
UNIT 4 ENVIRONMENTAL ZONES AND INDIAN ECONOMIC HISTORY

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4.1 INTRODUCTION

The present Unit focusses on the emergence, continuity and changes in the economic structures as they are informed by ‘environment’. Specialised formations of agricultural knowledge developed in agro-technological regions. The forests and geology helped to spatialise formations of knowledge, for instance, about granite carving in the Deccan. Livestock breeding, for instance, became a speciality of dry-farming regions. Differences among regions arose as ‘agrarian environments’.

Physical environments that directly influence Indian history stretch from Turkestan to Burma. Monsoon rhythms define the climate of South Asia proper, which embraces eastern Afghanistan, Pakistan, India, Nepal, Bhutan, and Sri Lanka, where natural environments enter history by defining agrarian conditions that emerge in the cycle of monsoon seasons.

4.2 MONSOON SEASONS IN SOUTH ASIA

South Asia occupies a transition zone between arid Southwest Asia and humid Southeast Asia. As we travel east from the high, dry Sulaiman slopes, across the arid Peshawar valley, Salt Range, Punjab and Indus valley; and then east down the increasingly humid Gangetic Plain to the double delta of the Ganga and Brahmaputra Rivers; we move from arid lands dotted by fields of wheat and millet to a vast flatland of watery paddy and fish farms.

Each year, the sun moves the months of humidity and aridity that mark monsoon seasons. Winter cold and summer heat are more pronounced in the north, where they influence the extent of wheat cultivation, but otherwise do not have major implications for farming, except at high altitudes. The same crops can be grown everywhere in South Asia with suitable inputs of water. Everywhere, the agrarian calendar is pegged not to moisture.

Seasons describe a cyclical narrative, roughly as follows. In January, the sun heads north across the sky from its winter home south of the equator, as the air dries out and heats up. Days lengthen and winter rains dissipate. April and May are the hottest months when it almost never rains. In June, Himalayan snow-melt gorges rivers in the north as the summer monsoon begins. The leading edge of the monsoon moves north-west from May through July, from Myanmar into Afghanistan. By late May, monsoons hit Andaman Islands, Sri Lanka, Kerala, and Chittagong.

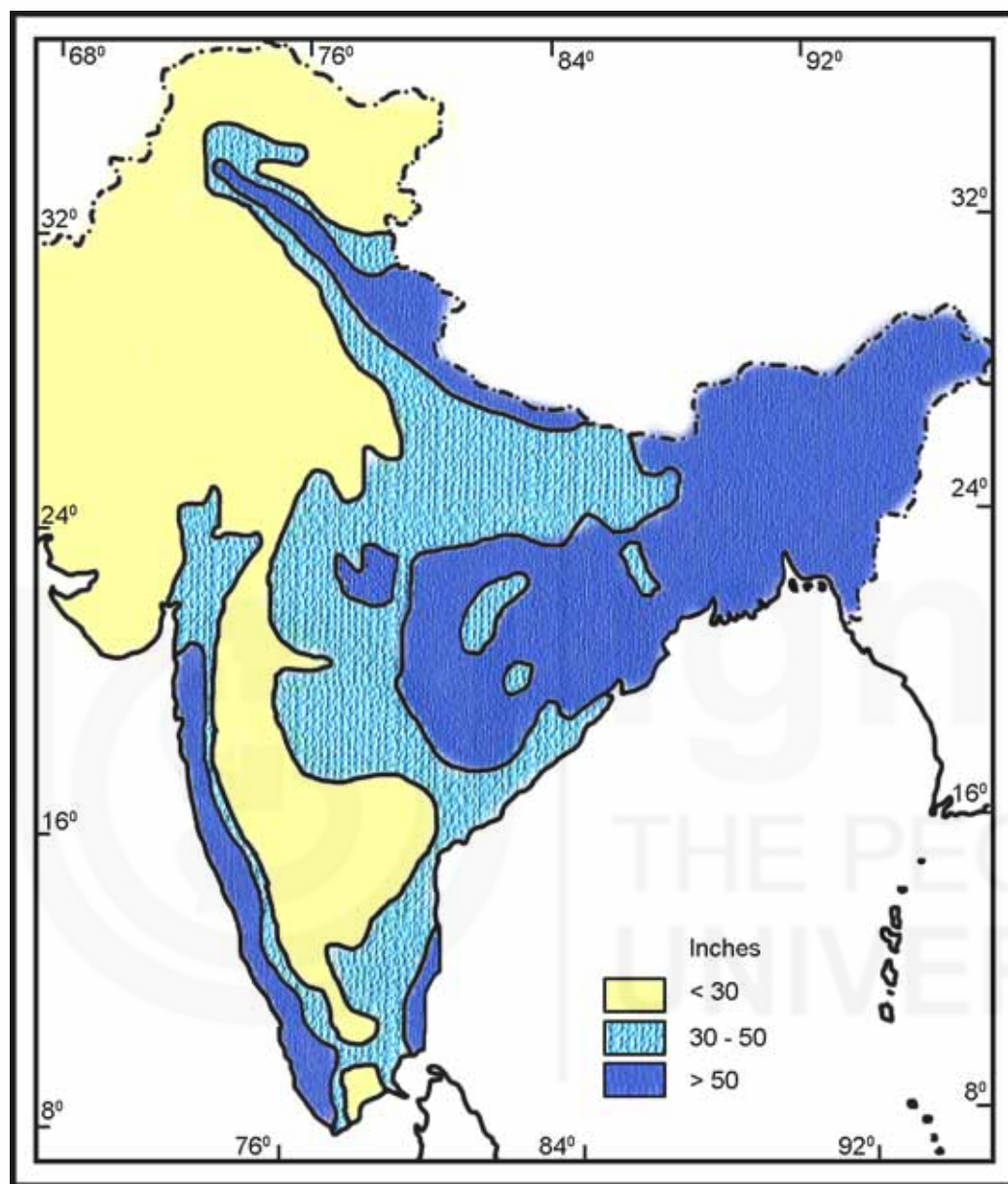
The earliest, heaviest, and longest monsoon season engulfs the far south (Sri Lanka and Kerala); the north-east (from Bihar to Assam and Chittagong); and the central-eastern regions of Orissa, Chhattisgarh, and Jharkhand. These are the most tropical regions with the most intense natural forest cover and extensive jungles. At the summer solstice, when the sun begins to move south again, the summer monsoon will have touched all of South Asia, providing the least rain to the arid western plains and north-west, which have the shortest, driest rainy season, and little rain to the interior of the Indian peninsula, in the rain shadow of the Western Ghats.

From July onward, the days begin to shorten and monsoon rains scatter, as a second season of rain begins, called the winter monsoon, which pours unpredictably on the south-east and north-east and often brings cyclones off the Bay of Bengal to attack Andhra and Bangladesh. Damaging cyclones were recorded in Bengal in 1831, 1832, 1833, 1840, 1848, 1850, 1851, 1864, 1867, 1874, 1876, 1885, and 1942. The worst by far were in 1864, 1867, 1874, and 1942. This fickle second monsoon lasts into January, when dry months begin again.

The seasonal calendar is marked by festivals, astrological signs, and natural phenomena, which articulate agriculture with a vast array of social activities. People enjoy the cool of December and January. As the sun moves north and summer begins, the sun becomes harsh, hot days accumulate, water bodies evaporate, the earth hardens, and farm work slackens. It is time for travel, migration, and moving herds to water and pasture in the hills; time for hunger, cholera and smallpox, skin and eye infections, malnutrition, dehydration, crying babies, and scavenging; time for trading and transporting, stealing, guarding, and fighting; time for rituals of honour and spectacle, and for building, repair, loans and debt, sometimes desperate commitments that will influence social relations of agriculture for seasons to come. Dry months are full of preparations for the rainy season sustained by the past harvest.

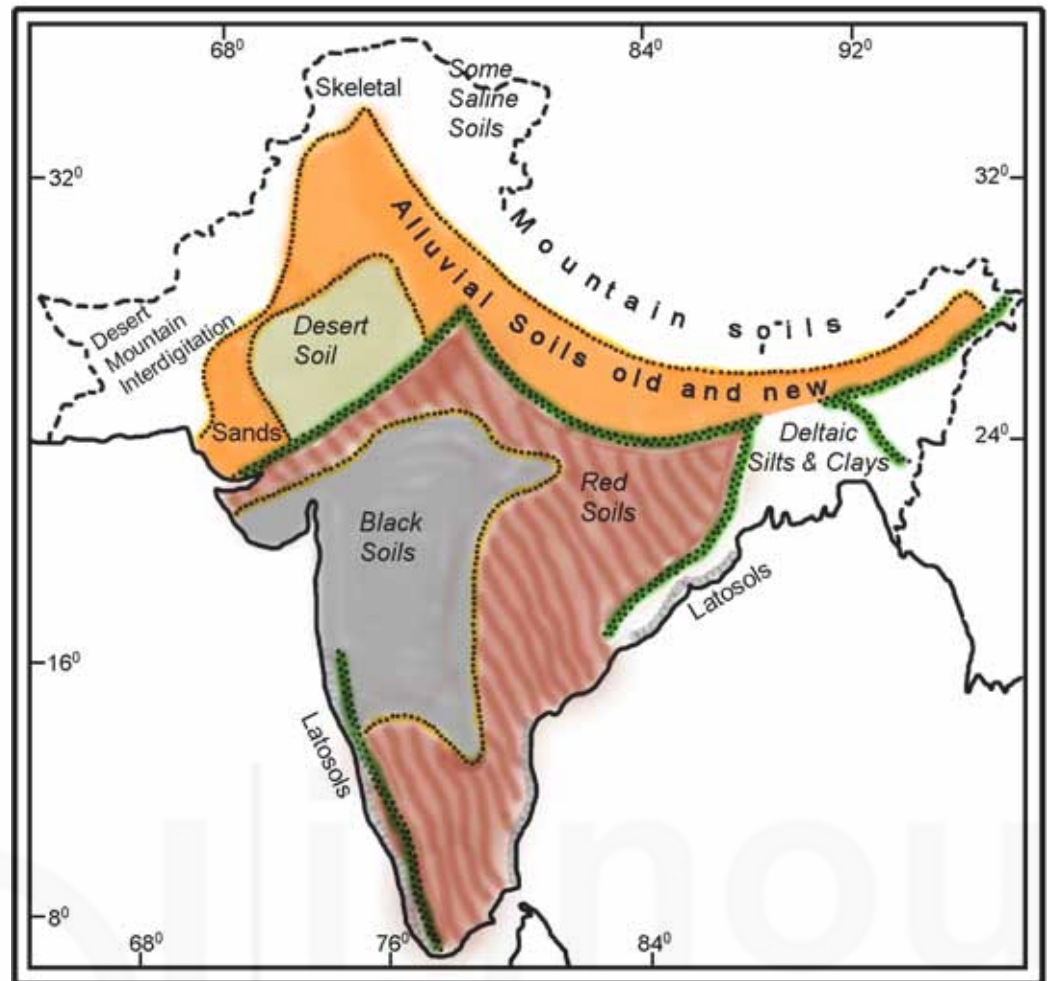
Crops move off the land most profusely during the second and third months of each monsoon, and the biggest harvests fill September-December. Regional differences appear most dramatically at harvest time. For example, the north-east, with its high rainfall, has three major harvest seasons. The *rabi* season covers March, April, and May, and yields mostly rice but in Bihar also wheat, barley, and pulses. *Bhadoi* crops include millets in Bihar and Chhotanagpur, in addition to rice, and arrive in August-September. The *aghani* season – called

kharif in north India – covers November, December, and part of January and brings the great harvest of the year. Winter rice, called *aman*, “was incomparably the most important and often the sole crop grown in the districts of Bengal, Bihar and Orissa” at the end of the nineteenth century, covering almost half the total land under cultivation.



Average annual rainfall. After Irfan Habib, ‘The Geographical Background’, in Ray Chaudhury, Tapan and Irfan Habib, *The Cambridge Economic History of India*, Vol. I, Delhi, 1982, p.7.

By contrast, in dry western India, the agricultural year begins abruptly in May, as it does for Bhils in the Narmada basin. Amita Baviskar’s study shows that the Bhils, after long, hot months without rain or work, “cannot sleep in the afternoon” because it would “appear indolent, and nature bestows her bounty only on those who bring it their industry as tribute.” As rains appear, “people who had migrated to the plains return home for the start of work.” Harvesting maize and *bajra* millets begins in August, and harvesting *jowar* millets and groundnuts continues through October. In November and December, “people sell chula, groundnuts, and other cash crops, carrying them to the traders.”



Soil Types. After O.H.K. Spate and A.T.A. Learmonth, Bombay, 1972, p.98.

Trade Winds

The monsoons are the backbone of Indian agrarian economy. Its discovery by Hippalus (c. 45 B.C.) also revolutionised the Oceanic trade. Monsoon winds blow in the subcontinent in both the seasons – summer and winter. Summer monsoon, known as southwest monsoon, begins with strong winds blowing southwest over the Arabian Sea. The winter monsoon takes the opposite direction when the wind blow from the continent (northeast), towards southwest. It is also commonly known as northeast monsoon. Both the monsoons have deep oceanic impact. We have already discussed the impact of the summer monsoon that brings torrential rains benefitting the agrarian sector of the economy. It also has deep impact on oceanic circulation. Merchants exploited monsoon winds for sailing their ships. It drastically reduced the total time-taken by a ship to reach the Indian ports. The merchants started their vessels with the beginning of the summer monsoons in July when the wind flow is towards southwest and used to leave the Indian shores in winter when the wind direction in the winter monsoon is directed towards northeast. In the early centuries it completely transformed the character of the Indo-Roman seaborne trade. Merchants exploited the knowledge of the sea wind changes to their advantage. They would sail in the month of July down the Red Sea to the Gulf of Aden (southern tip of the Arabian peninsula) sailing directly to the Indian ports. Though winds were incredibly strong, dangerous and hazardous at times, nonetheless it facilitated the faster movement of the ships with less efforts, for the ships were moving in the wind direction. The return journey used to begin in November when the wind direction changed towards northeast. The movement became so fast that now a ship could

reach from Egypt to an Indian port in three months time (if a ship started in July it was on Indian shore by September end) getting enough time to offload and reload the commodities to start back in November again. Now direct trade with western Indian ports replaced the hopping coastal trade. Vessels now started directly plying from Egypt to Gujarat as well as Kerala coasts directly.

4.3 SEASONS AND ECONOMY

After every harvest, crops take new life in the realm of circulation. They assume new material forms as moveable measures and stores of grain, fruit, pulses, and vegetables, in stocks, carts, trucks, bags, head loads, and shops. Crops become food, cuisine, feasts, stocks, clothing, and adornments, and seek their symbolic potential as gifts, offerings, tribute, largesse, shares, alms, commodities, and credit advances.

Agrarian wealth arises from the articulation of two economic seasons – of cultivation and circulation – because prices rise before the harvest, drop at harvest time, and then rise again as the heat prolongs. Speculators seek returns accordingly. The calendar differs for animal and vegetable products, for fish, fruit, and forest products, and for different grains in every region; but everywhere, it moves to the rhythm of sun, rain, and harvest. Commodity prices and markets – and thus profits and revenues for business and government – move along the temporal path of agricultural seasonality. Today, seasons influence the timing and outcome of elections and set the stage for most major political decisions in South Asia.

In the hottest months, in the season of circulation, crops move off the land and people move out in search of work. In years of plenty, people on the move can find food close to home, but during droughts, they go farther afield. With predictable regularity, food becomes costlier as labour is let loose from the farm, in the hot season. For those who must work for others, this is a time of distress, when historically, seasonal workers have moved in large numbers into warfare, manufacturing, building, and hauling, all perennial options. Opportunities for hot-season non-farm work are major determinants of landless workers' annual income.

Cheap labour, dirt roads trampled hard, and riverbeds dried up in the hot sun make dry months a good time to transport people, grain, animals, and building materials. Haulers, herders, carters, and grazing land are badly needed. Water and fodder for animals is a problem. Herders take flocks to the hills for grazing. Herds moving up and down slopes for grazing are major elements in mountain ecology, where farming and grazing often compete for land, as they do today in the Siwalik hills and higher ranges above Punjab.

Supply, demand, people, goods, and news on the move travel through towns and cities, where social needs, social accumulation, and social power mingle in markets, on the streets, and under the eye of the ruler, engendering conflict, competition, negotiation, and exchange. Markets and urban centres are places where various people mingle under rulers who order the social environment and receive riches from the land in return.

The season of circulation is a time to raise armies and mobilise demonstrations in towns and cities. The land is free of crops, so this is time to mobilise gang labour for clearing jungle, digging wells and canals, and building dams, temples, mosques, monuments, palaces, and forts. When the sun is most unrelenting, bandits are

desperate and feed off travellers on the road, a popular theme in ancient literature that rings true even today in the tales of Chambal Valley gangs who rob passing trains. The hot season is belligerent. Benevolent rulers need force to keep the peace and ambitious rulers use hungry soldiers to extend their territory.

In late May, all eyes turn to the sky and labour moves back to the land. This time is for preparation and expectation. Cultivation begins with a promise of rain. Work for preparing fields varies in timing, complexity and demand for workers, animals, and equipment, depending on the crops to be sown, soil to be planted, rainfall timing and quantity, and water supplies from other sources, like wells, tanks or streams; and also depends on the kind of assets that can be invested in anticipation of the harvest in specific places, because rich farmers can afford to make more elaborate preparations, and new technologies allow for new investments before planting begins. Expertise and experience are crucially important and highly valued. The accumulated wisdom of farmers, patriarchs, astrologers, almanacs, sutras, scientists, old sayings, magicians, holy men, textbooks, scientists, extension officers, radio, and TV pandits all come into play.

Prediction and calculation continue each day based on the amount of rain and water in rivers, streams, and reservoirs, for it is not only the amount of rainfall that determines the harvest but also its timing. Bad signs encourage conservative planting strategies for farmers living close to the margin. But farmers with extra assets often interpret rumours or signs of an impending bad monsoon or war as an indication of potential profit during subsequent scarcity and high prices; and this might stimulate a calculated gamble, extra planting. Such gambles often fail.

Whatever the expectation of rain, any extra planting or investments in potentially more profitable crops – like cotton, jute, rice, wheat, vegetables, sugarcane, tobacco, and plantain – often require loans. Historically, the expansion of farms into forests has typically involved credit, and the increasing capital intensity of farming (with irrigation, fertilisers, machinery, processing equipment, animals, or labour) depends upon credit. K.P.Agrawal, V.Puhazhendhi, and K.J.S.Satyasani's study reveals that with the increasing intensity of cultivation in India since 1970, credit has risen as a percentage of total capital formation in agriculture and allied sectors in India from 19% to 33%; and compound growth rates rose from 20% during the 1970s to 35% after 1980. For farmers close to the margin, debt may finance the next meal, and poor workers often enter the planting season already in debt because of food loans during the dry months.

The time when crops must be sown is a time of urgent investments, when gains from the past go to work, food prices are high, and people are hungry for work. Past losses hurt and farmers who have gambled and failed or lost labour in their households due to death or migration cannot carry on without help. Conflicts over resources rage at this time of year, especially over water and good land. Fights that stew for years erupt as time approaches to plough, plant, fertilise, and apply irrigation. Newly acquired assets go to work: cattle purchased at summer fairs; land bought, leased, or conquered; new fields cleared from forest; dams built and channels dug; wealth secured by marriage; the labour of growing children; and a good reputation that builds credit worthiness on solid standing in the community. Many farmers need advances of seed, food, and cash to accomplish planting, and advances may or may not enrich creditors, but the commitments they involve create social bonds that are critical on all sides.

In addition to market, social commitments within families, communities, sects, castes, and other groups enable farmers to acquire what they need to plough and plant. Reciprocity and redistribution now enter their productive phase, as horizontal solidarities and vertical bonds of loyalty and command facilitate planting. Gods also play their part and hear many prayers at planting time. Many interactions that animate the heady season of ploughing and planting bring villagers into town and city folk into villages. In cities and towns, past returns from trade, taxes, and sacred donations seek returns on the land. Creditors, tax collectors, landlords, merchants, and lawyers come from town to invest in crops and ensure they will get their due.

Too many rainless days after planting bring despair and high prices. Scarcities become famines after July when past seasons have been bad and food stocks are low. The poorest people must do whatever they can for food, which often means committing themselves or their children in desperate ways – in this context, what we call “bonded labour” can be seen as exploitation and also as protection against starvation. The scattered, unpredictable nature of monsoons and the possibility of flood or devastating storms make the maintenance of subsistence options in times of dire distress a critical life-strategy for many people.

Rains bring hope, mosquitoes, flooding, and waterborne diseases. As crops mature, so do estimates of yield and calculations of payments for obligations incurred to plant. All interested parties evaluate potential returns, as speculation and negotiation proceed with uncertainty about the harvest. The connection is again being forged between wet and dry months, between seasons of cultivation and circulation, between times of investment and reward.

Crops must be protected as they ripen, and predators take many forms. Conflicting interests – among landlords, farmers, labourers, creditors, and tax collectors – mature with the crop. Farm labour becomes most critical as the harvest approaches. Timely work is needed for watering, weeding, cutting, hauling, winnowing, drying, and storing the crop. Disruptions of work at this climactic phase can ruin crops and spoil futures planned on predictions of yield. As a result, enmity can take a nasty turn. As the harvest begins, reliable commitments of labour become more valuable and the market value of labour increases.

At harvest time, crop prices fall as labour demand is peaking. Labour demand is highest when another crop will be sown immediately, in regions that benefit from the winter monsoon or where irrigation allows a second or third crop to be planted. The most hectic work time hits all farmers at once, in each locality, and at this time, social stability and harmony are critical for everyone who invested in the crop. Conflicts also begin to intensify over the division of the crop and the fulfilment of promises.

Struggles over the crop intensifies in the season of circulation, especially when the yield is worse than predicted. Tax collectors, creditors, in-laws, and landlords can now become nasty. For all South Asian states that have depended on agriculture, the revenue year has conventionally begun with the summer monsoon. The fiscal (*Fasli*) year, derived from Mughal practice and retained by modern states, begins in July, when the summer session of the Indian Parliament also begins. Elections are generally timed to precede the monsoon, which makes the planting season a time of period of political promises as well.

4.4 MAPPING THE AGRARIAN SPACE

To analyse the history of social power in agriculture and its articulation with states and environments, we can look for dispersed activities that constitute agriculture and are scattered across *agrarian space*. A single logic or dominant form of social power may not control agriculture in such territory, but the markings of agrarian territorialism can be mapped, and their changing formations of social power can be charted chronologically. Mapping patterns of control and order, including internal resistance and external disruptions, defines the historical geography of agriculture. States help to organise agriculture by forming zones of power which co-ordinate many kinds of social activity that intersect on the farm. But many types of circulating elements inhabit agrarian space. Farms are only the most immediate point of contact between land and labour – the most tangible site of production – and most of what constitutes agriculture circulates far beyond the boundaries of the farm and well beyond boundaries of cultivation. Institutions that organise the movement of materials and activities into and out of farm land – including the state – organise social power in agriculture. States exert their powers by defining, enclosing, and regulating territorial units of agricultural organisation.

Knowledge is a critical element in farming and brings the other elements together in the organisation of agriculture. Texts depict territories of social power. Ideas moving among farmers create territories of knowledge. An elusive geography of ideas surrounds farmers who need to know how to make the best (or even safest and simplest) gamble with the rains. Each farmer needs to know about soil preparation, seed selection, planting, watering, manuring, and weeding for the specific combination of water, crops, soil, and labour conditions on each farm. Ways of knowing come from generations of learning in wide regions. Every individual calculation and decision on each farm is the result of conversations among many farmers and other people, which accumulate over generations. Textual representations of old forms of agricultural knowledge can be found in Sanskrit texts from the first millennium of Christian era, like the *Krisiparasara* and *Varahamihira's Brhat Samhita* (c. 6th century AD), which give astrologers and people who control powerful mantras and rituals key roles in agriculture. *Brhat Samhita* verses say that all astrologers must know “indications of the approach of the monsoon ... signs of immediate rainfall, prognostication through the growth of flowers and creepers ... [celestial influences on the] fluctuation in the prices of commodities [and] growth of crops ... treatment and fertilising of trees, water-divination [etc.]” [No.16] Because deities enjoy trees and water [No.537], the astrologer needs to know signs on the earth that indicate water sources below [No.499-61]. He needs to know portents of famine: sunspots are a dire signal, but also certain rainbows [No.29], shapes on the moon's face [No.36-8], eclipses [No.58], dust storms [No.67], appearances of Venus [No.105], and comets [No.146- 51]. The *Brhat Samhita* introduces its treatment of portents of rain with phrasing that we often find in old texts: “As food forms the very life of living beings, and as food is dependent on the monsoon, [the monsoon] should be investigated carefully.” [No.230] Seven chapters consider rain signs – and just like Tamil proverbs recorded in the 1890s – focus on configurations of the planets and signs like rainbows, cloud shapes, insect and animal behaviour, the sounds and shapes of thunder and lightning, and rainfall during each divisions of the solar and lunar calendar. Many agricultural proverbs recorded in modern times refer to the wisdom of

astrologers, who provided guidance for farmers. In 1802, Benjamin Heyne found a set of instruments in Mysore for measuring rain that were used to compile almanacs and to presage “the quantity of rain allotted to each country”; and the *Brhat Samhita* shows astrologers how to make such rainfall measurements accurately [No.245-6]. The *Krishiparasa* gives mantras to ward off insect and animal pests from the field, while the *Sarangadharapadhati* describes effective natural pesticides. In the 1870s, Lal Behari Day recorded a range of local curses, omens, and magical powers at work on Bengal farms.

Finally, mythologies and sacred geographies define agrarian space, because no farming population has ever believed that activity on the farm itself is sufficient for success in farming. Propitiating deities, paying homage to holy persona, visiting sacred places, and gathering with one’s own people to create ritual conditions for success on the farm are essential in agriculture.

Agriculture thus involves the exertion of powers of control over many moving elements – including esoteric knowledge, supernatural beings, human migrations, prices, commodities, and elements of nature – within which farmers apply labour on the land. Control over the means of production is thus no simple function of property rights, caste, or class structure. Agriculture is an aspect of social institutions and power relations within which farms and farmers work. It is an aspect of civilisation which generates, combines, and focuses physical powers over naturally moving and socially moveable objects in production. The historical geography of agriculture is therefore not simply described by the extent of fields and farms, or by the boundaries of states, or by cultural regions, although fields, farm territory, and political and cultural powers do mark territorial boundaries in agrarian space.

4.5 ENVIRONMENTS OF HISTORY

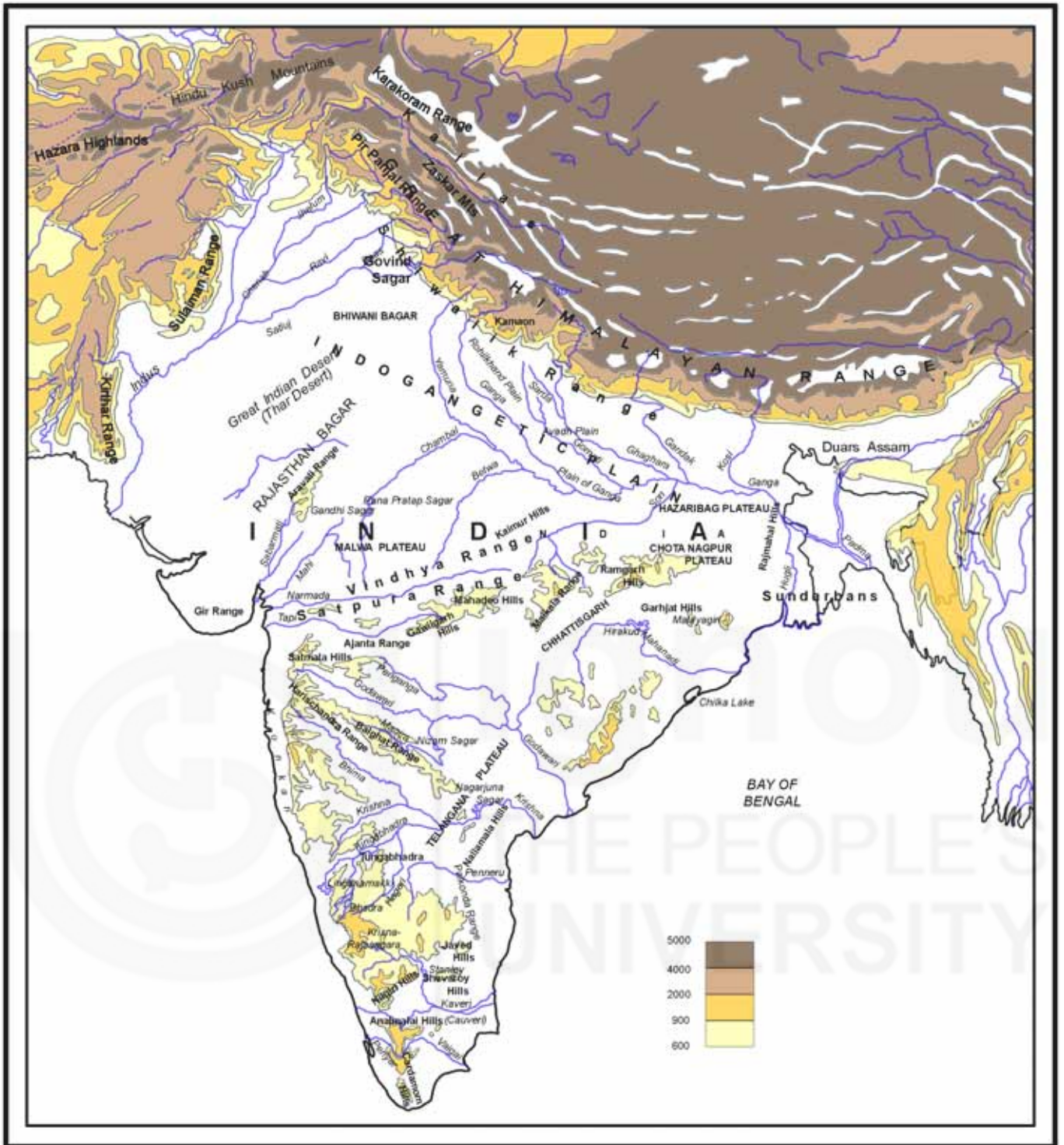
Historically, a majority of social activities and institutions in South Asia have had some agricultural aspect or dimension. This is what makes a cultural environment *agrarian*. A region is agrarian not because farming forms the material basis for other activities, but rather because a preponderance of social activity engages agriculture in some way or another, during seasons of cultivation and circulation.

For most of human history, there has been little organised co-ordination of agricultural activity across large expanses of agrarian space. Nature’s variability discourages overbearing, non-local control over the intimate, everyday conduct of farming. And yet, agrarian space is never haphazard. Spatial order appears in natural landscapes where many interconnected agrarian activities articulate with agriculture.

South Asian historical territories have assumed distinctive forms in six kinds of agrarian environments, which we can divide roughly, as below, into forty geographical units, all with ancient histories. In centuries *circa* 1500-1850, their territories came together in agrarian regions, culturally coherent, spatially organised territories of social power, which were further institutionalised, integrated, and differentiated by modern history.

Agrarian Environments		
I. Northern River Basins	II. High Mountains	III. Western Plains
1) Punjab	7) Kashmir	12) Indus Valley
2) Western Ganga-Yamuna Plain (Delhi-Agra-Mathura) etc.	8) Western Mountain Regions (Punjab, Himachal, Uttar Pradesh)	13) Sindh
3) Central Plain and Doab (Lucknow-Allahabad)	9) Nepal	14) Rajasthan
4) Eastern Ganga basin (Gorakhpur, Benares, Bihar)	10) Bhutan and Saurashtra	15) Northern Gujarat
5) Bengal, Ganga-Brahmaputra Deltas (West Bengal, Bangladesh)	11) Eastern Mountains (around Bengal and Assam)	16) Malwa
6) Assam (Brahmaputra Basin)		
IV. Central Mountains	V. The Interior Peninsula	VI. Coastal Plains
17) Malwa	24) Khandesh (Tapti Basin)	32) Gujarat
18) Bundelkhand	25) Berar (Waiganga Basin)	33) Konkan
19) Baghelkhand	26) North (Maharashtra; Deccan (Maharashtra; Godavari and Bhima Basin)	34) Karnataka
20) Chhotanagpur and Jharkhand	27) South (Karnataka; Deccan (Karnataka; Krishna-Tungabhadra Basin)	35) Kerala
21) Chhattisgarh	28) Mysore Plateau (Palar Ponnaiyar Kaveri Basin, above the Ghats)	36) Sri Lanka
22) Orissa Interior	29) Telangana (Krishna-Godavari Interfluve)	37) Tamil Nadu
23) Bastar	30) Rayalaseema (Krishna-Pennar Interfluve and Pennar Basin)	38) Andhra
24) Khandesh (Tapti Basin)	31) Tamil uplands (Vaigai, Kaveri, Ponnaiyar, Palar Basins, below the Ghats)	39) Orissa
25) Berar (Waiganga Basin)		40) Bengal

Agrarian environments are not defined in part by physical qualities, but also by long-term interactions of geography, culture, technology, and social power. South Asian environments can be divided schematically into two binary oppositions: mountains versus plains, and semi-arid versus humid tropics. Most farmland lies in the semi-arid plains, including river valleys and plateaux, and most of the remainder is in the humid lowlands, which have a higher proportion of population than farmland. Divisions, interactions, and intersections of uplands and lowlands and dry and wetlands occur amidst changing conditions. Rivers change course, deserts expand and contract, dry lands receive irrigation, forests grow and disappear, cropping patterns change, human settlements alter nature, and farms give way to city streets. We can however outline spatial units of long-term historical geography that allow us to track changes in the land and changes in their human content over long spans of history in South Asia. Historically, Gujarat, Malwa, Bengal, Assam, Khandesh, and Berar are at the intersection of landscapes, and they are thus repeated in the list of landscape subdivisions.



Rivers, Hills, and Mountains

4.5.1 Northern River Basins

The basins of the upper Indus and its tributaries, the Yamuna, Ganga, and Brahmaputra form one of the largest expanses of riverine farmland in the world. Soils are mostly alluvium. Farming is challenged and enriched by river drainage from mountains all around. Rivers bring moisture and nutrients, but floods also wreck havoc. Christopher V. Hill records that in 1875, the notorious Kosi River destroyed all the farms in its path, and an indigo planter wrote that, “miles of rich land, once clothed with luxuriant crops of rice, indigo, and waving grain, are now barren reaches of burning sand.” The Indus and Ganga provide natural routes for transit and shipping to the Bay of

Bengal and Arabian Sea. Bounded by desert and mountains, the climate in basins changes gradually from aridity in the west to humidity in the east. Along this gradient, monsoon rainfall and drainage from the hills increase and the dominant food grains shift from wheat to rice. Since 1960, wheat and rice cropping has overlapped because quick-growing varieties have allowed farmers with adequate irrigation to grow both in rotation, and today almost a quarter of the net sown area in Bihar, West Bengal, UP, Haryana, and Punjab grows wheat-and-rice, which is very rare outside the Indo-Gangetic basin.

In the north-west, separated by a low watershed from the Ganga basin (in Haryana), the Punjab is a triangular territory formed by the Indus and its tributaries (Jhelum, Chenab, Ravi, Beas, and Sutlej), and rimmed by mountains on the west and north (Sulaiman Range, Salt Range, Panjal Range and Lesser Himalayas). Rainfall increases with proximity to the northern hills from the Jhelum eastward, and aridity increases to the west and south. Groundwater recharge is most fulsome near riverbeds and closer to mountains, and the up-river Punjab also has more alluvial soil. Moving downstream toward the base of the Punjab at the confluence of tributaries with the Indus, rain and groundwater diminish, and soils become brown and sandy, as the Punjab shades into the arid Western Plains in Rajasthan.

C: In Punjab, as in general throughout the northern basins, the long-term geographical spread of intensive agriculture moved outward from places where drainage is easier to use on farms to places where more strenuous controls are necessary. Thus in drier regions, like Punjab, agricultural intensification moved from naturally wetter into drier areas; whereas in the flood plains and humid tropics, it moved initially from higher and drier parts of the lowlands into the more water-logged areas at river's edge. Everywhere, agriculture also moved up river valleys into the highlands. In the Yamuna-Ganga basin, the general trend of expansion of intensive agriculture has been from east to west and upland from the lowlands; and in the Punjab, from north-east to south-west. A major modern stage in this long process of expansion began with the construction of a vast canal network during the nineteenth century, and the most recent stage being the spread of motorised pumps and tubewells, since the 1960s.

In eastern regions of the northern basins, Bengal and Assam have the highest rainfall and volume of river water. Dense tropical jungles have historically presented the major challenges to expanding paddy cultivation. Today, the density of the human population is often seen as an obstacle to prosperity, but historically it has been more commonly a sign of the great fertility of the land. The Ganga delta shifted eastward over centuries and in 1787 joined the Brahmaputra in what is now Bangladesh. Agricultural frontiers in Bengal have moved east with the river, south into the Sunderbans, and also, as throughout the northern basins, up from the lowlands into high mountains.

Mountains border the Northern Basins on all sides, except in Rajasthan. Rivers come from the mountains, where reservoirs of timber and grazing land lie in the homelands of distinctive mountain societies. Lowland people have historically extended their power upriver into their surrounding mountains to colonise, conquer, and annex territory. Rajputs conquered up into Uttarakhand and mountains above Punjab. From ancient times, upper reaches of the Chambal and Parbati (tributaries of the Yamuna running down the craggy ravines of the Malwa Plateau) were attached to the agrarian economies of the Gangetic Plain, though they belong physically to the Central Mountains and they shade off in the west into the Western Plains.

4.5.2 High Mountains

From the Makran Range in the west, running north across the Sulaimans and Hindu Kush, and curving east across the Karakoram Range and Himalayas to the Naga and Manipur Hills, a vast high altitude landscape connects South Asia with Central Asia, Tibet, China, and Myanmar. It has steeply sloping mountain terrain, sharp valleys, and countless rivers, which mark natural routes of transportation and drainage, rushing down into the plains below and leading upward to the high plateaux of inner Asia. Winters are much colder than below in the plains, and summers, much cooler, creating different, complementary ecologies for animals, vegetation, forests, farmers, and markets. Like the lowlands, climates change from extremes of aridity in the west and to extremes of humidity in the east, with attendant changes in natural vegetation and agricultural options. Run-off is rapid, snowmelt gorges rivers in the spring, and erosion is severe. Forests are basic natural resources. Agricultural territories formed in valleys and extended upward, growing wheat and millets in the west and paddy in the east. Shifting cultivation, often called *jhum*, has remained most prominent in the east.

Localities are connected by valleys and passes, and separated by high ridges and peaks. Large political territories have formed only in the Vale of Kashmir, Kathmandu Valley, and upper Brahmaputra basin. Great distances and obstacles to travel separate territories in the High Mountains from one another, and these territories are connected more to proximate lowland regions than to one another. In the west, Baluch and Pashtu mountain societies live in corridors between Iran, Afghanistan, the Indus basin, and Punjab. Kathmandu is at cross-roads of South Asia and Tibet. Assam is not only intensely engaged in the history of Northern Basins, but also participates in the history of Southeast Asia and China.

Except in Bhutan, all High Mountain societies live under the authority of elites in valleys below, but rebellions today in Nepal, Nagaland, Mizoram, Baluchistan, Kashmir, and Chittagong Hill Tracts indicate struggles for political autonomy. Across the high mountains, from Yusufsai borderlands with Afghanistan to the Chittagong Hill Tracts, cultural oppositions between peoples of the hills and lowlands are typically stark. The term “tribe” is most often applied in modern times to the smaller scale social formations that thrive in the small, relatively isolated agrarian spaces of the High Mountains.

4.5.3 Western Plains

Semi-arid Western Plains run into High Mountains in the west and merge gradually with Northern River basins (in Haryana) and Central Mountains (in Malwa and Gujarat). They form a connective zone for long-term historical movements of people in every direction. Rainfall is very low, and spatially, the plains are dominated by the Thar Desert. In prehistoric times, the river Saraswati ran deep into western Rajasthan before it ran west into its inland delta near the Indus; and Rajasthan, the Indus basin, and Sindh seem to have become increasingly dry over millennia. There is indirect evidence that Rajasthan dried up noticeably in medieval centuries. The scrub-covered, rocky, and scattered Aravalli hills rise abruptly from flatlands in the east, providing fortress material and drainage for adjacent valleys. Irrigation, mostly from wells, and good monsoons are more common in the east, where they create good rich farmland for bajra, maize, wheat, jowar and cotton cultivation. Soil becomes increasingly sandy to the west; and in the south, grey-brown sandy soil becomes

good red loam, creating a naturally favoured zone for farming that runs along a corridor from Haryana through Jaipur and Ajmer into Gujarat.

As in all arid regions, people and animals have always travelled this landscape in search of water and wealth, and agrarian life here has always featured mobility, nomadism, pastoralism, stock rearing, and migration for trade and conquest. Medieval warriors and merchants – most famously, Rajputs and Marwaris – moved from old centres to acquire more wealth in regions of better farming in the east, north, and south. Dense population centres in the western plains are based on locally irrigated farms, strategic locations on trade routes, and extensions of political power embracing numerous similar centres across expanses of sparsely populated land. Trade connections to bordering regions on all sides and to sea-lanes are critical for economic vitality. Like the camel – its characteristic pack animal – this land has always had a tendency to wander uncontrollably into its surroundings, making its boundaries vague.

4.5.4 Central Mountains

This landscape of interlacing mountains, valleys, rivers, plateaux, and plains extends from Gujarat in the west, along the rim of the Gangetic Plain in the north, to Chhotanagpur in the north-east, to the Deccan plateau in the south, and to the edges of the Godavari River basin in the south-east. Its territories have formed amidst an interlaced complex of river basins that run in every direction to feed all rivers north of the Krishna and east of the Indus. The Chambal, Parvati, Betwa, and Ken run north from the Malwa Plateau and Bundelkhand into the Yamuna; their valleys form historic highways into the Gangetic Plain. The Vindhya and Satpura Ranges form the valley of the Narmada, which like the Tapti, drains west into the Gulf of Cambay. The Mahi drains Malwa into the Gulf, arching north and then running south. East of Malwa and Bundelkhand, in Baghelkhand, waters from the Maikala, Mahadeo, and Ramgarh mountains send the river Son north-east into the Ganga; they send the Narmada west, the Mahanadi east through Chhattisgarh into Orissa and the Bay of Bengal, and the Wainganga south into the Godavari. East of Baghelkhand, the Ranchi and Hazaribagh plateaux dump the Damodar River into the Hooghly and send the Subarnarekha straight into the Bay of Bengal. Ringed by mountains, Chhattisgarh forms a bowl-shaped radial drainage basin, from which the Mahanadi flows east into the Bay of Bengal. South of Chhattisgarh lie the dense hills of Bastar and inland Orissa, from which the Indravati drains into the Godavari.

Like the High Mountains and Northern Basins, which it parallels geographically, the Central Mountains are dry in the west and wet in the east. In the west, the barren scrublands of the Chambal ravines carry torrents of mud in the monsoon and then bake hard in the summer heat. In the east and south, tropical forests cover Jharkhand, Orissa, and Bastar. Like the High Mountains, too, this landscape is dominated by intersections of mountains and valleys, forests and lowlands, and their respective societies. Farms have been cut historically into the forest to foment interactive struggles within and among communities of farmers, hunters, and pastoralists. Shifting cultivation and tribal populations are prominent; and India's largest tribal groups live here, the Bhils (in the west), Gonds (in the central regions), and Santals (in the east). 1981 census figures show that all the groups of Bhils totalled 7,367,973 in southern Rajasthan, western Madhya Pradesh, Gujarat, and northern Maharashtra; the many Gond groups added up to 7,388,463, spread over seven states but with 5,349,883 in Madhya Pradesh; and Santal groups comprised 4,260,842 people in Bihar, West Bengal, Orissa, and Tripura.

More than in the High Mountains – because of better soils, wider valleys, longer summers, and constant invasions by agrarian powers on all sides – the trend in land-use and social power here has strongly favoured the hegemony of lowland farming communities and the expansion of more intensive farming regimes among hill people. Farms today show great variety in techniques and options, ranging from irrigated wheat farms in the Narmada and upper Chambal valleys to rice mono-cropping in Chhattisgarh, to shifting cultivation in Bastar, and to mixed forestry and millet farming in Baghelkhand. This variety parallels the variety of social formations, which combine tribal and caste elements more widely than elsewhere. Intensive farming is most dominant where soil, water, and states favoured a few extensively controlled, homogenised tracts – in the Narmada valley (which benefits from deposits of black cotton soil), the upper Chambal valley, the Waiganga valley (Gondwana), and Chhattisgarh. Khandesh and Berar participate in the history of the central mountains but also in that of the interior peninsula.

4.5.5 The Interior Peninsula

This semi-arid landscape consists of river basins and interfluvial plains; its agricultural character derives from lines of drainage, seams of good soil, and underground water in the rocky substrate of the Deccan trap. Geologically, these features come from volcanoes that left behind caverns of underground rock, boulders on the land, and black soil under foot. In the south-east, rocky outcrops become the Nallamalai, Eastern Ghats, Javadi, Shevaroy, and Pachaimalai Hills, which mark the descent of the peninsula into the eastern coastal plain. Framed by the Eastern Ghats, south of the Godavari, by the Western Ghats, on the west, and by central mountains, in north-east, the interior peninsula landscape touches the western plains in Gujarat, where Saurashtra forms the north-western corner of the Deccan Trap.

South of the Tapti and Narmada, all big rivers of the peninsula drain the Western Ghats and run most of their distance across predominantly dry, flat plateaux, sloping from west to east on the NW-SE bias of the Krishna-Godavari system. Fertile black soils run in wide seams along the Narmada basin, the upper Godavari, and the Krishna and its tributaries, Bhima and Tungabhadra. Outside the black soil tracts, the northern Deccan soil is predominantly medium black; and the southern soils in Karnataka and upland Tamil Nadu mix red with patches of black. All these soils are quite fertile when water is sufficient – which it usually is not – and the blacker the soil is, the more it can produce good crops with meagre moisture.

Getting enough water is the main problem for farmers, because most land lies in the rain shadow of the Western Ghats, and everywhere, monsoons are fickle. Historically, intensive agriculture has expanded outward from small regions favoured by river water and good soil. South Asia's east-west rainfall gradient here runs the north-west to south-east. In the north-west Maharashtra Deccan, wells provide most irrigation, even today, despite the spread of large river dams and canals. On the Karnataka plateau and around Hyderabad and Warangal, tank irrigation is more important, and becomes more so as we move further south-east. The gradual increase in drainage availability from north-west to south-east has allowed a parallel increase in irrigated acreage, multiple cropping, and population density; but a major hole in this overlapping set of gradations lies in the North Deccan interior and Pennar-Krishna interfluvium (Anantapur,

Bellary, Kurnool, Adoni, Raichur, Bijapur), where numerous tanks have long supported meagre irrigation and low population densities. There is indirect evidence of increasing desiccation in the driest parts of peninsula since the nineteenth century.

Agriculture has expanded over centuries into three forest types that distinguish the peninsula from Punjab, Rajasthan, and Gujarat. Originally, dry tropical forest of deciduous trees covered the flatlands, where only scrubby savannah remains. Monsoon forests that lost their leaves in the dry season once covered high plateaux and Eastern Ghats, which were once full of teak, most now gone. Evergreen rain forest originally covered the Western Ghats, and some remains. Into each forest type, farms pushed over the centuries, and overall, the peninsula's north-west-south-east gradient organised the geographical diversity of agro-technological milieus. Pastoralism and long-fallow millet cultivation dominated the driest parts, especially north and west, into the nineteenth century. Shortening fallow and well irrigation enabled more intense dry farming to take over where rainfall, technology, and water table allow. Rainfall and drainage have long made wet paddy cultivation more prominent in the south. Variegated soil and water conditions create various cropping regions, in which, millets, cotton, and oilseeds predominate, with patches of intensive well cultivation and irrigated paddy (especially in the south), and expanses of animal raising and pastoralism, especially in the north.

4.5.6 Coastal Plains

This composite landscape along the seacoast is formed of river valleys, plains, and deltas with adjacent interfluvial flatlands; and everywhere, it includes adjacent uplands and mountain sides, though dominated agriculturally by riverine plains, alluvial soils, and paddy fields. Its mountain border (on the west coast) and proximity (in the east) to tropical depressions that form the winter monsoon in the Bay of Bengal, bring it much more rain than the interior peninsula. On the whole, it is more tropical in appearance, even its driest parts, along the Tamil and Andhra coast. It is a borderland with the ocean, and thus includes a fishery ecology and social life along the beach that is an integral part of its history, as are coastal sea trade and connections to coasts everywhere in the Indian Ocean, Bay of Bengal, and Arabian Sea.

Some of its territories are relatively isolated from inland corridors – Chittagong, Orissa, parts of Kerala, and above all, Sri Lanka – and coastal regions communicate most intensively by sea, often more so with one another than by land with adjacent inland territories. The Tamil and Kerala coast are part of a cultural space that also embraces coastal Sri Lanka, and the cultural traffic between the South Asian littoral and Southeast Asia is constant and very influential over the centuries. Bengal's most prominent connections have always been run along waterways to Orissa, Assam, and Bihar. Migrations are common among these coastal regions, which logically have similarities in diet, featuring more fish, and in occupations, with more fishing communities and water transportation. Rice is the dominant food grain everywhere on this watery landscape.

4.6 LINES OF COMMUNICATION

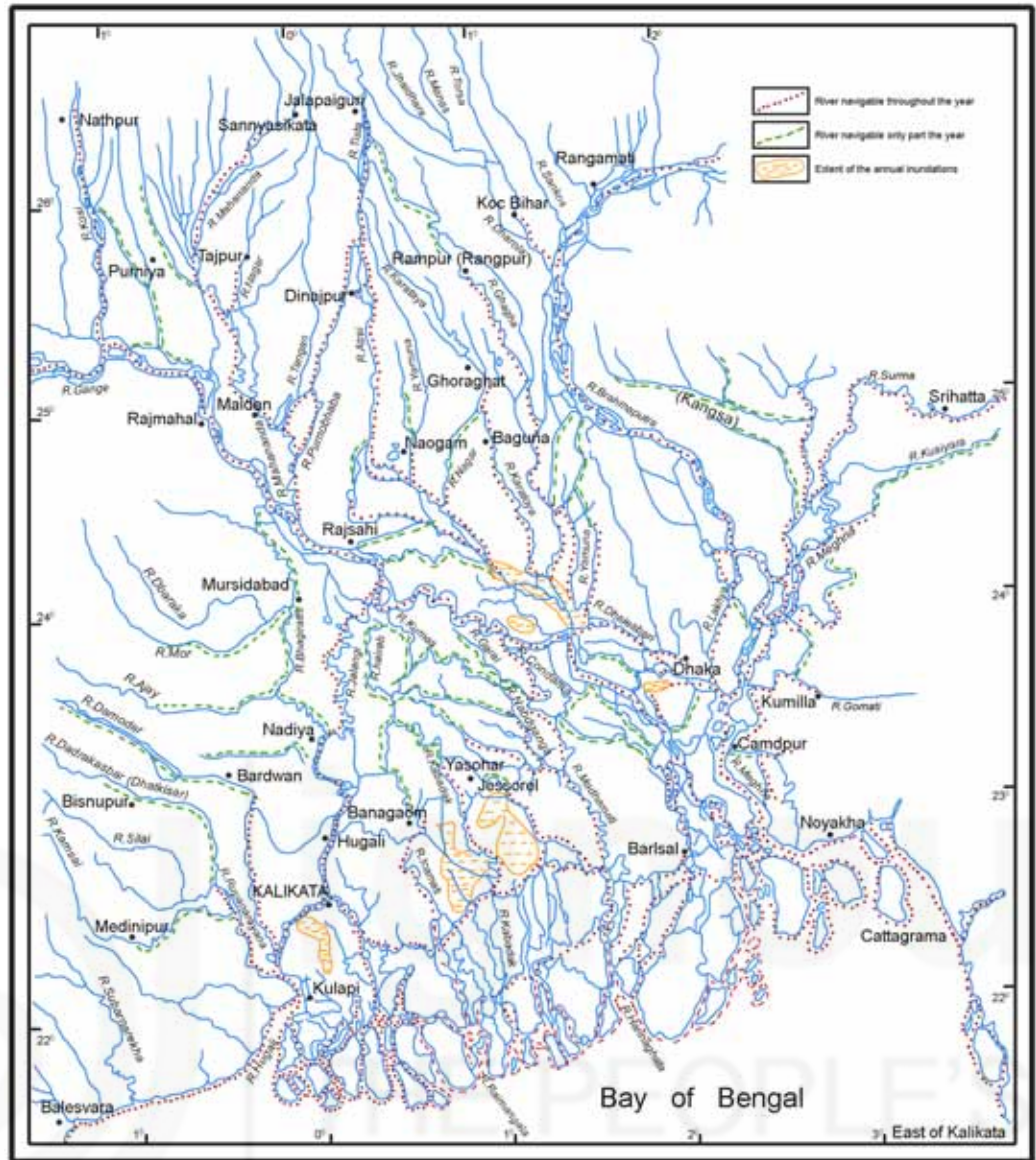
One zone of mobility defines South Asia overland inside inland southern Asia. This zone includes two broad corridors: one connects the Ganga-Brahmaputra delta in the east with Iran and the Palestine in the west; the other runs north-

south from central Asia into central India and the southern peninsula. These corridors intersect in two strategic regions: Kabul, Herat, and Mashad lie astride corridors that connect south, central, and west Asia; Delhi, Ajmer, and Bhopal lie astride the intersecting corridors that connect Kabul, Bengal, and Gujarat with the Deccan and southern peninsula. Though mountains are often seen as natural boundaries to mobility – most prominently, the Himalayas and Vindhyas – they do not so much obstruct as channel the movement of elements that influence agrarian history. Travels across Nepal to and from the Gangetic plain have always been less prominent than along routes running through Kashmir; and overland treks from Assam into China are fewer still. But to the west and north-west, barriers to mobility across the Hindu Kush, Iran, Central Asia, China have been erected mostly by military force – by Mauryans against the Indo-Greeks, Turks and Afghans against the Mongols, and British against the Russians. In the east, dense tropical jungles have restricted transportation over the high mountains, but in the west, battle lines have been more effective determinants than transport costs along the inland corridors of southern Asia. (For details see Unit 8, Maps 3, 4, & 5)

A second zone of mobility defines South Asia in the Indian Ocean. The sea is not a barrier but a watery terrain of low transportation costs. It creates a historical geography of shorelines that run from East Africa and the Red Sea to Southeast Asia and China. Over the centuries, technological change dramatically lowered transport costs. Long distance and bulk transportation were always cheaper, safer, and quicker, until the railways; and in Roman times, waterways connected South Asia with the Mediterranean and South China. In the day of Delhi Sultans, sea routes spanned Eurasia. By Akbar's time, they crossed the Atlantic and Pacific to connect coastal regions around the world. Coastal South Asia spread north along waterways in Bengal past Dhaka and west up the Ganga as far as Patna, as the Ganga also formed a highway inland up to Agra, along which flowed the Mughal revenue. Along the coastal shore lands, boats could land anywhere, moving with monsoon wind. Waterways formed open zones of interaction all along the coast, but some inland areas were much better connected to sea than others. From the mouth of the Indus to the Konkan, and from Kanya Kumari to Chittagong, the inland areas are more accessible to the sea, but Afghanistan, Kashmir, and Nepal are very distant. The coast of Myanmar-Malaysia is cut off by mountain forest and jungle from the inland corridors of southern Asia. The coastal regions of Orissa and Kerala are also relatively isolated by mountain forests from the inland corridors. (For communication network see Unit 24)

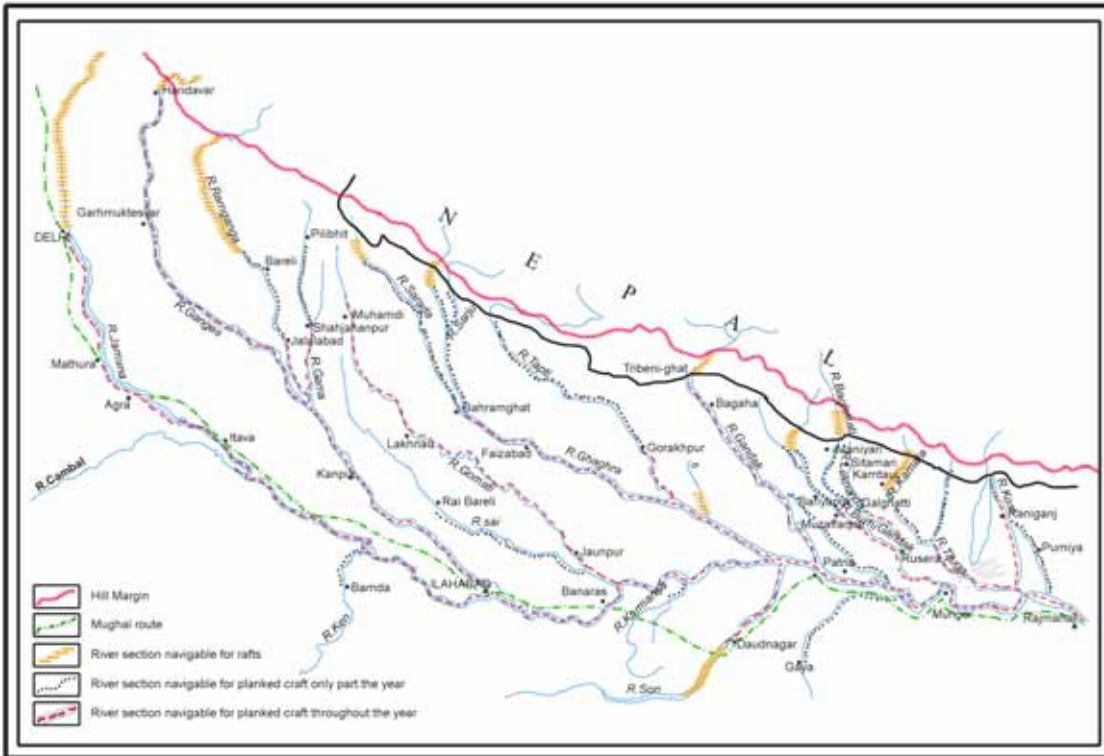
Fluvial Routes

Prior to the introduction of railways in India river transport occupied an important place in the communication network of India. The water transport was not only cheaper and faster as compared to land, but transporting bulky goods was made easy in the absence of modern means of communication in the past. To construct the Konark temple stones were queried and brought through fluvial route to Orissa from as far as Nilgiri Hills. Firuz Shah Tughluq (AD 1351-88) got Ashokan pillar transported to Delhi (installed at Firuz Shah Kotla, New Delhi) from village Navera near Khizrabad via Yamuna on boats. The rivers of the plains were fordable and navigable all the year round. It made possible to use them effectively for transportation.

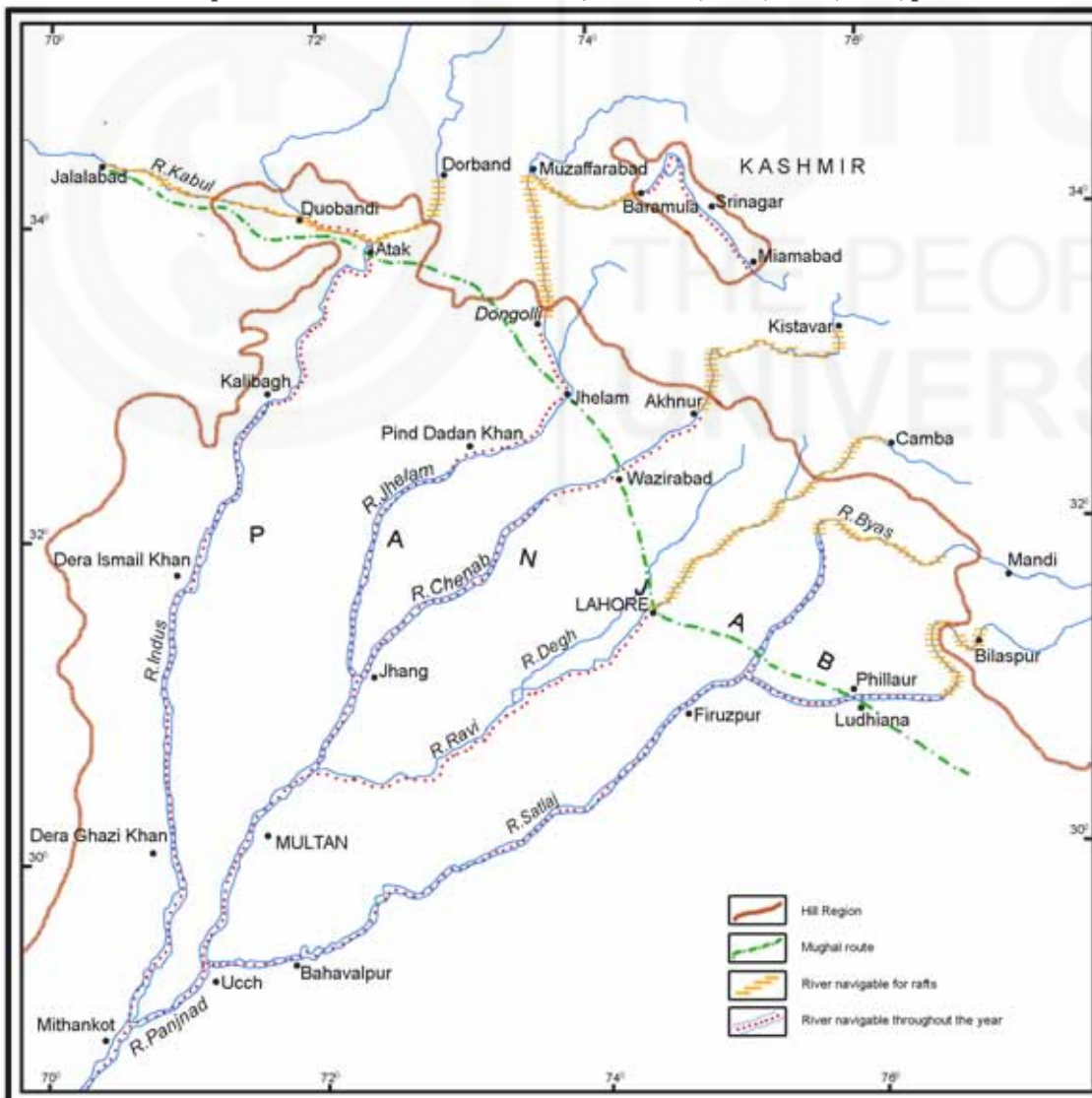


River Navigation in Bengal. After Deloche, Jean (trs. from French by James Walker), *Transport and Communications in India*, Volume 2, OUP, Delhi, 1994, p.25.

Indus and Ganga rivers are used for transportation from the earliest times. 'Bengal's fluvial ramifications, comments Jean Deloche, constitute perhaps the world's most complete and convenient inland navigation....Bengal, therefore benefits from an exceptional navigational network.' James Rennell's, (first Surveyor General who explored the river systems of Bengal during 1767 to 1776) survey of Bengal's riparian tracts is perhaps the most comprehensive study. Two major deltaic regions – Ganga and Brahmaputra – flank Bengal. 'The Ganges and Burrampooter rivers, together with their numerous branches and adjuncts, intersects the country of Bengal..., as to form the most complete and easy inland navigation.' ...'Nor will it be wondered at, when it is known, that all the salt and a large portion of the food consumed by ten millions people are conveyed by water within the kingdom of Bengal and its dependencies.' (see Map for navigational network of Bengal)

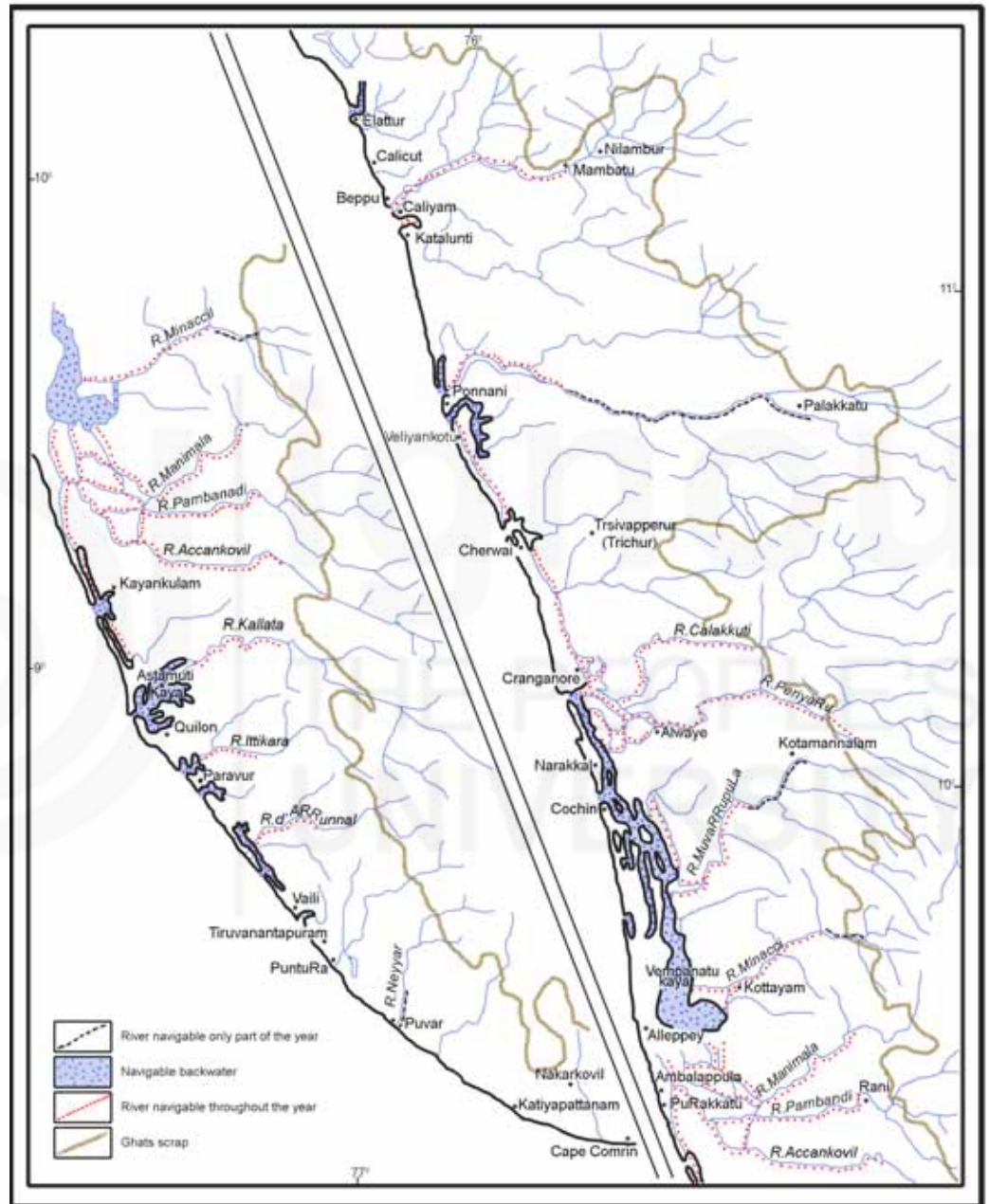


River Navigation: Ganga and its Tributaries. After Deloche, Jean (trs. from French by James Walker), *Transport and Communications in India*, Volume 2, OUP, Delhi, 1994, p.20.



River Navigation: North-West. After Deloche, Jean (trs. from French by James Walker), *Transport and Communications in India*, Volume 2, OUP, Delhi, 1994, p.16.

However, the peninsular India does not possess the same advantage. Courses of Narmada and Tapti were traversed by 'large tracts of basalt rocks'. Similarly, Krishna and Kaveri are at many points obstructed by granite rocks of Deccan plateau. Godavari passing through thick forests of Gondvana region; Krishna and Kaveri on account of their turbulent nature largely remained unfit for navigation. Nonetheless, boatmen did utilised Mahanadi for transportation. From Chhattisgarh plains upto the eastern coast, before it finally submerges into the Bay of Bengal the river is fordable. Bulky goods, particularly grains from the hinterland were transported to Orissa and boats returned with salt and other coastal manufactures to the hinterland.



Navigation Network: Kerala and the West Coast. After Deloche, Jean (trs. from French by James Walker), *Transport and Communications in India*, Volume 2, OUP, Delhi, 1994, p.88.

In the coastal region, however, Kerala is gifted, for, here the water channels form lagoons and are available for navigation for almost 300 kilometres. (compare coastal navigation of Kerala region to that of Bengal).

4.7 SUMMARY

Agricultural landscapes emerge over long periods of time from farming activity that conditions the natural world of human aesthetics. Agrarian history unfolds in the seasons of everyday life in agricultural societies. Seasons connect farming time to natural time and divinity. The physical quality of seasons in South Asia form a huge transition zone between the aridity of Southwest Asia and the humidity of Southeast Asia. Seasons and monsoons not only determined the agricultural map of the subcontinent, it steered in the past, to a large extent, the trading activities of the region. With the discovery of monsoon Indo-Roman trade increased greatly. Along the rivers, not only flourished the earliest and the greatest Indian civilisation – the Indus valley civilisation – but also there emerged a number of towns and cities. Rivers occupied a ‘key’ position in communication and transportation of goods all through the pre-railway era.

4.8 EXERCISES

- 1) Locate the monsoon and rainfall pattern on a map. Analyse the relationship between seasons and economy.
- 2) To what extent geographical regions determined the agricultural map of India.
- 3) Discuss the factors that determined the agrarian environment of Indian subcontinent.
- 4) Punjab presents a curious contrast lying between heavy rainfall and extreme arid zones. In what respect it affected the agricultural map of the region?
- 5) ‘High mountain zones were relatively isolated agrarian spaces.’ Comment.
- 6) Analyse the importance of travel and migration in the arid regions.
- 7) Examine the factors influencing the migration pattern in the coastal regions.
- 8) Compare the river systems of the northern plains with peninsular rivers.
- 9) Examine the importance of navigational and fordable rivers for communication and transportation.

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M.A. History

List of Courses

Course Code.	Title of the Course	Credits
MHI-01	Ancient and Medieval Societies	8
MHI-02	Modern World	8
MHI-03	Historiography	8
MHI-04	Political Structures in India	8
MHI-05	History of Indian Economy	8
MHI-06	Evolution of Social Structures in India Through the Ages	8
MHI-07	Religious Thought and Belief in India	8
MHI-08	History of Ecology and Environment: India	8

MHI-05 History of Indian Economy

Block-wise Course Structure

- Block-1** : Historiography, Environment and Economy
- Block 2** : Emergence and Structure of Complex Economy
- Block 3** : Early Medieval Economy and its Continuities
- Block 4** : Expansion and Growth of Medieval Economy-1
- Block 5** : Expansion and Growth of Medieval Economy-2
- Block 6** : Trade and Markets
- Block 7** : The Rural Economy
- Block 8** : Craft Production, Technological Change and Industrialisation