
UNIT 10 AGRICULTURAL DIFFUSION AND REGIONAL SPECIFICITIES -II

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10.0 INTRODUCTION

Agricultural diffusion in the peninsular India is a vexed issue. The antiquities of crops and cereals and the technology of agriculture and related practices is difficult to ascertain. The scholars have, debated the sources of stimuli. North Indian influences are either discarded or seem to have been adopted in a modified way. Environment and cultural response seems to have played a significant role in the choices made by early communities. Throughout proto-historic and early historic India such choices remained limited and agriculture could not attain an edge over other resource-use practices. The creation of agricultural infrastructure and the consequent spurt in agrarian expansion came with royal initiatives. The entire process was institutionalised and even the driest parts in peninsular India were agriculturally colonised.

This unit surveys several issues related to expansion of agriculture in various regions of peninsular India from the proto-historic times to the medieval period. This process of agricultural expansion was conditioned to a large extent by the

opportunities that environment offered. We discuss here the agro-pastoral nature of pre-iron Age settlements and the uneven nature of agrarian growth in the Chalcolithic period. We also examine the heterogeneous character of megalithic subsistence patterns, the concept of ecological zones and co-existence and inter-relationship between them and the various facets of agrarian growth in wetland and mixed and dry zones in different regions of peninsular India.

10.1 PRE-IRON AGE SITUATION

The earliest pre-Iron Age agricultural settlements in the peninsular India were located in the semi-arid regions where agricultural cultivation had limited possibilities. Owing to sandy loamy soil and low rainfall the region was more conducive for development of pastoralism. In the states of Andhra Pradesh, Tamil Nadu and Karnataka the lower Godavari, Krishna, Tungabhadra, Pennar and Kaveri basin opened to agriculture in the third millennium BC. As the economy was marked by a variety of sustenance factors like millet farming, cattle and sheep pastoralism and hunting of wild animals, it can be called as an agro-pastoral economy. Ecology had important bearing on proto-historic developments, which were marked either by agrarian growth or lack of it. The first Chalcolithic cultures were found in the western and southern Deccan. In the region of Andhra a few well-documented sites like Nagarjunakonda and Kesarapalli are located in the coastal plains while the rare site of Chagtur is situated in the Mahabubnagar district of Telengana plateau.

10.1.1 Three-fold Classification

Bridget and Raymond Allchin, on the basis of the excavated sites provide us with a three-fold classification for the emergence of the settlements in the peninsular India. In the earliest settlements at Utnuru, Kupgal, Kodekal, Palvoy, Piklihal I, Maski I and Brahmagiri Ia, that are dated around 2500-1800 B.C., cattle husbandry played an important role. Here, ash mounds or cattle pens have been discovered. However, the presence of rubbing stones and querns at earliest levels indicate the processing of grain for food. These settlements were located on the top of granite hills or on levelled terraces or in the valleys between hills. The location of the settlements in the intermediate period continued to be more or less the same. The important sites for this period include Piklihal, Brahmagiri (parts Ia and Ib), Sanganakallu I, Tekkalakota I, Hallur IIa and T.Narsipur. The third phase includes the sites of Tekkalakota II, Hallur (layers 8-9), Piklihal, Sanganakallu 1.2, Brahmagiri and Paiyampalli. While metals like copper or bronze were not found at some of these sites in the earliest phase, the later phases showed enhanced use of metal and interaction with Chalcolithic cultures of central India and northern Deccan. These settlements were in proximity to streams and away from major watersheds. The soil types in the settlements included tropical black clays, tropical red and black sandy loam, ferruginous tropical soil and deltaic alluvium. Apart from the above-classified sites there were many other sites in the three physiographic regions of Andhra viz., coastal Andhra, Rayalaseema and Telengana besides Northern maidan of Karnataka and Sahyadris of Tamil Nadu.

10.1.2 Agro-pastoral Economy

The landscape ecology (topographical conditions, flora, soil variations and rainfall) along with archaeo-botanical and archaeo-zoological evidences of pre-Iron age

settlements indicate the agro-pastoral nature of economy. Generally, areas with the potential of rain fed gravity flow irrigation were colonised. This colonisation was geared to the cultivation of millets and pulses. Of animal husbandry, cattle occupied prominence over sheep/goat. Ethno-historical studies have suggested that sheep/goat pastoralism branched off from millet farming-cum- pastoral stock. The early farming cultures moved in to the habitation of surviving late Mesolithic cultures and interacted with them. At some sites Neolithic-Chalcolithic cultural horizon is found to have overlapped with the Iron Age culture.

10.2 CHALCOLITHIC CULTURES OF DECCAN

The region of Deccan is not uniform. The various sub-regions are:

- 1 Western Deccan with high altitude and strategic passes;
- 1 Upland plateau of the central part;
- 1 The fertile plains of eastern Deccan; and
- 1 Mysore plateau and the upper reaches of Krishna-Tungabhadra plains in the Southern Deccan.

In this region, the archaeologists have extensively explored Chalcolithic cultures of Maharashtra. Here, the various chalcolithic cultures like Svalda, Daimabad, Malwa and Jorwe are dated between ca. 2300 B.C. and 900 B.C.

10.2.1 Environmental Variations and Agrarian Specificities

As far as environment is concerned, the region of Deccan is marked by features such as plateau like morphology, shallow stream valleys, basaltic rocks and chalcedony, agate, chert and jasper (varieties of quartz stone). As the rainfall variability is high, droughts occur frequently. The region abounds in black soil which has moisture retentive minerals. This moisture retentive quality of soil is seen as a boon for rain fed farming in the semi-arid regions. Except in the Tapi valley most streams have narrow flood plains. High flooding, migrating stream courses and the breaching of natural levees (a natural embankment built up by a river) do not affect the settlements in the Deccan plateau as much as they do in the Gangetic plains. It has delimiting impact on agriculture, as there is no fresh addition of alluvial soil and the dependence on monsoons becomes inevitable.

The Svalda sites are mostly found in the Tapi basin. Kaothe is an important excavated site of this culture, where dwelling pits have been found. In the courtyard of these dwelling pits, deeper pits are found which were probably used for storing grains. These dwellings also had make-shift kitchens. In the Tapi valley farmsteads have been identified at many sites. Located within a distance of three kilometers of major sites they lay in proximity to fields. It is postulated that semi-nomadic Chalcolithic people may have lived and practiced agriculture only during a certain season. Here, the evidence of crop production reveals cultivation of *bajra* - pearl millet (*Pennisetum typhoides*). Generally, the early farming cultures in central India and Deccan produced barley (*Hordeum vulgare*) whereas the Kaothe people were cultivating *bajra*. The succeeding Chalcolithic people did not cultivate it. Besides agriculture, the Kaothe society also practiced hunting and fishing. The Malwa culture spread in northern and central parts of Maharashtra in around

1700 B.C., primarily in search of fresh pastures. Inamgaon is an important excavated site of Malwa culture. The subsistence pattern of Malwa people indicates cultivation of barley besides domestication of animals and hunting of wild games. Jorwe culture can be considered as a representative Chalcolithic culture of Maharashtra and is spread over the entire state except the coastal strip on the west and Vidarbha region in the Northeast. Prakash in the Tapi valley, Daimabad in the Pravara – Godavari valley and Inamgaon in the Bhima valley constitute the major centres of this culture. However, the concentration of sites in these regions is not uniform. Here, the absence or presence of black cotton soil has been seen as an important determinant. As Tapi valley has the most fertile topography, highest density of sites is found here. Godavari basin, because of undaunting surface records a lesser density while the Bhima valley, more or less a rocky terrain with thin soil cover, has sporadic distribution and the minimum density.

Many early farming settlements have been found in the Khandesh region of the Tapi drainage. However, these are located mainly on the tributaries than on the main river. Because of erosion and bad land topography, irrigation and intensive cultivation is not possible here and so population concentration is not found on the banks of river Tapi. Pravara–Godavari valley in itself is also not uniform. While the upper reaches can support few farming settlements, the lower reaches have larger tracts of black soil. However, the settlement density in the lower reaches is not as high as in Tapi valley. In Bhima valley except for certain small patches at Chandoli, Songaon, Walki and Inamgaon, the whole of the basin is dry and does not contain large stretches of cultivable soil. According to Leshnik, the black cotton soil zone clearly represents an ecological adaptation dictated by available technology, knowledge and means. Except for the site of Walki evidence of plough cultivation is not found anywhere. It has been suggested that the large fissures that develop in summer in the fields help in circulation of air and serve the purposes of a plough and so is the old adage ‘the black cotton soil ploughs itself’. Antlers (each of the branched horns of a stag or deer) found at Inamgaon could also have been used as plough. Perforated stone disc used as weights for digging sticks have been found. The digging sticks were useful in burn and slash cultivation or jhum cultivation. After the forest was burnt, sowing and planting was done directly in to the ashes.

Crop production and plant economy is better attested in Malwa and Jorwe cultures at Inamgaon and Daimabad in comparison to other sites. Jorwe farmers practiced rotation of *kharif* and *rabi* crops. At Inamgaon, though the principal cereal was barley, cereals like wheat, rice, *jowar*, *kulith* (*Dolichos lablab*), and *ragi* (*Eleusine coracana*), green pea, lentil, green and black grams were also cultivated. The traces of an irrigation channel (extant length 118 m; 3.50 m deep in the middle, 4 m wide) and an embankment parallel to it, belonging to Jorwe culture suggests that it could be used as a narrow water tank and water could be diverted to adjoining fields by gravity flow. This irrigation channel is supposed to have helped in the cultivation of wheat and hyacinth bean. The channel probably fell into disuse after BC 1200 or so. Late Jorwe levels show decline of agriculture and rise in the weaning age. At Inamgaon is reported a rapid decrease of the quantity of charred grains with a simultaneous increase in animal bones.

10.2.2 Subsistence Pattern

Subsistence pattern of Chalcolithic cultures in Maharashtra shows some important features: farming; hunting-fishing; rearing of cattle, sheep/goat, buffalo and pigs;

except for the coastal strip, the semi-aridity of the whole region with an annual rainfall between 400-1000 mm; possibilities of artificial irrigation at Inamgaon; fertility and moisture retentive nature of black cotton soil and its self ploughing character. Though the Chalcolithic farming villages present evidence of early agrarian development, their scope was limited and they could never have an edge-technological or economic – over the pastoralists. The Jorwe farmers had to quit agriculture and opt for pastoralism instead.

10.3 ARCHAEOLOGY AND LITERATURE: IRON/MEGALITHIC AGE AND TAMIL ANTHOLOGIES

In peninsular India, several sites including those in the Northern Deccan show an overlapping of Neolithic-Chalcolithic cultural horizons with Iron Age levels. In this section we study the evidence surviving in literature and place it side-by-side with archaeological details.

10.3.1 Megalithic Distribution and Typology

Megalithic burials, strewn in almost the entire peninsula are generally associated with the Iron Age. However, these are not reported from western Deccan. In Andhra, Karimnagar has a large number of such burials. Some of the Megalithic sites in Maharashtra, Karnataka and Andhra Pradesh including the region of Deccan are T. Narasipur, Jadigenatalli, Ramapuram, Hallur (South Dharwar district), Chandrawalli, Brahmagiri, Maski, Nagarjunakonda (coastal Andhra), Yelleswaram (coastal Andhra), Hashampet, Khapa (Vidarbha region), Tekklaghat (Vidarbha region), Mahurjhari (Vidarbha region) and Ranjala. Megalithic burials reported from the Tamilakam region include Panparripu, Adichanallur (Tinnevely district), Thirthu, Paravi Perumal Malai (Madura district), Pollachi, Porkalam (Trichur district), Kothapalayam, Pazhayannur, Singanallur, Kodumanal, Tirukkumbuliyur (Trichinapalli district), Alagarai (Trichinapalli district), Ariamedu, Muttarapalayam (near Pondicherry), Suttukkeni (near Pondicherry), Kadamaliaputtur, Perumbayur, Sanur (Chingleput district) and Amirthamangalam. Megalithic people used variety of methods for the burial of the dead. These can be classified as sepulchral (pits, chambers, legged, unlegged) and non-sepulchral (commemorative or memorial) types. The choice of a particular type depended on geological suitability and cultural response. Urn burials though widely distributed are quite common in eastern coastal plains. In Malabar Coast laterite small rock cut chambers have been found. Resources like water, minerals and arable land influenced such choices and had important bearing on megalithic settlements.

10.3.2 Agro-pastoral Economy

The megalithic burial sites were situated away from the habitation. Also owing to non-sedentary behaviour of the pastoral, semi-settled megalithic farmers, evidence for large identifiable habitation places has not been found. The resource constraint or conflicts with the neighbours seemed to have resulted in short periods of occupation and sporadic distribution of such sites. McIntosh has attributed the higher frequency of the grave sites in the early period to environmental deterioration and cultural response. Presence of some agricultural implements like iron axes (flat iron with crossed iron bands for hafting, pick axes), flanged spade, hoe,

sickles etc., indicate the practice of agriculture. Some of the systematic archaeo-botanical investigations of megalithic sites have shown evidence of remains of rice, barley, wheat, millet, common pea, lentil, grass pea, horse gram, red gram, Indian jujube, etc.

The nature of subsistence economy of megalithic people has attracted the attention of a large number of scholars. Megalithic culture, which formed the agrarian background to emergence of historical places in deltaic Krishna-Godavari region, reveals only occasional occurrences of iron objects. The rise of urban centers in the lower Krishna is attributed to this agrarian background. In Telengana plateau the excavations generally attest prolific presence of iron implements that were related to increasing craft production. However, few sites in the plateau like Pochampadu and Peddabankur have also exposed agricultural implements. Because of non-availability of clear-cut patterns, the megalithic economy has been variously characterised as settled agrarian, pastoral nomadic, pastoral and agricultural or semi-sedentary agriculture. It has been suggested by some that this economy was a mixed one with predominance of pastoralism. In fact, one can visualise different subsistence strategies at work. It was possible that in the early phase pastoralism was dominant and in the later phase irrigated agriculture became more common in the riverine regions and new areas were colonised. Some Scholars have suggested that the megalithic black and red ware tradition witnessed population pressure, which coincided with the shift from highland, pastoral cultivation to deltaic paddy producing plough cultivation in Andhra and South India in the post-5th century BC.

10.3.3 *Tamilakkam, Sangam Literature and the Ecological Concept of Tinai*

Early Tamil anthologies or what is commonly known as *Sangam* literature contain several strata of Tamil compositions. The earliest and most archaic stratum is believed to belong to Iron Age. The region of *Tamilakkam*, i.e., the area broadly corresponding to modern day Tamil Nadu and Kerala, offers possibilities for studying various ecological zones and the natural determinants of modes of subsistence in the early historical period. The nature of agriculture in the *tinai* ranges from slash and burn cultivation of hills and forests (*kurinji*) to shifting cultivation and pastoralism of lower hills and lesser forests (*mullai*) to plough agriculture of riverine regions (*marutam*) to extremely limited possibilities of arid zones (*palai*) resulting in plundering and hunting activities. Several communities like hunters and food gatherers (*kadar/vetar*), cattle rearers (*ayars/dayars*), practitioners of shifting agriculture (*kuravar*), plunderers and cattle lifters (*maravars/kallars*), plough agriculturists (*ulavars/toluvvars*), fishermen (*partavars/valayars*) and salt manufacturers (*umanars*) existed in different and often overlapping ecological segments.

Instead of identifying and literally borrowing the contents of Tamil anthologies, social scientists are increasingly making attempts at realistic application of the concept of *tinai*. It is difficult to arrange a hierarchy or even segregate these physiographic divisions neatly and fix their chronological development. Both *kurinji* and *mullai* had cultivable slopes. The *tinai*s represent micro-eco-zones which overlapped and provided opportunities for interaction. Consequently, macro-zones could be produced. In terms of human communities and material production overlapping segments were centres of their existence. According to Rajan Gurukkal, distribution of four forms of material production namely animal husbandry, shifting

cultivation, petty commodity production and plough agriculture are archaeologically attested but their beginnings cannot be dated.

10.3.4 Plunder and Agriculture

Specifically, from agricultural point of view, the region of *Tamilakkam* could be further divided into *Vanpulam* (non-agricultural stretches) and *Manpulam* (riverine agricultural wetland). *Pura Nanru*, a Tamil anthology contains songs on slash and burn cultivation. As opposed to this, the agriculturists in the wetland area were aware of agrarian technologies like harnessing of bullocks at necks with a cross bar and Tamil anthologies make references to irrigation devices like tanks, minor dams and use of sluices. Animal power was also used for threshing and pounding. In the redistributive economy, cattle and grains were the common gift items though some expensive material gifts could also have been offered to the bards. In some studies, the meanings that cattle raids and plunder acquire in redistribution process of megalithic economy and their relationship with agriculture has been highlighted. Several concepts and terms like *vetci* (cattle raid), *karanti* (cattle rearing), *vanchi* (chieftain's attack), *kanchi* (defending the attack) and *tumpai* (preparing for a raid) attest to the plunder activities. In order to augment their resources, the chieftains of *Vanpulam* indulged in plunder activities. As compared to resource deprived *Vanpulam* chieftains, the chieftains of *Manpulam* owned large paddy fields and were prosperous. As is clear from songs and institutions described in *Pura Nanru*, the society idealised war and martial ethos. An inevitable and invariable consequence of such plunders was incessant trampling or putting of the paddy fields on fire. Cultivable fields were destroyed and the peasants always remained vulnerable to such attacks. Thus, in the redistributive economy plunders played a significant role. Though the society understood the significance of agricultural surplus for gaining prosperity and strength but the organisation of attack or the raising of the raiding army was not done on a permanent basis. In such a scenario advanced plough agriculture could not spread beyond riverine regions of Kaveri, Vaigai, Tamraparni and Periyar before the early medieval period. Though the technical know-how existed in *Tamilakkam* but because of plunder and redistribution and also lack of management and use of ideology or force to harness labour, the scope of agricultural practice remained limited.

The *Manpulam* sub-regions existed as islands in the larger landscapes of *Vanpulam*. It would be erroneous to assume that these sub-regions remained isolated and stagnant over time. The interaction between hilly tracts and riverine regions had transforming impact on semi-developed or un-developed eco-zones though the contradiction within economic infrastructure could not be totally done away with. The process of human adaptation was governed by social and environmental limitations. *Vanpulam*s consisted of inhospitable arid and hilly areas besides pastures. Known as *enal* or *punam* these abounded in cultivation of millets and grams. As *Vanpulam*s constituted of diverse ecological niches, subsistence economy could not have been uniform. Pastoralists–agriculturists who were engaged in animal husbandry and dry farming also practiced craft production. Similarly in the riverine areas artisanal categories could be supported by surplus generated from plough agriculture. People in *Vanpulam* depended on *Manpulam* for a variety of reasons viz., work for artisans, exchanging hill products with wetland agrarian products and marginal sections of *Vanpulam* society drawing sustenance in one form or other. Some exchange centres, *ankaati* or *avanam* are referred to in Tamil anthologies. Poems in *Pura Nanru* describe the exchange routes passing through inhospitable *Vanpulam* tracts. The common medium of exchange

was paddy and the required commodity was salt. This exchange was necessitated by differential access to resources. Though the degree and volume of foreign trade can be debated, the Tamil region was definitely a part of long distance exchange also. Items obtained from nature including agrarian products were exported from the Tamil land. These included pepper, ginger, cardamom, cloves, aromatics, and wood species like teak and sandal, cotton fabrics and precious and semi-precious stones.

10.4 EARLY STATE FORMATIONS AND AGRICULTURE

The process of state formation offers insights into development, interaction and integration of eco-zones in early peninsular India. Three major phases in the process of state formation have been identified in the Tamil region. In the proto-historic period developed micro-eco-zones ruled by clan-based chieftainships. These micro-zones were basically habitats of proto-historic communities. In the Tamil anthologies one finds, references to macro eco-zones, which were produced out of interaction among micro eco- zones. In the early historic period, these macro-eco-zones were integrated under the secondary state of Satavahanas. The Pallava period ushered a marked change in the organisation of agrarian production. While the warring chieftains were unable to use force on peasants for production in the earlier period, the *brahmanas* exhibited better management as a corporate body. The *brahmana* landowners efficiently managed the labour, both for agriculture and arts and craft. These *brahmanas* in the Pallava-Chola period, wielded power and status and as recipients of land endowments enjoyed several privileges over it. The warring strength of Pallava-Cholas is attributed to a developing peasant economy under the *brahmanas*.

Attempts to redefine nature of the Mauryan State have highlighted the unevenness of the constitutive elements of the empire. It is believed that the core metropolitan area initiated the process of conquest and control of diverse regions with differential access to the resources: an agricultural rich tract, mineral rich stretches and trade routes etc. Forest dwelling communities were either forcibly subdued or placated and tamed, depending upon possibilities of the relevant strategy. The state was faced with the need of agrarian surplus as well as forest produce. Agrarian surplus required forest clearance and colonisation of new areas. On the other hand, the forests were also to be protected for their material value. Thus, equilibrium had to be created between forest clearance and agrarian expansion. Whether or not the Mauryan State facilitated the diffusion of North Indian elements and ideology and provided the external impetus for secondary or pristine state formation under Satavahanas can be debated. The rule of the Satavahanas extended to Maharashtra, Karnataka and Andhra Pradesh, roughly corresponding to the commonly understood region of the Deccan. The region certainly had the potential and the productive capacity, which might have caught the attention of the metropolitan state of the Mauryas. The tribe of Andhras is mentioned along with many other tribes in the Ashokan Rock Edit XIII. The shift of iron epicentres outside the Gangetic belt and search for newer resource areas brought Ashoka to the peninsula. Consequently iron ores in the Deccan were tapped. The presence of Ashokan inscriptions in the gold mining areas of Karnataka further substantiates this point. Kautilya's *Arthasatra*, a text of political economy highlights the profitable nature of the southern trade route as it passed through gold mining areas and abounded in precious items like rubies, pearl and diamonds. The Mauryans established their

provincial capital at Suvarnagiri (meaning gold mountains) in Karnataka. They issued their rock edicts in this area. Fertile alluvial plains of the Krishna-Godavari delta and the mineral rich Eastern Ghats facilitated the pre-state developments in Andhra. Similarly, the Southern Deccan had dispersed fertile pockets. However, not all the pockets of Deccan attest evidence pertaining to Mauryan contact. Though the iron was present in Deccan, it could not be used effectively for the agrarian expansion owing to certain ecological factors.

10.5 EARLY MEDIEVAL AGRARIAN DEVELOPMENTS

In the early medieval period, agrarian developments can be seen in Deccan plateau, Andhra plains, Tamil region and the coastal strip from Maharashtra down to Kerala. The peasant economy, which was confined in early peninsula only to *marutam*, did spread in to other eco-zones also. It has been suggested that the peasant society was getting organised. *Brahmadeyas* and the temples emerged as instruments of agrarian expansion. Creation of such institutions was accompanied with clearance of forests, construction of irrigation devices and management of cultivating labour in the areas, hitherto unknown for growth of agriculture. Agricultural infrastructure was increasingly being created. Whether the sponsorship of such infrastructure rested with the state, intermediary groups or the local autonomous bodies cannot be uniformly true for the whole of peninsula. What is certain is that agrarian expansion was a continuous process and the emergence of newer institutions facilitated the integration of the existing agrarian regions. Pallavas and Pandyas did adopt and modify North Indian elements to the specific agrarian situation of their regions. As implementers of stone sluice technology, they made major contribution to artificial irrigation.

10.5.1 *Nadus* and the Newer Instruments of Agrarian Integration

Nadus, which evolved out of peasant settlements, can be considered as basic agrarian units in early medieval Tamil land. Seen as peasant micro-regions, the antiquity of some of these can be dated back to the period of earliest Tamil anthologies. These agrarian entities owed their dynamism to interactions with the newer evolving institutions of agrarian expansion. In the early medieval centuries, their numbers rose in all the Tamil macro-regions. Different ecological zones differed in their access to utilisation of water resources. While the riverine regions like Kaveri delta necessitated the adoption of flood control mechanisms viz. embankments and canals, in the drier and upland areas, tank and reservoirs were constructed. The process of expansion was at times accompanied with conflict between different subsistence strategies, pastoralists and shifting cultivators clashing with plough cultivators. Depending upon the available technology, human initiatives and convergence of historical factors, the plains opened to agriculture in a phased manner. The process of such an expansion can be seen in Pallava region of Palar-Cheyyar valley and Pandya region of Vaigai-Tamraparni valley. By eleventh century, most of *Nadus* had emerged, the highest number being in the Kaveri valley. Although the term *Nadu* literally means cultivable land, it was generally applied to settlements irrespective of the degree and level of agrarian development. *Periyanaadu*, a supra-local organisation of agriculturists emerged in eleventh century A.D. in the drier areas North of Kaveri and continued to operate till the fourteenth century A.D. This organisation was more active in peripheral areas. Another

division created by re-aligning *nadus* into larger units primarily for revenue purposes was *valanadu*. *Valanadus* were delineated on the basis of natural boundary markers like watercourses.

Brahmadeyas or land endowments to *brahmanas* were institutionalised in Andhra and Deccan at an early date i.e., fourth century A.D. while the Tamil region witnessed such developments only by the seventh century A.D. These endowments were located in virgin land or already cultivated land. In the Pallava-Pandya regions, the reservoirs with stone sluices were developed by the ruling class and maintained by local bodies known as *sabha* and the *ur*. These endowments were made in the vicinity of water bodies in all the *nadus*. The *nadus* under Pallavas evolved within *kottams*, pastoral-cum- agricultural regions. Studies on the temple distribution have revealed that during the Chola period there existed a relationship between agrarian expansion and temple ecology. Along with the *brahmadeyas*, temples emerged as important instrument for agrarian integration of various pockets like *nadus* and *kottams*.

10.5.2 Reclamation, Irrigation and Crop-production

Agrarian expansion in the early medieval period had three important dimensions:

- 1 Horizontal expansion of cultivation through reclamation of diverse pocket, clearance of forests and clearance of forest and establishment of rural settlements;
- 1 Creation of irrigation facilities; and
- 1 Qualitative and quantitative increase in crop production.

Burton Stein identified three episodes of relatively stable agrarian integration in South India from the ninth to the nineteenth century. He writes, “In only one significant respect was there an important change – the relationship of cleared, cultivated land to forest. The reduction of forest and the expansion of regularly cultivated land was a continuous process... As in any developing tropical, agrarian system, the clearing of forest was one of the standard methods for expansion; this kind of change in environment may therefore be considered a regularised process in which the tempo of expansion is a factor of vital importance”. However, no uniform pattern is discernible in the whole of peninsula, although it is possible to speak of general developments. Not all the areas could be deforested for developing agrarian settlements. In the Eastern Ghats, the settlements in the dense forests with shrub-savannah and thorny thickets remained non-agricultural in nature. However, those on the foothills had natural catchments where tanks could be constructed with lesser efforts and agricultural activities could be carried out. It has been suggested that peasants themselves could do reclamation of virgin or wasteland within settled villages while forest clearance and creation of irrigational infrastructure was possible only through the above mentioned institutions like the *brahmadeyas* and the temples. The dynasty of Kadambas in Goa reclaimed forest and coastal land. The cleared coastal land was used for cultivation of rice. Skandasisya of the late Pallava period ordered the clearance of forests by burning and establishment of new village in the Salem district. Kakatiya rulers and their intermediaries in Andhra were credited with the forest clearance and reclamation in the Telangana plateau. There is a rich corpus of epigraphic data from the peninsular India substantiating the process of extension of cultivable tracts. The land endowment records mention several boundary markers like water bodies, plants and trees and forests, villages communities besides referring to land size productive capacity and the nature of soil.

Irrigation received special attention in the early medieval period. Development of sluice-weir in channels to draw water from tanks and rivers did not develop before the Pallava period. The sluice-weir of tanks, which began to develop from eighth century onwards, increased the agricultural productivity. In pre-Pallava times, surface irrigation or its modified techniques of *picottah* was a dominant practice. Another important development was the creation of channels from the rivers to feed the tanks. Inscriptions from various talukas of Karnataka attest the presence of such channels. While the technological changes were being introduced in the drainage system, the management of tanks for the purposes of de-silting, repair of broken sluices, or raising the capacity of storage necessitated the organisation of irrigation.

Developments in the drainage system were directly related to wet cultivable produce. Other crops, production of which increased in the early medieval period included extension of cultivation to wildy grown products, garden products, vine crops and several new crops. The surplus produce of wet rice could be used for short or long distance exchange or temple related rituals and services. Because of demographic pressure, varieties of millet like finger millet (*ragi*) and fox tail millet (*kanuga*) and certain inferior grains like *jowar* came to be cultivated on a large scale. Finger millet either came from Africa or could have been a native of Karnataka, from where it spread to Andhra Pradesh, Tamil Nadu and Maharashtra. The epigraphic charters instructed the peasants for mandatory cultivation of *ragi*. If the Tamil anthologies are believed, the production of sugarcane can be dated to early Christian centuries. A logical development was production of jaggery. The production of jaggery was a long drawn process and it assumed commercial proposition by the tenth AD. The increased cultivation of betel leaves (*tambula*) and areca nuts (*guvaka /puga*) in the eleventh century AD. has been linked to their ritual consumption in the temples. Regional studies on the western coast of Konkan have amply demonstrated the production of areca nuts on a commercial scale from the middle of the ninth century A.D. The western coast was also popular for production and trade of spices in general and black pepper in particular. Coconuts, widely known for their ritual status were introduced in the peninsula in the early Christian centuries. Orange was probably a native of Kashmir and was diffused in the peninsular India around tenth century AD. It was being cultivated in Karnataka before tenth century AD from where it was diffused to the Arab world.

10.5.3 Geo-polity and Agrarian Expansion

Geo-political context of important dynasties in the early medieval centuries provides useful insight in to agrarian specificities in the peninsular India. The core region of the Hoysala and the Kakatiya dynasty, located in the modern districts of Hassan and Mandya and Warangal respectively, recorded low rainfall- 30 inches per year upon which depended the generation of royal revenue. The proportion of high agriculture based on irrigation was about 1/5th of sown acres in Hoysala Kingdom and 1/8th in the Kakatiya dominion. The ratio of cultivated to non-cultivated land was less than half in both these regions. Pandyas and the Cholas, on the other hand, were located in the rich riverine plains providing extended zones of cultivation and were thus more densely populated. Tirunnevely district under Pandyas exported grains, cotton, cotton clothes and bullocks to Malabar Coast. Vaigai basin in the fourteenth century imported money, coconuts and fish. Cholas used grain surplus to establish exchange relations extending up to Malaysia.

10.5.4 Eco-zones: Phased Opening of Agrarian Frontiers

Studies on settlement histories while taking cognizance of agrarian specificities in terms of environmental factors, crop and irrigation factors also highlight phased opening of agrarian frontiers at a regional or even a micro regional level. The process of the making of an agrarian region in early medieval Andhra brings out various facets of agrarian expansion. The proliferation of rural settlements in Andhra shows a phased agrarian expansion. Though the agricultural activities continued in various pockets since early time, the qualitative and quantitative expansion did not take place before early medieval period. Coastal Andhra formed a paddy monoculture. In the pre-10th century A.D. dynasties like Eastern Chalukyas did not venture into Rayalaseema and Telengana as they were governed by the 'high revenue yielding area' factor. Environmental setting of Telengana and Rayalaseema was not conducive for the growth of agriculture. In Telengana the rainfall was uncertain and the soil could not retain moisture. In this region Kakatiyas promoted agriculture through construction of large tanks and reclamation of land in the districts of Khammam, Mahbubnagar, Nalgonda and Warangal. Though the process of reclamation also continued in the Rayalaseema districts like Cuddapah, Kurnool and Chittoor, the region as a whole lagged behind and did not open to agriculture on a considerable scale before the Vijayanagara period. Production of dry crops in Rayalaseema is attested by the epigraphic references to *nela*, *chenu*, *polam* and *varipolamu*. The hero stones found in Cudappah, Chittoor and Anantpur districts belonged to the heroes who sacrificed their lives in cattle raids. However, in the medieval period we have instances of women sacrificing their lives in their attempt to close breaches in the tank bunds. Anantasagaram tank in Anantpur district reveals one such story. Within Andhra, the coastal area has been characterized as a wet ecological zone, Telengana a mixed ecological zone and Rayalaseema as the region of dry farming. However, exceptions existed in all these ecological zones. In the coastal region, Eastern lowland border stood in contrast to the elevated Western position. In Telengana, the central and the eastern part witnessed steady rise in tank construction. Red soil could become productive only with the wet cultivation. In the Rayalaseema region, Cuddapah despite being the hilliest area opened early to agriculture because of its basins at the confluence of Krishna and Tungabhadra rivers. Anantpur and Kurnool developed last. The epics of *Palnavirula Katha* and *Katamaraju Katha* point out to limitations of fragile ecology and the conflict between different subsistence methods over resource-use. Palnadu country, identified within the modern state of Guntur, acted as a buffer zone and had a geographical identity of its own. Here, the staple crops were sorghum and millet. The epic of *Katamaraju Katha* describes the conflict between migrant pastoralists and agriculturists in the fourteenth century.

In Salem district (Tamil Nadu), an arid region in the Northwestern part, two phases of agrarian expansion in the river valley have been identified between 10th and mid 14th century AD. However, in the mid 16th century even the driest portion of Salem was also opened to agriculture. In a study of Tirunnevely, specifically from agricultural point of view, three ecological zones viz., the wet, the mixed and the dry, have been identified. The wet zones were established by 1000 A.D. The dry zone depended on the mercy of rains, was favourable only to cultivation of millet. This zone, rich in black and sandy soil was colonised in the fourteenth century A.D with migrants from other places including Andhra hinterland. The mixed zone abounding in elevation and red soil had moderate rainfall. Here, the slopes facilitated the construction of reservoir type tanks. As mentioned above,

such terrains also facilitated the construction of large tanks elsewhere. Ramappa lake in Mulug taluk of Warangal district was similarly surrounded by hills on three sides and its bund on one side had a height of 56 feet and a length of 2000 feet. In the Narsampet taluk of the same district, Pakala lake had a dam made up of laterite pebble and earth, about one and a half kms. long from which 40 channels were created. The process of proliferation of rural settlements and emergence of agrarian regions, which began on a considerable scale under the dynasties of Hoysalas, the Kakatiyas, and Pandya-Cholas, was really accelerated in the 16th century Vijayanagra period. New agricultural frontiers were opened in the drier upland stretches and market oriented production of cash crops like cotton and indigo began. Settlement studies, which classify phased developments in various eco-zones, do not exhaust the possibilities of variations. Also, environmental determinism may relegate the human factor to a status of passive recipient of agrarian changes. Traditions in the region of the Deccan contain the motif of construction of settlements and resettlements. It is recorded that the Karahada region in Southern Maharashtra in 14th –15th century AD suffered a famine for twelve years after which it was ruled by pastoralists till its re-colonisation by Adil Patsah of Bidar.

10.6 SUMMARY

As the earliest pre-iron Age agricultural economy was marked by a variety of sustenance factors like millet farming, cattle and sheep pastoralism and hunting of wild animals, it can be called as an agro-pastoral economy. The agro-pastoral nature of economy continued throughout the chalcolithic cultures. Studies have demonstrated the importance of black cotton soil to the uneven agricultural growth in the Chalcolithic Deccan. Because of non-availability of clear-cut patterns, the megalithic/iron economy has been variously characterized as settled agrarian, pastoral nomadic, pastoral and agricultural or semi-sedentary agriculture. In the early phase pastoralism was dominant and in the later phase irrigated agriculture became more common in the riverine regions and new areas were colonized. Sangam literature contains various references to ecological segments, their interaction and possibilities of agricultural development. However, agriculture in proto-historic period did not acquire prominence over other subsistence strategies. With the process of state formation and increased interest in generation of agricultural surplus, agrarian expansion received new impetus. Early and later medieval was marked by newly emerging instruments of agrarian expansion, creation of agricultural infrastructure and opening of even dry areas to agriculture.

10.7 EXERCISES

- 1) What do you understand by the adage ‘the black cotton soil ploughs itself’? Describe briefly.
- 2) Irrigated agriculture followed the pastoral economy in the megalithic age. Comment.
- 3) Why did agriculture remain confined to *Manpulam*s in the *Tamilakkam* region? Discuss.
- 4) Mark the statements given below as right or wrong:
 - a) *Nadus* evolved out of trading settlements.

- b) Production of jaggery assumed commercial proportions by 10th century A.D.
 - c) Arabs introduced Orange in the peninsular India.
 - d) The physiographic region of Rayalaseema was last to open to agriculture in medieval Andhra.
- 5) What are the three dimensions of agrarian expansion in the peninsula in the early medieval period? Describe
- 6) How have the eco-zones been classified? Substantiate your answer with example of Salem district of Tamil Nadu.

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