following the empire's collapse and withdrawal, these contexts also disappeared, as did the urban character of the region. As noted earlier, it is only in the last few decades that populations in the region are beginning to approach Vijayanagara levels. It is also in the last few decades that the rich archaeological record of the central Tungabhadra has come under severe threat, making increased systematic regional work such as discussed in this chapter a pressing need in this region, as elsewhere in South Asia.

Acknowledgments

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Notes

1. Much of the recent research on the Indus Valley or Harappan Civilization does emphasize long-term sequences and cultural change, but this is not by and large representative of South Asian archaeology as a whole.

2. That is, speakers of Indo-Aryan languages, glossed as "Indo-Aryans through a presumed equivalence of 'race,' language, and culture."

3. Old World lapis lazuli sources are restricted to southern Baluchistan (Pakistan) and northern Afghanistan (Kenoyer 1998:96).

4. However, it must be acknowledged that seventeenth- and eighteenth-century architecture and material culture have not been studied in this region.

5. As noted above, earlier occupation no doubt also occurred in the area, but at present, we lack the evidence to address its impact on the Tungabhadra landscape.