Chapter III

TRADITIONAL AGRICULTURE –
A HISTORICAL SKETCH

Introduction

We identify three general stages in the history of agricultural development, namely traditional, Green Revolution and the post-Green Revolution agriculture. There has been a gradual change over the centuries from traditional agriculture to Green Revolution strategy and then to certain attempts at sustainable agricultural initiatives. It is observed that technology change has been central to this transformation. Correspondingly, the agents and the priorities of technology development have changed. The socio-economic impact in each stage depended on the agents and the forces behind the process and the priorities in agricultural technology development.

Traditional agriculture is broadly understood as an indigenous system that employs a crude technology for farming operations. Historically it is a very lengthy stage, which we argue, extended up to the advent of the Green Revolution in the late 1960s. It is divided into two phases: the early and the pre-modern. The early phase refers to the period from the spread of agriculture to the beginning of the second half of the 19th century. The pre-modern phase begins with the second half of the 19th century during which period various reform measures were initiated in the State, which brought about far reaching changes in the socio-economic conditions of the people.

This chapter attempts to examine the history of the early phase of traditional agriculture only. (The later phase is examined in the fifth
chapter). This chapter is divided into three sections. The first section gives a brief historical account of the pre-agriculture phase, the evolution of agriculture as technology per se, and the spread of agriculture. In the second section we seek to examine the early phase of traditional agriculture in Travancore. An attempt is also made to examine the evolution of agricultural tools, especially plough, and the corresponding socio-economic transformation that plough technology had resulted in, its effect on the pattern of land holding and social stratification. The third, attempts to discuss the farming systems and the main traits of traditional agriculture.

I

The Pre-agriculture Phase (The Age of Hunting and Gathering)

Any study of the production system of a society warrants an understanding of the historical setting in which it evolved. Technology is the result of the interaction among various means of production, especially, man and nature and their evolution in different times of history. Such a study is necessary to understand the dynamics and the socio-economic consequences of technical progress since it cannot be seen in isolation from the history of mankind itself. [Rosenberg, 1990:3].

Ancient past is divided into (i) prehistoric, consisting of the Palaeolithic, Mesolithic and Neolithic Ages; and (ii) protohistoric\(^1\), consisting of Copper, Bronze and Iron Ages\(^2\). Pre history generally means pre-literate history [Kosambi, 1962: 111]. It is argued that it is primarily a history of technology [Daumas, 1969:12] since the influence of the local environment in its development was prominent.

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\(^1\) Generally ancient cultures prior to the inception of the use of language and writing, are called prehistoric. In the strict sense, history prior to the occurrence of written accounts, is prehistory. But there are periods with illegible writings, and hence neither prehistoric nor historic. Such periods are categorised as protohistoric. See: Gurukkal and Varier, 1999:57.

\(^2\) In the case of Kerala, copper and bronze occur as part of Iron Age and denies identity as separate phases.
In the Stone Age, spanning Palaeolithic, Mesolithic and Neolithic Ages, means of subsistence, all over the world had been hunting and gathering. Therefore, the primitive population had to shift from place to place and there was no permanent settlement\(^3\). At this stage, they made pebble tools and roamed around hunting along the grasslands in the valleys, besides gathering food in the jungle\(^4\).

Hunting - gathering was also the means of subsistence of the Mesolithic (It comes in between the Old (Palaeolithic) and the New (Neolithic) Stone Ages) stage of culture, but there was shift from big games to smaller animals as well as birds. Naturally, there was a corresponding shift of the morphology of tools from the bigger types to smaller ones. In each stage of development, tools underwent an improvement or transformation, depending on the change in the nature of the means of subsistence. Therefore tool technology or mechanical technology development was not a process independent of the nature of production activity in the society. People developed tools out of locally available inputs and for location specific production purpose. Hence, the process of technology development in the traditional phase, from the very beginning, even before the advent of agriculture was purely indigenous.

The phenomenal changes in the environment (the disappearance of the great glaciers and the consequent rise in temperature) along with various other factors led to the transformation of the prolonged Old Stone Age. Just as any other cultural / technological transformation, the transformation of the Old Stone Age into the New was a slow process, but fundamental in character.

\(^2\) It is argued that permanent settlement could not have come before the day of cheap metals like iron [Kosambi, 1962:94].

\(^3\) Maurice Daumas has identified “pebble-tool” culture in the production of stone implements, as the first stage (of the five stages, see Maurice Daumas, 1969:21-28) in the evolution of manufacturing techniques.
In the Neolithic or New Stone Age people had developed and used well shaped and well grounded tools of smooth surfaces. But the most important contribution was that they invented agriculture.

**Agriculture as technology per se**

Agriculture itself as an innovation had set in radical changes in human life. Agriculture as 'the art of cultivating the ground' [Walker, 1820], is considered the first step in the progress of civilisation. It has necessitated and resulted in further technology development. Because of its widespread implications over the whole range of social life, the development of farming constituted a veritable revolution [Clark, 1969: 72]. It has evolved in direct response to and simultaneously bred revolutionary transformation in the social, political, cultural and economic realms of human life.

It is argued that when ancient societies gradually abandoned hunting and gathering for agriculture about 12,000 years ago, a profound technological change occurred. Agriculture necessitated domestication of animals and taken together it is considered as the most important of all human inventions to date [Toynbee, 1976:40-41].

Radical changes happened with the agricultural system in the New Stone Age. It has been argued that this revolution created 'civilisation' by permitting people to be sedentary. In due course, the increased food supply allowed for population growth and generally contributed to social well-being. It is also observed that significant changes occurred in the life-style and material well being of the people with agriculture.

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5 Major General Alexander Walker argues that it is on the power of augmenting the means of subsistence, that the increase of the people depends (Walker, 1820:230)
The commencement of agriculture together with population growth necessitated control of land. The system (agriculture) could not have been perfect without the use of a considerable number of tools and instruments, and of animals subdued to labour [Walker, 1820]. The primitive farmers used simple Neolithic tools like stone-axe and digging stick. This limited the extent of forests that could be cleared and used for farming. They cultivated an area that was just enough to meet their food requirements. Manure application was totally unknown to the primitive farming community.

Technology transforms the life style of the people. The invention of agriculture checked the nomadic life style of the people. The slash and burn cultivation warranted some form of human settlement. They were forced to stay for cultivating and harvesting. The innovation of agriculture had laid the foundation for later development of permanent settlement, which led to the formation of civilisations.

It is claimed that the earliest kin-based village settlement (ur) system in Kerala dates back to the Neolithic times - the age of the invention of agriculture. These societies were much concerned about fertility in farming and they resorted to pleasing the nature and gods for assured fertility. It is argued that many of the myths and rituals associated with fertility originated during this phase.

The Age of Human Settlements and the Spread of Agriculture

The Iron Age witnessed the rise of extensive settlements of agro-pastoral communities in different ecological niches and the emergence of
intensive inter-territorial contacts. The discovery of the cheap metal - iron, had revolutionised human civilisation. Iron had popularised agriculture and crafts and helped cultivation on an extensive scale.

It is argued that permanent settlement was made possible and facilitated after the invention and widespread use of cheap metals [Kosambi, 1962:12:94]8. With an iron axe the farmer could clear the virgin forests for farming and with an iron plough he could till the hard soil [Childe, 1979:191].

The people of iron technology subsisted on various means such as hunting and gathering, animal husbandry, agriculture and crafts production, as determined by the ecological conditions of the areas they inhabited. The means of subsistence determined the nature of technology used.

The economic conditions of the Iron Age in Kerala can be seen best represented in the Tamil heroic poems. As Chera or Kerala was an inseparable constituent of the Tamil macro region, an understanding of

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7 In the absence of literary sources, historians seek the help of archaeological evidences to rediscover and to qualify this lengthy phase in human history. The monuments and burials called ‘Megaliths’ are the predominant archaeological remains of the Iron Age. Megalithism is seen as a tradition that existed in the Iron Age.

8 It is argued that iron was not available in any quantity to Indian peasants before the 6th century B.C. [Kosambi, 1962:12]. Iron, the knowledge of iron using and the heavy plough, it is claimed to have come from North India.

9 Kerala during the early centuries of the Christian Era formed part of the larger unit called Tamilakam. Any account of the early history of Kerala / Travancore, normally demands a reference to the Sangam Age and, thereby Tamilakam. The Sangam age, which comprised the first centuries of A.D, was the formative epoch of Kerala history [Sreedhara Menon, 1967:64]). Literary sources detail the modes and strategies of human existence in the Iron Age. The ancient Tamil heroic poems, popularly known as the Sangam literature, constitute a category of vital source material to study the later phase of the Iron Age cultures.

10 The present Kerala during Sangam period was known as Cheram. In pre-Aryan days the area that is referred to as Kerela today was part of the Chera Empire, which was one of the three empires that flourished in South India [Namboodiripad, 1952:5]. It is argued that there is an etymological connection between Keralam and Cera or Cereanadu. The land of the then Keralam was divided into five divisions on the basis of topography, viz., Venad, Kuttanad, Kudanad, Puzhinad and Karkanad. The region lying north of Venad is Kuttanad or the ‘land of lakes’. The whole of the present Ernakulam, Alleppey and Kottayam Districts and a portion of the Quilon District were included in this division [Sreedhara Menon, 1967, reprint 1970: 64-65].
Tamilakam is imperative to understand the early history of Kerala and therefore Kuttanad.

II

Traditional Agriculture – Early Phase

As observed earlier, it was plough and iron that facilitated the spread of agriculture and led to permanent settlement. Thus mechanical technology was more prominent in the early phase of traditional agriculture. Tools and implements, which are central to mechanical technology, were developed in agreement with the topographical characteristics of the area. Therefore, farm variability and technological diversity seem related. Farm variability is one of the central themes of Sangam literature of Tamilakam. Farm variability is best expressed by the concept of tinai.

The most relevant aspect of the anthologies related to agriculture in Sangam literature is the concept of tinai according to which broadly, Tamilakam consisted of five types of landscape ecosystems (tinai-s) viz., Kurinci (hilly backwoods), Palai ( parched zone), Mullai (pastoral tract) Marutam (wetland) and Naital (littoral). It is argued that this five-fold division threw light on the technology of the time and the development of human culture [Thaninayagam, 1966].

Tinais have been grouped on the basis of the nature of landscape, according to which the zone of plough agriculture (Marutam) was called menpulam and the rest excluding Naital was collectively called vanpulam. In short they were the zones of the then advanced agriculture and primitive agriculture, respectively [Gurukkal and Varier, 1999:163-64].

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11 In the Puranam (PN) and Akavan (AN) of Sangam literature.
Table 3.1: Landscape Ecosystems, Peoples and Means of Subsistence in Tamilakam

<table>
<thead>
<tr>
<th>Tinai</th>
<th>Inhabitants</th>
<th>Means of Subsistence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurinci</td>
<td>kanavar, kuravar, vetar</td>
<td>Hunting and gathering</td>
</tr>
<tr>
<td>Palai</td>
<td>kallar, eyinar, maravar</td>
<td>Plunder and cattle feeding</td>
</tr>
<tr>
<td>Mullai</td>
<td>ayar/itaiyar</td>
<td>Animal husbandry, shifting agriculture</td>
</tr>
<tr>
<td>Marutam</td>
<td>uzavar, tozuvar</td>
<td>Plough agriculture</td>
</tr>
<tr>
<td>Naiyal</td>
<td>Paratavar (valayar or minavar)</td>
<td>Fishing and salt extraction</td>
</tr>
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Source: Adapted from Purananuru (PN) and Akkanuru (AN)

Marutam is the region of the wet-rice ecosystem generally characterised by the alluvial tracts along the riverbanks. The description of ploughed land in the poems (AN 194) suggests that the use of plough was common, and bulls were used for ploughing.

As an area of advanced agriculture Marutam tracts attracted people from other tinai-s. The poems mention mezi, nancil, and kozu meaning plough in the context of Marutam. Marutam being the ecosystem of plough agriculture, it required the services of artisans/craftsmen like taccar and kollar the existence of whom in the tinai is attested by the poems. The area created a surplus and was in prosperity.

In all the above five landscape ecosystems, technology was developed to suit the particular ecosystem and the means of subsistence. The process of technology development respected the limits set by the environment. In no way the traditional agents of agricultural technology development namely, cultivators, labourers and the local artisans tried to surpass the limits. Technology was not taken as a tool to contradict the
nature. This heritage of environment friendly technology was the hallmark of traditional agriculture. As localities varied with respect to environment, it ended up in technological diversity.

Technological diversity, it has been pointed out, is an identifying feature of traditional agriculture. It is explained by differences in local environment or farm variability. It is observed that farm variability affects the level of productivity of resources, as well as the acceptability and response to innovation [Mellor, 1967:133]. The differences that one finds in simple agricultural tools and in plough are justified by the variability in farm and the specific utility of the tool form. There existed considerable variation even in one type of tool.

**Tools and the History of Technology**

Agriculture makes use of several technologies: mechanical, biological or genetic, chemical and managerial. Of them, mechanical technology seemed more prominent in traditional agriculture. Plough was central to cultivation in the marutham track and brought about vital changes in the socio-economic setting of the traditional agrarian society like changes in the extend of cultivation and in the relations between the landlord and the labouers. Of the 'machines', plough was considered the 'breakthrough' around which major socio-economic changes seem to have occurred.

Tools speak of the technology of the time. The development of various types of tools illuminates the early technological history. It has been argued that tools were very much associated with the history of mankind.

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12 Here mechanical technology is understood in a very limited sense, namely the technology of simple 'machines', mainly tools / implements, and not as understood in the modern sense.
and that man started using tools even before the use of his rational faculties [Daumas, 1969].

In the course of millennia tools underwent a process of gradual and steady improvement from generation to generation. These improvements could not have been attained by the intellectual resources or efforts of any single individual, but were the outcome of the constant care of thousands of farmers and workers over the years.

It is argued that primitive technological activity was linked with the acquisition of means of subsistence and the tools evolved during that process. Subsistence was the driving force (priority) behind the process of technology development. They were purely made of local materials and expertise. Their shape and form were determined by the requirements of the locality and the time. Thus tool-making was totally a local and an endogenous process.

Therefore, the features of farm tools or implements varied with locality in the process of adaptation. The case of chopper in the later years of the Stone Age is typical [Varier and Gurukkal, 1999:44]. In the history of evolution of tools, micro-stone tools followed the path of chopper. These tools might have been used for cutting and cleansing of wild grains and roots. This development from chopper to micro stone tools was an improvement in the endogenous process of technology development. The people of Adichanallur in Tinnevelly cultivated rice, stirring the soil presumably by digging sticks instead of the plough [Sahadevan, 1966:3]. The primitive tribes in Kerala had used a tool called kuzhivadi (digging stick) and it was handled by women.

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13 It is quite paradoxical that the hand preceded the brain; it is equally paradoxical that in a certain sense the tool preceded intelligence” Daumas, 1969:14.

14 Gradually the making of these tools involved complexity and therefore needed more technical skill.
An example from the pre-modern phase is that of Mammatti of South Travancore. It required greater manual power in handling, than those in and around Trivandrum; and the same instrument has a very long handle in northern taluqs and is known as the Toomba. A small instrument known as the Kalai-vettu mammatti was used for weeding in later stages of cultivation. This has the same appearance as the mammatti, but is smaller, so that it can be freely worked between plants.

Bill-hook or Vettukatti used for cutting bamboo differs in shape and weight from that used for cutting leaves from palmyra trees. The sickle or reaping knife is a very light instrument with a wooden handle and has a greater curvature, with uneven cutting surface.

The shape of the winnower is that of a square with the centre a little depressed. In other places the three sides, especially the middle, are higher than the rest, and the one side is purposely opened out for getting out the chaff. In certain areas eerukotta (a small pyramid-like bamboo basket) was used for winnowing. In land preparation, coconut fronds were used by men for levelling by the hand after puddling was over when the area was small. This is called Madal Valikka in technical parlance.

Introduction of labour-saving machinery was not considered beneficial to small peasant proprietary holdings. [Nagam Aiya, 1906:10]. Therefore, the implements used in early agriculture were of the usual character, simple and very cheap\(^\text{15}\). There were a large number and variety of tools in use. They were mostly made of indigenous materials with local labour. Their shape and form were dictated by the necessities of the time when they were invented. Long habits persuaded farmers and labourers to

\(^{15}\) Velu Pillai [1940:293-296] listed the various implements used in early Travancore agriculture. They included plough, levelling board, rake, harrow, seed drills, inter-culturing and weeding implements; minor implements like vetaruval, thumpa, vetukaihi, kunthali, para, kodali; irrigation implements like water wheel, pikota, ghamela or the mhote, water pump and steam pump.
use them in the same manner as their forefathers had done, though the demands of intensive cultivation called for improved implements [Velupillai, 1940:293].

Plough (*kalappa*) was a radical change in the evolution of tools. It, being the most important of the tools in traditional agriculture, was very well adapted to the specifications of the locality. It has often been the subject of attempted improvement and adaptation. This instrument varied very much in size, weight and form in different parts of the country. The local artisans helped the farm sector in this adaptation. The old wooden plough used in Travancore consisted of a tongue of wood fitted with an iron tooth, a stilt for holding and a pole to be attached to the necks of buffaloes or bullocks [Ibid].

The plough in South Travancore for instance more resembles the Tinnevelly plough and consists of two bits of wood, one fitted to the other by means of another long peg-like wood, and there is nothing of the shape of a mould-board. In Trivandrum and other central districts, the plough is one complete piece, but of wood, rather broader and having the extremity shaped like a mould-board. Ploughs in the North are more suited to wet land cultivation known locally as the Punja cultivation [Nagam Aiya, 1906: 9-10].

Thus there has been a wide spectrum of tools for a particular task in the rural production process which again substantiates the fact that the process of tool making was fully an endogenous endeavour, respecting the local variability in soil, nature of the crops raised, tastes of the people who were associated with the making and the use of the tools, plough etc.
Developments in Farm Implements and Social Transformation

The tools developed and introduced in agriculture transform the society. History of nations and civilisations validates this argument. As an international experience we take a Philippine text.

*Our primeval farming was either slash and burn or stick and mat, with the stick used for tilling and the mat for transplanting. This latter method was the one prevalent in the lowlands, where, as in all primitive agriculture, farming was a function of women, because hunting was the function of men. But as lowland hunting declined, agriculture became the more important function of women- and women therefore became the predominant figure in the society. They were the food growers, the priestesses, and the queens through whose side of the family ran the right to succession [Joaquin, 1982]*

A similar experience is found among the Dravidians in South India. Originally men were engaged in hunting and animal husbandry; women were active in gathering and light agricultural operations, with very simple tools like the digging stick. With agriculture using plough and ox for land preparation, men had an upper hand in the farm. Agriculture came to be identified mainly with the ‘stronger sex’. This along with the upper hand men had in hunting had its influence in making the Dravidian society patriarchal [Childe, 1979: 89].

The stick and mat of primitive agriculture required little strength and thus could be handled by women. But an agriculture of plough, harrow, spade and draft animal required muscle power. The introduction of plough made males to take over a function that had traditionally belonged to women. Men became the agriculturists and as food growers the male sex
replaced the female as the dominant figure in the economy. This consequential change in the social fabric was because of the gender bias of the tools and implements.

Gordon Childe [1979] explains the change in social relations brought about by farming with ox and plough. Evolution of the farming system from plot cultivation (small scale) to the tillage of fields (large scale) was enabled by the introduction of plough. It was a tool-based change – a change from hoe to plough. This resulted in a very close relation between farming and animal husbandry. Women were relieved from the tiresome tasks of farming. It abolished monopoly of women over grain stock. Men got an upper hand in society with farming using ox and plough. Thus there was a gender bias of heavy tools and it affected the power balance in the society and family.

As oxen came to be used for the hard task of ploughing, just grassing was not enough for them. They required straw from the fields. Cow dung was found good for land and it increased its fertility. The use of ox as a motive power in farming was a stepping-stone towards the invention of steam engine and petrol motors [Ibid, 1979:89]. Such a change occurred in Tamilakam during the Sangam period. Thus agriculture using plough has also changed the source and requirement of energy in agriculture.

Generally these mechanical improvements were labour saving. As a result, plough enabled more food to be produced with fewer people than before. Not all in the society had to be engaged in agriculture, which meant that energy could now be released for non-agricultural activity including arts and science, and all other endeavours that improved the quality of life.
Plough Agriculture – A Radical Technology Change

Radical technology changes result in major changes in the agricultural system of the society and in its social and economic transformation. These technological changes bring about disturbances in the contemporary system, eventually causing its transformation. In traditional agriculture these changes occurred mainly in mechanical technology, in the form of varied and improved tools. Tools help in identifying the production system in early agriculture.

Plough (kalappa) marked a fundamental change in the evolution of agricultural technology. More than a tool, it represented a technology and therefore, a system of agriculture. Even today, plough stands as the true symbol of farming, and for a greater part in history as the pride of the tiller\(^6\). Often a subject of attempted improvement it has been the most important implement used by the cultivators of Travancore [Velu Pillai, 1940:293]. It revolutionised agriculture and initiated greater social, cultural, political and economic transformation.

As already noted, before the introduction of plough and iron, people frequently changed their residence from place to place. Though they stayed and cultivated an area using hoe and digging stick, gradually the soil yielded only less and less yield. Repeated cultivation in a given area was less productive as the simple farm tools could hardly break and turn up the surface soil. Therefore they travelled seeking virgin lands.

There was no question of their possessing land, for land ownership is not a primitive concept. Permanent plots were meaningless till the plough had come to the help of the cultivator. For that the fertile bottomlands had

\(^6\) Till recently, it has been an election symbol
to be cleared for forests and kept clear, which was not possible in the monsoon country without iron tools in plenty. Therefore before plough and iron, as Kosambi observed, land to the savage was territory and not property [Kosambi, 1962:95].

**Plough Technology and Social Stratification**

Introduction of plough brought about contradictions in the farming relations. The primitive relations of production were based on familial division of labour and clan kinship. In that system, the cultivator and his family members worked in the land for their subsistence. They worked with simple tools for the common good or support of their family. In that system there was no provision for personal or direct reward for the additional labour that plough technology demanded. The use of the technology of plough in agriculture with the potential of increased productivity, required a system of productive relations transcending kinship.

With plough, agriculture became more extensive and it warranted more manpower. Though plough was a labour saving device, it caused a shift in the scale of operation, which, in turn, increased the demand for labour and forced the farming relations to change.\(^{17}\)

To capture a virgin area of land for cultivation, the Brahmans, the privileged class required labour to join them. This necessitated some permanent arrangement for the supply of labour for the Brahman households. The Brahman land as an independent unit of production required working families attached to it for ensuring permanency of labour.

\(^{17}\) There is an assessment that the disagreement between relations in farming operations based on kin-labour and plough based forces of production was serious and it impeded the growth of productivity [Cohen, 1978; Anderson, 1983]
So naturally families of clansmen must have become tied up with Brahman households for ensuring permanency of labour, an assured supply.

The emergence of non-kin labour in the agrarian sector through the interaction between Brahman households and the neighbouring clannish folk was one of the major processes in social formation. The production units existed either as independent units or in clusters. The tilling clans and non-tilling Brahmans together in a cluster represented a nexus of new relations of production surpassing kinship. It represented a new mode of appropriation of labour as well as surplus. In that sense it marked an alternative system.

The fundamental aspect of the system has been a tenurial tie between the tilling clannish folk and the non-tilling Brahman households. The system tried to cope up to some extent with the requirements of plough agriculture. This development could be seen as the cultural adjustment of a society to a new technology, based on a useful knowledge [Brinkman, 1981].

During the 5th and 6th centuries of A D the agrarian societies of Tamilakam were gradually becoming class-structured. This was directly related to the spread of plough agriculture and the corresponding new relations of production that meant social stratification based on entitlements to the nature of land-use. It was primarily a tripartite stratification of the people into landholders, leaseholders and tillers. Since plough agriculture implied specialisation of a variety of arts and crafts, a further stratification of the people who were grouped along the line of occupations followed gradually.

The social relations began to be further structured during the sixth-seventh centuries with the steady expansion of plough agriculture across the
wetland. Expansion of agrarian settlements through the creation of brahmadeya-s often involved the superimposition of the superior rights of the Brahmans over the communal holdings and the clan families of the locality. It must have been an intricate process of transformation of primitive agriculture and clan settlements into advanced agriculture and farmer settlements, respectively [Gurukkal and Varier, 1999: 253].

The relations of production in plough agriculture were expanding towards domination of the total society. This was a long institutional process involving the proliferation of occupational specialisation and its ordering into a hierarchy.

In the process the clan identity disappeared and Jati (the Kerala term for caste) came in as the substitute, mostly by retaining the names of the clan. Several names like pana, paraya, vettuva, veta, kurava, marava, paratava etc. vouch for the retention of clan names for Jati [Ibid, 1999]. The dominant position of the Brahmans was the crucial element in the operation of the Jati hierarchy.

The Transformation of Kerala

The ecological conditions seem to have influenced the formation of loosely organised and dispersed settlement patterns in Kerala which stand out in sharp contrast to the nuclear village settlements in other parts of India [Mencher, 1966]. It is also argued that ecological and political factors in Kerala combined to develop an agrarian system that resembled European feudalism in some important respects [Tharamangalam, 1981].

There is a lot of ecological difference between the agro-climatic zones of Kerala and those of the rest of India, in terms of seasons, rain fall, permeability, landscape, soil structure and so on. The most striking
difference about the wet rice landscape ecosystems is the surplus of water in
the case of Kerala and its scarcity in the case of regions elsewhere. Kuttanad is the classic example in this regard.

Regarding farming, in the wetlands of Kerala, the management of surplus water has been the central problem since the days of the very inception of agrarian settlements. In contrast, in Tamilakam, the problem was management of scarcity of water and hence irrigation. Such ecological differences presuppose regional difference in the material process of the appropriation of nature, which means difference in technology.

The spread of Brahman households in Kerala and their clustering into settlements was a complex process of a variety of simultaneous developments. The formation of a full time work-force out of the clannish peoples, reclamation of water-logged and marshy low-lands into paddy fields, and evolution of a pattern of human settlement as determined by the local service requirements were the major developments. Of all the developments the reclamation of paddy fields was obviously the most significant, for the rest followed mainly as its effects.

The reclamation of water-logged and marshy places was labour intensive. The process included laborious tasks like the construction of numerous big and small canals to drain the water. So the major aspect of the process was large-scale social mobilisation of collective labour for the productive preparation of the low lands. The knowledge about water, soil and landscape and the technology of water-management were essential. The Brahmans' command over knowledge, institutional devices, ideology, social control and their magico-religious charisma enabled them to be the dominant community in Kerala too as elsewhere in the sub-continent.
Now we proceed to a brief sketch on the farming systems and the main traits of traditional agriculture.

III

Farming Systems in Traditional Agriculture

A discussion of the farming systems is imperative in understanding the internal dynamism of the paddy economy in traditional agriculture. The emphasis in traditional agriculture was on a farming system that involved an interaction between soil, water, farm animals, plants and food. The farming system encompasses the totality of activities of the farm related to crop production, processing, disposal and overall prosperity of farm household.

It comprises all cropping patterns adopted on the farm and their interaction with farm resources, other household enterprises and physical, biological, technological, socio-economic, religious and environmental factors. The interaction retained fertility of soil, controlled pests through natural agents and crop mixtures. The indigenous cropping system was based entirely on internal organic inputs and the necessary inputs were raised from the farm itself [Shiva, 1996:61]. In that sense, the traditional farming system was an integrated one.

Traditional farming system was based on mixed or rotational; cropping systems. The farmers relied much on organic manure and they recycled farm wastes and agricultural residue for farming operations. This recycling provided food to the soil that increased its sustainability without degrading the soil. The ideal farm was one that raised crops with differing periods of maturity and harvest.
Traditional peasant societies combined animal husbandry, poultry and agriculture in a mutually reinforcing manner [Shanin, 1976]. Maintaining diversity and selecting vibrant varieties they laid down the foundations of agriculture. It has not been possible to find a common agricultural tradition for an area. As far as agriculture is concerned what exists is not a common tradition but a variety of local traditions.

The cultural practices and techniques developed in these systems have been practiced for centuries and remained dominant in many parts of Asia. Traditional production techniques involve few inputs other than those available on the farm or created by the farmers’ labour: seed saved from last year’s harvest and hired labour to repair dikes and raise, pull, and transplant seedlings. Human and animal labour are also be involved in harvesting and threshing operations [Barker, et al, 1985:29].

It is argued that indigenous farming systems have evolved as a result of informal experimentation by farmers over a long period—through assessing variations, selecting preferred options and rejecting the inferior. The informal innovation systems of rural women and men practised over the centuries is also recognized [Swaminathan, 1993:165].

The interaction of farm household or labourers with farm resources, other household enterprises and physical, biological, technological, socio-economic and environmental factors, led to the formation of the immense riches of indigenous knowledge (IK). It has been central to the traditional farming systems.

**Traditional Agriculture and Indigenous Knowledge**

Traditional farming systems are seen as sources of sound ideas of locally adapted cultivation practices. In traditional agriculture, knowledge
was not set by scientific determinants but by farming practices [Ludden, 1996:37]. The locally developed knowledge, in today’s diction, called Indigenous Knowledge (IK), is the information base for a society and is dynamic. Traditional farmers inherited a rich collection of indigenous knowledge, which were handed-down through generations by word and practice.

Agricultural practices in a traditional society were based on the knowledge of the farming community. A limitation of this treasure is that it was neither properly codified nor fully translated. But the proverbs, folk songs and value system are in many cases, pieces of perfect knowledge about the right time for sowing, harvesting etc., which reduce the threat from natural calamities, pests and diseases. Their indigenous skills are not less than a modern engineer’s inventions.

The archaic formations of agricultural knowledge present in various cultures serve as tips of the iceberg of indigenous knowledge. When we make a historical treatment of agriculture as an object of knowledge, a bundle of terms cohere as ‘agricultural technology’, and the farmers have very little to say except to provide these words and proverbs.

Indigenous knowledge is defined as the knowledge of the people living in a certain area, generated by their own and their ancestor’s experience and include knowledge originating from elsewhere which has been internalised by the local people [Reijntjes 1992]. It is highly localised, restricted and often integrated with belief systems and cultural norms. Alcorn (1984) and Hunn (1985) reported that IK and practices of local farmers may expose ideas which contain “seeds” of adaptive value. IK was derived from interactions between people and environment. This knowledge is characteristic of all cultures. In comparison with most modern techniques, they are more effective, locally available, relatively cheap, less destructive to local environment, keeping with the norms of peasant communities [Kakonge, 1995]. According to Warren (1989) the term “indigenous” is used to refer to a localised agricultural system, which has developed over time with cropping pattern based on an agricultural knowledge system expressed in the local knowledge. Such a system is viewed to be in dynamic equilibrium with the environment, influenced by changes emerging from within the system as well as those adopted from other indigenous systems.
In fact, the collected oral wisdom of farmers did provide data for modern science. British colonial bureaucracy codified agriculture as it did other objects of knowledge, and in the 1840s modern formations of agricultural power/knowledge began to engage agrarian India [Ludden, 1996:37].

There are numerous proverbs and sayings on primitive agricultural practices, but they have not been codified. There had been certain efforts to codify them in the Kerala context. *Krishigeetha* is the result of such an effort.

It speaks of seed, its variety, geography, climatic conditions, crop diversity, weeding, manure and its application, agricultural tools, drought animals, timing of farm practices, moral advises and moreover of a lifestyle based on farming. In it one could see the purity and prosperity of genuine local knowledge. It mentions about a hundred of paddy and other seeds, their merits and demerits, and the type of land and climate in which each type gives a better crop. The wisdom on seed was an essential element of the strength of traditional farming.

The farmers were able to identify various types of seeds and seedlings and they were aware of the nature and qualities of various seeds.

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19 For example, the Madras Agriculture Department compiled 'sayings and proverbs' on agriculture in Telugu and Tamil in 1890s to advance 'knowledge of the agriculture of the country'. Sayings selected for publication were those that 'really apply to agricultural matters', setting a stamp of modern codification on 'wisdom... of ages' [Ludden, 1996:38-9]. C. Benson who compiled the first 'sayings and proverbs' volume was a Collector of Kurnool and author of *An Account of Kurnool District Madras*. Later, he brought out *A Collection of Telugu Sayings and Proverbs Bearing on Agriculture*.

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20 Consequently, traditional farming, irrigation, related industries, education, medicine, art all started deteriorating and finally died out. Though many foreign powers had looted India, the real harm was done by the British especially under rulers like Warren Hastings by shattering the basic production structure in the village societies.

21 Though there are different versions of this work—all complementary—the present reference is based on *nattumalayalam- Krishigeetha Chollum Vayanayum*—A Folkloristic Study of an 18th Century Text on traditional and primitive agriculture (Malayalam) 1999 eds. T.T Sreekumar, C.R Rajagopalan and Vijayakumar Menon; Centre for Folklore Studies, Kanimangalam, Thrissur. It is valued as a collection of divine sayings on the secrets of farming. The original, in manuscript and in print is kept in certain libraries including the Indian Library at London.
There was a good stock of local variety of seeds for cultivation. *Krishigeetha* refers to a good number of seeds, suited for food, medicine and for special dishes.

In the traditional agriculture system, the farmers and the peasant community got involved themselves in the production, storage, and preservation of seeds and thus became custodians of the common genetic heritage. “For 10000 years, farmers and peasants had produced their own seeds, on their own land, selecting the best seeds, storing them, replanting them and letting nature take its course in the renewal and enrichment of life” [Shiva, 1996:63].

Traditional agriculture reminds farmers of the measures and the necessity to retain the fertility of the soil regularly. There should be the proper application of organic manure composed of green manure (*tholi, pachila*), cowdung (*chanakam*) and ash (*charam*) – all valuable for soil [Krishigeetha: 47]. Regarding preparation of land, importance has to be given for making of *varampu, vachal* and *kachal* in order to ease drainage. Those who reduce or thin the inner bunds (*varampu*) are to be beaten with cane stick (*chooral*). The number of times ploughing is suggested, varied, say-ten times-*pathu chalu* [Ibid: 56]; eight times-*ettu chalu*, six times-*aaru chalu* [Ibid: 62]; four times-*nalu chalu, three times-moonnu chalu* [Ibid:65].

*Krishigeetha*, a typical example of the indigenous knowledge of Kerala primitive agriculture presents a wholesome knowledge on farming - starting from, distant preparation, namely construction or maintenance of cattle-shed, treatment of farm tools etc. It speaks of the various relations to be observed and the manners to be kept in farm management. It advises on the type of seed, methods to be followed in land preparation including
ploughing. For instance it speaks on the types of seed and their advantages in certain seasons:

Virippallo kazhamayum kaliyum  
Vattanum mundappally njavarayum  
Padu nokki viithaykenavum

[Krishigeetha, an Eighteenth century text in Malayalam, 1999:37]

The text means that seeds like Kazhama, Kaali, Vattan, Mundappally and Njavara are to be sown respecting the Njattunila.

It is well concerned about maintaining the fertility of soil and advises proper application of manure. While preparing the land enough care is to be given for drainage facility. It underlines the importance of ploughing thus:

Pathu chalil kuranjittorutharum  
Vithu kandathil aakkathirikkanam

[Krishigeetha, 1999: 56]

‘Nobody should sow the seed before ten times of ploughing’

The Concept of Njattuvela

Seasons were very important in traditional agriculture. The concept of njattuvela\(^2\) is a clear and good example of the scientific approach of traditional farmers. The term njattuvela is the combination of two Malayalam words njar (seedling) and vela (time). Thus naytuvela means day/time appropriate for transplanting seedlings.

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\(^2\) This concept is based on the calculation of the availability of rain (based on the day that Vishu falls). It is also known as njattunila and njattila. There are numerous proverbs on the availability and nature of rain in each season. The timing of agricultural operations are based on the nature of each crop and season in the njattuvela. For example, in Thiruvathira njattuvela there is ‘Thirumuriya mazha’, means rain and sunlight come interchangeably. Experiential knowledge of traditional farmers on the timing and availability of rain is quite appreciable.
Another pronunciation is *njayittuvela* and it is asserted that it is *njayarvela*. *Njayar* (Sunday) is Sun [Sujithkumar, 1999:227]. Thirteen and a half days constitute one *njattuvela*. So based on climate an agricultural year in Kerala begins on April 14\textsuperscript{th} or 15\textsuperscript{th} of one year and ends on April 13\textsuperscript{th} or 14\textsuperscript{th} of next year, covering 27 *njattuvelas*.

For convenience there are 27 *njattuvelas* in sequence and are named after the stars from *Ashwathy* to *Revaty*. Of the 27 stars, the Sun (*njayar*) moves to which star, determines the name of the *njattuvela*. When the Sun moves from one star to another *njattuvela* also changes. Each crop or each step in farming was performed according to *njattuvela*. As per *njattuvela* *sowing* of each crop and transplanting of seedlings have their own time and season.

The *raashichakram* (the Zodiac consisting of twelve signs) is the basic text of the *njattuvela* calendar. (Information obtained from Sri. Sukumaran, Jayanivas, Ithithanam, an astrologer, our interview dated 10-9-2003). For astrological purposes, the astrologers use a square diagram with all the twelve months in the Malayalam Era (M.E). They count with *medam*, the ninth month and not with the first month *chingam* of the M.E. Correspondingly there are 27 *nakshatra* or stars. The *njattuvela* corresponding to a particular star will be known in the name of the fourteenth star counting from the name of that star. For example, the *njattuvela* of *chothi* star would be *aswathy*.

The following exhibit presents the *njattuvela* calendar.
EXHIBIT 3.1 Njattuvela Calendar
Njattuvela speaks of the best time for each farming operation especially transplanting seedlings. This idea was at the core of the primitive agricultural strategy. For instance, Krishigeetha speaks of the ideal time for transplanting the Virippu crop as per the njattuvela prescription:

*bharaniyakum njattunila thannil*  
virippinnokke njarrathu pakanam  
*thiruvathira njattunilayolam*  
virippangu nadunnundu kuthrachil  
punarthathil virippu nadunnavan  
gunaheenanmaraya khrishivalar*  

[Krishigeetha, 1999:57]

The above lines instruct the farmers that for virippu season transplanting the seedlings must be done in the njatunila of bharani itself. There is the practice of transplanting even in thiruvathira njattunila for virippu. But those who do transplanting in punartham are surely unwise farmers'.

Thus the respect for seasons was central to the traditional agriculture system and its wisdom. Seasons formed an important element of the environment.

Environment and Culture – Its Role in Traditional Agriculture

Traditional agriculture was bound or tuned by the environment. Environment refers to the natural richness of diversity, landscapes and ecosystems. People formed their tastes and needs within the limits set by the nature. They were entirely dependent on the environment that determined their mode of subsistence. Ecological differences presupposed
regional difference in the material process of the appropriation of nature, which meant difference in technology.

Cultivators developed the farming practices duly respecting the nature without disturbing the ecological balance of the area and respecting the moral right of the future generations to survive. They never tried to correct the environment to suit a particular technology; instead they tried to develop a technology to suit the environment. The significance of the concept of *njattuvela* in traditional agriculture proves the influence of environment on agriculture. People developed their cultural values influenced by the environment. The culture of the people was deeply rooted in the agricultural occupation and life style. The basic culture of mankind had grown hand in hand with agriculture.

**Religion and the Caste System in Traditional Agriculture**

Religion exerted considerable influence on the productive system in the traditional society. Agricultural practices were associated with religious rituals. Most of the religious festivals were in the post-harvest or pre-sowing times. The primitive roots of most of the Indian myths and rituals lie in the rural agrarian setting. The world religions sprouted and flourished in agrarian culture.

Kosambi [1962:2] observed that the religious observances of the various human groups in India, particularly those that are lowest in the social, cultural and economic scale, show roughly the order in which the particular groups were enrolled into a greater productive society.

The Neolithic people had interwoven their livelihood means of farming and cattle with the concept of fertility. Kosambi traced the primitive roots of some Indian myths and rituals that started in the
beginning of civilisation [Kosambi, 1962]. Worship of Mother Goddess and various fertility cults started in the Neolithic phase. Many of the agricultural festivals originated here [Varier and Gurukkal, 1999: 42].

Caste system which was the prominent form of social organization in the traditional Indian society was presented as God-given [Bhagavad-Gita, 4.13]: “The four-caste (-class) division has been created by Me”. Social law based on a man-made tradition had already become Sacred Law and the orthodoxy attempted to maintain its power by rigid rules of exclusion for those who could not conform [Thapar, 1966:160]. The resultant social stratification shaped the production system and thus the organisation of production/technology for a very lengthy period in history. It is argued that Indian Buddhist monasteries promoted agrarian settlement [Kosambi, 1962:100].

Religious festivities were associated with agrarian seasons. Scriptures of all religions have reference to certain successful agricultural practices. Agriculture flourished with the settlement of people and thus they became ‘a people’.

It is argued that the most remarkable of the rites of Hindu worship owed its origin to their respect for agriculture. Their sacred bulls and their superstitious regard for the cow, have their foundation in the great service they rendered to husbandry [Walker, 1820: 230]. Bible speaks of the need to be religious for a good harvest [Deuteronomy. 11:8-15]. Obedience to Yahweh ensures blessings23. It also refers to the relation between energy (draught animals) and farm yield. “Without any oxen to pull the plough

23 “But if you obey the voice of Yahweh ......You will be blessed in the town and blessed in the country. Blessed will be the fruit of your body, the produce of your soil, the issue of your livestock, the increase of your cattle, the young of your flock. Blessed will be your pannier and your bread bin You will be blessed [Deuteronomy, 28:1-5]. Also refer ibid 7:12-13).
your barn will be empty, but with them it will be full of corn” [Proverbs 14:4].

*Krishi Geetha* desires that each farmer has to be a firm believer in God. From the very days of land preparation and outer -bund maintenance, the farm labourers of *punja* in Kuttanad- the *paraya* and *pulaya*- were on celibacy [Thakazhi, 1948:24]. The religiosity of the rural agrarian society had been reflected in the rituals, cults and festivals associated with agricultural practices and seasons.

Of the above rituals, fertility cult was very common in primitive societies. The worship of Shiva, for example, incorporated a number of fertility cults, such as those of the phallic emblem (*lingam*), the bull (*nandi*), etc., and was also associated with a number of fertility goddesses. The most important form of Shaivite worship, the worship of the *lingam*, became current about the beginning of the Christian era [Thapar, 1966:133].

The concept of fertility is related to technology, so with Shiva and Devi. Shakti cults were developed with their basic belief that the male can be activated only by being united with the female. The gods therefore acquired wives and the wives were worshipped in their own right; for example, Lakshmi, the wife of Vishnu, and Parvati, Kali, and Durga, the various manifestations of the wife of Shiva. Persistent worship of the mother goddess, had remained an enduring feature of religious life in India [Thapar, 1966:160-61].

Beliefs and rituals associated with fertility cult were so rooted that they are still found in certain areas in Kerala24. Goddess worship assumed

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24 In the Kodungallor temple, there is a Goddess idol, which people call 'vassorimala'. This idol worship is done drawing the *padmodalam* and pouring a liquid mix of turmeric and rice powder on it. The idol may be treated as the Goddess Earth and *padmodalam* representing the female sexual organ [Gopalakrishnan, 1987:20]).
prominence in the Modern Stone Age with the primary roots in agriculture. Devi was treated as the Goddess of land fertility and human fertility. They had interwoven their idea of agriculture and livestock with the concept of fertility. Mother goddess worship and male sexual organ worship had begun in the New Stone Age. Ritual copulation, sexual organ worship, human sacrifice and other rituals are as old as the New Stone Age. This marked the beginning of many agricultural festivals [Varier and Gurukkal, 1999:42].

The ancient society sanctified their tools by associating them with gods or devas. In the legend of Parasurama, he is always seen with an axe in hand; similarly, Vishnu and the avatar Balaraman are associated with wheel and plough respectively. Once in a year all workers in various fields of production lay their tools at the feet of their deity for pooja (worship). All, especially farmers treated their farm tools with respect.

The conviction was that success in farming relied on power, which in turn depended on morality. There is a reminder in Thirukkural thus: 'however deeply one ploughs and whatever skill one exerts, the earth bears fruit only for those who have earned religious merit (punniyam)’ [Rao, 1996:11]. Using the bounty of the earth for religious merit, by patronising Brahmins, became the linchpin of agrarian power in medieval times.

The social structure of traditional agriculture in India was caste-ridden. The occupational structure of the society was set by the caste

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25 During the New Stone Age Goddess worship was popular in Egypt, Syria, Iran and in the Mediterranean places. Idols of female images, interpreted as that of Devi, made in clay, stone or bone, were recovered from these areas [Childe, 1976].

26 The Sanskrit word for caste, varna, actually means colour. The Aryan culture emphasised the colour aspect of the caste. Initially the division was between the Aryans and the non-Aryans. The Aryans were the dvija or twice-born castes, the first being physical birth and the second the initiation into caste status, consisting of the kshatriyas-warriors and aristocracy, the brahmins-priests, and the vaishyas-cultivators; the fourth caste the shudras-Dasas and those of mixed Aryan-Dasa origin. The caste status of an occupation could change over a long period. Gradually the Aryan vaishyas became traders and landowners and the shudras moved up the scale to become the cultivators. see Romila Thaper, 1966; rpt.1984:38-40).
system. Till the advent of the British hegemony and even during the first half of the nineteenth century traditional Kerala society remained under the determining aspects of the caste system.

The scenario of agriculture in Kerala was unique with the predominance of the homestead system of cultivation. A typical homestead consisted of a dwelling house with a small garden in front and a variety of annual and perennial crops grown in mixture on a small piece of land with or without livestock, poultry and/or fish for meeting the fundamental requirements of family and also to generate additional income by the sale of surplus for the purchase of items non-produceable in the homestead. People built up a life-style deeply rooted in the bio-diversity of the land. This closeness helped in the uninterrupted interaction between the farming community and the nature, which resulted in the three systems of agriculture in Kerala.

The three systems of agriculture have been the Nanjanad system, the Kuttanadu system and the Nilamkrishi [Nagam Aiya, 1906:4,5]. Each system had developed its own farming practices with certain common features with other systems, but adapted to the specific features of the particular area. The traits discussed above had been prominent in the three systems.

In the light of the historical facts discussed, we attempt to focus on the Kuttanad farming system. Before proceeding to a discussion of the socio-economic conditions in the early and pre-modern phases of traditional agriculture and their evolution in Kuttanad in Chapter V, the rationale behind the Green Revolution strategy and its history are examined in the next chapter.