
UNIT 11 ORGANISATION OF AGRICULTURAL AND CRAFT PRODUCTION: NORTH INDIA, C. AD 550 – C. AD 1300

Structure

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11.1 INTRODUCTION

Studies in the agrarian history of early medieval north India have been dominated by various themes of *agrarian relations*; aspects of *agricultural production*, with which we are concerned in this Unit, have received relatively less attention. From early works such as U.N. Ghoshal's pioneering *Contributions to the History of Hindu Revenue System* to R.S. Sharma's *Indian Feudalism* and later, the focus of our thought has been the history of *agrarian relations*, relating to the ways in which agrarian surplus was extracted from the producers (e.g. as taxes) and distributed, as also to the various forms in which control over land and producers was claimed and/or exercised (e.g. landownership). No comparable interest has been shown in matters of agricultural production such as land and its productivity, crops, technologies of production, etc. Some important essays have no doubt been written, but there has been no full-fledged attempt at writing a *history* of agricultural production, as there has been of revenue system or feudal agrarian relations; there are indeed book-length discussions even of the debate whether these relations were feudal or not. The routine compilations of data on agricultural production that are commonly seen in the economic histories of the period lack in historical analysis.

The history of early medieval mineral and craft production, our second concern in this Unit, is in an even more sorry state, with a near complete domination of non-agrarian economic history by the twin themes of urbanism and commerce. In fact, there are very few independent studies of extra- agrarian production, which is often briefly treated as an adjunct to urban or trade history.

A good deal of the above trends in historical research may be understood in terms of the historians' preferences for certain themes, to the corresponding neglect of others. This is easily seen in the example of an historian of medieval India, Professor Irfan Habib, whose keen interest in the technologies of craft production in early medieval India is not really shared in a sustained manner by the specialist historians

of the period; contrariwise, Habib has shown little interest in the theme of agrarian expansion in the early medieval period, almost indispensable in the agenda of others.

Other factors than the historian's preference have also been at work. First, and perhaps foremost, is the nature of epigraphic sources, which remain much the most important basis of historical reconstruction. The inscriptions of the period, which are mostly what are called 'land-grant inscriptions', contain very irregular and sporadic references to agricultural and non-agricultural production. A small but significant set of inscriptions relates to distribution of produce in non-agrarian contexts, and these have been utilized for urban and mercantile histories, wherein are found, as indicated above, brief discussions of mineral and craft production.

The over-reliance on inscriptions, in turn, has been fed by two factors, one a reality, the other a (mistaken) belief. The reality is the extreme poverty of archaeological data, what with the negligible interest shown by most professionals in early medieval archaeology. And there appears to be a widespread belief, at times expressed in so many words, that the historians do not stand to gain much from literary sources, even that all that needs to be learnt from them has already been done, and that further knowledge must come from other sources, including the literary ones that have not yet been discovered. The facts seem to be otherwise. Only a fraction of the vast corpus of early medieval literary sources has been used in a systematic fashion for reconstructing socio-economic history, such as the *Rajatarangini*, Marco Polo's (13th century) itinerary, the accounts of Arab geographers (AD 851 onwards), etc. Even the much-used account of Xuan Zang has remained untapped for the most part, so far as the nature and extent of agricultural production in seventh-century India are concerned. Yet even the small amount of references from the wide range of literary sources that has been gathered by scholars like Abhay Kant Choudhary (*Early Medieval Village in North-Eastern India*) shows up the promise that these sources hold for the economic historian.

As you go through the following survey of our current knowledge of agricultural and craft production in early medieval north India, you will do well to bear in mind the above remarks and look upon the survey as providing but a few sign posts in an uncharted, exciting field of enquiry.

11.2 EXTENT AND EXPANSION OF AGRICULTURE

The agrarian landscape of India during the early medieval period is brought alive in an unprecedented manner by land-grant inscriptions, which, though known from the earlier centuries, really belong with this period. Hundreds of them have been found from across early medieval North India, although with significant variations in numbers and content over time and space. Indeed, historians have been so deeply impressed by these records as to almost equate them with agrarian history itself.

With so many villages appearing on the historical record for the first time, it is generally believed that they mark a much greater agrarian dynamism than seen in the preceding or succeeding period. Just as the Mauryan-period economy is noted for state control and initiative and the Kushana-period economy for commercial and urban prosperity, agrarian expansion by means of land-grants is seen as a key feature of early medieval economy: '...land grants served as an important means of bringing virgin soil under cultivation in Central India, Orissa and Eastern Bengal. The same was true of South India...' (Sharma, 1980); 'The granting of land gradually changed the political economy through conversion to peasant cultivation in new areas. Wasteland,

theoretically belonging to the state, included grassland and jungle, the intention being for the grantee to clear and settle it then introduce plough agriculture to yield a revenue.’ (Romila Thapar, 2002); ‘... the age in question [early medieval period] saw expansion and proliferation of agrarian society to an unprecedented degree.... Granting of land in favour of religious donees by the issuance of royal copper plate charters holds a crucial clue to the mechanism of the expansion of agriculture into hitherto uncultivated and uninhabited area’ (Ranabir Chakravarti, 1997).

By the same token, the agrarian history of the regions for which land-grant inscriptions are not available is neglected. In the case of the plains of the Punjab, the absence of land grants has led, along with other considerations, to the denial of the importance of agriculture in the region before the Sultanate period. It is stated: ‘The Punjab was not yet [till c. AD 1300] the bread basket it was to become later, but its attraction lay in its network of staging-points along routes linking the watershed and the Ganges Plain to the north-west and beyond’ (Thapar, 2002).

This view of land grants as the central agency of land reclamation in early medieval India is a deeply flawed one. It runs foul of the cardinal fact that much the largest majority of land grants consisted of villages already settled, of land already under cultivation. Agriculture had already been expanding, villages had been forming, for some thousands of years when land-grant inscriptions on durable material (stone, copper) begin to appear on the historical scene, giving us the names of some of them. The general evidence of the land-grant inscriptions thus shows, somewhat paradoxically, that land grants generally did not play any role in the process of agrarian expansion.

To be sure, we do possess examples that are exceptions to the general character of the land grants. There are very few cases – to be discussed presently – when the state sought to extend cultivation by making grant of an uncultivated plot or a deserted village, where the donee of necessity had to bring the land under the plough in order to enjoy the grant. More in number are the cases when grants by private individuals led to restoration of tillage on fallow land (*khila*) that had once been under cultivation. But all these add up to only a small fragment of the total number of the land grants. As already noted, the testimony of the vast majority of the land-grant inscriptions does not show up the donees as agents of land reclamation; in giving us details of the hundreds of settled villages that were given away, it demonstrates exactly the opposite case, i.e. the countryside had been opened up, forests pushed back, waste reclaimed without any role of the grantees.

A most helpful sketch of the agrarian map of early medieval India in the first half of the seventh century A.D. is provided by the Chinese pilgrim-traveller Xuan Zang. For the plains of the Punjab, for example, he notes the existence of a number of kingdoms with large territories, such as those of Takka, Chinapati, Jalandhara and Shatadru or Sotlej. References are made to the fertility of soil, food crops, fruit trees and suchlike for each of these kingdoms. All this would point to the Punjab having been a land of extensive cultivation during the seventh century, rather than one merely of a set of staging points on commercial routes straddling it (a view favoured, apart from Thapar, by Sharma too). In this way, a non-epigraphic source serves to correct an impression formed largely out of the negative evidence of land-grant inscriptions.

The account of Xuan Zang also furnishes a more complete picture of the extent of agricultural production than can be known by adding up the testimony of individual

inscriptions (of North India at all events). A large number of agrarian regions were already in place at the time of his visit: Eg. Takshashila and Kashmir in the north-west; Mathura, Sthanvishvara, Kanyakubja, Ayodhya, Kosambi, Shravasti and Varanasi in the north; Vaishali, Vriji, Magadha, Munger, Kajangala, Pundravardhana, Tamralipti, Karnasuvarna, and Kamarupa in the east and north-east; and Malwa, Jajhoti, Anandapura, Kheda, and Valabhi in central and western India. The very fact that an area was identified as a region would show that it was well-settled on a recognizable scale. In fact, for most of these regions Xuan Zang gives his estimate of their respective areas, bringing out their extensively settled character; the Jalandhar region, for instance, is stated to be 1000 *li* () east to west and 800 *li* north to south, and the Multan region about 4000 *li* in circuit. The basically agrarian character of these regions is noted in a variety of ways: The soil of some (e.g. Sthanvishvara and Multan) is stated to be rich and fertile, regular cultivation is reported for some others (e.g. Kanyakubja and Tamralipti), good or abundant crops for yet others, and so on.

There are good reasons to believe that Xuan Zang based his account on careful observation and generally refrained from making sweeping statements. He possessed a critical eye for detail of all kinds, not just agricultural one. Thus stretches of forest were as regularly noted, from their conspicuous presence to their dominance, whether within a region or beyond it. Trees were a notable feature of Jalandhar region in the plains of the Punjab, but landscape in Orissa was easily dominated by forest cover; there were regular forests within its Kongoda region, which was separated from the Kalinga region again by a forest. There were forests and hills also between Kalinga and Southern Koshala (Chhattisgarh area), the latter itself being a thickly wooded and marshy region. Konkan and Maharashtra too seem to have been dominated by forests, lengthy expanses of which are also stated to have intervened between Kosambi and Prayag, Varanasi and Kushinagara, and Magadha and Munger.

Then there were regions where agriculture was less important. Thus for a considerable stretch along the lower Indus valley, cattle pastoralism was 'exclusively' the source of livelihood. Poor agriculture is reported for some regions in Gujarat, and the importance of trade underlined. Significantly, no such statement is made for any of the regions in the Punjab. In areas such as Kapilavastu and Ramagrama which are described as desolate and sparsely inhabited, agriculture had apparently received a setback.

It is of this macroscopic survey of the discerning Chinese observer that the land-grant inscriptions provide microscopic glimpses. In other words, the bird's eye-view of Xuan Zang is complemented significantly by the close, ringside view from the epigraphs.

As already iterated, most of the time these epigraphs bear witness to agrarian expansion as an already accomplished act, prior to the grant, and not something to be undertaken subsequent to the grant. In a few instances, however, they do record grants of uncultivated land which the donees would have had to bring under the plough: In such cases, the land grants became the agency of land clearance. One such case is seen in the Tippera Copper Plate Inscription of Lokanatha from Bangladesh, mid-seventh century AD, when more than a hundred brahmanas were given away a large piece of forest land, 'having no distinction of natural and artificial, having a thick network of bush and creepers, where deer, buffaloes, bears, tigers, serpents, etc. enjoy, according to their will, all pleasures of home-life'. The brahmana donees must obviously have initiated agrarian expansion for this tract.

More numerous are instances of other type, mostly reported from Eastern India where the donee received a piece of fallow land, i.e. land that had once been under cultivation,

but where cultivation had ceased of late. Such pieces of land were called *khila*. The history of agriculture, in South Asia as well as elsewhere, has not always been a story of unchecked, continuous expansion. There have been phases of stagnation or regression as population failed to grow significantly or declined due to famine, epidemic or war. In the latter case, settlements would be abandoned and arable would fall into disuse, becoming *khila*. Each such *khila* land meant a loss of revenue to the state, which took control of it as state property, and would obviously be interested in the restoration of its cultivation by tax-paying peasant families. This kind of restoration must have been a routine, ongoing process, but there was little reason for inscribing such an act on stone or copper plates.

What we see in the inscriptions are special cases, when a private individual, in order to earn religious merit, requested the state officials to make a piece of *khila* land tax-free for a certain sum of money, which land he would then donate to a brahmana or some religious institution. The donee would naturally bring the land back under the plough, and enjoy its produce without having to pay any taxes to the state. These transactions therefore testify to a kind of agrarian dynamism that arose out of private initiative, with little active role by the state. Moreover, each such instance shows a contraction of the arable first and its expansion to the earlier level thereafter. On a graph these instances would represent not points on an upward curve but a complete V-shaped trough on a level line.

It is reasonable to suppose that there would have been in the settled villages not only such fallow land but also other types of culturable (i.e. cultivable) waste land within and on the borders of village, including land used for grazing animals and small patches of forests. That is to say, even among the settled villages there would have been some scope for land reclamation for a variety of reasons. The Kanker copper-plate inscription from Central India, dated AD 1213-14, records an increase in the revenue-yield of the village at the time it was being granted and also the fixation of its boundaries (*maryadikrtya*) on the same occasion; the increase in the revenue yield was apparently due to an increase in the cultivated area of the village, which also necessitated the boundary fixation. A similar increase was registered in this record for another village.

There are some indications (e.g. the right to cultivate land or get it cultivated, *krsatah karsayatah*) that the grantees of settled villages were given the right to reclaim or get reclaimed such waste or fallow pieces of land as might exist or come up in the village being granted. The donees would normally be interested in promoting such reclamation, for that would add to their income (waste land) or maintain it (fallow land). Unlike in the case of grant of uncultivated land, however, the grantees of settled villages were not required by the act of grant itself to undertake any reclamation.

11.3 IRRIGATION

If the land-grant inscriptions usually tell us nothing about the role of the state in the promotion of agricultural production, it does not mean that the state did not play any such role. A 12th century non-epigraphic source, the *Rajatarangini* by Kalhana, relates in some detail how the early medieval state could contribute to the cause of agriculture on a significant scale by other means than issuing grants on copper plates or stone of uncultivated land to religious personnel or institutions. During the eighth century AD, according to this source, king Lalitaditya Muktapida caused a 'diversion of the waters of the Vitasta (i.e. Jhelum) river' at a certain place and also distributed a large number of water-wheels (*araghattas*) among the villages. A far more consequential intervention by the state occurred in the next century with the ingenious flood-control measures, extensive land reclamation, and creation of a network of canals by the state official

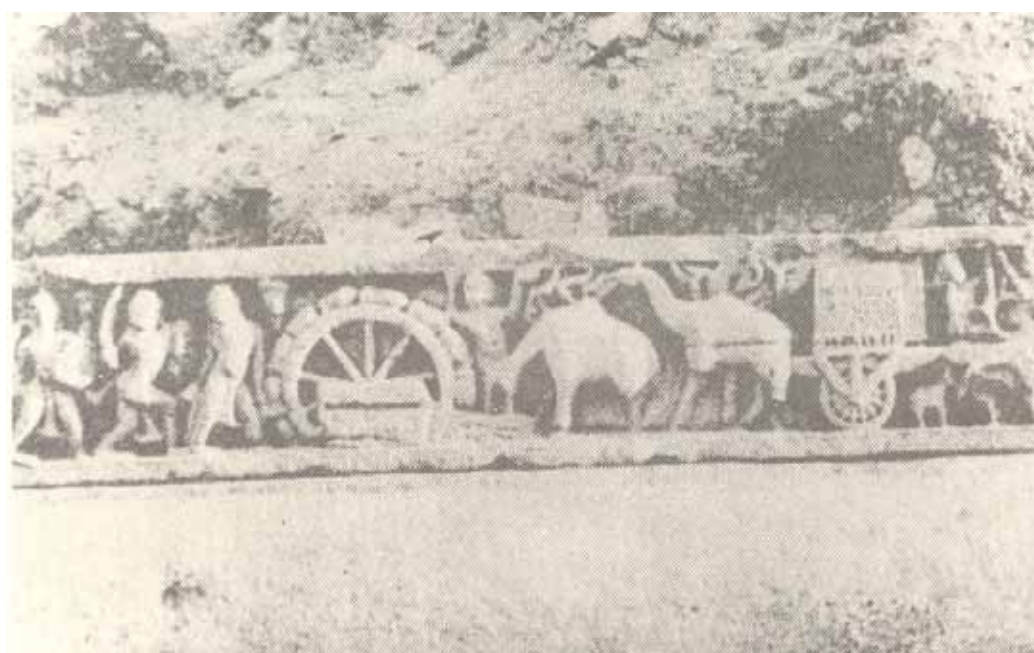
Suyya. The revolutionary impact of Suyya's measures was thus described by Kalhana: 'Where formerly during times of great abundance the purchase price of a *khari* of rice had been two hundred Dinnaras . . . , in that same realm of Kashmir since his times . . . , the purchase price of a *khari* of rice came to be thirty-six Dinnaras.'

Irrigation facilities are reported for the region of Sind also at the time of its conquest by the Arabs in the eighth century. These seem to have consisted of state-maintained canals as well as facilities under community or individual possession and operation such as water-wheels.

The allusion to *araghattas* in the *Rajatarangini*, mentioned above, occurs in the context of the diversion of river waters. There are also specific references to *araghattas* set up on wells elsewhere in the text (*Rajatarangini*, I.284, VI.48). These associations of the *araghatta* with surface water (river) and water at a depth (well) represent the first two stages of the three-stage history of the device that is generally called Persian wheel or *Rahat* in Hindi (derived from *araghatta* or *arahatta*). In the first stage pots were attached to the rim of a wheel that was set up on a source of surface water; as the wheel was rotated, the pots took in and poured out water in continuous succession. This was the first stage of the device that is called 'noria' in English.

In the second stage, the pots were not fixed to the rim of the wheel but to a long rope that was then used as a chain and hung, like a garland, over the wheel. This rope-chain with pots is appropriately called pot-garland. When the water-wheel was placed over a well at a suitable height, the pots at the bottom of the hanging pot-garland would be immersed in the water of the well. By rotating the wheel, it was thus now possible to use the well efficiently for irrigation and other purposes.

This second-stage in the history of *araghatta* is widely attested not only in the literature of early India (e.g. in the *Panchatantra*) but also in the early medieval inscriptions of South Rajasthan and Gujarat. These *araghattas* on wells were operated manually either by hand or by foot. When they came to be operated by animal power with the application of a gearing mechanism, the third stage of the water-wheel was reached. A vivid description of this is given in the *Babarnama*. A vague claim for the existence of this in the tenth-century India was rebutted by Habib, and the rebuttal has not been contested so far.



Araghatta: Detail from a relief on the north side of topmost terrace of shrine at Mandor (c. 1200AD) S.P. Verma, *India at Work in Sculpture and Painting*, Aligarh, 1994.

There are a fair number of references to wells and tanks in the inscriptions from various regions. From Gujarat in particular comes good epigraphic evidence of a special type of large wells with steps, called *vapi* or step-well. Not all these wells, tanks, etc. were used for irrigating crops, as historians often assume too readily without enquiry. All the *vapis* that occurs in the epigraphic records have thus been thought as meant for agriculture, *vapi* being even *translated* on occasion as ‘an irrigation well’, as in rendering an inscription of a Maitraka ruler of Gujarat (*Epigraphia Indica*, XI, p. 108), although *vapis* serving non-agrarian purposes are quite well known. Likewise, it is wrong to think that the great Bhojpur lake in Malwa was created for augmenting agricultural production.

In a great number of cases, however, the agrarian function of the water resources is clarified beyond reasonable doubt by the contextual analysis of the inscriptions. Thus in the above-mentioned Maitraka record, two *vapis* were granted along with two hundred forty measures of land as *brahmadeya* to two brahmanas and there is a further reference to the cultivation of the grant.

In semi-arid regions of Western India, these irrigation devices of course brought much-needed security to cultivation, but they could also make possible double-cropping, as they do in other parts of India: A seventh century inscription from Mewar refers to *araghattas* and tanks on the boundaries of arable fields, some of which are said to be producing two crops in a year.

Very interesting irrigation arrangements are seen in some early medieval inscriptions of Orissa, one of which refers to the grant of one *hala* or plough measure of land (i.e. land that could be ploughed by one plough in a day) ‘with the right to draw water from the tank Tungana until the crop ripened’. In another instance, a brahmana was granted a watercourse along with land, but was ‘asked to share the water with other families of the locality during summer’.

Even when water resources are not mentioned in our sources, it is possible to infer irrigation from other kinds of references. The cultivation of sugarcane over North India is known from a variety of early medieval sources, both literary and epigraphic. As ‘outside the middle Ganga Plains (Bihar and eastern Uttar Pradesh) sugarcane must usually be irrigated’, the instances of sugarcane cultivation become pointers to the prevalence of irrigation. The inscriptions of the Chandella rulers, for instance, are replete with references to sugarcane in the fields of early medieval Bundelkhand. The terrain of the region lends itself to tank irrigation with least effort, while the variable (and therefore undependable) rainfall creates a general demand for it. Archaeological evidence for tank irrigation, traditionally dated to early medieval period, also survives in the area.

For all its importance, the irrigation measures would have covered only a small proportion of the total cropped area, as they continued to do till much later times. The larger proportion would have been dependent not only on rainfall but also on inundation of the flood-plains. The area of the floodplains must have been much larger then, which has now been considerably reduced by the large-scale embankment of rivers during the modern period for a variety of reasons, e.g. to facilitate railway train movements. The annual flooding of the plains of the Indus river was in particular important, on account of both the semi-aridity of the region as well as the enormous expanse of the inundation. But the importance of such as inundation was noted by late medieval chroniclers for areas with considerable rainfall too, such as eastern Uttar Pradesh. The division of land as *deva-matrka* (dependent

on rains) and *nadi-matrka* (dependent on rivers) in the sources underlines the importance of rainfall and river inundation for agriculture.

11.4 CROPS

By piecing together the casual references and occasional notices in the literary and epigraphic sources, it is seen that a large number of crops were raised in early medieval North India. The staples included wheat, barley, several varieties of rice, millets such as Kodon, China and Ragi, as well as a number of pulses. Apart from the oilseeds, viz. sesame, mustard, and castor, the sources also bear witness to the cultivations of a wide range of cash crops: saffron, sugarcane, betel leaves, betel nut, cotton, flax, sann-hemp, indigo, coconut and arecanut. So also are documented many vegetables as well as spices. Fruits appear to have constituted a significant supplement to common diet.

We are also reasonably well-informed, aided by later references, on the spatial distribution of these products. Thus wet rice cultivation is mentioned in the sources from well-marked rice-zones, but, as Xuan Zang attests, ‘upland rice’ was being grown, no doubt as a lesser crop, in many parts of north and north-west India: Jalandhara, Pariyatra, Kosambi and Takka (western Punjab). Cultivation of cotton is seen not only in Bundelkhand and Malwa but also, somewhat surprisingly for the modern observer, in Bengal. A number of literary sources, both indigenous and foreign, combine with the epigraphic ones to bring out the production of sugarcane through the early medieval centuries across our region, from Gandhara and Kashmir in the northwest to Rajasthan, Malwa, Bundelkhand, Uttar Pradesh, Bihar and Bengal. Saffron cultivation was already well in place in the north-west regions including Udayana, Darel and Kashmir, and as far as Kapisha in Afghanistan.

As to the scale on which different crops were produced in different regions, one should not of course expect any quantitative data from our sources. It is nevertheless possible to obtain some idea of the relative importance of a particular crop in a region. Thus while the Chinese pilgrim I-zing underlines the abundance of wheat in the north-west, the singular importance of rice as land measure in the inscriptions of early medieval Assam leaves no doubt about the crop’s dominance there. A similar importance of rice for Kashmir may easily be detected in the *Rajatarangini* of Kalhana, but a reference in the *Nilamata Purana*, another text from the region, would show the importance of barley as a secondary crop, then as now. Barley appears to have been a crop of some importance in the western regions too. Similar indications of the dominance of rice in the regions of Eastern India appear in the sources, which are unfortunately rather reticent in this respect about wheat and next to silent about millets. A Chinese testimony shows that at least towards the closing centuries of our period, Malwa had assumed its present feature of a major cotton-producing region; according to another Chinese witness (Xuan Zang), religious taboos against onion and garlic had already taken their toll on the production of these crops in India at the onset of the early medieval period.

The special features of certain regions were already recognizable in the first half of the seventh century, such as the fame of Magadha for its excellent variety of rice. Vaishali in the neighbourhood was famed about the same time for its orchards of mangoes and plantains, a reputation that it still enjoys. It was, however, a story as much of change as of continuity. For instance, many varieties of rice seem to have come up during our period, with Bengal alone accounting for more than fifty of them. Likewise, from their negligible presence in the earlier period, coconut and

arecanut grew to be important cash crops in Bengal by the twelfth-thirteenth centuries. And, as we know, the agrarian contours of early medieval India were again to change significantly in the Mughal period. Maize was not introduced in our period, as is sometimes believed on the basis of an Assam inscription.

11.5 CRAFT PRODUCTION

We may begin our survey with the most basic of the Iron Age crafts, i.e. iron smithy. As with so many other crafts, we get no more than fleeting glimpses of it through the curtains of the sources. Sometimes it is in the form of the presence of the blacksmith, whether in a West Indian village getting his due of the harvest as in the *Lekhapaddhati*, or at the very limits of rural society, in a forest settlement in North India, as in the *Harshacharita*. When craftsmen (*karu*) in general are reported in land-grant inscriptions, e.g. Chandella charters, and those from early medieval Kumaon-Garhwal (which allude also to *karmanta-sthala*, probably the working place of the artisans), we can be reasonably certain of the presence of blacksmiths among them. Large bulks of inscriptions may at times draw a near total blank on them, as is probably the case with the inscriptions from early medieval Orissa. But from Orissa comes the most solid evidence of the massive scale and high skill of ferrous (i.e. relating to iron) metal-working, in the form of iron beams in the temples, when at times wooden beams could be dispensed with altogether. Malwa, with its famous Dhar iron pillar, presents a parallel case.

A good general index of the iron craftsmen's excellence is seen in the fame of Indian swords abroad, several centres for making which are recorded in the literary sources at home. These swords with patterned blades were prized everywhere, and came to be called 'Damascus' swords. These seems to have been a remarkable technological affinity between India and Islamic lands to the west in this respect. As Ahmed Y. al- Hassan and Donald R. Hill state in their book *Islamic Technology*: 'In general it is no exaggeration to say that Islam and India formed one cultural area as far as Damascus steel was concerned.'

The areas which were mined for iron ores in the earlier period and were in use in later times must obviously have continued to be tapped during our period, e.g. Jharkhand. Talcher in Orissa is believed to have supplied ores to the smelters of the region, as it does to this day. But one also gets a reference to the production of iron and other metals, e.g. silver and copper, in Western Punjab in the seventh century A.D., to which no reference has been traced in the later period. This has been explained, plausibly in our view, in terms of the existence of small deposits of the ores of these metals in the Lower Himalayas, Shivaliks, and Salt Range. They could be mined only for a limited period, whereinafter they were not noticed in the later literature. Their exhaustion would have led to prospecting in other areas. Likewise Kalhana reports the massive mining of copper by the state in a hill in South Kashmir for the eighth century, but not for the earlier or subsequent periods.

Largescale mineral production of non-ferrous metals included the famous Panjhir (later called Panjshir) silver mines in North Afghanistan, where ten thousand miners are reported to have been working in the tenth century A.D. However, as our source (Ibn Hauqal) makes it clear, the large number was an indicator less of the quantity of the silver deposits than of a chaotic silver rush among the people. It is stated: 'The people of Panjhir made the mountain and the market-place like a sieve because of the many pits.... [In this business] you will see a man start his day owning one

million, and by nightfall he owns nothing. Or he may start poor in the morning and by evening become the owner of unaccountable wealth’.

Cinnabar, the only important ore of mercury, was being mined at Broach in Gujarat in the tenth century, according to Al-Masudi.

A major source of gold in North India was the gold-bearing sands of the rivers, the most important of them in this respect being the Indus, as attested by Abul Fazl. A description of how gold was obtained from the Indus in the eleventh century is seen in Alberuni’s work on mineralogy, *Al-Jamahir fi ma’rifat al-Jawahir*:

‘At its sources there are places in which they dig small pits under the water, which flows over them. They fill the pits with mercury and leave it for a while. Then they come back after the mercury has become gold. This is because at its start the water is rapid and it carries with it particles over the surface of mercury which picks up the gold, leaving the sand to pass away.’

Nepal was an important source of copper, which was obtained also from tribal areas and beyond. In general the existence of mines as well as prospecting for metals may also be discerned in the inscriptions of the Kalachuris and of the Gahadavalas. Actual finds as well as epigraphic and literary references add up to an impressive account of the numerous types and expert execution of the non-ferrous metal products.

Stone, earth, and wood provided material for a number of important crafts: stone masonry, sculpture, lapidary, pot-making, brick-making, and carpentry. All these are attested in varying degrees of scale and detail for different regions. Early medieval India saw a new phase of art and architecture with distinct regional styles: Stone sculpture in black basalt during the Pala period in Eastern India, for instance, is so very different from the stone images in sandstone and marble from Western and Central India, and together they make early medieval India quite distinct from the preceding periods in Indian history. This new phase with its extensive sweep not only bespeaks many a significant innovation on the craftsmen’s part but also bears witness to the honing of their skills to classical perfection.

A major sphere of the non-agrarian economy was production of salt. Salt was made from sea water in the coastal areas on the west and the east. It was also obtained from the Sambhar Lake in Rajasthan and the Salt Range. Salt pits, where salt would be produced from nitrous soil, are also frequently attested, especially in the inscriptions of the Kalachuris, Chandellas, and Gahadavalas. In Sind the Saran Delyar deposits were probably exploited for the purpose. The significance of these local supplies may easily be appreciated in view of the high costs of transporting salt over long distances on land.

Then there were the crafts that derived from primary production in the countryside: textiles, oil-pressing, sugar-processing, liquor-making, and leather work. With their broad production base in agriculture and animal husbandry, it is not surprising that all these crafts should have been practised widely. Textiles were naturally far more important than the other products, and happen also to be the most visible in the sources.

A significant development in cotton textile technology took place during our period. The cotton gin came, between the sixth and the tenth centuries, to be fitted with both crank handle and worm gear, so that separation of cotton fibre from seeds and

other waste material could be done far more efficiently. As to carding of cotton, it used to be argued for several decades from 1969 that the carder's bow was introduced in India in the eleventh century. The older view has now been confirmed that the bow had been in use in India from pre-Gupta period onwards. Spinners, however, did not yet have the advantage of the spinning wheel, which is first seen in India in AD1350. (For explanation of these technical terms see Unit 23, Block 5)

The early medieval sources provide lists of a great variety of textiles, of cotton as well as of wool, sann-hemp, silk, and Ranku deer's hair. There have probably been no systematic comparisons in detail of these with the types mentioned in the earlier sources, as far as we know, but P.K.Gode showed *mashakahari* – bed-curtain or 'mosquito-net' – to be one innovation of our period, and it is likely that there were some more. The famous tie-and-die technique, of which Habib finds the earliest reference in Banabhatta's *Harshacharita*, was another early medieval novelty.

As the word *chakra* (wheel) for the oil-mill in the *Manusmriti* and the *Mahabharata* shows, the oil-mill, employing rotary motion, had been in use since early first millennium AD at least. An early medieval text, *Bhagavata Purana*, gives it a fuller name *taila-yantra-chakra*. Oil-mills came to be such a regular feature of common life that to speak of a machine, *yantra*, was to speak of an oil-mill. Lexicons take words like *yantra-grha* (machine-house) and *yantra-sadman* (*sadman* means *grha* or house) to mean an oil-mill or oil manufactory, so that the term *yantra-kuti* in a late-sixth century inscription from Gujarat has rightly been understood as an oil-mill or manufactory. An inscription from Himachal Pradesh, dated AD 804, calls it *tail-otpada-yantra*. This process of *utpidana* (squeezing or pressing out of) was apparently different from the ancient practice of grinding the seeds for oil-extraction as indicated by the term *taila-pesham* in Panini's grammar. However, the more common word for oil-mill in early medieval Sanskrit inscriptions is not *yantra* or *chakra* but a new term, apparently vernacular in origin: *ghanaka*, occasionally also called *ghana* or *ghranaka*. The term that is now popularly used for the oil-press is *ghani*, affiliated to *ghanaka*, rather than *chakki*, a derivative of *chakra*. The other current term for the oil-mill, *kolhu* also has its counterpart *kolhuka* in a ninth century Sanskrit inscription from Gwalior. The precise significance of this shift in nomenclature—*chakra* or *yantra* to *ghanaka* or *kolhuka* – for the technological history of the oil-press remains to be ascertained. All that is certain is that the making of the *ghani* in its present form was a wholly Indian conception, for the *ghani* of South Asia is very different from oil-presses elsewhere.

In his dictionary of Deshi works, called *Deshinamamala*, the famous twelfth century Jaina scholar Hemachandra listed *kolhuo* as a term for sugar press, and also described the process as one of *nipidana* i.e. squeezing. The similarity of terms suggests a similarity in the mechanism of the oil-press and the sugar-press. The flourishing state of the sugarcane-processing industry across North India is shown of course by the combined weight of the numerous references to sugarcane cultivation, its products, sugar-press, and the persons engaged in the processing and the distribution of the products. But perhaps the more remarkable thing is the impressive scale on which sugar industry, including sugarcane plantations, spread out beyond the subcontinent, from Iran through West Asia and North Africa to Spain and Sicily, all during our period. It is generally thought that the knowledge of sugar-making was brought to China from India about mid-seventh century by an envoy of the Tang emperor who was sent to India for this specific purpose. A re-examination of the evidence suggests that it was the Indian Buddhist monks and two

artisans from Magadha who were really responsible for the technology transfer to China about AD 647-648. The Chinese knew how to make a type of sugar at a much earlier date, but what they learnt now was the processes of making *khanda* and *sharkara*, the two coveted age-old Indian varieties.

The details of these processes, which had thus far remained unknown to historians of sugar-industry, have happily been revealed by a recently found fragmentary document in China, dated to ninth/tenth century AD, which refers among other things, to the working of the sugar press by oxen, the device seemingly being *kolhu*.

References to several varieties of liquor as well as liquor-makers point to liquor-making to have been a widely practised craft. The seventh-century account of Xuan Zang as well as the twelfth-century play *Moharajaparajaya* show liquor to have been a major source of state revenue, which would suggest that liquor was produced on a substantial scale. As to the details of production process, a majority of the Indian historians have not been sensitive to, or even aware of, the basic question whether these liquors, or any of them, were fermented only or both fermented and distilled. Through a review of the works of those few who have pursued the question, and adding his own research to theirs, the great Joseph Needham has argued that some form of distillation was practised in India from very early times, and that, along with non-spirituuous liquors, distilled ones too were produced during the early medieval period.

Preparation of hides and their products is rather sparsely represented in our sources. An inscription from central India refers to one shoe-maker (*mochi*) while another is seen in the *Rajatarangini*. The tenth century Paschimbhag inscription from Eastern India mentions dozens of *charmakaras* (leather-workers) in connection with a monastery, but they seem to have been attached to the establishment as agricultural workers (*karmakaras*) rather than as leather workers, to the caste of which they belonged. This phenomenon of the professional caste of leather workers providing agrarian labour remains an important feature of Indian countryside even now, as craft specialization, being inadequate for regular livelihood, is not a full-time, all-season job. But the leather-workers who were organized into associations, as seen in an early medieval law-digest, seem to betray a higher level of status and (therefore) of professional skill and engagement. A category apart were the famed leather workers of Gujarat, whose products, rated as the best and the costliest in the world, drew the unstinting admiration of foreign observers like Al-Masudi and Marco Polo.

The hides were mostly those of the domesticated animals in all probability. However, as some references (e.g. the *Harshacharita*) suggest, skins of wild animals too must have been regularly used in leather work. In this as well as in other respects, most notably carpentry and basket-making, forests were an important source of the craftsmen's raw material. The tuskers of Orissa's forests were thus the basis of its ancient reputation in ivory work, which continued in the early medieval period, as attested in the *Hudud-ul Alam*; for central and western India, too, the agency of tribals (Pulindas) in the procurement of ivory is seen in early medieval Jaina sources.

11.6 ORGANISATION OF CRAFT PRODUCTION

The basic unit of craft production in the countryside was the individual craftsman with his family, living amid the agrarian communities, often in the company of the families of other professionals, including other craft specialists. A scatter of references, epigraphic and other, brings out the widespread dispersal of a number

of crafts over the countryside: that of the potter, the weaver, the ironsmith, the carpenter, the jaggery-maker, the oil-miller, the leather-worker, the liquor-maker, and so on.

Some of these groups were treated as untouchables and suffered from spatial segregation, living outside the village (even the town). The composition of such groups, however, seems to have varied from region to region; thus weavers were noticed by Alberuni as one such group of untouchable craftsmen who lived at a distance from the main settlement, but in a Jain text, they are listed among a category of professional groups called *narua*, that is, not untouchable, distinct from the category of *karua* groups, that is, untouchable ones. The binary division of these professional groups as *naru-karu* has persisted down to modern times. Similar contrasts in status for other groups too may be seen in the contemporary sources, with probable exceptions such as the leather workers, who seem to have been regarded as untouchables everywhere. In spite of the *narua* and *karua* divisions among them, artisans in general continued to be known generally as *karus*.

A typical arrangement between the artisans and their rural clients was worked out, one that came to be known later as *jajmani* system. The artisan would undertake to provide a fixed number of services to a peasant family in return for a fixed share in the peasant's harvest. A document in the *Lekhapaddhati*, a work from Western India, attests to the prevalence of this practice with reference to five *karuakas* (a variant of *karu*). In addition, a few inscriptions refer to the agricultural fields of artisans, e.g. the reference to a carpenter's field in a Maitraka charter. Going by latter-day practice, it is likely that the arrangement also included allotting a small cultivable plot to the artisan; he would raise a crop and use up all its produce, keeping nothing as seeds for the next season, which would be provided by his peasant clients in the form of a tiny share of the produce 'for seed' over and above the share for his consumption.

There would have no doubt been variations in the details of this arrangement over time and space, but it is plain that it covered neither the entire range of rural craftsmen nor the entire range of the production (and repair) work of any single artisan. We have seen above in the *Lekhapaddhati* the working of the system with reference to five *karuakas*, only three of whom are named as the blacksmith, the carpenter, and the potter. Whoever the other two might have been (it is often thought that they were the barber and the washerman) the villagers' requirements of professional services (e.g. weaving, oil-pressing, liquor-making) certainly went far beyond the services of the five *karuakas*. Similarly, going by considerable comparative evidence, there would often be demand for more pots, sickles, repair work, etc. than those agreed upon in the *jajmani* system. All these extra demands would be met outside the *jajmani* system, often through market exchange.

At the same time references to the fields of these artisans show – as does that to the leather-workers as agricultural labourers – that craft work was not the full-time job of these specialists. In fact, lack of sufficient demand for their skills (chronic underemployment) was a major reason why such specialist families tended to settle down only in larger villages and why even from there they would often be willing to extend their *jajmani* ties to the neighbouring small settlements.

This mix of the *jajmani* and the market context of craft production in the countryside was probably not seriously disturbed by the donation of some of these villages by the state to religious functionaries or institutions. Theoretically, it generally meant

the transfer of the craftsmen's obligations towards the state to the donees. On the all important question – what the donees did with their newly-won claims on the craftsmen and their families (which too must have tended to grow in number along with the rest of the village population) little direct or otherwise relevant evidence unfortunately has yet come to light.

In some religious establishments, however, craft production came to be organized, by special measures, on a pattern that resembled the *jajmani* system but could be more comprehensive than the usual web of *jajmani* ties. A hint of this is seen in a twelfth-century inscription of Orissa, when a potter was given two measures of land on condition of supplying on a daily basis cooking pots to a temple for religious service. A detailed portrayal of such an arrangement in tenth century for several temples in Sylhet region in Bangladesh is provided by the Paschimbhag Copper Plate Inscription. In one of these temples, for instance, two oil-millers, two potters, two carpenters, and two masons figure among the dozens of other service-providers as recipients of substantial plots each (at least 7.5 acres), apparently in lieu of their services. These services are not specified; in view of the substantial holdings, it perhaps means that their services were now at the temple's disposal. That is to say, the craftsmen (and others) would meet all the requirements (and not just some stipulated part of them) of the establishment.

Quite distinct from the thin spread of the artisans over the countryside was their concentration in varying degrees at certain places. Their larger presence was evidently in virtue of a larger demand for their products, and these places would generally be nodal points. That is to say, they would be points in networks of settlements where lines of communication (land or water routes) met or, which is the same thing, branched – lines along which food surpluses were mobilized, regions were interlinked and authority was asserted.

One type of such places was recognized as *karvata* or *kharvata*. One contemporary defined it as 'larger than a *grama* (village), but smaller than a *nagara* (city)' while another saw it as a village that 'abounded in artisans and agriculturists'. The *kharvata* was, then, distinguished as a settlement from an average village by its greater size and prominence of craft production, but was not necessarily recognized as an urban centre. In fact, as one of the two definitions shows, it could continue to be recognized as a village only but as the other definition shows, it could alternatively be recognized as a market town, a place where regular markets or *hattas* were held. Indeed, it is in the sense of market town that the terms *karvataka* and *kharvada* occur in inscriptions.

In an urban economy proper, a larger conglomerate of craftsmen would of course be seen. During the tenth century, for instance, in the flourishing town (*pattana*) of Siyadoni, located at the Lalitpur gap that joins North India to Malwa and thence to West and South India, one witnesses a sizeable presence of artisans, including potters, liquor-makers, weavers, sugar-boilers, braziers, oil-millers, and stone-cutters. Here, as elsewhere (e.g. Arthuna in Rajsthan), these craftsmen figure in the context of religious charity, and do not therefore represent all the crafts that were plied in the town. For instance, in the late twelfth century, the Jain holy site of Sanderaka in Marwar comes into our view as a place where royal and other benefactions were being made, where a donated house fetched annual cash income from its rent-paying inmates, and where there also were merchants numerous and important enough to have a *goshthi* organization of their own. Seven cart-makers or *rathakaras*, who were residents of this place, also figure as donors, and this is how we know that this

was an important cart-building site. This holy town must have had other craft activities – just as there must have been other cash transactions than that mentioned in the inscription – but we know nothing of them.

At times an urban economy was served by artisans living in neighbouring villages, as ancient Varanasi had been. Thus while in the Chhatisgarh region during early thirteenth century an engraver of inscriptions was a resident of a town called Padi, the artisans (*shilpins*) who engraved Amgachi plates of the Pala rulers Mahipala and Vighrahapala lived in a village called Poshali. The probable urban connection of the village is suggested by its identification with the modern village Posela, situated in the vicinity of the well-known medieval town Mangalkot. A similar situation may have existed in the case of the settlement Shubankarapataka in Assam with its two groups of weavers.

It is in the context of these producers outside the *jajmani* arrangement, temple establishment, and the like that craft guilds are mentioned. The more common term for these guilds was *shreni* (e.g. the *shreni* of oil-millers at Gopagiri in Gwalior region), but they were also known by other names, such as *deshi* (e.g. the *deshi* of liquor-makers in the Karitalai inscription from Central India) and *goshthi* (e.g. the *goshthi* of the *shilpins* of Varendra region in Bengal). When a number of professionals at a place are seen as acting together in a religious context (liquor-makers and stone-cutters at Siyadoni), or when they were being taxed as a unit (braziers and liquor makers at the town of Utthapanaka or Arthuna in Rajasthan), one may legitimately infer the existence of a guild-like organization of each such group, even though the term as such does not occur in the records.

An idea of the character of these guilds may be formed through a critical analysis of the combined testimony of law-digests, inscriptions, and other sources, which were concerned in different ways with their working and composition. Members of a craft guild tended to belong to one caste: Craft skills were handed down from generation to generation within a family, and marriage ties brought such families together as a caste. But these were varying levels of expertise where the masters were identified as *acharyas*, to whom others would flock as apprentices. Four stages of reaching perfection in a craft were recognized, and the trainees apparently learnt at the job while making a living out of it.

The affairs of the guilds were managed by a small group of its more influential members. At Gopagiri or Gwalior, a *shreni* of oil-millers had ten chiefs called *mahattakas* while a *shreni* of gardeners had seven chiefs called *maharas*. Thus the number and titles of those who looked after the affairs of the guild could vary from guild to guild, even at one place; the variations over regions would have been, if anything, even greater.

These guilds were mutual-help associations, membership of which was meant to provide insurance against misfortune, natural calamity, and oppression. The collective affairs of guilds could also perhaps include pursuit of common economic interests, such as by excluding competition from within and without. Their corporate character is again seen in collective acts of piety and receipts of deposits, but there seems to be little clearly-analysed evidence for the guild *as a unit* organizing production or undertaking an economic enterprise during our period. In fact, an indication to the contrary is seen in the cases where a guild received a deposit of a large sum from an outsider, in lieu of which members of the guild agreed to make a regular contribution (in cash or kind) *on an individual basis*. The deposit apparently went to the collective fund of the guild, which, lacking its own corporate means, could only depend on the

individual contributions of its members. It is inherently probable that the guild sought to augment its funds by lending some of it and gaining interest thereon, which everyone did, for example the Sun temple of Jagatsvamin at Bhinmal in Rajasthan in the thirteenth century (as shown by the Bhinmal Stone Inscription of Udayasimhadeva Vikrama Samvat 1306/c. AD1249). This was, however, quite distinct from the guild (or the temple) functioning as a banker.

There is good evidence to show that a number of artisans in early medieval India worked in conditions of dependence on merchants, even though no hint of any such dependence is seen for the majority of the artisans and their groups. In his commentary on the *Naradasmr̥ti* in the eighth century, Asahaya explained *shrenis* in the sense of artisans who were attached to, i.e. dependent on (*pratibaddha*) a big merchant. At the end of our period, in the legal treatise *Kṛtyakalpataru* composed in mid-North India, artisans are clearly stated to consist of two groups: dependent ones (*ashrita*) and independent ones (*anashrita*). It also speaks of ‘artisans among merchants’ and matters are further clarified by Hemachandra calling *shreshthins* or merchant-financiers as governors of the forts (*durgapalakas*) of eighteen guilds and subguilds. It is at this point that the state of affairs is seen to find a striking corroboration in the numerous epigraphic references to merchant settlements, called variously the *grama*, *nagara* or *kotta* (fort) of merchants, from the late sixth century to early thirteenth century. In a sixth-century charter of the Maitraka ruler Vishnusenā from Western India, for instance, a whole lot of craftsmen is seen to be living among and under the authority of merchants: sugar-boilers, indigo-dyers, liquor-makers, braziers, oil-press workers, producers of vinegar or bitter wine, tailors, weavers, shoe-makers, blacksmiths, sawyers and potters. The reference to a merchant chief (or alderman) subjecting ‘the blacksmith, sawyer, barber, potter, and the like’ to forced labour is a clear statement on the subordinate position of some of these artisan groups. Details of the nature of the dependent status of the artisans, however, remain to be worked out.

11.7 SUMMARY

Our topic has been a relatively neglected field of study. Yet the available information – a good deal more of which will be found in the readings suggested below – makes it possible for us to trace the changes and continuities in economic production in North India during the seven-odd centuries that followed the Gupta period. As in earlier times, the advance of the agrarian frontier continued apace, though not without some setbacks off and on; the land grant charters among other sources showcase this, but it is a mistake to think that land grants were generally *responsible* for the advance. Irrigation measures of different kinds were a significant aspect of the agrarian dynamism, especially in regions like Kashmir, Rajasthan and Gujarat, as also in peninsular India.

A similar dynamism is witnessed in the realm of craft production, with a number of innovations and a burst of activity in monumental architecture and other fields; in his survey of material remains in pre-Sultanate Bihar (and Jharkhand), for instance, R.S. Sharma found those of the early medieval period the largest.

A lot more effort is needed to clarify the nature of dynamism of early medieval economy, but what is known is enough to belie the obstinate image of an unchanging East or medieval stagnation. Any enquiry into an economy’s dynamism would necessarily be concerned also with issues of regression, constraint and crisis.

In the end, you may note again – as you return to its re-reading for doing your exercises – that this Unit has sought not only to supply the details of agricultural and craft production but also to bring out the ways in which those details have been pieced together from the sources, and in the process has also pointed to some of the gaps in our knowledge.

11.8 EXERCISES

- 1) How do the land-grant inscriptions relate to the process of agrarian expansion?
- 2) Analyse briefly the irrigation techniques used during the early medieval period.
- 3) What were the traditional methods used to irrigate fields during the early medieval period?
- 4) Enumerate the cropping pattern in north India during the 6-13th centuries.
- 5) Critically examine the various forms of organisation of craft production in North India during the 6-13th centuries.
- 6) In what ways did the organisation of craft production in rural areas differ from that in urban centres during the 6-13th centuries?

11.9 SUGGESTED READINGS

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