Evolution of Human Settlements- AR6004
Unit 1
Importance of Evolution of Human Settlements
Lecture 2

Natural and Man-Made Determinants

If you look at determinant settlements. You have two kinds; Natural Determinants and Man-made determinants. Natural is topography i.e. location, climate, natural resources like water or any minerals, building materials and technology. Man-made determinants; trade, political power, religion, defence, mobility i.e. transportation, ethical issues etc. If you look at topography, it is one of the most important natural determinants since the time and memorial which actually influenced the settlement patterns and human settlements. You have features like mountains, hills, plains, valleys and deserts. The topography of an area was important for an early human settlement because initially you had hunters which meant it had to be densely populated forest. Then once agriculture came into being, it had to be flat open areas such as plains and valleys. Then you needed large flat spaces which were required by farmers to plant crops. The rich soil in coastal plains and river valleys were excellent for such crops. Mountains initially were considered to be less friendly because they were at a higher region, you would have to climb up, steep mountains were hard to cross. But later on, it was even proving to be useful in terms of keeping enemies away. Deserts were also discrete settlements for the lack of water, they were very hot and dry. The intense heat, the lack of water, made travel in these deserts very difficult.

Relief, if you look at relief you have the area that needed to be high enough to be safe from flooding but low enough to be sheltered from strong winds. This is the acropolis which literally means the high city, which is the origin of the Athens city we know of today. Standing high above the hill in the centre of Athens, it is almost visible from anywhere around the surrounding areas.

Climate is the next important natural determinant, which is closely linked to topography. Plains were preferred because the climate was moderate, neither too cold nor too hot. Later settlers in mountain ranges chose that for other reason like

topography for natural defence and safety and availability of food. In the mountains of course, the climate was more erratic, cool to very cold.

Natural Resources, natural physical features like rivers, lakes, inland seas, were good sources of fresh water. Water was very important for many reasons. You needed fresh water for drinking, cleaning, animals, animals would also come where water was, people also caught fish from rivers, lakes, they hunted water birds and in addition, most importantly, farmers required water for irrigating their crops. A river's natural flooding, could help irrigate their farms. Farmers could also dig canals or trenches to direct river water to their crops. For example, the farmers in Mesopotamia dug canals for this purpose and this is the first example we have in history for canals that have been made for irrigation purposes only. Water was also later on used for transportation, cities and towns often use rivers as highways. People travelled in boats to visit relatives and trade goods. Towns near the sea could trade well with countries far away.

Soil; deep fertile soil made it easier to farm crops and rear animals. A source of timber or rock, natural resources was very important for building. Wood was required as a fuel for heating and cooking. Defence, a hilltop or the inside of a river meander, would provide protection from attackers. This is an example of Durham and the River Wear. It is at this point, you can see how the river actually gives natural protection and the entire town can be accessed by bridges that were built only later on. It is at this point, River Wear makes a remarkable curve and almost isolates the central part of the city, in which you have the main castle and cathedral. This site was mainly chosen for this natural defensive qualities. Usually topography, climate, natural resources, all went hand in hand to create a suitable environment for a settlement pattern.

Ancient Towns in India

We will be finally going to discuss the Ancient towns in India. In this topic, we will cover; Mohenjodaro, Harappa which constitute the Indus Valley Civilization. We will be looking into; Chanakya's Arthasastra; regional concepts and the main eight town planning concepts stated by the Manasara Vastu Shastra. Then, finally we will look into the planning concepts behind Fatehpur Sikri, Shahjahanabad, Jaipur and Delhi.

If you look at the Indus Valley Civilization, this has been discussed many a times and can never be missed out, when we talk about town planning or evolution of human settlements because we have learnt so much from them, sophisticated and advanced urban culture at that point of time. Streets in perfect Grid patterns in both Mohenjodaro and Harappa. The evidence for the world's first sanitation system. Individual wells and separate covered drains along the streets for waste water. So, there is evidence for both drinking water as well as waste sewage water as well. Houses opened to inner courtyards and smaller lanes were ensured with good lighting and ventilation and security as well. Impressive Dockyards, Granaries, Warehouses, Brick Platforms and protective walls. Massive Citadels protected the city from floods and attackers. City dwellers; traders and artisans. All the houses had access to water and drainage facilities. So, there is actually no evidence of any class system or different types of houses for any kind of people. How did the development of a city, actually take place? Cities grew out of earlier villages that existed in the same locality anywhere greater than a hundred years. They grew in size and density and were surrounded by numerous towns and villages. Cities interlinked by trade, economic activities, religious beliefs and social relations etc. Vast Agricultural lands, rivers, forests by pastoral communities, fishermen folk and hunters surrounded each city. So, every city developed, a kind of rural background was also there, surrounding the city, which actually supported the agricultural purposes, the fishermen and the hunters, which actually made sure that the city was protected from the so called beasts and wild animals that existed in the forest. You have classification of towns, you can see the size and towns, the population in those parts. Small villages were anywhere from 0 - 10 hectares, Large towns = 10 - 50 hectares, Cities were greater than 50 hectares. So, if you look at the main cities, you can see; besides Rehman Dheri, Dholavira was a city, Rakhigarhi was a city, Ganweriwala was a city, Harappa and Mohenjodaro were considered the most major cities because of the largest in population as well as in size, with respect to hectares. This is the plan of Mohenjodaro which you can see from the excavation side. There was no necessity for fortification. Major streets are in the north south direction. North being this direction, intersecting at right angles you can see, there is nothing circular or curvilinear, everything is straight at 90 degrees, streets were built within the built up areas i.e within these houses that are more narrow, which made it safer and more pedestrian friendly and more useful for people living in that

area. Distinct zoning for different groups. The groups did not exist because of class but solely on occupation. The type of houses did not change, the size of houses did not change and the very fact that all the houses had accessibility to drinking water and sewage system, is evident that there is no classification. The settlement divisions if you look at, you have the great bath and granary around here, college the institutional building and cultural buildings, all surrounded by western and northern parts. This was considered to be agriculture and industries and in the south you have the, assembly hall, tower which mainly consisted of the administration, trade and commerce. If you look at Harappa now, which had a population of 23,000 over 150 hectares and the earliest city may have been formed during this phase in 2500 - 2800 B.C. It became the centre for trade networks, extending from Baluchistan and Afghanistan to the west of the seacoast in the south. The towns built over, raised mud brick platforms which actually show evidence of flooding situations over there. To avoid flooding into the town, the entire city or town was built on top of a platform. If you go into the details of town planning in Harappa, a Citadel mound and lower tower town surrounded by a Massive Brick Wall. The Citadel has square towers and Bastions. Large open areas and the side gateway have been used as a market or a check point for taxing goods coming into the city. Outside the city walls, you have a cluster of houses which represent temporary rest stops for travellers and caravans. No division of society is reflected in the layout of the society since large public buildings, market areas, large and small houses as well as craft workshops are found in the same neighbourhood. Barrack like group of single roomed tenements were for the poorer classes. When you say poorer classes, it was only meant for their occupation, in terms of facilities with respect to water and drainage there was not any changes. If you look at the basic town planning, you had single room tenements and houses with courtyards, two of them, houses with rooms on three sides, opening into a central courtyard. Nearly all large houses had private wells. Hearths, which is basically nothing but used for cooking and heating up, common in all rooms. Bathrooms were there in actually every house with chutes leading to drainage channels. The first floor bathrooms are also built which is not heard of at that point of time in any civilization. Brick staircases provided access to the upper floors. Houses were built with a perimeter wall, adjacent houses were separated by a narrow space of land. Granary with areas for threshing grains. Burnt bricks were mainly used for drains, wells and bathrooms because these areas were exposed to

water. Sun dried bricks were used mainly for fillings and timber was used for flat roofs and for frames or for lacing of brickwork. This is the city planning images. You can see the image over here of the canals or the water channels that were made. You had separate ones for drainage, you had separate ones for water, drinking water. Here you have the narrow passages connecting the different houses, the entire town was built on a mound. You can see the quality of bricks and the single storey houses and some of them g + 1, had access to light and ventilation. This is the Mehrgarh Period : 7000 - 5500 B.C, you can see the layout over here, this is pre-Harappan with no use of pottery. You have a flood thatch, wooden nodes, doors, windows and a mud brick wall plastered with adobe. Now, we come onto Chanakya's Arthasastra and what it actually entails. Congested town should be freed of surplus population, which should then be housed in new places. Towns positioned to help each other. The Sangrahan collection register, Tax collector was meant for 10 villages - the Sarvathik was among 200, the Dronamukh or the chief was among 400 and the Sthaniya was among 800. The migrated people in a new settlement were exempted from payment of taxes for a few years. If you look at the planning with respect to Chanakya's Arthasastra, you actually had the main citadel here which consisted of the palace and the temples, around it you had the treasury, Gold smith or the tradesmen whom you have in the front. Then you have the priest and ministers for an area, traders, skilled workers and the Kshatriyas and then on top you have the cemeteries, forest goods and then you have the depressed class, what we refer to as the poorer class. The city is centralized located to facilitate trade and commerce. The city is usually near a perennial river body or a water body, so water is not an issue. Usually circular, rectangular or square in pattern as it suits the topography. Then you have separate areas for marketing of different goods. Six dandas high and 12 Dandas wide that was the kind of ratio that was used for planning of towns. Three moats of 14 feet, 12 feet and 10 feet wide and depth about 3/4th of the width and 3 East west and 3 north south roads should divide the town. So, these were the kind of rules and regulations meant among the Chanakya's Arthasastra and you should have one well for every 10 houses. These kind of rules and regulations ensured that there isn't overcrowding and if people were there, they did not have problem for water, they lived. Even though there was a class system that emerged, this town planning did enable the caste system. It actually suitably made sure that every had access to all the facilities that were required.

Ancient Town Classification

Now, we come onto the classification of towns. How are Ancient towns classified?

You had; Dandaka, Sarvatobhadra, Nandyavarta, Padmaka, Swastika, Prastara, Karmuka and Chaturmukha, we will discuss these in detail now. You have Dandaka over here, you can see this is the layout for Dandaka town. Streets are straight and cross each other at right angles at the centre. It has four gates or entrances. Width of the street varies from one - five Danda. You have 2 transverse streets, one and two, extremities with a single row of houses. Then the village offices are located to the East, the female deity, the Kamadevatha was located outside the village and the male deities in the northern portion, within the village. Sarvatobhadra; this type of town plan is applicable to larger villages and towns, which have to be constructed on a square site preferably. According to this plan, the whole town should be occupied only by houses of various descriptions and inhabited by all classes of people and then around the houses, you have the shops, the trades people, around the houses. The temple dominates the village, which usually exists right outside the village. Next, we have Nandyavarta, this can be used for the construction of towns and not for villages, it is adopted for the sites either that are circular or square in shape and nearly a scale, we are talking about 3000 - 4000 houses. The streets run parallel to the central adjoining streets with the temple or the presiding deity in the centre if it is a circular plan. Nandyavarta is the name of a flower and the form which followed is the layout of the flower as well. Padmaka; this type of plan was practiced for building of towns with fortress all around it, on each protection. This actually ends up being the fortification. This resembles the petals of a lotus, radiating outwards from the center. The city is used to be practically an island, surrounded either by water or having no scope for any sort of expanse. Swastika; this contemplates some diagonal streets as well, dividing the site into rectangular blocks. You have rectangular blocks as well. The site need not be marked out into a square or a rectangle, it can actually be of any shape. A rampart wall, that is again a fortification wall, it is very important and a moat also exists, which is usually filled with water. You have two main streets crossing each other at the centre, running south-north or east-west. Prastara; the characteristic feature of this plan is that the site may either rectangular or squarish, but it can never be circular or triangular. The sites are set apart for the poor, the middle class,

the rich and the higher rich classes depending upon the size of the houses. So, you have the high density smaller houses for the poorer people, one segment, then you have next group on income and you can see the least densely populated, the high income group having the bigger size houses and the biggest pocket of land for themselves. The main roads are much wider when compared to those other patterns. The town may or may not be surrounded by a fort. A fortification is not necessary but if it's there, it is alright. So, here the class system is completely pronounced, social system was completely pronounced. But all these plans when you see, the market area always surrounds these houses and in the center you usually find either a deity or a temple. With Prastara it exists outside the village, the village deity or the thing because there was a severe classification based on class. So everyone couldn't access the same temple, they would have temples outside the premises of the village. Karmuka; this plan is suitable for the place where the site of the town is in the form of a bow or a semi-circular or parabolic. This needn't exist on a plain, it could exist on a seashore, a river bank. So you will have a river or a water body over here. The main streets run from north, south, east, west and you could even have diagonal streets. The presiding deity, commonly a female deity is installed in any convenient place, usually at the centre, because all converging roads would meet at the centre point and then you would have the houses at every bay between different street points. Chaturmukha; this type of plan is applicable to all towns, you actually have the largest to the smallest, this layout is possible. This can either be rectangular or square; you can have four phases, that is what is important. The town is laid out, east to west lengthwise, with four main streets, four access points, and the temple of the presiding deity is always in the centre, houses again show that there was no major classification in terms of the size. You have the market area surrounding the houses; it could have fortification, though it is not necessary.