1. Southern Neolithic Culture: a Brief Outline

The Neolithic period was originally defined by the occurrence of polished stone tools and pottery. Literally, Neolithic means new stone tools as opposed to Palaeolithic. The word "Neolithic" was coined by Sir John Lubbock while subdividing Thomsen's "Stone Age" into Palaeolithic and Neolithic in his Prehistoric Times, published in 1865. The term 'Neolithic' came to be used to describe the technological progress of man in the areas of manufacturing polished stone tools and pottery. The art of pottery making and domestication of animals was characteristic of the stage of Barbarism of Edward Tyler who traced the development of human societies through the stages of Savagery, Barbarism and Civilization. According to M.C. Burkitt, the Neolithic comprised of the four main characteristics - the practice of agriculture, domestication of animals, the manufacture of pottery and the grinding and polishing of stone tools (Singh, 1974). The Neolithic culture is largely associated with the characteristic tool-kit comprising polished stone tools including axes, adzes, arrowheads and also microlithic artefacts. These typical artefacts of the Neolithic culture are associated with the agricultural way of life and more specifically cultivation of cereals. The concept of Neolithic Revolution was popularized by V. Gordon Childe (Allchin, 1982) in the 1940s to reflect the dramatic change in the food economy that was brought about by the early farmers. He traced the spread of the Neolithic way of life from western Asia and Egypt across Anatolia and then to Europe in a 3000 year span. After the Second World War, this hypothesis was tested and buttressed by intensive field work in the Fertile Crescent. He remarked Food production – the deliberate cultivation of food-plants, especially cereals and the taming, breeding and selection of animals was an economic revolution – the greatest
in human history after the mastery of fire (Childe, 1951: 23). However, some scholars prefer to call the change from food-gathering stage to food-producing stage “evolutionary rather than revolutionary” (Singh, 1974). The presence of polished stone tools and pottery were considered to imply incipient village communities and a sedentary way of life with agriculture and domestication of animals (Allchin, 1982). R. J Braidwood and B. Howe have opined that the causes for the development of an agricultural way of life were the ‘ever increasing cultural differentiation and specialization of human communities.’ The demographic stress set in a tendency to settle more or less permanently in a location cannot be ruled out as one of the important reasons for the shift from a predominantly hunting-foraging economy to a food producing economy (Thapar, 1978).

The end of the Pleistocene period coincided with the end of the last Ice Age and the interglacial climatic conditions, similar to the present, were established all over the globe. It is during this period the first domestication of plants and animals took place. The remains of the wild precursors of domesticated sheep and goat from the cave sites of Indo-Iranian borderlands from the pre-Neolithic strata and the continuance of sheep and goat remains in the non-ceramic Neolithic levels seem to suggest that the domestication of animals pre-dated the domestication of wheat, emmer and ainkhorn and barley (Allchin, 1982). While domestication of animals or pastoralism requires a nomadic way of life, the domestication of wild crops and their subsequent cultivation demands a considerable sedentism. The Neolithic economy is characterized by both these means of subsistence. This would suggest that the Neolithic period indeed heralded the beginning of incipient settled communities with considerable complexities to allow a degree of semi-nomadic subsistence.
Geographically the Indian subcontinent lies between the countries of Western Asia and those of Southeast Asia. In the north the Subcontinent is bounded by the mighty Himalayas but the passes and Valleys in northwestern Indian Subcontinent (Baluchistan) have permitted the migration of peoples, cultures and ideas through the ages. Among the important sites where excavations have been conducted in recent years mention may be made of Abu Hureyra in north Syria, Ain Ghazal on the outskirts of Amman, Gilgal in the Jordan Valley, Grittile in southeastern Turkey, Umm Dabaghiyah in Iraq and Ganj Dareh in the Kangavar region of the Central Zagros Highlands. Excavations at Abu Hureyra showed the domestication of wild varieties (einkhorn) of wheat by the presence of emmer wheat. There were also rectilinear mud-brick structures and evidence of trade of obsidian, jadeite and agate from Turkey, soapstone from Zagros Mountains, cowrie from Red Sea and turquoise from Sinai. All these indicated a settled community with an incipient agricultural economy, supplemented by trade with near and far regions. Ain Ghazal, Gilgal and Grittile all have remains of structures and while Ain Ghazal’s contact with Jericho is mirrored by the two caches of plaster human statues like those found in Jericho, Grittile has remains of cultivated emmer wheat and lentils and also domesticate sheep, goat, pigs and cattle. It is interesting to note that all the above mentioned sites exhibit evidence of cultivation of crops, domestication of animals and even settled communities in the pre-pottery Neolithic phase.
1.1 Classification

The distribution of the Neolithic culture is very largely influenced by the diversity of the physical environment as with the climatic variation over the Indian sub-continent. The differences in the geology and soils, monsoon distribution and the resulting natural vegetation have caused different wild progenitors of the crops to favour different regions. This has in turn shaped the distribution and spread of the Neolithic culture in the Indian sub-continent.

B.K. Thapar has established the Neolithic culture of the Indian sub-continent in six different geographical regions (i) the region covering Baluchistan, Swat and Upper Sind Valley in Pakistan, (ii) northern region covering the Kashmir valley, (iii) eastern region covering Assam, Chittagong and the subhimalayan (Siwaliks) regions including Darjeeling, (iv) the Chhotanagpur plateau which covers parts of present-day Orissa, Chattisgadh, Jharkhand, Bihar and West Bengal, (v) mid-eastern region which
comprise of parts of Bihar and Uttar Pradesh and (vi) south, comprising the peninsular India (Thapar, 1978).

The Allchins have made divisions of distinct regions based on the physical environment, climate and the presence of wild progenitors of the domesticated crops. The divisions are (i) the Indus system and its western borderland, (ii) western India, including northern Deccan, (iii) Southern Deccan and (iv) the Ganga Valley (Allchin, 1982).

It is important to note that both these scholars recognize the Southern Neolithic as a distinct cultural geographic entity.

Broad parallels can be drawn between the Neolithic of the Baluchistan region and the neighbouring Iranian plateau and the region to the east of the Caspian Sea and the plains to the north as far as the valley of the Oxus and ‘thus appear as interrelated parts of a larger whole-geographically and even culturally’ (Allchin, 1982). The northern region comprising of the Neolithic sites in the Kashmir valley display much similarity with the Neolithic cultures of north China. In discussing the origins and affinities of these northern Neolithic sites certain things at once strike the eye as foreign to the Indian tradition. Among them are the forms of the bone tools, the rectangular perforated stone knives, jade beads, the pit-dwellings and the placing of domestic dogs in graves with their masters. Each one of these features is found in the Neolithic cultures of north China, the perforated knife in particular being a characteristic trait. Also dog burials are reported in the Ang-Ang-Hsi culture of Manchuria (Allchin, 1982:116). They further go on to state that the bone industry, including harpoons, is also a frequent occurrence of north Chinese Neolithic sites and that the evidence of trade and more profound contacts with the Chinese world is noteworthy. But it is important to mention that the Allchins note the absence of any
similarity between the Burzahom ceramic industry and the Chinese Neolithic pottery. The Neolithic culture of eastern India including Assam and the subhimalayan region has yielded fully ground shouldered celts, quadrangular axes and adzes found in association with cord-marked pottery in the later stages. While the similarities between the earlier phases characterized by wholly chipped and edge-ground axes and the food-producing Hoabinhian culture of Southeast Asia has yet to be ascertained (Gorman, 1971). The affinities between the later stage of eastern Indian Neolithic and south China and Southeast Asia are clearly demonstrated by the shouldered axes and quadrangular axes. These parallels of the northwestern, northern and eastern Neolithic cultures with “foreign” counterparts makes us put the Southern Neolithic in a different perspective.

Chronologically, the Southern Neolithic is broadly placed between c.2800-1000 B.C. (Allchin, 1982) has now been revised. According to Fuller et al. (2007), a suite of AMS C-14 dates places the Neolithic between 3300 B.C. and 1400 B.C. Although the Southern Neolithic is slightly later in date when compared with the Neolithic in Baluchistan and it is a late contemporary of the Mature Harappan period it stands out because of its distinct characteristics. The fact that it is characterized by the Ashmound Tradition (which will be discussed later), the predominance of cattle-pastoralism and the inclusion of a number of millets and pulses whose wild progenitors were found in the region, have carved a distinct place for Southern Neolithic.

1.2 Spatial Extent of the Southern Neolithic

As a result of extensive field work and studies conducted by various scholars over the last 150 years the geographical scope of the Southern Neolithic has expanded
phenomenonally. It has now come to cover the region south of the river Krishna, with an exception of a few sites on its northern banks also. The term Southern Neolithic has been associated in the scholarly tradition to the presence of ashmounds and cultural traits associated with it. The inclusion of sites in coastal Andhra Pradesh and the Neolithic sites in Southern Neolithic is still debated upon. While Vijay Prakash et al. considered them as part of the Southern Neolithic in order to gain better understanding of the socio-economic and cultural aspects of the Neolithic period, Narasimhaiah (1980) has not included evidence from Tamil Nadu into the larger Southern Neolithic group. Thimma Reddy (1994) and David Raju (1988) also include the coastal Andhra sites in the Eastern Neolithic group along with the sites in Bengal, Bihar and Orissa due to some of the comparable cultural traits between the two, while Vijay Prakash et al. included these in the Southern Neolithic complex (Korisettar et al. 2002). The early agricultural sites of Northern Deccan (Maharashtra) are late contemporaries of the Southern Neolithic sites and are grouped separately as the Chalcolithic sites because of the preponderance of copper artefacts and also slightly different pottery repertoires both in types and wares. The mutual influences of the Deccan Chalcolithic and Southern Neolithic on each other can be seen in the middle and later phases in the Neolithic cultural sequence. It can thus be said that the Southern Neolithic is found almost all over peninsular India. Nevertheless, one can notice a dense distribution of ashmound sites in the modern districts of Raichur, Bellary, Koppal and Chitradurga in Karnataka and Anantapur and Kurnool districts of Andhra Pradesh which has resulted in the region being called the ‘core region’.
There are certain variations in the Southern Neolithic due to the great geographical and chronological extent. There are apparent differences in the artefactual assemblages of the core region and the other regions (Korisettar et al. 2002). Keeping in mind these differences and also the presence or absence of ashmounds, Paddayya has identified five zones of Southern Neolithic (Paddayya, 1973). This distribution of sites into five zones extends till the north western parts of Tamil Nadu and western Andhra Pradesh. Zones 1 and 4 have the densest distribution of ashmound sites and these zones comprise of what is known as the core region. Zone 2 which includes the upper Krishna basin also has ashmound sites. Zones 3 and 5 have very few sites in them and are devoid of ashmound sites. However, the
situation has changed in Zone 5 due to the discovery of many new sites by David Raju (1990) and P.C. Venkatasubbaiah (1992). The absence of ashmounds in Zones 3 and 5 have to be viewed in relation to the different cultural ecology and social organization (Korisettar et al. 2002).

1.3 Nature of Southern Neolithic

Ashmounds are unique to the Southern Neolithic and have been the subject of much debate for over 150 years when they were first noticed. It was Col. Colin Mackenzie, the first Surveyor General of India who discovered few of these features including the Kudatini ashmound during the preparation of topographical maps of parts of Karnataka and Andhra Pradesh in the early 19th century which was followed by a few more in the Shorapur Doab by Col. Meadows Taylor in the 1850s. But it was Robert Bruce Foote who not only discovered a number of ashmounds and Neolithic habitation sites in the Bellary–Anantapur region but was also the first among those who have strived to find out the age and origin of these features. Many views are propounded about the origin and age of these ashmounds. Their association has been drawn from Neolithic cattle dung heaps by scholars to cremation grounds of rakshasas or demons of Hindu epics, like the Mahabharata in the local legends and myths. They have been thought to result from industrial activities like iron-smelting, gold smelting, brick making and pottery making activities. Cole has argued that the ashmounds are in fact geological deposits like kankar formations, limestone slag and volcanic ash. They have also been linked to the mass satis committed by women during the Vijayanagar period. But all these theories have now been put to rest by many repeated analyses which have proved beyond doubt that these ashmounds are...
results of repeated or periodic burning of large quantities of cow-dung during the Neolithic period.

In the 1930s, officers of the Geological and Archaeological Departments of the erstwhile Hyderabad State discovered many ashmound sites and have made remarks on the origin of the same. They attribute these ashmounds to the iron-smelting processes. A. Sundara (1987) and V. Raml Reddy (1990) are of the opinion that these ashmounds could possibly belong to the Iron Age. They have provided evidence from Terdal in Belgaum and Palavoy in Anantapur in the form of some sherds of Iron Age pottery and pieces of iron ore and slag.

R.B. Foote noticing the proximity of these ashmounds with the Neolithic settlements and drawing from the importance of cattle in the rural areas associated these ashmounds with the Neolithic culture. This was further confirmed by W.F. Smith, Presidency College, Chennai who conducted a chemical analysis (Foote, 1916). This was later corroborated by Zeuner's report (1960) and Mujumdar and Rajaguru (1967). F.R. Allchin (1963) in his book *The Neolithic Cattle-Keepers of South India* has presented a comprehensive study of ashmounds drawing from his excavations at Utnur and also ethno archaeological evidences. He has identified the importance of the word *Budi* in many place names and has related this to the significance of cattle in the folk traditions and beliefs. He has strengthened Foote's inferences about the pastoral nature of the Neolithic people and has considered the ashmounds to be cattle pens and has differentiated them from the habitation sites. Differing from Foote on the account of ashmounds being accidental, Allchin has strongly argued that these were deliberate periodical episodes of cattle-dung burning and probably was a Neolithic ash-fire cult.
In the 1990s further work was undertaken by K. Paddayya of Deccan College at Budihal in Gulbarga district. He has identified the prevalence of dominantly pastoral economy at the site and has plotted different activity areas at the site such as spaces for butchering animals, a chert-blade production area, a waste disposal spot...
and a distinct habitation area. This made him come to the conclusion that Neolithic economy was predominantly pastoral with little or no importance to cultivation of plants.

The development of Southern Neolithic is very broadly seen in two phases by K.S. Ramachandran. The first phase is characterized by the absence of metal and the presence of pecked and ground stone tools and an incipient blade industry and the second, along with the stone tools, is distinct by the occasional occurrence of copper artefacts, a well-developed blade industry and more elaborate dwellings (Soundara Rajan, 1964). The Allchins (1982) have delineated a three-phase sequence of the Southern Neolithic especially the ashmound sites on the basis of their study at Piklihal, Utnur and several other Neolithic sites in the area. They have also compared the cultural sequence at Piklihal with other major sites like Brahmagiri, Sanganakallu, Tekkalakota, Hallur, Palavoy and have drawn a cultural sequence of the Southern Neolithic based on tool technology, ceramic assemblages and absence or presence of copper artefacts. The characteristics of the three phases are described in the following.

1. The first phase is marked by a ground stone-axe industry with a ‘rudimentary stone-flake and blade tradition’. The pottery assemblage consists of handmade burnished grey and buff ware and a small percentage of black and red slipped ware. Some of the grey ware types were painted with red ochre, for example as at Brahmagiri. The presence of grinding stones and querns are suggestive of grain processing activity. Ashmounds are associated with this phase and thus indicate a combined agro-pastoral economy.

2. The second phase shows some important developments. The settlements were now seen on granite hills and the terraces on their hillside.
The stone-axe tradition continued with an increase in the number and regularity of stone blades from prepared cores. Perforated pottery and spouted vessels begin to appear and so also the rusticated ware. Few copper and bronze artefacts were found in many sites. Sites like Tekkalakota, Piklihal, Sanganakallu, Hallur and Brahmagiri witnessed this phase.

3. The third phase is mostly noticed in Tekkalakota, Hallur and Paiyyampalli. It can also be noticed in Piklihal, Brahmagiri and Sanganakallu in the overlap period. This period witnesses a change in the pottery repertoire in the sense of a change in the proportion of the ware found. The grey ware continues to be used but with the increase in the number of later wares like the early black-and-red wares, red slipped ware as in Sanganakallu. There is an increase in the number of copper and bronze tools although the stone-axe and blade tool industry continue right upto the Iron Age.

According to this three phase model, the Ashmound Tradition sites are earlier than the hill-top fully sedentary habitation sites (Allchin, 1982). This has also been supported by Paddayya (1991-92, 1993). But the excavations in Watgal have revealed a permanent habitation site with its habitation deposits dating to a good early third millennium B.C. when the Allchins have proposed an only ashmound stage (Korisettar et al. 2001, 2002). It is interesting to note the presence of most of these settlements on granitic hill-tops in relation to the close proximity to water springs. The spring activity in this granitic terrain is periodically recharged by the ground water that percolates into the rocks and rises due to capillary motion to emerge as springs. These springs act as sources of fresh water to the Neolithic settlers and also the depressions in the plains surrounding the hills were marshy and made good habitats for swine and fowl (Korisettar: personal communication, 2006).
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<td>Phase I</td>
<td>Ashmounds at Utnur, Kodekal and Palavoy</td>
<td>Shorapur, Raichur, Bellary(?), Chitradura, Anatapur</td>
<td>Stone-axe industry with a rudimentary stone-flake or blade tradition; predominantly handmade grey or buff-brown ware with a less common black or red burnished slip; presence of querns suggestive of grain cultivation or collection; Domestication of cattle, sheep and goats and forest cattle stations indicating seasonal grazing; complete absence of metal making it a truly Neolithic phase.</td>
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<td>Phase II</td>
<td>First settlements on the tops of granite hills, or on leveled terraces on the hillside, or on saddles or plateau between such hills Pikihal (Upper Neolithic), Brahmagiri, Sanganakallu, Tekkalakota I, Hallur IIA and T. Narsipur</td>
<td>Beginnings of Neolithic beyond ashmound zone: southern Karnataka, northeast Tamil Nadu and beginnings of villages on Upper Tungabhadra River.</td>
<td>Mud floors in circular huts of wattle and daub; stone-axe tradition continues with an increased number of stone blades from small blade cores from siliceous stones; new elements in pottery like perforated and spouted vessels and surface finishing like rustication appear; appearance of metal objects like gold in Tekkalakota and copper and bronze in other sites.</td>
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<td>Phase III</td>
<td>Tekkalakota II, Hallur, Paiyampalli, Pikihal (intrusion period), Sanganakallu 1.2 and Brahmagiri</td>
<td>Emergence of megaliths in eastern Karnataka. By end of period, megaliths in wider region of Tamil Nadu, eastern Maharashtra.</td>
<td>Axe and blade industries continue; increased frequency of copper objects like chisels, fish-hooks, flat axes; presence of Equus cabalus is suggestive in conjunction with the rock art showing horse and riders.</td>
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<td>3000 B.C.</td>
<td><em>Earliest Neolithic occupations, with ceramics. No ashmounds.</em> e.g. Watgal, Kodekal, Utmar.</td>
<td>Shorapur and Raichur.</td>
<td>No clear evidence of animal herding or plant economy.</td>
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<td>2500 B.C.</td>
<td><em>First ashmounds,</em> e.g. Utmar, Budihal, Palavoy, Brahmagiri A(?), kudatini(?). Early hilltop ashmounds in Bellary District, e.g. Kurugodu, Choudammagudda(?).</td>
<td>Shorapur, Raichur, Bellary(?), Chitradurga, Anantapur.</td>
<td>Bone evidence for cattle, sheep, goats. No archaeobotanical data, but inferred beginnings of cultivation system likely to be established.</td>
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<td>1400 B.C.</td>
<td>Village continuity, some hilltops abandoned. Last ashmound formations cease (e.g. Velpumadugu). Megalithic pottery and burials begin.</td>
<td>Megaliths in eastern Karnataka. By end of period, megaliths in wider region of Tamil Nadu, eastern Maharashtra.</td>
<td>Wheelmade ceramics. Specialised stone axe workshops. A few possible iron implements from this period (?). Possible finds of horse.</td>
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<td>800 B.C.</td>
<td>All hilltop villages abandoned.</td>
<td>Megalithic burials widespread, including inland southern Tamil Nadu.</td>
<td>Clear attestation of iron working. Clear attestation of horses. Earliest finds of cultivated rice in South India (Veerapuram).</td>
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<td>300 B.C.</td>
<td>Settlement on plains.</td>
<td>Megalithic burials continue, and cease during this period (?). First agricultural village sites in inland southern Tamil Nadu</td>
<td>Rice agriculture more widely adopted.</td>
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Table 1.2: Revised chronological framework and developmental stages of the Southern Neolithic (after Fuller et al. 2007)
The two key aspects of the Southern Neolithic economy include domestication of animals (cattle, sheep and goat) and plants, which includes both the cultivation of crops, the wild varieties of which are found in other places and have been introduced in the region through exchange and gradually adopted like sorghum, finger millet, pigeon pea and rice and also domestication of pulses such as the horsegram and millet-grasses like browntop millet and sawa millet.

Pastoralism in the Southern Neolithic context is well represented first by the number and monumentality of the ashmounds and the animal bones in both the ashmounds and habitation sites. Based on the large scale excavations in Budihal and surface collections at various other ashmound sites, Paddayya is of the opinion that all ashmound sites were habitation sites and that makes the Neolithic economy predominantly pastoral in nature with very little emphasis on cultivation (Paddayya, 1993). This claim is refuted by other scholars like Fuller et al. (2001) who are of the opinion that Neolithic sites are primarily of three types. Firstly, ashmounds which stand isolated or with no stratified deposits around them like those at Utnur, Gudekal, Kuditini and Choudammagudda. Secondly, ashmounds with an extent of stratified deposits around them like Kupgal, Budihal and Palavoy. Thirdly, the deeply stratified habitation sites found mostly on hilltops, such as at Sanganakallu, Tekkalakota and Kurugodu.

The Allchins have suggested that the ashmounds were probably seasonal settlements. They have well recognized both the pastoral as well as the agricultural nature of these Neolithic settlements. F.R. Allchin has recognized the importance of some sort of cultivation in the Southern Neolithic economy (Allchin, 1963). What the Allchins call seasonal settlements can be seen in relation to the four types of settlements that Schiffer et al. propound. Schiffer et al. (1987) suggests that sites can
be visitations (short stays of less than a day), or short encampments (ranging from a couple of days to weeks), extended encampments of several weeks and months and finally permanent or continuous year-round habitation sites. Korisettar et al. (2001) are of the opinion that ashmounds like Kuditini, Utnur, and Choudammagudda can be classified as short encampments and the larger ashmounds with some stratified deposits around it like Budihal, Pallavoy and Kupgal can be classified under the extended encampments. Hilltop sites like Sanganakallu and Tekkalakota which are non-ashmound sites and have deep stratified deposits are the ones that can be described as continuous habitation sites.

Venkatasubbaiah (1992) has noted the differences between the Neolithic sites in the Pennar Basin, Cuddapah district of Andhra Pradesh and the Neolithic sites associated with the Ashmound Tradition. He has explained the absence of ashmounds mainly due the utilization of the dung for manuring purposes in the agricultural operations. He has laid stress on an economy mainly dependent on millet and pulse farming and a complementary pastoralism of cattle, sheep and goat. Korisettar et al. (2004) have further extended this hypothesis and suggest a similar explanation for the absence of ashmounds in Paddaya’s Zone 3 of the Southern Neolithic, which includes in its extents Hallur, T. Narsipur and other sites on river banks. It has also been suggested by the same authors that these sites in the Pennar Basin and also Paddayya’s Zone 3 might have been later extensions of the Neolithic culture at a time when the ashmound tradition had declined in the core region accompanied by increased agricultural activities, represented by second and third phases of the Allchins’ chronological phases.
Thus the authors of the Neolithic culture have been seen differently as seasonal pastoralists (Allchin, 1963), sedentary pastoralists (Paddayya, 1993) and also as predominantly agriculturists (Venkatasubbaiah, 1992).

In the Southern Neolithic cattle, buffaloes, sheep, goats, pigs, the ass, the horse and dogs constitute the domestic animals in that order of abundance. The presence of horse in the late Neolithic is viewed with suspicion. Rats and squirrels are rare but present at sites like Tekkalakota. Cattle bones are dominant in both the habitation and ashmound sites. The provenance of the domesticated cattle breeds found in the Southern Neolithic is still not established. Two breeds of cattle have been identified (a) long homed (*acutifrons*), slender bodied and humped (the zebu) and (b) massive and relatively short. In Velpumadugu, 20 km southeast of Bellary in Anantapur district, the humped bull or the zebu is well depicted in a rock bruising. The role of sheep-goat has not been given as much importance as cattle-pastoralism in the Neolithic economy. The large number of cattle bones, ashmounds and rock-art could be a reason for this. *Bos, Bubalus, Capra* and *Ovis* invariably occur at almost all the Chalcolithic sites between central India and the Southern Deccan in the time period from 2500 B.C. onwards.

Recent studies by Fuller et al. (2001) were aimed at obtaining archaeobotanical evidence from selected Neolithic sites in peninsular India. After studying various sites, both the ashmound sites and the non-ashmound sites, they have indicated that millets and pulses were of much importance in the subsistence and were therefore cultivated. In the ashmound sites, though there is no evidence of food production in a large scale, Fuller et al. (2001) are of the opinion that there could have been food processing on some level due to the presence of querns in some of the ashmounds like Palavoy (Rami Reddy 1978), Budihal (Paddayya, 1993), Kudatini
The most widespread pulse on Southern Neolithic sites is horsegram/kulthi (*Macrotyloma uniflorum* (Lam.) Verde., synonym *Dolichos uniflorum*). This pulse occurs from the earliest samples, such as the lowest level at Sanganakallu. It has also been recovered from all regions of the Neolithic thus far sampled. The green gram/mung (*Vigna radiata* (L.) Wilczek, syn. *Phaeseolus radiatus* L.) is also widespread throughout the at least the middle and later periods of the southern Neolithic. The closely related black gram/urid (*Vigna mungo* (L.) Hepper) is less widely represented in Neolithic samples, although it has been found from late (?) Neolithic of Hallur and from the Iron Age (first millennium B.C.) at Veerapuram, Kurnool District. From the above mentioned work, it can also be learnt that the pulses mungbean (*Vigna radiata*) and horsegram (*Macrotyloma uniflorum*) are native to the region and the wild progenitors of mungbean are found to occur in the deciduous forests in the western Ghats and that of the horsegram are found among the *Acacia* thickets of peninsular India. In the past the wild progenitors of green and black gram were considered the same species, *Phaeseolus sub lobatus*. Two other pulses that make appearance in the later stages of the Neolithic are Pigeon Pea and Hyacinth bean. Pigeon pea/ Tuvar/Arhar (*Cajanus cajan* (L.) Millsp.) was derived from the wild *Cajanus cajanifolia* which is restricted to southern Orissa and Bastar. Archaeobotanical finds suggest that the domesticated pigeon pea was diffusing in the Peninsula in the mid-second millennium B.C. Archaeobotanical remains of pigeon pea are found in the Late Neolithic levels at Sanganakallu (Karnataka), Peddamudiyam (Andhra Pradesh) and Early Jorwe levels of Tuljhapur Garhi (Maharashtra).

The staple cereals of the Southern Neolithic are the millets of which foxtail millet, sawa millet and kodo millet are important. The ubiquity and quantity of millets

(Paddayya, 1992) and Utnur (Allchin, 1963; Fuller et al., 2004). The most widespread pulse on Southern Neolithic sites is horsegram/kulthi (*Macrotyloma uniflorum* (Lam.) Verde., synonym *Dolichos uniflorum*). This pulse occurs from the earliest samples, such as the lowest level at Sanganakallu. It has also been recovered from all regions of the Neolithic thus far sampled. The green gram/mung (*Vigna radiata* (L.) Wilczek, syn. *Phaeseolus radiatus* L.) is also widespread throughout the at least the middle and later periods of the southern Neolithic. The closely related black gram/urid (*Vigna mungo* (L.) Hepper) is less widely represented in Neolithic samples, although it has been found from late (?) Neolithic of Hallur and from the Iron Age (first millennium B.C.) at Veerapuram, Kurnool District. From the above mentioned work, it can also be learnt that the pulses mungbean (*Vigna radiata*) and horsegram (*Macrotyloma uniflorum*) are native to the region and the wild progenitors of mungbean are found to occur in the deciduous forests in the western Ghats and that of the horsegram are found among the *Acacia* thickets of peninsular India. In the past the wild progenitors of green and black gram were considered the same species, *Phaeseolus sub lobatus*. Two other pulses that make appearance in the later stages of the Neolithic are Pigeon Pea and Hyacinth bean. Pigeon pea/ Tuvar/Arhar (*Cajanus cajan* (L.) Millsp.) was derived from the wild *Cajanus cajanifolia* which is restricted to southern Orissa and Bastar. Archaeobotanical finds suggest that the domesticated pigeon pea was diffusing in the Peninsula in the mid-second millennium B.C. Archaeobotanical remains of pigeon pea are found in the Late Neolithic levels at Sanganakallu (Karnataka), Peddamudiyam (Andhra Pradesh) and Early Jorwe levels of Tuljhapur Garhi (Maharashtra).

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sawa millet (*Echinochloa colona*) and especially foxtail millet (*Setaria* sp) indicate that they were the staple cereals. Although it is not clear whether they were domesticated or collected from the wild, the purity of the samples and relatively few other grasses present argue for cultivation.

Certain fruits and vegetables like the jujube, date palms, cucumber and tubers like yams were possibly collected from the wild. There is unfortunately not much archaeobotanical evidence for these but charred remains of nut shells and seed pits and small unidentifiable fragments of these structures are present (Fuller, 2004).

The reports of excavations in the 1950s had descriptions of the skeletal and bioarchaeological remains. Emphasis was laid on the cultural interpretation of the burial data, funerary practices and the significance of funerary goods especially the headrests found in Tekkalakota, T. Narsipur and Budithittu. The analysis of human skeletal remains concentrated on racial affinities, gender and age and osteology. Evidence for skeletal remains chiefly comes from burials, both pit and urn burials (single and double urn burials in case of infants and multiple urn burials in case of adults) which are typical of this culture anywhere in the Southern Neolithic province.

At Brahmagiri 21 burials (18 urn burials of children), Piklihal 3 burials, Utnur 1 burial, 6 from Nagarjunakonda (one urn burial of a child), Tekkalakota 18 burials (6 child burials), at Hallur 2 burials, 1 at T. Narsipur another two more were encountered, majority of them from Tekkalakota were fractional burials imposing restrictions on a detailed study. The higher frequency of child burials is indicative of high infant mortality obviously reflecting on the low immunity in that age group. While pit burials remained unmarked in the habitation areas, there are instances of marked burials such as the earliest evidence of a stone covered burial from Watgal and a stone layered burial at Piklihal, needs to be taken into account in conjunction
with the adult urn burials from Tekkalakota and numerous child urn burials from all the excavated sites with the exception of Sanganakallu and Maski to trace the beginning of marked burials and the eventual trend towards megalithism.

1.4 Review of Earlier Work on the Southern Neolithic

The study of Southern Neolithic began more than 150 years ago. Col. Colin Mackenzie was the first to notice the ashmounds during the preparation of the topological maps of parts of Karnataka and Andhra Pradesh including the Kudatini ashmound. In 1838, R. Cole after some examinations of the ashmound samples considered them to be of volcanic or limestone origin. But, in the 1840s Newbold after conducting an excavation in the Kupgal ashmound, came to conclusion that it was man made basing his arguments on the discovery of cattle bones, pottery and a rubbing stone. In the 1850s Col. Meadows Taylor discovered a number of ashmounds in the Shorapur Doab. The first collection of Neolithic flakes was published in 1842 in Lingsugur, Raichur Doab by Primrose.

Much of our knowledge of the Neolithic is due to the major contribution to the field by Robert Bruce Foote of the Geological Survey of India (Madras). R.B. Foote, during his geological tours in the areas of present day eastern Karnataka, western Andhra Pradesh and north-eastern Tamil Nadu between 1866 and 1897, discovered a large number of prehistoric sites. Foote has discovered over 250 Neolithic sites which include ashmound sites. His contribution of the large number of sites is coupled with the understanding that he had of the prehistoric cultures. The *Foote Collection of Indian Prehistoric and Protohistoric Antiquities: Notes on their Ages and Distribution* was published in 1916. As mentioned earlier, he was the first to associate the ashmounds with the Neolithic settlements in the vicinity and also arrived...
at the conclusion that they were burnt cattle-dung taking into consideration the predominance of cattle pastoralism in the rural areas. He also drew parallels of the cattle-dung burning process with a similar *zariba* process in East Africa. He also looked at the Neolithic sites from the point of view of landscape archaeology and pointed out that influence of the topography of the area on the distribution and location of the settlements. He reasoned that the Neolithic settlers chose to inhabit the granite hills in order to command a vast viewshed of the region and also because these hills facilitate the collection and storage of water. The terraces on these hills are naturally suited for habitation and the proximity of cultivable fields also attracted the Neolithic settlers. Robert Bruce Foote made valuable contributions in relating the available resources with the artefacts noticed in the sites. His inferences about the functionality of the grinding grooves in grinding of stone axes contributed in the understanding of lithic technology.

In the first half of the 20th century, considerable work was carried out in the dominion of the Nizam of Hyderabad. Munn compiled in 1934 a list of Neolithic sites discovered in the Raichur and Shorapur Doab in the 20th century. Excavations were conducted in the Neolithic sites of Maski, Kallur and Kadkal (Karadkal – Lingsugur) between 1935 and 1937 by the Archaeological Department of the Hyderabad State. There were also more arguments put forth regarding the origin and age of the ashmounds. While Sewell (1899) and Longhurst (1912) have argued the mounds to have resulted from the mass *sati* cremation in the medieval period, Sir J.J. Modi (1927-30) has drawn comparisons between the burial places in ancient Iran and the ashmounds of South India (Allchin, 1963). Yazdani (1935) has associated these ashmounds with the ancient metal working. He concluded that the ashmounds
have resulted from either iron-smelting or gold-smelting activities (Korisettar et al., 2001).

M.H. Krishna published in 1943 the results of his excavation at Isila and indicated the possibility of a multi-culture occupation in Brahmagiri by the study of surface findings in the *Annual Report of the Mysore Archaeological Department for the Year 1942*. Earlier R. Narasimhachar had brought to light the archaeological potential of Chandravalli and Brahmagiri sites (Korisettar et al., 2002). In 1947, R.E.M. Wheeler's report on the excavation in Brahmagiri was published in *Ancient India* 4. This was significant not only for the scientific field excavation and systematic recording, but more significantly for the chronological cultural sequence that it provided. It placed the Neolithic period which Wheeler described as 'pointed-butted axed culture' as in relation with the successive Megalithic and Andhra cultures. B. Subbarao's doctoral research on the *Stone Age Cultures of Bellary* (1948) dealt with his excavations on Sannarachamma hill at Sanganakallu. This report not only confirmed the relative cultural sequence arrived at in Brahmagiri but also shed valuable light on the material culture of the Neolithic period. The excavations demonstrated well the pre-neolithic layers i.e. the Mesolithic layers and also the early and later phases of Neolithic culture. The latter was reflected in the pottery which underwent noticeable changes (Subbarao, 1948). Excavations were also conducted by Ansari and Nagaraja Rao in Sanganakallu and published in 1969 as *Excavations at Sanganakallu - 1964-65* and this report gives a detailed account of the excavation of the house floor (Ansari and Nagaraja Rao, 1969). It also corroborates the earlier work by B. Subbarao.

The report of the excavations at Maski conducted by B.K. Thapar of the Archaeological Survey of India was published in *Ancient India* 13 in 1957. This
A report on the excavations in different locations of the site brought to light the four cultural periods in the stratigraphy: the earliest being the later phase of Sanganakallu, which is described as Neolithic-Chalcolithic due to the sparse occurrences of copper objects (Thapar, 1957).

In the 1950s, two British archaeologists, Raymond Allchin and F. E. Zeuner, made significant contributions to Neolithic archaeology. Both scholars took an interest in understanding the origins and makeup of the Deccan ashmounds, and carried out complementary research.

F. E. Zeuner visited a number of ashmounds and sampled the ash for chemical and microscopic study. Allchin, on the other hand, undertook a survey in the Raichur Doab and excavation of both habitation site and ash mound. Zeuner was able to establish beyond reasonable doubt that the ash mound originated from dung, presumably of cattle, as they were similar in their chemical composition as well as including large amounts of silicified grass cells (which would today be called phytoliths), as one expects to find in the dung of grazing animals. Raymond Allchin's excavation evidence from Utnur indicated that the ash mound there was associated with a rectangular, post-hole defined enclosure, interpreted as a cattle pen. In addition, it became apparent that the accumulations of cattle dung had been episodically burnt, perhaps as part of a regular cycle, which might well have had symbolic or ritual significance.
In 1960, the site of Piklihal was excavated by F. Raymond Allchin for the Department of Museums and Archaeology Andhra Pradesh and the report *Piklihal Excavations* was published in the same year. Piklihal, a major Neolithic site with the remnants of an ashmound was also occupied during the Megalithic and Early Historic times. The excavation yielded artefacts from all the three occupation levels and the site showed a continuous occupation. The overlap layers represented the transition from the Neolithic to the Megalithic (Allchin, 1960). The artefacts from this site have been studied in detail and the pottery typology arrived at for all the three periods is very extensive. Another important work of F.R. Allchin in the field of Southern Neolithic is the comprehensive book on ashmounds, the *Neolithic Cattle-Keeper of South India* published in 1963. This work throws valuable light on the origin and age
of the ashmounds based on the excavations in Utnur and also the ethnoarchaeological study of place names and the significance of cattle dung and pastoralism in folk tradition (Allchin, 1963).

M.S. Nagaraja Rao and K.C. Malhotra excavated Tekkalakota in 1965. In *The Stone Age Hill Dwellers of Tekkalakota*, the authors classify the Neolithic into early and late phases where the later is Chalcolithic in character. The excavation report deals in detail with the houses or huts belonging to the later phase or the Neolithic-Chalcolithic phase. The report gives information on the burial practices which were mostly extended. According to the authors, the Neolithic of Tekkalakota shows close affinities with the Deccan Chalcolithic in the matters of spouted vessels and burial practices. An ethnographic study of the hutments of the Boya tribes is included in the report which is very similar to the circular huts found in Tekkalakota (Nagaraja Rao and Malhotra, 1965).

Hallur was excavated by the Kannada Research Institute, Dharwad under M.S. Nagaraja Rao in 1970, *Protohistoric Cultures of the Tungabhadra Valley*. Hallur was inhabited in the Neolithic and also in the Megalithic period. The later phase of the Neolithic occupation here shows much similarity with the Deccan chalcolithic. It is noteworthy that copper fish hooks and urn burials were found here. Iron arrowheads make their first appearance in peninsular India here in Hallur. Archaeobotanical remains of *Tectona grandis* and *Eleusine coracana* and *Eleusine indica* have been recovered from the late Neolithic levels (Nagaraja Rao, 1971).

Hemmige and T. Narsipur in the Cauvery basin were excavated by the State Department of Archaeology in 1964 and 1971 respectively. Both these sites have cultural remains of Neolithic and Megalithic periods. These sites have yielded the terracotta head-rests which have not been found in the Neolithic sites of the core
region. These sites lie outside the ashmound sites region and the pottery from these sites apparently show closer affinities to Jorwe ware (Sheshadri, 1971) (Hanumantha Rao and Nagaraju, 1974).

The geographical scope of Neolithic sites expanded to a great extent by the extensive work of A. Sundara in the Tungabhadra and Krishna river systems in the 1970s. K. Paddayya’s work on the Neolithic archaeology in the Shorapur Doab and the Krishna valley in the 1970s contributed greatly to the increase in the understanding of the Neolithic culture. His later work in Budihal in the 1990s has provided new perspectives to the study of ashmounds. This intensive horizontal excavation and his study of many other ashmounds resulted in the propounding of a sedentary pastoral economy of the ashmounds. The excavations at Budihal revealed the spatial distribution of activities in a site (Paddayya, 1993).

Likewise, in the modern Andhra Pradesh Neolithic archaeology has been advanced by various scholars like V. Rami Reddy’s work in Palavoy, David Raju’s study of protohistoric cultures of coastal Andhra Pradesh, M.L.K. Murty’s work on protohistoric cultures and P.C. Venkatasubbaiah’s contribution in the field of protohistoric agricultural settlements in the Central Pennar basin.
In the recent years, archaeobotanical studies by Vishnu-Mittre, M.D. Kajale, Dorian Fuller and archaeozoological studies by P.K.Thomas and Joglekar of Deccan College have provided valuable insights on the Neolithic economy.

For the present study, a few sites have been chosen and the archaeological background of all the sites will be given in the following chapters.