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# UNIT 7 ORIGINS OF AGRICULTURE

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## 7.0 INTRODUCTION

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The beginning of agriculture, considered to be a momentous event in nature-human interface, is generally associated with the Neolithic revolution. The ground stone artefacts of this period which were well-rounded and had smooth long edges made the cultivation of soil an easier process. Once man took to agriculture several very significant changes followed that may be legitimately called as heralding the beginning of a new phase in man's relationship with environment. Human dependence on the resources of nature for survival ended. Production of cereals like barley, wheat and rice allowed them to get their own food. They also began to domesticate some species of animals – both for supplies of milk and meat as well as for harnessing their labour for various purposes. This was a completely new relationship with environment and its resources.

We deal in this Unit with the origins of agriculture. We discuss the transformation of hunter-gathers societies in societies that began to cultivate cereals and took to other associated developments in agriculture. Thus the characteristic features of the Neolithic revolution and related evidence along with the patterns of agriculture in West Asia and the Indian sub-continent come under specific focus.

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## 7.1 NEOLITHIC REVOLUTION

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The changes introduced in the stone artefacts that made smooth surfaces, and well-rounded and symmetrical shapes possible were of such far-reaching consequences that they were termed as ringing a remarkable shift in the stage of human evolution. V. Gordon Childe called this stage as 'the Neolithic Revolution' as he noted that the impact of the new stone tools and artefacts on human life was of enormous significance. (cf. *Man Makes Himself*, London, 1936). "Childe argued that once Neolithic tools began to be made, they would in turn make it easier to cultivate the soil. This would come about when humans (probably women, since in the gender division of labour they did the gathering of seeds and roots,

while the men mainly hunted) discovered that they might not confine themselves to collecting wild grains, but increase their food supply by themselves putting seeds in the ground. Ground stone axes would help cut trees to clear the ground much better than the earlier rough tools; and with the sharp stone tips of digging sticks (as primitive hoes), the ground could be better softened to take in the seed. Smooth and sharp spear-heads and arrowheads would also make it easier to hunt, and so reduce the distances that hunters had earlier to traverse in tracking down game.

“Other developments would take place, not directly attributable to Neolithic technique, but certainly to agriculture. As cultivation became more widespread, domestication of cattle would be put on a firmer foundation. Stubble on the fallows would be available as fodder for cattle, which would supply both milk and meat, and so help to reduce dependence on hunting. Settled agricultural communities, inhabiting villages, could now arise. These communities would in time be able to produce a surplus, that is, grow more food than the producers themselves required for their bare subsistence. Use of clay and mud-brick construction would enable the surplus grain to be stored. Such surplus could then also be appropriated by non-producers, establishing their right by force, the right in time confirmed by cult and custom. Classes, private property and the state now made their appearance, based on such expropriation of the surplus” (Irfan Habib, *Prehistory, op.cit.*, pp.48-50).

There has been some debate on the use of the word “revolution” to denote the onset and continuance of the Neolithic stage of culture. Since the general time span of this stage is considered to be from c.7000 to c. 3800 BC, it is argued that the spontaneity associated with the word revolution may not be quite applicable on a time span lasting for more than 3000 years. However, as suggested by Irfan Habib, “we need to compare the pace of change achieved during the Neolithic Revolution with the pace witnessed earlier. The previous Mesolithic age, characterized by microliths, had a span of some 25,000 years in the major part of India, with man still remaining basically a forager and hunter. In less than one-eighth of that time all this was changed, once Neolithic techniques had appeared in Pakistan’s western borderlands, around c.7000 BC. It is this relative shortness of the Neolithic phase, along with the immense changes it brought about in man’s social life, that makes it deserve the term ‘revolution’”( *Prehistory, op.cit.*, p.50).

The domestication of plants and animals a characteristic feature of the Neolithic stage of culture set on course a self-sufficient food producing economy. The inhabitants obtained assured supply of food through cultivation of cereals and they also began the practice of domesticating animals. A remarkable change in their life-style took place. Not dependent solely on the environment for food resources necessitating a periodic shift in their places of habitation in search of fresh supplies of food, the human groups now began to lead a more settled and sedentary life.

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## 7.2 EARLY AGRICULTURE AND ENVIRONMENT

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The beginning of agriculture, as we have said earlier, was an event of very far reaching consequences. It was also an event that had demarcated a definite shift in human relationship with environment. As a matter of fact a marked change had taken place in the environmental conditions obtaining in the part of the world with

which we are concerned. A perspicuous description given by Bridget and Allchin explains this circumstance. They write: “At the end of the Pleistocene [the prehistoric period marked by great fluctuations in temperature with glacial periods followed by interglacial periods], approximately ten thousand years ago, climatic conditions more or less similar to those of today were established in West and South Asia. This provided the setting for man to make a number of important advances in his control of the environment, and set in train a series of events which led ultimately to the appearance of the first urban societies in both regions, some six thousand years ago. Perhaps the most fundamental advances were the domestication of several breeds of animals and plants” (Bridget & Allchin, *Rise of Civilization in India and Pakistan*, *op.cit.*, p.97). Clearly, conducive environmental conditions and availability of necessary material support through Neolithic Revolution helped the practice of agriculture to germinate and allowed it to take roots.

In this region agriculture first began in West Asia and from there it spilled over into South Asia. The evidence available today suggests that the people of Syria and Palestine were the first to practice agriculture. They were known as Natufians “after a camp-site in the Wadi-el-Natuf, in Jordan”, and “used sickles of small flint blades set with gum into the grooved shafts of bone. The blades were finely notched and set in a line to make a continuous saw-edge. The silica in the grass or corn stalks had polished the edges of the flints into a bright lustre from constant use. On the flat rock floor at the cave mouth were hollows made by pounding the grain into flour, and stone mortars were found for the same purpose” (M.S. Randhawa, *A History of Agriculture in India*, Vol. I, New Delhi, 1980, p.101). The techniques described here “could have been knocking at India’s doors as early as 10000 BC, if one relies”, says Irfan Habib, “on a stray carbondate (latest calibration) for a stratum of Neolithic tools without pottery (‘a ceramic’ or ‘pre-ceramic’) obtained from Ghar-i Asp or Aq Kupruk II in northern Afghanistan; more certain seems to be the date of c.7500 BC obtained from the nearby site of Ghar-i Mar or Aq Kupruk I” (*Prehistory*, *op.cit.*, p.50). Surely the agricultural techniques from West Asia had diffused over Afghanistan from where they had to cross over into the Indus system.

This early agriculture had a profound impact on human-environment interface, as stated earlier. As a result of a complex interplay of sedentary societies with their environments new social and economic structures emerged. The process of their emergence and their characteristics have been described by the Bridget and Allchin with good effect and we shall quote them at length: “When man first started to cultivate crops and to herd his own domesticated animals, an increased interest in fertility and in magical means of promoting it appears to have become an almost universal aspect of culture. It may well be that this interest gave rise to some of the most important new concepts in the whole of religion, namely, belief in an afterlife, in resurrection after death, and belief in the transmigration of souls and the cycle of rebirth. Throughout the length and breadth of India there are found today, at the folk level, rites and festivals which are intimately associated with the changing seasons, the sowing and harvesting of crops and the breeding of cattle and other livestock. There is also a whole pantheon of local gods and goddesses some of whom remain unassimilated while others have been absorbed at different levels into the sanskritized hierarchy of gods of the ‘great’ or classical Indian tradition. There can be no doubt that a very large part of this modern folk religion is extremely ancient and contains traits which originated during the earliest periods of stock raising and agricultural settlement.

“Also associated with permanent settlement were a series of new crafts involving important technological discoveries. Among these were the manufacture and use of pottery, in time to become ubiquitous as a trace of human occupation; and the discovery of the smelting of copper and its alloys, and their use in the manufacture of tools and weapons. The stone industries of the early settlements throughout South Asia show considerable variations from site to site and from one region to another. They also vary from one cultural level to another at sites with prolonged occupation such as Amri and particularly Mehrgarh. At the latter there were local supplies of bitumen which survives in the excavation and, being used in hafting, allows us to see how stone artefacts form component parts of different tools. In all cases the lithic blade industries of the early settlement are closely related to those of the regional Mesolithic sites with which they share sources of stone and basic technology. The regional, cultural and chronological variations are in the types of artefacts made from blades and flakes, and in their relative proportions. All assemblages at this stage are varied and clearly intended to serve many purposes” (*The Rise of Civilization in India and Pakistan, op.cit.*, p.99)

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## 7.3 EARLY AGRICULTURE: REGIONAL DISPERSAL

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The successful exploitation or domestication of several species of wild plants and the consequent rise of sedentary settlements were processes that showed multiple patterning over such a large geographical area as South Asia. Moreover climatic divergence and similar differences over physical environment were supportive factors of such a patterning. Different plants and resultant crops found favour in different regions. The early agriculture of the region South Asia can be divided into several sub-regions each showing some variation from others. The evidence of early agriculture in sub-regions has been discussed in the following sub-sections.

### 7.3.1 Baluchistan

Baluchistan forms the border region with the Indus system. The spill-over of agriculture from West Asia via Afghanistan had taken place in this region before it reached the Indus system. The environmental conditions obtaining in this region are, therefore, of interest to us as that is likely to explain in the emergence of agriculture there. As stated by Bridget and Allchin, “The climate (in this region) is one of extremes, the summer temperatures being very high, and the winters often very cold, with snow lying for up to two months in the higher valleys. Given these climatic conditions, the choice of habitations for communities of the Neolithic period must have depended primarily upon their suitability for varying pastoral and agricultural requirements. As the rainfall is generally less than 10 inches per annum, mainly falling in the winter months, water for men and animals was obviously a prime necessity in site location. Because of the scarcity of water, settlements were never large, unless they coincided with a good permanent spring or source of water. This scarcity also set strict limits upon the production of crops. Consequently a pastoral element in the economy has predominated and has certainly been well represented up until the present day. There are signs that in Baluchistan, in prehistoric times, attempts were made to retain rain water in surface drainage tanks, behind earth or stone embankments” (*The Rise of Civilization in India and Pakistan, op.cit.*, p.100).



The suitability of this region for the growth of agriculture has also been testified by others. Possehl writes: “A number of scholars have observed that the Afghan-Baluch region is environmentally and ecologically very much akin to the entire Iranian Plateau and the uplands of the regions bordering the Mediterranean [which is considered the place of origin of agriculture in the world]: It has a steppe-like quality with pistachio, juniper, and almond tree cover, along with the hard cold winters in which wheat and barley evolved. It is also within the range of the winter westerlies, which bring moisture, often in the form of snow, to the Near East on across the Iranian Plateau to the Punjab and Western Sindh. What this tells us is that the Afghan-Baluch region is a perfectly reasonable place for both wild barley (which is documented) and wild wheat to have been found” (G.L. Possehl, *The Indus Civilization, A Contemporary Perspective*, New Delhi, 2002, p.23).

The two major sites of interest to us in this region are Kili Ghul Muhammad and Mundigak. Kili Ghul Muhammad has yielded evidence relating to the domestication of cattle-sheep, goat and oxen and of mud-brick houses suggesting sedentary way of life. The site seems to have developed in several phases and pottery too appears in a later phase supporting settled way of life for its inhabitants. Mundigak, the other site, also provides evidence of permanent settlement. Initially the houses were like oblong cells made of pressed earth but subsequently larger houses began to appear. They were made of sun-dried bricks and had more than one enclosed living room. Bridget and Allchin write: “Domestic hearths are found from the beginning, and ovens, presumably for baking bread, are situated at first outside the houses, and later, possibly in the court yards” (*The Rise of Civilization in India and Pakistan, op.cit.*, p.102). The details suggest that organised agriculture and the associated permanent settlements had become a conspicuous feature of Baluchistan region. These developments could serve as a precursor to the beginning of agriculture in the Indus system.

### 7.3.2 Indus System

As a geo-historical entity Indus valley is quite well known. We have called the same entity with the name Indus system to make it a little more flexible and give us the facility of including some of the fringe areas to make our description cogent.

The environmental conditions of the Indus system have been graphically described by Bridget and Allchin. They write: “The Indus plains offer a very different environment from the upland villages of Baluchistan. The picture that we see today, even despite modern flood control measures, of a highly unstable river, constantly changing its course within a wide flood plain, and laying down quantities of silt in the course of its annual inundation over large areas of the plain, was probably the same in many respects at the time of the earliest settlements on the edge of the plain. The rate of accumulation of silt throughout the period (approximately 180 cm per millennium for the plain as a whole, or 250 cm near the river’s banks) has been such that not only must many features of the valley have become submerged, along with any early sites associated with them, but the plain itself must have expanded in area, increasing the extent of highly fertile alluvial soil. The main channel of the Indus flows through a wide alluvial flood plain which, with the recession of the annual inundation of June to September, is of great fertility. Wheat and barley sown at that time ripen by the following spring, without either ploughing or manuring of the ground. The banks of the river and of its subsidiary channels are not cultivated and must then, as now, have supported a dense gallery forest. These forests were until recent times rich in game, and must

have provided attractive hunting grounds. So too must the plains beyond the active flood plain, for they would have produced a rich and varied grassland vegetation and have provided grazing for wild no less than for domestic animals. Once the agricultural potentials of the new alluvium were realised, and means were discovered of overcoming the problems of protecting settlements on the flood plain from inundation, an entirely new type of life became possible. On present showing this development took place in several stages, reaching its culmination around the opening of the third millennium B.C." (*The Rise of Civilization in India and Pakistan, op.cit.*, pp.104-05).

It is clear from this description that the peculiar behaviour of rivers in this region helped agriculture to grow and take roots. The deposits of alluvial resulting from the seasonal flooding of the rivers were a fertile soil. It was not necessary then to clear any wooded or bushy areas for agriculture as a precondition. This area has yielded rich evidence of early agriculture through a fairly well excavated site known as Mehrgarh. We describe the evidence obtained from this site below.

Mehrgarh is located on the banks of Bolan river at a distance of approximately 150 kms from the Quetta valley. The excavated site shows three different stages of settlement all of which may be termed as Neolithic settlements. From the beginning itself the habitation comprised of houses made of sun-dried mud-bricks having several smaller rooms and a hearth. "The presence of agriculture", as stated by Irfan Habib, "is attested by finds of seeds: the bulk are of naked six-row barley; the other sub-species of barley like hulled six-row and two-row, and of wheat like einkorn, emmer and hard [species of wheat] are present in small amounts". He suggests "Such cereal cultivation had probably spread from West Asia. Agriculture seems to have given an impetus to animal domestication. Goats were already domesticated and the humped ox (the characteristic Indian or *zebubull* and cow) and sheep began to be tamed and bred from captured wild stock" (*Prehistory, op.cit.*, p.51). The other evidence pertaining to agriculture and therefore of significance to us is the appearance of mud-brick structures of growing sizes, as we move from the earlier stage, to a later stage supposedly used as granaries. Moreover another specific find of great relevance is sickle blades of stone set in bitumen. This is perhaps the earliest indication of the use of tools specifically for agricultural purposes. Clearly otherwise arid zone harboured agriculture due to environmental conditions made available by alluvial carrying rivers.

### 7.3.3 Northern Valleys

Evidence of early agriculture in this region is best reported from the Kashmir area. There are two principal sites in Kashmir that give us useful material evidence on early agriculture. From Burzahom, close to Srinagar, we get information about pit-dwelling inhabitants. The walls of these dwellings as also their floors were sometimes plastered with mud. There are also some deeper pits which were probably reached through steps. It is, however, significant that direct evidence for agriculture in Burzahom has not been available. The other site, from where such evidence has been unearthed, is at Gufkral. From the early stages we find evidence that suggests that wheat, barley and lentils were grown by them. Domestication of sheep and goats is also reported. As suggested by Bridget and Allchin, the Kashmir valley culture "appears as a local adaptation to the special environment of the mountains, its people having rich sources of food from hunting and from agriculture" (*The Rise of Civilization in India and Pakistan, op.cit.*, p.116).

### 7.3.4 East

The region East of the Indus area is different from the Indus area environmentally as it has been a region of high monsoon rainfall. The Mesolithic settlements have been present in this region from a very early time and the beginning of agriculture has in many cases been in continuation of this culture. There are two main sites, at Koldihwa and Mahagara, which yield interesting evidence on early agriculture. The habitation at these sites was in circular huts which were raised on wooden posts. The marks of holes left behind by these posts give us a fair idea of the shape and size of the huts which were generally circular in disposition. The most significant find is husks of rice indicating that this probably was the earliest rice growing culture. The wet environmental conditions resulting from monsoon were probably a prime reason for rice cultivation. The view that Koldihwa and Mahagara were the earliest rice growing places has been contested by Irfan Habib. He is of the opinion that the dates of Koldihwa-Mahagara sites has been misread; and the earliest evidence of rice cultivation in fact comes from Chopani Mando in Belan valley to the South of Allahabad between Tons and Son rivers.

[The] grains of domesticated rice were found by G.R. Sharma and his colleagues at Koldihwa in the valley of the small Vindhyan river of Belan, South of Allahabad, and carbon tests of material thought to belong to the same strata as the rice, yielded dates ranging from 6719 to 5010 BC. As such, the site would have contained the earliest occurrences of rice in the world. This statement has actually found a place in many textbooks. But it is now certain that the early dates from Koldihwa are due to a misreading of the charcoal-bearing strata; and the true cultural sequence seems to be as follows.

First of all, in the same small valley of the Belan river, at Chopani Mando, there was a Late Mesolithic or 'proto-Neolithic' phase, which is carbon dated 3385-3135 BC. The people lived in huts, whose floors have yielded large numbers of microliths. They were hunters and gatherers; and so the males were nearly as robust and tall as those of Sarai Nahar Rai and Mahadaha five thousand years earlier, though the women were already becoming smaller (mean adult height: 162 cm) and gracile. This is what the skeletons found at Lekhahia in the Mirzapur district of Uttar Pradesh, c.3035-2780 BC, tell us. Life was still short: out of nineteen skeletons whose age at death could be roughly determined, eleven died before reaching the age of 25. To return to Chopani Mando, we find here some ground-stone tools like hammer stones, querns and mullers; but there is no trace yet of domestication of plants and animals, though wild rice was gathered. Hand-made pottery had appeared, sometimes bearing cord-impressed decorations. This pottery links this culture to the 'Vindhyan Neolithic' represented by the sites of Kunjhun river, Koldihwa and Mahagara, the last situated in close proximity to Chopani Mando. The Vindhyan Neolithic must have succeeded the Mesolithic culture of Chopani Mando some time around 3000 BC; its carbon dates from Kunjhun river range from 3530-1265BC, while at Mahagra the dates are confined to the second millennium BC or 1770-1375 BC. The Vindhyan Neolithic is certainly important because, as has been mentioned, it has yielded very good evidence of the cultivation of rice, which is now India's major food crop. The otherwise primitive nature of this culture is evidenced by its cord-impressed pottery, which was still hand-made.

*(Prehistory, op.cit., pp.62-63).*

Another site of significance is Chirand located in Bihar on the plains of the river Ganga. This site has been assessed for its closing period as “contemporary with the Late Harappan” by Bridget and Allchin (p.119). The occupants lived in huts made of bamboo and strengthened with mud-plaster. Evidence for rice cultivation in the form of rice husks has become available from this site. Since fish bones have also been found along with rice husks it may be assumed that rice and fish formed a main food item the inhabitants.

### 7.3.5 Peninsular India

The evidence for early agriculture in this part of the country comes mainly from sites excavated in the Karnataka region. These sites are commonly known as ‘Ash-mounds’ and are located at Utnur, Kupgal, Kodekal and Pallavoy. It is suggested that no outside influence worked in the development of these sites and they had an impulse of their own in developing a Neolithic culture. The geographical peculiarities of the region where these sites are located have been described by Bridget and Allchin: “In that part of the Deccan plateau where this new pattern first developed, the predominant physical features are residual granite hills rising from a rolling ‘sea’ of black cotton soil. The hills were favoured for settlement, and wherever they contained suitable caves or rock shelters, these were used for habitation, and often enlarged by the construction of a levelled stone terrace in front. Small plateau on the summits of hills or level areas on hillsides were likewise exploited and artificially levelled or extended. In some cases there seem to have been single large terraces, while in others there were many small ones, rising one behind the other up the slope of a hill. At this early period, sites are only rarely found on the banks of rivers away from hills. There is as yet no evidence for structures associated with the earliest settlements in this area” (*The Rise of Civilization in India and Pakistan, op.cit.*, p.122).

Interestingly the ‘Ash-mound’ sites have been found to be contemporary with the early phase of Harappan culture. The most notable feature here is the existence of cattle-pens where domesticated cattle like sheep and goats were kept penned together. “These pens were surrounded by two heavy stockades of palm-trunks. The inner of the two provided the area in which the cattle were penned, while the outer provided a space within which the herdsmen lived” (Bridget and Allchin, *op.cit.*, p.123). We have not found any direct evidence of agriculture in the form of grains from these places. But the availability of tools such as rubbing stones, querns and ground axes suggests that cultivation was practiced.

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## 7.4 SUMMARY

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The evidence discussed by us so far leads us to form a certain view about early agriculture in India. The environmental conditions had become favourable at a time about 10,000 years in the past from now. Agriculture originated in West Asia and from there travelled a route that passed through North Afghanistan, the Indus system, northern valleys to the central and eastern parts of India. Sedentary settlements came into being as mud-brick houses began to be built. Domestication of cattle was practiced and early agriculture had begun. Sheep & goats became the early domestic animals and wheat and barley were cultivated as cereal crops. As we move to eastern India we find the beginning of rice culture. The local environmental conditions had made their impact as the variety of evidence from the sites spread from Baluchistan to Chirand in Bihar verily testify this feature.

South India was, however, an exception as Neolithic Revolution there seemed to occur due to an impulse that was not part of the development in Northern India.

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## 7.5 EXERCISES

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- 1) Examine the significance of Neolithic Revolution.
- 2) Describe the evidence for early agriculture from Baluchistan and the Indus System.
- 3) Discuss the origin of rice cultivation in India.

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## 7.6 SUGGESTED READING

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Bridget and Raymond Allchin, *The Rise of Civilization in India and Pakistan*, Great Britain, 1982.

Irfan Habib, *Prehistory in People's History of India, 1*, New Delhi, 2001.