
UNIT 16 AGRICULTURAL PRODUCTION

Structure

- 16.1 Introduction
- 16.2 Pattern of Resource Use
 - 16.2.1 Land
 - 16.2.2 Extent
 - 16.2.3 Forest Clearances
- 16.3 Question of Productivity
 - 16.3.1 Soil
 - 16.3.2 Famines
- 16.4 Techniques of Production: Crops
 - 16.4.1 Cropping Pattern
 - 16.4.2 Crops
 - 16.4.3 Means of Production
- 16.5 Techniques of Production: Irrigation
 - 16.5.1 Well
 - 16.5.2 Tanks, Dams and Reservoirs
 - 16.5.3 Canal
- 16.6 Organisation of Agricultural Production
- 16.7 Pastoral and Forest Economies
- 16.8 Agriculture and the State
- 16.9 Summary
- 16.10 Exercises

16.1 INTRODUCTION

Agriculture and environment are closely related and interdependent. It will be interesting to find ‘what role did environment play in steering the contemporary medieval economy, particularly the production process?’ In the Indian context the question becomes much more relevant considering that Indian economy was largely dominated by agriculture all through its history. David Ludden has mentioned in Block 1, in fine detail the question of regions and environment and how the topography was influencing the cropping pattern and agricultural production. Here, in this Unit the attempt is to go deeper into the issue within the framework of the ‘medieval age’.

It is generally acknowledged by scholars that during the pre-colonial period in spite of colonisation and wars resulting in deforestation, to a certain extent, there was ‘harmony’ and ‘equilibrium’ between man and environment. Cutting of forests and export of timber was ‘sustainable’. The cutting was limited largely to the extent nature was ready to replenish. But during the colonial period that balance got disturbed. However, recent researches emphasize that even earlier the picture does not seem to be as ideal as it is projected. For fuel and building material timbers from neighbouring forests were regularly supplied and forest were cut. Advancing armies brought no less harm to the existing forest line apart from clearances for agriculture.

The impact of riverine changes was no less important in our period of study. Richard Eaton has analysed in the context of Bengal the impact of riverine changes in the

Bengal Delta. He suggests that during the medieval period, there was sharp eastward movement of Bengal's major river systems. The main channel of Ganga, Bhagirathi-Hooghly, in West-Bengal gave way to the present Padma-Meghna system resulting in rich deposition of silt that made the culture of wet-rice possible in the region. As a result east Bengal attained unprecedented agricultural growth. The process began sometime in the 15th century but got intensified after late 16th century.

Ludden and Eaton's researches clearly point out how environmental changes influenced the agrarian economy of the subcontinent. However, it is equally important and interesting to find how human interventions were decisive in altering the existing environment. We will come to these issues of and on during our discussion on specific agrarian issues in this Unit.

Let us first begin our discussion on the nature and pattern of agrarian resources during the medieval period.

16.2 PATTERN OF RESOURCE USE

By the term resource use in the context of agriculture we imply the 'means' that were instrumental in the process of agricultural production. Land, of course, occupied the foremost place in this context. Besides land, 'working capital' was another important component of it. Working capital represents ploughs, bullocks, etc. The third factor was the capacity and capability of the peasants to organise the cultivation. Here, peasant himself along with his family members occupied foremost place in the production process particularly in the medieval context when the cultivation was largely based on 'individual peasant farming'. Further, the role of hired labour and tenants-at-will was equally significant.

16.2.1 Land

Land was available in *abundance* all through the medieval period. Thus, the high land:man ratio was an important feature of the medieval agrarian structure. Though it is very difficult to assess the actual size of landholdings per *asami* (household) during the Sultanate period, some regional studies pertaining to the Mughal period do shed some light. Dilbagh Singh (1990) has calculated for eastern Rajasthan the size of landholdings per *asami* as high as approximately 90 *bighas*.

Since land was in *abundance* it was the state's concern to keep the peasant tied to the land. Aurangzeb in his *farman* (royal decree) to Rasikdas (1665-66) ordered that if the peasants have fled the *amils* (revenue collectors) should try to bring them back. All through the state's interest was to expand the cultivation for the purpose of increasing its revenue resources.

Bullocks constituted a major working capital during the medieval period. S. P. Gupta has calculated for eastern Rajasthan that there was on an average 3.31 bullocks per peasant, indicative of a favourable cattle population during the medieval period. In the Maratha country villages, particularly frontier villages, had to constantly face the problem of cattle lifting that in turn created problems to cultivate the land.

Another important aspect relating to resource use was the capacity of the peasant to possess the ploughs. The more the ploughs in his possession the more the *jots* (ability to cultivate) he could manage and the higher would be his status in the village hierarchy. S. P. Gupta (1986) has mentioned as much as 9 ploughs in the possession

of a *patel* (village headman) of *pargana* Mauzabad in eastern Rajasthan as against the maximum of one or two held by the poor peasants.

The availability of animal power was another important factor instrumental in the extension of cultivation. Abul Fazl, court chronicler of Akbar, records the number of cattle allowed tax free for each plough was 4 bullocks, two cows and one buffalo. While in 1924-25 in Uttar Pradesh average number of cattle per yoke was 2 bullocks, 1.1 cows and 1 buffalo suggests the availability of higher stock of cattle in c. 1595. It also suggests the greater capacity of peasants to plough. (Irfan Habib, Cambridge, 1982)

For eastern Rajasthan Dilbagh Singh (1990) has assessed that a plough possessed the capacity to cultivate around 50 *bighas* of land. However, *Haqiqat-i Suba Bihar* mentions that the official perception of the Mughals in this regard was that one plough was sufficient for twenty *bighas* of well cultivated land after that new plough should be issued for any further addition. In spite of variation in assessment Dilbagh Singh's analysis for eastern Rajasthan 'that there was a broad correspondence between the extent of cultivation and the number of ploughs and oxen available in a particular village' holds good. Dilbagh Singh mentions that there was considerable reduction in cultivation in *parganas* Amber and Gaji Ka Thana (eastern Rajasthan) on account of lesser availability of the animal power.

16.2.2 Extent

Delhi Sultans, particularly Alauddin Khalji and later Muhammad Tughluq experimented with measurement of the agricultural land. Abul Fazl provides us in great details the statistical information with regard to the extent of cultivation. It is interesting to note that for measurement both *kharif* and *rabi* crops were measured separately. Suppose, in a village both *rabi* and *kharif* crops are harvested then that village land was calculated twice.

Abul Fazl's *arazi* (measured area) figures probably comprised not only the gross cropped area as W. H. Moreland has pointed out, but also included current fallows, cultivable waste and parts of uncultivated waste as rightly pointed out by Irfan Habib (1963) and Shireen Moosvi (1987). Shireen Moosvi has calculated that Ain's *arazi* figures included around 10 per cent of the uncultivable waste. Dilbagh Singh and S. P. Gupta's calculation for eastern Rajasthan show that the range of waste land varied from 7-20 per cent. This could be *basti* (habitation), forest, *nullah*, *nadi*, tank, garden land or hills. Shireen Moosvi for Akbar's period and S.P. Gupta for eastern Rajasthan have pointed out that the total cultivated area was around 50-65 per cent of the measured area. B.L. Bhadani's (1999) statistics for western Rajasthan also suggests that the area under cultivation was almost 'half of the area surveyed.' However, K. K. Trivedi (1998) argues for *suba* Agra that the measured area was approximately 55 per cent out of which only 50 per cent was under cultivation.

Shireen Moosvi has calculated the average rate of extension of cultivation at 0.23 per cent as against 0.21 per cent rate of growth of population during c. 1600-1871. She has compared the gross cultivation in c. 1595 with that of c. 1910 agricultural statistics and concluded that the average extent of cultivation comes out to be 47.35 per cent i.e. it was almost half of what it was in 1910. Irfan Habib (Cambridge, 1982) has assessed that average yields per head under the Mughals were probably much higher than what it was in c. 1900. K.K. Trivedi's study on *suba* Agra also points out that in case of food crops the yields were 20% higher in 1595 as compared to 1892 statistics. Shireen Moosvi, however, argues that yields per acre between c. 1540-1870 for major food

crops remained practically the same; in case of cash crops there was relative decline in their output. South India also records high level of productivity during this period. But there occurred sharp decline in the productivity during the 19th century in the region.

In Marwar region, on account of aridity, there was tendency to leave the cultivated lands fallow for approximately three years to regain fertility. This led B.L. Bhadani (1999) to conclude that probably there was tendency to shifting cultivation in the Marwar region. A.V. Desai has stretched the argument for Ganga-Yamuna *Doab*. But Shireen Moosvi (1987) rejecting Desai's formulation argues that it 'was confined to some scattered non-contiguous pockets which were not geographically or ecologically distinct in any sense from the tracts around them...'

High productivity largely depended upon irrigation facilities and quality of the soil. Harbans Mukhia argues that generally speaking cultivation during the medieval period confined largely to the 'most' fertile plains. High yields for various crops entered in the *Ain-i Akbari* (c. 1595) led K.K. Trivedi (1998) to conclude that in *suba* Agra 'the cultivation was normally confined to fertile land.' Chetan Singh (1991) also points out that in Punjab the extension of cultivation was largely occurred only in 'agriculturally developed areas' during the 17th century. The availability of good quality water equally affected production. Yields under saline water could possibly be good but oily and extra saline water was not useful in terms of productivity.

One reason for the large scale expansion of cultivation was distribution of secular (*jagir*) and religious (*madad-i maash*) grants. Each *madad-i maash* grant was normally consisted of 50 per cent *banjar* (waste) or *liak uftada* (cultivable waste) under the Mughals. In Maharashtra Shahji's Poona *jagir* initially was a desolate country infested by 'wolves, wild beasts and robbers.' Dadoji Kondadev implanted Malves (hill tribe) to clear the land and got them settled in the region by giving permanent rights over the land they cultivated.

The pattern of productivity on irrigated and dry land varied from region to region. In Kashmir the average output of *abi* (irrigated) land was six times higher than yields of the *khushki* (unirrigated) land. In Maharashtra cultivable land available was very little. A.R. Kulkarni (1969) has brought out that in village Menoli (Vai *taluka*) cultivated land was just 16 per cent of the total village land while availability of irrigated land was even much less. It constituted only 1 per cent in village Nayagav, *pargana* Sirval (modern Bhor *taluka*). However, Bhimsen, writing in 1658, mentions about Aurangabad that 'the region is very thickly populated and not a single piece of land was to be found there which was without cultivation.'

Dilbagh Singh's study on eastern Rajasthan shows that there was distinct decline in agricultural production in post 1750s in the region that resulted in growing 'poverty and indebtedness' of the *raiya*s (peasants). In *pargana* Chatsu in 1763 *raiya*t possessed 350 fields out of which they sold off 175 to *Mahajans*, 'a number of them reduced to the status of share croppers and wage earners.'

16.2.3 Forest Clearances

Clearing of forest line for the purpose of agrarian expansion was a common feature during the medieval period. The history of development of agriculture is history of forest depletion. The growth of one form of sustenance (agriculture) resulted in depletion of another form of sustenance (pastoral/forest economy). The beginning of our period saw vast expanse of forest cover in the Gangetic plains. The forest

cover drastically changed by the close of the seventeenth century. Armed power went hand in hand in the process of extension of cultivation by clearing forests. Armed band accompanying woodcutters was a common feature in north India during our period of study. In the Ganga-Yamuna *Doab* we get frequent references to peasants/rebels taking refuge in the forest. Balban harshly dealt with such uprisings of the Mewatis and the Kateharias (Katehr region, modern Rohilkhand) and cleared the jungles of the nearby areas where they took refuge and established forts with Afghan garrisons. The fourteenth century historian Zia Barani observes:

Towards the first year of his (Balban's) reign he employed himself in harrying the jungles, and in routing out the Miwattis, whom no one had interfered with since the days of Shamsuddin...

In the year of his accession, the Sultan felt the repression of the Miwattis to be the first of his duties, and for a whole year he was occupied in overthrowing them and in scouring the jungles, which he effectually accomplished. Great numbers of Miwattis were put to the sword. The Sultan built a fort at Gopal-gir, and established several posts in the vicinity of the city, which he placed in the charge of Afghans, with assignments of land (for their maintenance)...

After the Sultan had thus routed out the Miwattis, and cleared away the jungle in the neighbourhood of the city, he gave the towns and the country within the *Doab* to some distinguished chiefs, with directions to lay waste and destroy the villages of the marauders, to slay the men, to make prisoners of the women and children, to clear away the jungle, and to suppress all lawless proceedings. The noblemen set about the work with strong forces, and they soon put down the daring of the rebels. They scoured the jungles and drove out the rebels, and the *ryots* were brought into submission and obedience...

While the Sultan was engaged in these duties news arrived from Kateher that disturbances had broken out...he gave them (soldiers) orders to burn down Kateher and destroy it...The whole district was ravaged, and so much plunder was made that the royal army enriched, and the people of Badaun even were satisfied. Woodcutters were sent out to cut roads through the jungles....

Zia-uddin *Barani*, *Tarikh-i Firuz Shahi*, Elliot, H.M., and John Dowson, *The History of India as told by Its Own Historians: The Muhammadan Period*, Allahabad, Vol. III, pp. 103-106.

Nurul Hasan has brought to notice with regard to *suba* (province) Bihar that during the reign of Shahjahan most of the *zamindaris* originated in *bankati* or land populated after clearing forests.

From the time of Shah Jahan, it was customary that wood-cutters and plough men used to accompany his troops, so that forests may be cleared and land cultivated. Ploughs used to be donated by the government. Short-term *pattas* [documents stating revenue demand] were given, [and these] fixed government demand at the rate of 1 *anna* per *bigha* during the first year. *Chaudhuries* [intermediaries] were appointed to keep the *riaya* [peasants] happy with their considerate behaviour and to populate the country. They were to ensure that the *pattas* were issued in accordance with imperial orders and pledged word was kept. There was a general order that whosoever cleared a forest and brought land under cultivation, such land would be his *zamindari* ... Ploughs should also be given on behalf of the State. The price of these ploughs should be realized from the *zamindars* in two or three years. Each *hal mir* (i.e. one who has four or five ploughs) should be found out and given a *dastar* (sash or turban; i.e. mark of honour) so that he may clear the forests and bring land into cultivation. In the manner the people and the *riaya* would be attracted by good treatment to come from other regions and *Subas* [provinces] to bring under cultivation wasteland and land under forests.

Nurul Hasan's translation of *Haqiqat-i Suba Bihar* (Berlin.Ms., Pertsch 505, now in Marburg, Germany) *Medieval India - a Miscellany*, Vol.1, Aligarh, 1969, pp. 237-238.

The cleared tracts were entrusted as *pattas* upon those involved in the clearances thus the new *zamindaris* were created in the region. There was sharp increase in cultivation in Bihar on account of clearance of forests for agriculture. The land south of Munger was largely a forest belt inhabited by tribals. Sher Shah with the help of his Rajput and Afghan soldiers suppressed the tribals (Cheros/Kharwars?) adjoining Sasaram and cleared the jungles and tried to expand the areas under cultivation. Sher Shah also sent Khawas Khan and Darya Khan to win over the tribal tracts across the Son river in Palamau and cut down the jungles of Jharkhand in huge quantities (AD1538). There were also Rajputs who fled from north and central India created new settlements in the Jharkhand and Chotanagpur plateau called *bhums* (Singhbhum, Birbhum, Barabhum, Sikharbhum, Manbhum, etc.). Many *zamindaris* were established. Raja Bahroz Singh of Kharagpur (1631-76) brought enormous quantity of land under plough in this region by clearing forests. Aurangzeb granted Kunda (in Hazaribagh) to Ram Singh in *ghatwali* (service tenure) tenure to guard the passes. The Mughals granted a *jagir* (revenue assignment) to the Lokragarh-Khetauri Rajput family of Manihari Godda. Chandels conquered the tract of the Bhuiyas and founded three kingdoms Gidham, Khaira and Kharagpur. With these conquests Koeri, Kurmi, and Muslim peasants also migrated along with them. They formed their own settlements (*bhums*) like Brahmanbhum, Gopibhum, Bhangibhum, etc. Thus helped in reclamation of land and extension in cultivation in the tribal areas of Jharkhand and Chotanagpur regions and sowed the seeds of settled agriculture in the tribal regions.

16.3 QUESTION OF PRODUCTIVITY

Productivity is closely related to the nature of the availability of soil in a particular region. The quality of soil in turn depended upon 'other' factors – rainfall pattern, availability of irrigation channels and nature of mineral deposits in the soil. Closely related to soil are famines. Its frequency and dreadfulness is largely determined by the availability of natural resources and how well the area is equipped to handle the natural disasters.

Let us review the pattern of availability of natural resources during the medieval period in the subcontinent and how far it affected and determined the pattern of agricultural production in the region.

16.3.1 Soil

Depending on the nature of soil and local conditions, while taking up the assessment Mughal rulers adopted 'indigenous methods of the classification of lands'. In *Suba Bihar* the lands were classified under the heads *kahelfi* (irrigated) and *kanhel* (tank irrigated lands; also known as *talabi* in certain areas). *Bhoor* was sandy soil generally yielded *kharif* crops. The other two major land classifications were *bangur* (upland) and *khadir* (low land). *Khadir* crop was generally uncertain. Similarly, as compared to arid regions alluvial soil does not require deep ploughing.

Under the Mughals land was divided into *polaj*, *parauti*, *chachar* and *banjar*. *Polaj* never allowed to remain fallow and less labour was required for cultivation. *Parauti* was left out of cultivation for sometime to recover its strength for cultivation. *Chachar* lay fallow for three or four years. *Banjar* remained largely uncultivated for five or more years. Even some of the *banjar* tracts remained barren permanently particularly in a desert and hilly tracts. For assessment *polaj* and *parauti* lands were further divided into *abi* (irrigated, watered through channels), *chahi* (well irrigated), *nahari* (canal irrigated lands), *barani* (unirrigated; depended on rainfall),

and *sailabi* (flooded or kept moist by rivers; inundated). *Subas* of Delhi and Oudh particularly possessed *sailabi* lands fed by their chief rivers Ganges and Yamuna. Crops on *sailabi* lands equally possessed the danger of being destroyed by excessive river floods. On certain *sailabi* tracts production of three crops was possible. *Barani* lands were divided into two: *Duhur* (also *dahri*, *chikanawat*) – low lying; overflows by rivulets and often under water for one to two months; *katli* – land around river banks. *Sailabi* lands were most suited for rice. *Barani* lands largely produced jowar, bajra, lahdarah, and moth. *Ain-i Akbari* mentions the soil of Ajmer as largely sandy. Kashmir had three types of lands – *abi* (irrigated), *lalmi* (rough), and *chalkhair* (bushy).

There were many regional variations of soil types. In the Maratha territories rain fed land was known as *jirayat* while land enjoyed irrigation facilities was called *bagait*. Alluvial soil, to be found along the rivers was known as *malai* or *malav*. Plains generally possessed black soil while in the hilly tracts red soil was commonly present. In the Konkan region black soil was rare and mostly the soil was reddish brown. Alluvial soil was available only along the river banks. In this region lands were of two types – *malvarkars*, where plough could be used; another type was *dongrivarkas*. These were steep slopes where cultivation was possible only through manual labour. In south India land was of two types – *nancai* (wet land i.e. irrigated) and *punca* (dry lands; unirrigated).

India was known for its fertility of soils. Both, from the point of view of crops sown and lands left fallow Indian soils' fertility stand unquestioned. Indian soils have unbroken record of yielding two or at times three to four crops a year. Manuring in the form of animal droppings was available in abundance on account of the presence of cattle population in good numbers. Further, as Harbans Mukhia has pointed out, the high fertile property of river waters, particularly of the Ganga basin, resulted in deposition of 'fertile silt in the river valley with each annual inundation' as the major factor keeping in the fertility of river basin soils naturally intact.

16.3.2 Famines

Famines used to occur at regular intervals. It were often the result of scarcity of rainfall (*barani*) or caused by excessive rains. There occurred severe famine in Delhi during Iltutmish's reign. The famous famine of 1326-27 during Muhammad Tughluq's reign completely devastated the *Doab* region. In 1631 floods led to extreme famine situation around Surat. A year preceded to it was a drought year. Thus during 1630-32 Gujarat saw unprecedented famine resulting in the loss of 3 million lives. Locusts also used to harm the crops quite often. In 1675 though rain was sufficient crops were destroyed by locusts in Marwar region. B.L. Bhadani's (1999) study shows that from late 17th century onwards famines became more frequent a phenomenon in Marwar region. Let us find out state's response to tackle the crisis and the relief measures undertaken by the state.

Barani in his *Fatawa-i Jahandari* suggests that 'The King can help the people by reducing the land tax (*khiraj*) and the poll tax or by advancing them loans from his treasury by making a gift of what he can do to the poor and needy. He can direct the cash loans to be advanced to merchants so that they may import from other countries and sell it to the *raiya* at the cheapest possible rates. If the famine is more severe, the King can remit the land tax and poll tax altogether and issue a general order to the rich men of the kingdom asking them to take charge of the poor and destitute so that the people may not perish in every tribe or locality.' (Rashid, 1964)

Alauddin during famine made it mandatory to purchase the grains only to meet the immediate needs. Muhammad Tughluq laid out elaborate instructions, both long term and short term, to handle the problem. To provide immediate relief during the *Doab* famine he distributed gifts from the treasury. Ibn Battuta (d. 1377) informs us that he ordered 'that all the inhabitants of Dihli should be supplied with six months 'sustenance' to distribute six months provisions to the families living in Delhi. He abolished, as a relief measure, all duties on foreign goods coming to India. Wells were dug up at the state's initiatives. Seeds were distributed to the peasants. As a long term measure Muhammad Tughluq ventured to bring huge amount of land under state's direct cultivation with direct financial support by the state. Muhammad Tughluq also chalked out a farsighted master plan. He suggested that in the famine prone areas alternative form of crops might be cultivated. Firuz's canals also brought great relief in the areas.

Abdullah in his *Tarikh-i Daudi* records that during famine Sikandar Lodi (1489-1517) took *zakat* (transit duty) in kind. Sher Shah, conceived the plan of storing the grain for any 'unavoidable circumstances'. *Tarikh-i Afghan* mentions that even he ordered to extract and collect 10 *istar* per *bigha* to be collected from the peasants for storage. As a result grain became cheap and one does not record any famine during Sher Shah's reign.

The impact of famine was devastating. Prices used to mount all time high. We get frequent references to people resorting to eating flesh of dead animals. Famines accompany death and destruction causing health hazards in the region. Famines often resulted in loss of cattle, inadequacy of man-power, and in the migration and dislocation of the peasant population. In 1630 famine people from Rajasthan migrated to Patna where Hiraji Sah provided them with shelter and fulfilled their basic needs. Migration of peasants towards places like Burhanpur, Agra, Mathura, and Malwa, etc. was a common feature during famine occurrences in Rajasthan. *Amil of pargana* Naraina informs that 1665 famine forced *riaya* (peasants) to migrate to the territory of Malwa. He tried to bring back the migrants, but found many had died, some turned to labourers. He assured that he was trying to bring back their relatives and other peasants to rehabilitate the villages. Gujarat famine (1630-32) not only caused dislocation of population but also its impact was so devastating that there occurred changes in the cropping pattern. Peasants abandoned cultivation of cash crops (cotton and indigo) to food crops.

16.4 TECHNIQUES OF PRODUCTION: CROPS

Indian agriculture during the medieval period was not static. New techniques were constantly being evolved and adopted in the field of agriculture and drastic changes took place not only in terms of techniques involved but also in the patterns of crops grown. (for techniques see Unit 23, Block 5).

16.4.1 Cropping Pattern

In north India there were two crop seasons – *kharif* and *rabi*. In Rajasthan it were known as *siyalu* (autumn) and *unhalu* (spring). In south India on the basis of specific variety of rice cultivation there existed two crop seasons *kuddapah-kar* and *samb-peshanam*. Otherwise in case of other crops there was complete absence of crop seasons. Duarte Barbosa (c. 1518) commented on Malabar that here, 'everything is produced in every month of the year.' In south India particularly black soil areas contained enough moisture that made possible agricultural production all the year round. Certain crops (sugarcane, indigo, etc.) required one year to mature, while gestation period for some (betel-vine, etc.) was three years. Some crops were sown together but harvested at

different periods of time. As for multiplicity of crops, Indian peasant stood next to Chinese. *Ain* records as much as 40-45 crops sown. The cultivation was largely *do-fasli* (double cropping) unlike the European single crop production. As a result larger agricultural surplus was available as compared to their European counterparts. Ibn Battuta (d. 1377) also observes double cropping, a norm in India. He remarks, 'The Indians sow twice a year. When the rain falls in their country in the hot season they sow the autumn crop, and harvest it sixty days later. When they harvest these sixty days after sowing then, they sow the spring cereals... They are sown in the same ground where the autumn crops are sown for their land is generous and of good heart. As for rice, they sow it three times a year, and it is one of the principal cereals in their country'. Sujan Rai Bhandari (1695) informs us that in certain cases in Punjab even three or more crops were cultivated. But some areas like western Rajasthan (Bhadani, 1999) on account of aridity even the areas containing sweet water wells were not enough for double cropping. In Rajasthan double cropping was possible only in clayey soils, in lighter soils it was rather rare. Crops grown on rain fed tracts fetched low prices as compared to the crops required artificial means of irrigation. For Maratha region, however, A.R. Kulkarni (1969) concludes that only in the *Des* area where black soil could be found rotation of crops was possible. Along the coastal regions where soil largely contained marine deposits was favoured for garden crops. Where irrigation facilities were available second crop was possible otherwise in the Maratha region usually one crop was raised.

During the medieval period there was tendency to encourage cultivation of high grade crops replacing the inferior ones. Muhammad Tughluq asked the peasants to grow high grade crops – wheat replacing barley, sugarcane replacing wheat, and cultivation of date and grapes in place of sugarcane. Aurangzeb also clearly emphasised in his *farman* to Rasikdas (1665-66) that attempt should be to switch over from inferior (*jins-i adana*) to high grade crops (*jins-i ala*).

The medieval peasant did possess the knowledge that some crops are beneficial to the soil. Pulses like mung, urd, and peas were grown with foodgrains mainly with a purpose to enrich soil fertility. L.A. Alaev (Cambridge, 1982) confirms the prevalence of crop rotation in South India. Some crops particularly cash crops and *rabi* crops required more ploughing and artificial means of irrigation in comparison to food crops. That is why in more arid regions like Rajasthan generally bajra, jowar, etc. were produced.

We do get references to mixed crops. The practice of growing mixed crops was known in Mughal India. Bajra was usually mixed with one or the other leguminous crops (mung, urd, moth, etc.). Similarly, there are references to the production of gochani (wheat mixed with gram), *bejhari*, etc. Moth in Rajputana and gram in Punjab and Haryana belt were always grown along with foodcrops and rarely single.

16.4.2 Crops

Cropping pattern still continued to be the same in the Gangetic plains. Largely wheat, barley, gram, pulses, sugarcane, cotton, oil seeds (sesame, mustard, etc.), etc. were grown in the tract. Barley was the major crop grown in Rajasthan. However, it was not the favoured crop in the regions of Bengal, Bihar and Assam.

Gram was extensively produced in western Rajasthan but later its production declined sharply. Bhadani (1999) tried to draw parallel to the extensive cultivation of gram during the 17th century to its great demand by the Rajput soldiery for cavalry.

In southern part of India rice was the staple crop of the region on wet lands (*nancai*). Other important crops grown in south India were cholam, ragi, varagu, sesame, flax,

groundnut, cotton, etc. In medieval Orissa, Kashmir, and Assam also rice was the staple crop, though wheat, barley, pulses, gram, etc. were also produced in the region. In Kashmir almost 2/3rd of the land was covered under paddy cultivation grown on *abi* (irrigated) land. Bihar was also known for its rice production. However, in Rajasthan rice was not at all produced.

The areas flanking the Western Ghats were famous for the production of spices. Besides, spices other items of production were aniseed, cumin, coriander, caraway, dit, etc. Long pepper grew wild in the forests of Champaran (Bihar). Abul Fazl mentions it fetched as high as 16 *dams* (40 *dams* = 1 rupee) a *ser* (40 *sers* = 1 maund).

Opium was produced largely in the regions of Malwa and Bihar. Nainsi and Peter Mundy (1655-56) record that opium, cotton and indigo were also grown in the Merta region (Rajasthan).

During the medieval period san/sunn-hemp dominated over jute in terms of production in Bengal. The latter could achieve greater importance only in the 19th century in Bengal at the expense of rice and sugar. It was also produced in Ratnagiri district in *abundance*, used largely for making fisherman's nets, ropes, etc.

Coffee (*qahawa*) was a known drink among the elites. It was largely imported from Arabian peninsula and Abyssinia. A coarse variety of it was produced in southern Maharashtra. Kashmir was known for its saffron.

The 17th century marked by the introduction of various new crops viz. maize, potato, sweet potato, tobacco, groundnut, chilly, and tomato.

Ain does not list maize among the crops for which cash revenue rates are provided. It appears to be a late introduction from the new world. Use of the word *makka* suggests its travel from the Red Sea route. Though we do get references to its cultivation in the 17th century from eastern Rajasthan, Maharashtra and the Deccan probably its extensive cultivation started from the nineteenth century onwards. (Habib, 1963)

Chilly was introduced in India during the 17th century, but its spread became more common during the mid-18th century only.

Use of tobacco spread phenomenally fast. Anand Ram Mukhlis (18th century) observed a large quantity of tobacco grown in the Sambhal region. Alexander Hamilton visiting Orissa in 1708 referred to the production of tobacco at Balasore.

Among the garden crops Ibn Battuta (d.1377) speaks high of mangoes. Bernier (1656-68) is full of praise of the mangoes of Bengal, Golconda and Delhi. The entire Konkan coastal belt produced mangoes, coconuts, betel-nuts, betel-vine, areca-nuts, palm, pineapple, jack-fruit, sweet potatoes, etc. *Des* gardens in Maharashtra with irrigation facilities were famous for production of grapes, betel leaves, figs, etc. Alberuni found the use of betel-leaf (*pan*) fairly widespread in India. Amir Khusrau (13th century) in his *Aijaz-i Khusrawi* mentions as much as 42 varieties of it. Bihar was known for the production of *Maghi pan*. Hajipur (Bihar) was acclaimed for the production of jackfruit. In *sarkar* Tirhut, *suba* Bihar orange grooves extended as far as 30 miles.

Pineapple, a native product of the new world, introduced in India by the Portuguese. It rapidly spread almost all over the region. Papaya and cashew nuts were other introductions from the new world.

It is interesting that fruits were largely seed grown. Turks introduced grafting technique (for details see Unit 23, Block 5) that provided great boost to the growth as well as

quality of certain fruits particularly oranges. Using grafting techniques various fruits from central Asia began to be cultivated during the 17th century (sweet cherry, apricot, kola, *narangi*, *sanglara*, etc.). However, melons were produced by importing seeds from Central Asia. Bernier mentions that 'there are no means of procuring good ones, and sowing it in ground prepared with extraordinary care, in the manner practised by the grandees. Good melons, however, are scarce...' Initially use of grafting was the royal preserve. Shahjahan lifted ban on restriction of the use of grafting techniques, thus its use filtered down to the masses.

During the 13th century production of grapes was not as widespread as at the turn of the century. Muhammad Tughluq encouraged peasants to shift to production of grapes. We hear Firuz Tughluq planted several varieties of it in his 1200 orchards around Delhi resulting in sharp decline of its prices. Shams Siraj Afif mentions its prices as 1 *jital* (copper coin) per *ser* while wheat could be bought at 8 *jitals* a *man* (= 40 *sers*) during Firuz Shah's reign.

Production of fruits and vegetables was largely confined to the vicinity of the urban centres. In north India Mali caste specialised in its production. In medieval period there developed tradition of maintaining orchards. But it were largely maintained by the emperors or the nobility. State's approximate annual income from royal gardens in the Deccan during the late 17th century was Rs.557,586.

Commercialization of Agriculture

Irfan Habib argues that the state's insistence to collect revenue in cash and also to gain profit was the major factor behind the commercialisation of agriculture during this period. An alternative opinion is that there is plenty of evidence of prevalence of money and exchange in the rural economy prior to the state's demand of revenue in cash. However, this action of the state would certainly push commercialisation in the agricultural sector. At any rate the cultivator also benefited from it either by selling his produce in the market or by producing high value crops. The peasants responded to the needs of the market. Cotton was one of the crops produced keeping in view the demand of its final product, the textiles, outside the local market. Sugar, both, candy and powdered was produced for the market. Indigo was one of the most important of the commercial crops in demand. Indigo cultivators from Sehwan in Sindh who used to export their product to the middle east had to face lot of difficulty when the demand declined sharply in 1640s. Tobacco, though a 17th century incorporation, also got commercialised very fast. Thus considerable amount of agricultural production was actually 'commodity production'. Irfan Habib (1968-69) argues that the cultivation of cash crops required larger investments and it was beyond the affordability of an ordinary peasant. Thus he links the commercialization of superior agriculture to *khwud-kashta* cultivation. He says that '*Khwud-kashta*, organised for commodity production, comes closest to capitalist farming.'

16.4.3 Means of Production

We have scanty information on the types of tools used for agricultural operations. However, wooden tools were more commonly employed in comparison to iron. European travellers mentions the use of wooden plough but iron ploughshare (*phal*), though for sandy and light soils hard wood ploughshare was also in use. In the Deccan and south India particularly in the black soil regions heavy plough drawn with the help of 2-3 and at times 4-5 pairs of oxen was used. But plough used in the wet lands was smaller and light. Indian plough was without mould boards for its usage was hardly suitable to Indian conditions. It involved threat of mixing saline and acid substances. Similar was true of the use of less depth plough. That reduces water retention and threatens fast drying of the soil.

Cattle manuring was most common. In western Rajasthan we do get references to flocks of sheep kept on the fields for two-three nights. Commenting on the situation in south India L.A. Alae (Cambridge, 1982) mentions that to fertilise the soil approximately a flock of 1000 heads (of sheep and goats) spending 5-6 nights on a *kani* (=1.32 acres) was required. Since it involved high payments to the herdsmen, only the higher strata could afford it. In the Deccan and south India wet lands and black soils hardly required manuring instead red soils called for its usage.

Generally the technique used for rice cultivation was transplanting of seedlings in cluster of 3-5 plants. It used to take three to four months to be ready for harvesting. For broadcasting, dry as well as sprouted seeds were used in south India.

16.5 TECHNIQUES OF PRODUCTION: IRRIGATION

While *kharif* crops largely depended on the monsoons/rains, *rabi* crops heavily relied on the availability of the artificial means of irrigation in north India. Babur laments the absence of 'running waters'. He emphasised the fact that crops were mainly dependent on rainfall and some other artificial means of irrigation. We do get frequent references that bad monsoon or excessive rains resulted in migration of the peasants. In contrast to Babur Zain uddin Khawaf (*Tuzuk-i Baburi*) highlights the presence of rivulets from the rivers for irrigation purposes. *Ain* records a number of *mahals* (smallest unit for revenue assessment) and villages located on river/stream banks largely using water from them for irrigation. As compared to the north, rainfall pattern in south India was much more evenly distributed on account of south-western and south-eastern monsoons. Further, in south India 'dry cultivation' (based on artificial means of irrigation) was more common as compared to north India. Though extensive irrigation ventures were undertaken by the rulers, elites as well as villagers, hardly much care was taken for its maintenance.

16.5.1 Well

The most common means for irrigation was from wells. Muhammad Tughluq granted loans to the peasants for digging up wells. Babur notes the prevalence of both the Persian wheel in Lahore and Dipalpur and indigenous *charas* in the region east of Yamuna (see Unit 23, Block 5 for the techniques used in both the *charas* and Persian wheel). The *charas* (in Gujarat called *kosa*) could work both on the well and on the river banks. *Rabi* crop largely depended upon artificial means of irrigation. In his *farman* to Rasikdas *karori* (revenue collector) (1665-66) Aurangzeb also emphasised that the old wells fallen out of use should be repaired and that new wells be dug at different places for extension of cultivation and production of *jins-i kamil* (high grade crops). The *baoris* (step-wells) were also used for irrigation purposes. Muhnot Nainsi, *diwan* of Raja Jaswant Singh (AD 1638-78) in his *Marwar ra Pargana ri Vigat* mentions two types of wells used for irrigation – *kosita* (shallow; largely *kuchcha* wells) and *kohar* (deep; largely brick lined wells). *Kachcha* wells generally outnumbered *pakka* wells.

Irfan Habib argues that the introduction of Persian wheel resulted in increase in productivity in the region of Punjab. Chetan Singh (1991), however, questioned the effectiveness of Persian wheel in the region. He says that Persian wheel had its own limitations. It was not very effective where water table was very low. Beyond ten meters its use becomes less economical. That is why in certain areas of Punjab *charas* continued to be more effective where water has to lift from great depth. Manucci (1656-1712) records *charas* as the prominent mode in the environs of Lahore. Advantage with *charas* was, Chetan Singh argues, its low cost and use of less animal power. It is interesting, however, that Muhnot Nainsi records the opposite what Chetan Singh is arguing. He mentions that

charas (kosita) was used upto the depth of 15-45 feet and Persian wheel (*arhat dhibra*) operated on the depth ranging from 42/45-84 feet. It is interesting to note that in eastern Rajasthan there is no reference to Persian wheel instead *charas* was the most common device used to lift water from wells for irrigation. Probably 'prohibitive cost of the system placed it beyond the reach of Indian cultivator' as rightly pointed out by Irfan Habib.

In Maharashtra land irrigated by wells was called *motasthal*. However, well irrigation in this area was not a common feature as in Rajasthan and the Mughal territories. Similar was the case in south India. Nonetheless, for irrigating garden crops wells were often used.

16.5.2 Tanks, Dams, and Reservoirs

Use of dams for irrigation purposes was widespread during the medieval period. Babur equally acknowledged the use of lakes, tanks, ponds, and reservoirs for irrigation purposes. Zainuddin Khawaf refers to *jalhas* i.e. lakes and ponds in some cases extending from 1-3 *kuroh* (2.5-7.5 miles). These were particularly useful for irrigating vegetable fields and orchards. Babur records that where proper channels were not available people themselves used to carry water in pitchers to irrigate plants. However, such cumbersome method could possibly be used to irrigate small plots.

Dams were used efficiently to utilise the flood waters. Chandella dam of Muzaffarpur village, tehsil Chakiya, district Varanasi, Uttar Pradesh that survived till 1954-56 utilised efficiently the flood water flowing into Chandraprabha river used for irrigating vast tract of Chandraprabha-Karmanara *Doab*.

Raja Bahroz Singh of Kharagpur (1631-76) erected a dam, Bhimbandh (south-west of Kharagpur). It utilised the rain water from the hills. He chalked out an interesting plan of distributing rain water. Large channels on raised platform were erected to carry out water from the dam. Such was the distribution that water was made available throughout the year. Another similar reservoir *raja rani* was erected by Bahroz on the eastern side of Kharagpur hills to utilise rain water for irrigation. The water remains in the reservoir all the year round and it is still in use for irrigating paddy fields.

In the Maratha territory irrigation by aqueduct, known as *patasthal* was a common feature. Villages used to store rain water in the dams to be used for irrigating their fields through aqueducts. However, rivers and streams usually dry up in the summer and the method was not at all useful for irrigation in the summer.

Tanks and reservoirs were also used to irrigate fields. K. K. Trivedi has pointed out the presence of tanks in almost every village in Agra *suba*. In Marwar we do hear of the construction of large number of tanks Sur Sagar, Farasat Sagar (AD 1607 by Maharaja Sur Singh), Vasant Sagar, etc. by rulers and nobles. These tanks required regular cleaning. Abul Fazl records when Akbar visited Merta he ordered a reservoir to be cleaned which was earlier used for irrigation purposes.

The most popular forms of artificial means of irrigation in south India were reservoirs, tanks and dams. However, construction of it involved huge amount of money that made individual efforts impossible. Invariably, one finds largely the involvement of either the entire village or group of villages or else elite or the state. Vijayanagara rulers took special interest to lay vast network of tanks in their territory. The earliest record of tank construction by the Vijayanagara ruler is of 1369 when Bukka I's son Bhaskara Buvadura (Prince Bukka) brought the water of Maldevi river for irrigation. The tank is still used for irrigating fields. The tank is seven miles long and two and half miles broad. He also ensured the water supply at Penukonda by digging a channel and connecting it to a tank.

Porumamilla Tank Inscription AD 1369

- (V.6) May Achyuta (Vishnu) protect the three worlds, freed from misery..., because there was altogether no such (merit) to compare with (known till then) as (that accruing) from the establishment of a tank.
- (V.9) A son, a literary composition and a tank, (hidden) treasure, a Siva temple, a forest (-grove), a Brahmana-village: (these) seven (kinds of) offsprings are the best.
- (V.28) Having thus heard the supreme reward, king Bhavadura, the pious soul; commenced to make the earth tank-nourished (tatcka-matrika).
- (L.48) Its procedure (was as follows):
- (Vv.29-31) It (i.e. the tank) is situated in the country to the south of Sriparvata (Srisaila), the great sacred place of pilgrimage; the yojanas to the east of the sacred place (tirtha) called Ahobala; in the division of the gentle blessed Siddhavata-natha; two yojanas to the west of his (capital) Udaya-giri; and to the east of the flourishing city of Porumamilla. I shall (now) describe in this edict the sequence of the period of construction of the tank:-
- (Vv.32-35) In the second half of the creator's life-time, in the Sveta-varaha Kalpa, in (the age of) the Vaivasvata Manu, and in the 28th Yuga, - in that divine part of the country - in the first quarter of Kali, after the lapse of four thousand, four hundred and seventy - (in figures) 4470 - years of mortals, and also after the (lapse) of Saka years measured by the number of the earth (1), the Namdas (9), the eyes (2), and one (1) - (in figures) 1291 - in the (cyclic) year Saumya, in the month called Karttika, on the fourteenth (day) of the bright half, on the auspicious day of Guru combined with Pushya, when there was Karkataka lagna, under the influence of well-chosen auspicious planets,
- (V.36) Of the tank constructed (at the above specified time and place) according to (the requirements of) the Sastra I shall in the edict describe the twelve constituents (amga) for the benefit of future kings:
- (V.37) (i) a king endowed with righteousness, rich, happy (and) desirous of (acquiring) the permanent wealth of fame, (ii) and Brahmana learned in Hydrology (pathas-sastra), (iii) and ground adorned with hard clay, (iv) a river conveying sweet water (and) three yojana distant (from its source), (v) the hill parts of which are in contact with it, (i.e. the tank), (vi) between these (portions of the hill) a dam (built) of a compact-stone wall, not too long (but) firm, (vii) two extremes (srimga) (pointing) away from fruit (-giving) land (phal-sthira) outside, (viii) the bed extensive and deep, (ix) and a quarry containing straight and long stones, (x) the neighbouring fields, rich in fruit (and) level, (xi) a water course (i.e. the sluices) having strong eddies (bhrama) on account of the position of the mountain (adri-sthana), (xii) a gang of men (skilled in the art of) its construction, - with these twelve essentials an excellent tank is easily attainable on (this) earth.
- (V.39) While (i) water oozing (?) from the dam, (ii) saline soil, (iii) (situation) at the boundary of two kingdoms, (iv) elevation (kurma) in the middle (of the tank) bed, (v) scanty supply of water and extensive stretch of land (to be irrigated), (vi) and scanty ground and excess of water: (these are) the six faults in this (connection).
- V.40) Devoid of faults and adorned with a multitude of good qualities, renowned in the world by the name Anantaraja, this endless ocean, of which the water is sweet, was founded by king Bhaskara.(V.41) (There were) one thousand labourers (working) at the tank and dam every day, and a hundred carts (were employed) for the masonry work of the sluice and wall (bhrama-bhitti).(V.42) And this most excellent tank was completed in two years. There is, to be sure, no limit at all to the expenditure of money and grain in this (connection).
- (V.43) The measurements in terms of rekha-damdas of the height, the width, and the length of the dam together with (the portion of) the hill (included in the) dam, are here given:
- (V.44) The dam, having eddying waterducts (i.e. sluices) (and) protected by Vighnesa, (Gana-pati), Isvara (Siva), Vishnu, Bhairava, and the great Durga, is one which has the enormous length of five thousand rekha-damdas, height of seven and its width eight. And the land (is) excellent and yields plentiful crops in all seasons and contains groves.
- (V.45) This land was liberally given for the gratification of gods and Brahmanas. Through the merit of this gift of land the tank was made to be an ornament (of tanks).
- (V.46) Just as the dam of a reservoir should not be injured, so likewise the dharma-dam of the ocean of kings. Therefore I, Bhaskara, repeatedly request the kings on earth to protect my charity.
- (V.50) The Officer-in-charge (adhikarin) of the tank is the clever son of the minister called Kumaragiri-natha, Devarraja by name.
- (V.52) (One) khari (of land) producing paddy and (one) khari of black-soil land, - (these) were out of regard given to him by Bhaskara, preceded by a libation.

V.S. Sukthankar, 'The Porumamilla Tank Inscription of Bhaskara Bhavadura: SAKA 1291', *Epigraphia Indica* Vol.XIV No.4 (1917-18) pp.106-109

Devaraya I brought the water of Tungabhadra from 15 miles distance to his capital. It is even now used for irrigating the fields. Krishnadevaraya also built at Nagalapur (present Hospet) a huge tank – Rayara Kere for irrigating rice fields and gardens.



During the Vijayanagara period, particularly in the semi-arid regions, many individual efforts were also undertaken by men of prominence. In return they were assured of a share in the enhanced produce. It formed part of their 'transferable property'. Such tenures came to be known as *kattu-kodage* in Karnataka and *dasavanda* in Tamil region. In one such case builder of the tank in a temple village (*devadana*) was assured 3/10th of rice produced on land irrigated by the tank and a part share in ragi produced on the dry land. In return he was held responsible for repair and maintenance of the tank. Involvement of temples in tank building activities for irrigating fields in their own *devadana* villages was a common feature of our period in south India.



1) Stepped Tank: Vijayanagar; 2) Anegundi Anicut; 3) Anegundi Anicut; 4) Outlet from Kamalapuram Tank; and 5) Waste Weir

Source: Dominc J. Davison- Jenkins, *The Irrigation and Water Supply Systems of Vijayanagara*, New Delhi, 1997.

16.5.3 Canal

In south India rivers are largely rainfed and water level often fluctuates. On account of this canal irrigation was hardly favoured as means of irrigation. In contrast, in north India from the beginning of the 14th century our period saw the establishment of huge canal networks for irrigation purposes. Though, the beginning was done by Ghiyasuddin Tughluq (1320-25), it was Firuz (1351-86) who established a huge network of canals for irrigation purposes. To obtain continuous water supply to his newly built town of Hissar Firuz dug two canals from Yamuna – the Rajabwah and the Ulughkhani. It greatly helped in the extension of cultivation in the region. Both Barani and Afif mention that earlier only the *kharif* crop was cultivated now even the cultivation of *rabi* crop also became possible. Afif praises that it also helped in raising the ground water level in the region. Later during Akbar's reign both Rajabwah (1560) and the Ulughkhani (1570-71) were re-excavated. Shahjahan further extended the canal 30 *kuroh* (1=1.5 miles) in length and brought the water down to his newly built capital – Shahjahanabad (*Shah nahr; nahr-i faiz*). During Shahjahan's reign another important canal was excavated in the Upper Bari Doab region (Punjab) on river Ravi that carried the water upto Lahore.

In the Maratha territories digging up of the canals and dams were largely the responsibility of the respective villages. However, A.R. Kulkarni (1968-69) argues that the state must also be 'bearing total or partial expenditure of the construction of new dams or the repairs of old dams.' Water canalised through aqueducts was called pals through cooperative efforts. Kulkarni (1968, 1969) mentions an interesting *mahzar* of 1674 in which plaintiff complained against the construction of a dam on river Banganga by the *ryots* of the Mohadi village in Nasik district.

To a large extent in the northern region agriculture was rainfed. Digging up of wells was the result of individual efforts. Whatever canals were excavated in the northern region as a result of state initiatives. They could irrigate only a small area. In the Deccan and southern plains we do find creation of artificial lakes by constructing dams across the streams. However, in spite of the great concern of the state to provide irrigation facilities, approximately total irrigated land in south India constituted 3-7 per cent at the turn of the 19th century (except Tanjore where the per cent was as high as 50).

16.6 ORGANISATION OF AGRICULTURAL PRODUCTION

The Indian medieval economy was largely, 'free peasant economy.' We do not get much references to peasant opting for community cultivation instead largely peasants along with his family members carried on the production process on individual basis. In south India as well small peasant householder along with his family labour formed the basic unit of production. However, those holding larger estates (*khwud-kashta* peasants in north) had to depend on 'regular inflow of additional labour.' In the Maratha country since large number of young populace joined Shivaji's army, state was anxious to ensure whether enough man power for cultivation was available or not.

Largely in a village set up there existed three categories of land holders: higher castes (superior right holders), lower castes (*rai-yats*), and menial castes (agricultural labourers and village servants, etc.). (for details see Unit 17) Menial castes worked as agricultural labourers. Medieval north India, this way presents a contrast that on the one hand land was available in *abundance* on the other hand, there was presence

of large number of landless labourers. Stray references to forced labour are also recorded. In western Rajasthan Nais were employed as forced labourers by the Rathors while *bhumias* (synonym for *zamindar* in Rajasthan) forced Dhedhs (leather workers) to weed out grass from the fields in the Jalor region. In contrast to north one finds deficiency of labour force in south India. Alaev (Cambridge, 1982) argues that 'the deficiency of labour force was to an extent connected with the fact that an appreciable part of the population from high castes considered physical labour as degrading and some agricultural operations as forbidden and constantly sought to avoid personal participation in the production process... (and) oriented to labour saving and not to land saving.'

During our period of study we get frequent references to migration of peasants and agricultural labour from one region to another. (for details see Unit-17) When a new village was colonised or rehabilitated the leader assumed the status of a *zamindar* in the territory. In the Maratha territories he was known as *patil* who normally assumes the grant as his *watan* (hereditary revenue assignment). Peasants whom he generally brings for cultivation used to get *mirasi* rights.

The dominant agricultural castes in north India were Jats Ahirs and Rajputs who were directly involved in the cultivation. Brahmans generally used to get their land cultivated with the help of hired labour. In western Rajasthan *Kamins* (low caste people) are mentioned among the cultivators. In western Rajasthan Rajputs held superior rights in the region. They held the *zamindari (basi)* villages and not the *raiya* suggests that in the region it was a non-cultivating superior land holding caste. (Bhadani, 1999) *Patels* were another non-cultivating caste in western Rajasthan. Their concentration was in Jalor region. In contrast the Jat villages were *raiya* shows that they were the cultivating caste in the area. Paliwal appears a peasant caste in almost all the *parganas*. In the Maratha dominion generally the cultivators hailed from the Maratha class.

Besides these so called 'agricultural' castes one finds several other castes that otherwise either belonged to artisan category or else to the lower strata in the social hierarchy possessed lands and were reported as cultivators.

Alaev (Cambridge, 1982) speaks of the presence of regional division of labour in south India. Malabar specialised in the production of pepper and spices, while for rice it had to look towards Gujarat, Coromandel, and Bengal.

16.7 PASTORAL AND FOREST ECONOMIES

Pastoral Economy

Pastoralism was probably present and scattered all over and there existed intimate relationship between agriculture and pastoralism. In western Rajasthan pasturage were not only owned by the village community as common resource pool, rather a large number of pasturages were also maintained by the Rajput rulers in their *khalisa* (crown land) territories (Bhadani, 1999). Along the riverine tracts that were generally flooded and where inundation was a common feature sedentary agriculture gave way to pastoralism and nomadism. Chetan Singh's (1991) study on Punjab shows the presence of large scale pastoral communities particularly in the lower Indus plains subsisting on pastoral economy. Abul Fazl (c. 1595) and Sujana Rai Bhandari (1695) observed the prevalence of shifting cultivation in the lower Indus plains. Similarly, arid regions where scarcity of rainfall makes it difficult to cultivate the

fields presence of grassy and wild lands gave way to pastoralism. In these regions cattle herding became the chief source of subsistence. During the medieval period per head cattle population was much more than what it was in 1900. Irfan Habib points out that the presence of extensive wastes to sustain the large cattle population was the main reason for this favourable ratio. He further argues that the presence of large scale cattle population resulted in the use of bullocks and not the bullock-carts for transportation of grains in the villages. Consequently pastoral products like *ghi* was much cheaper in comparison to wheat in Mughal India. In Rajasthan *ghi*, wool and leather products were important items of export. One of the *Qanungo Bahi* of 1662 records that approximately 650 maunds of *ghi* was exported from western Rajasthan from the *khalisa* land alone. (Bhadani, 1999) Mithila region, particularly Tirhut, in Bihar was famous for its milk and curd preparations. Cattle were an essential part of the agricultural processes, both, for the purposes of cultivation and waterlifting. Interestingly religious inhibitions restricted the usage of cattle population as a source of 'food'. In Rajasthan camel breeding was an important economic activity. Camels were not just used as beasts of burden; they were also employed in agriculture. In western Rajasthan animal breeding was one of the important occupations. Animals, particularly bullocks and cows were exported from the Marwar region to the neighbouring areas. In western Rajasthan particularly Mallianians Sanchor were famous for good breed of cows. Peasants of Nagam were known for bullocks breeding. Though Mallani was also famous for horse breeding, in general horse breeding was not a very important profession instead Rajasthan was famous for sheep and goat breeding. Raibaris and Gujars were chief pastoral and nomadic communities who largely involved in animal breeding in Rajasthan. Nuniz mentions that the region around Bankapur (modern Dharwar) was rich in seed-plots and cattle breeding farms.

Forest Economy

During the medieval period the extent of forest reserves was much more than what it is today. Though agricultural products formed the mainstay of India's economy, revenue from forest products was equally important. It sustained a number of manufactures particularly related to timber, mulberry, honey, animal skins, etc. Almost ten per cent of the resource contribution was from tribal sector. Timbers from the hills were floated down the river routed to various timber marts in the plains for onward consumption. Chetan Singh has highlighted the importance of timber for boat-building along the river towns in Punjab. Wazirabad on river Chenab was known for its boat-building activities. It received the timber-logs via river Chenab from the hills. Western Ghats were known for its production of good quality teak, rated next to Malabar teak. Its production in the region provided great boost to shipbuilding industry. Shivaji's shipbuilding activities were located in Kalyan and Bhiwandi which were famous for its timber production.

Babur mentions good quality of Kabul rhubarb that was in turn coming from western Himalayas. *Majith* or madder used as dye, particularly dying the coarse woollen cloths, by the Bhotias. Gumlac, another kind of a dye, was procured from the western mountains. Musk, an animal product, was another most sought after article found in the western Himalayan region stretching from Kashmir to Assam. Ivory from elephant tusks was another product in demand among the nobility. We get numerous evidences of Mughal emperors demanding tribute (*peshkush*) in the form of forest/hill produce/rarities. Shahjahan's daughter Jahanara's letters addressed to Raja Budh Prakash of Sirmur (c. 1664-1684) shows that the Raja sent to Princess Jahanara ice, musk, pomegranates, and sal wood from Kalaghar forest.

16.8 AGRICULTURE AND THE STATE

Irfan Habib (Cambridge, 1982) basing on Barani's analysis that 'heavy taxation affected agriculture' argues that there existed a 'relationship between land revenue and agricultural production' and 'a decline in agriculture caused a corresponding fall in land revenue.' He draws a paradox that while Muhammad Tughluq's heavy taxation provoked an agrarian rebellion of great intensity in *Doab*, he was also the first Sultan to chalk out a systematic policy of improving agricultural production. He established a separate department of *amir-i kohi* headed by a *diwan*. To bring in entire *Doab* under cultivation he appointed a number of officers each holding the responsibility of bringing in 30 *kurohs* (1=2.5 km.) of land under cultivation. Barani laments that under the project 70 lakhs of *tankas* (a silver coin) were distributed but hardly 'a thousandth or hundredth part' was brought under cultivation. Whatever might have been the result of Muhammad Tughluq's efforts it nonetheless brought forth the concept of extension of cultivation by bringing in new areas under cultivation. His effort to bring in the concept of adding more high value crops by replacing the lesser value crops was equally important.

Peasants heavily depended upon state and the rich strata for conducting agricultural operations. Ordinary peasants were often short of seeds, required extra money to irrigate the land or dig a well; or else for even ploughing the fields. (for details see Unit 17)

State played pivotal role in funding the irrigation projects. Canal irrigation was almost entirely dependent on state or nobles' initiatives and fundings. Even constructing a brick-lined (*pukka*) well was beyond the means of ordinary peasant. For the first time, Muhammad Tughluq (1325-51) during *Doab* famine extensively distributed loans (*sondhar*) among the peasants for the construction of wells for irrigation purposes and to expand agriculture. Later, under the Mughals such pre-harvest loans came to be known as *taqavi*. Dilbagh Singh mentions that in eastern Rajasthan it was the state's prime concern to construct new wells and upkeep the old ones. Aurangzeb in his *farman* to Rasikdas also raises the same concerns.

Shivaji instructed his officers to advance money to the cultivators for purchasing bullocks, seeds, etc. Peasants were to pay back the balance in easy installments. Shivaji ordered in 1676 to the *subadar* of Prebhaveli *mamla* (*taluk*) to pay visit to all villages to find out the needs of the cultivators whether they were in possession of sufficient amount of seed, plough, oxen for cultivation, if need arises, to distribute advances. But state assistance was not always sufficient and many a time peasants had to bank on village *mahajans* in such cases often he had to pay double the amount. State's prime concern was to encourage peasants to bring as much land as possible under cultivation. State lured them by taxing nominal amount only.

Monopolies and State Interventions

The market forces commonly and largely determined medieval agricultural markets. However, Alauddin's market control measures was one such instance when state tried to intervene and attempted to control prices. But the venture collapsed soon after his death.

Nonetheless we frequently encounter the 'monopolising' tendencies on the part of the state. Mining all through the medieval period was state's preserve. Even use of grafting technique remained restricted for the Royal gardens. The ban

was lifted in Shahjahan's reign. The production of *chay*, a dye produced in the eastern Deccan was completely controlled by the king. There is an interesting case of indigo monopoly exercised by the Mughal ruler Shahjahan during 1633-35. Indigo was the most sought after agricultural product. The emperor's move was motivated by 'profits involved'. Shahjahan entrusted monopoly rights to Manohar Das Danda granting him the sole right of buying indigo of the empire on payment of Rs. 11 lakhs. All merchants were asked to purchase indigo from him. It fell heavily upon the peasants. Many peasants anticipating the slump destroyed their crop. They received much a lower rate for their labour. Shahjahan then tried to handle the situation by farming out the cultivation rights to Mir Jumla. But imperial monopoly could hardly last a year and the emperor was forced to withdraw. Mughal annual revenues from salt monopoly at Machhlipatnam alone constituted approximately Rs 110,000.

16.9 SUMMARY

The dominant features of medieval agriculture were favourable land man ratio, pasturage and animal population. Though land was in *abundance*, there was presence of landless labourers in large numbers; existing social structure binding them by 'custom and force'. There was large scale expansion of agriculture mainly on account of extensive forest clearances, as a result of introduction of new techniques of irrigation, particularly Persian wheel and canals. Discovery of the new route opened up new channels of contacts that brought in knowledge of new crops particularly from the New World resulting in the introduction and expansion of the variety of crops sown. Recurrent famines, however, affected agricultural operations. It not only resulted in the displacement of peasant population on account of large scale migrations but also at times influenced the production process. We have seen how after 1630 Gujarat famine peasants switched over to food crops resulting in the decline of cotton production in the region. In the entire production process states' role was very 'central'. On the one hand state extended all possible help to the peasants to combat natural calamities, on the other side, state did try to monopolise the production to a limited extent.

16.10 EXERCISES

- 1) State briefly the dominant features of Indian agriculture during the medieval period.
- 2) How did the soil conditions effect the growth pattern of agricultural operations?
- 3) How far the environment influenced the cropping pattern during the medieval period?
- 4) To what extent artificial means of irrigation stimulated the production process during the medieval period?
- 5) Analyse the techniques of production used in India during the medieval period.
- 6) What role did the state play in the growth of agriculture during the medieval period.
- 7) Discuss the importance of pastoral and forest products in medieval economy.