Conservation Geography
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Module – 1
Introduction to Conservation Geography
Lecture - 2
Geography and Conservation

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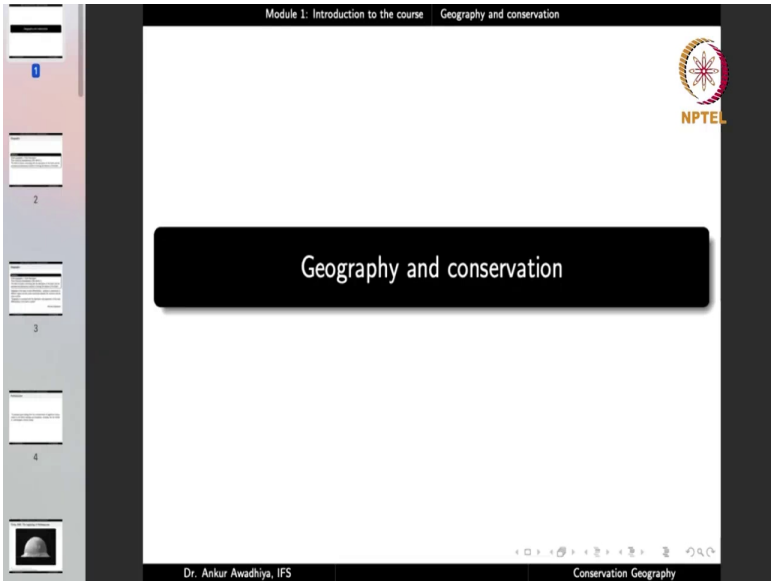

Namaste! We carry forward our discussion on the introduction to the course. And in this lecture we shall have a look at Geography and Conservation. In the last lecture, we observed that conservation means to keep something together and conservation has become very important, because we have now realized that our impacts on the various ecosystems on this planet have been a bit too much.

That is we have over exploited the resources, we have polluted nature, we have grown in our population to such a large extent that now we are causing a rampant loss of habitat, destruction of habitat and things like introductions of various invasive species which are wreaking havoc to the planet. Now, if we do not do something quickly then we will lose out on a large number of our ecosystems.

And with those gone, the ecosystem benefits that we received from them, things like protection of soil, protection of our water resources, the provisioning of clean air and water they will all be

gone. And so, now, it has become very important to conserve the resources, protect whatever is left, otherwise, we will lose them forever. Now, the question is how is Geography related to conservation and that is the topic of the current lecture, Geography and conservation.

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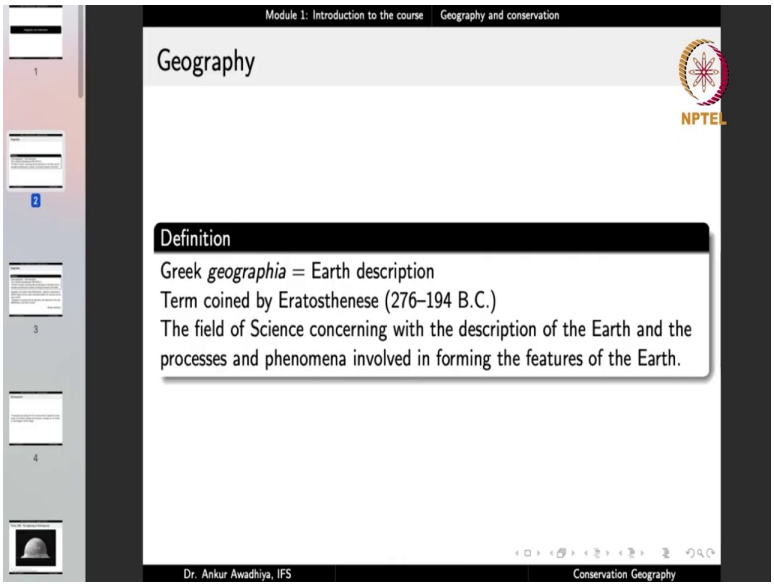

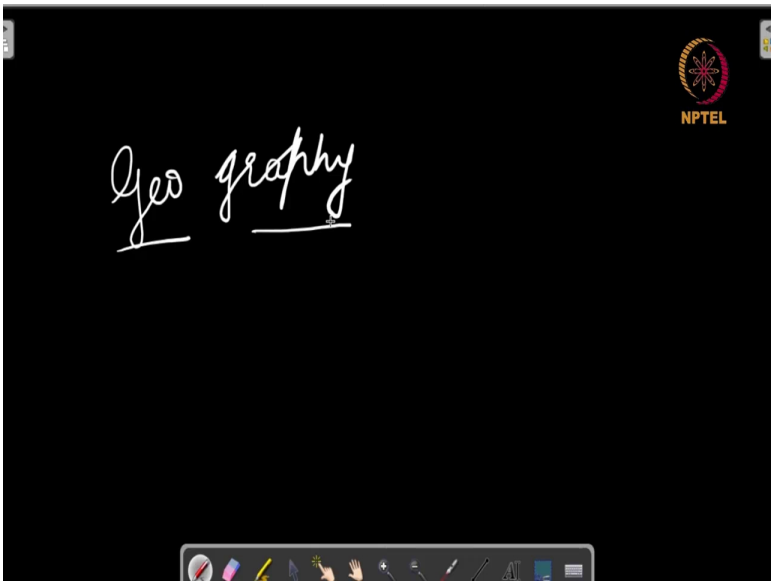

So, what is Geography mean? The word Geography has come from two word roots. So, when we write Geography, geo means Earth and graphy is to write. So, Geography is essentially the science of writing about the Earth or describing the earth. So, this is a science of Earth description. This term was coined by Eratosthenese, who lived between 276 and 194 B.C.

So, this is a very old term. And we can define it as the field of science concerning with description of the Earth and the processes and phenomena involved in forming the features on the Earth. That is, we are trying to describe Earth. When you describe earth you ask or you write things like there are mountains, here there are planes here, there are oceans here, there are rivers at such in such locations and so on.

But once you make that description, the next question that arises is why do we have rivers in these particular locations? Why do we have mountains in these particular locations? And what determines what would be the shape of the river? What determines what would be the sediment load in the river? So, once we begin describing different things, the next question is why do they arise in those particular locations?

What governs them? So, we not only describe the Earth, but we also describe the processes and phenomena that are involved in forming the features of the Earth. So, Geography or the science of Earth description is the field of science concerning with the description of the Earth and the processes and phenomena involved in forming the features of the Earth.

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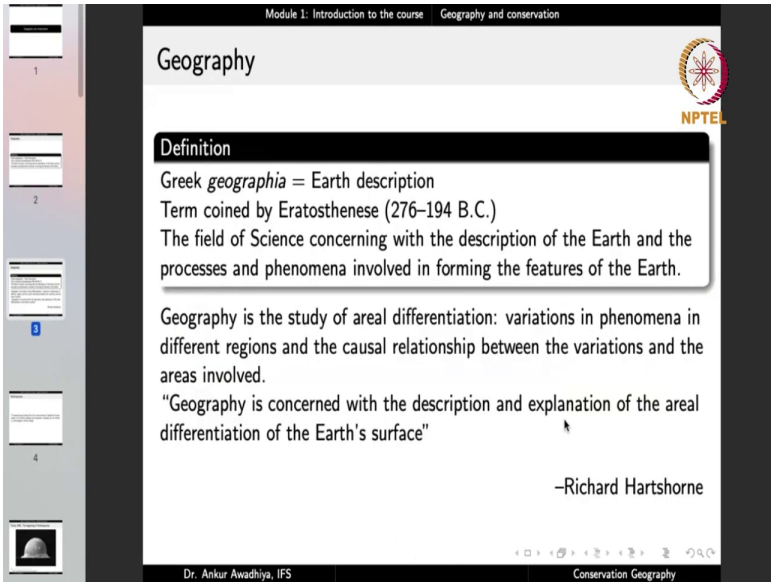

Now, we can also write it as Geography being the study of areal differentiation. That is, if we look over a large area, what are the different things that we find? So, when we are describing the Earth, when we are describing that we have mountains here and planes here, what are we doing.

We are just looking at a last sized area and we are looking at the different features that are present in those different locations.

So, we can write it as Geography being the study of areal differentiation, differentiation over an area or variations in phenomena in different regions and the causal relationship between the variations and the areas involved. So, this is just another way of saying that we are describing the different places on the Earth and we are describing the processes and phenomena that are involved.

So, this is just another way of putting the same thing that Geography is the study of areal differentiation. Richard Hartshorne also said that Geography is concerned with the description and explanation of areal differentiation of the Earth's surface. So, we are describing the areal differentiation and we are explaining why do we have a particular set of areal differentiation so that is Geography.

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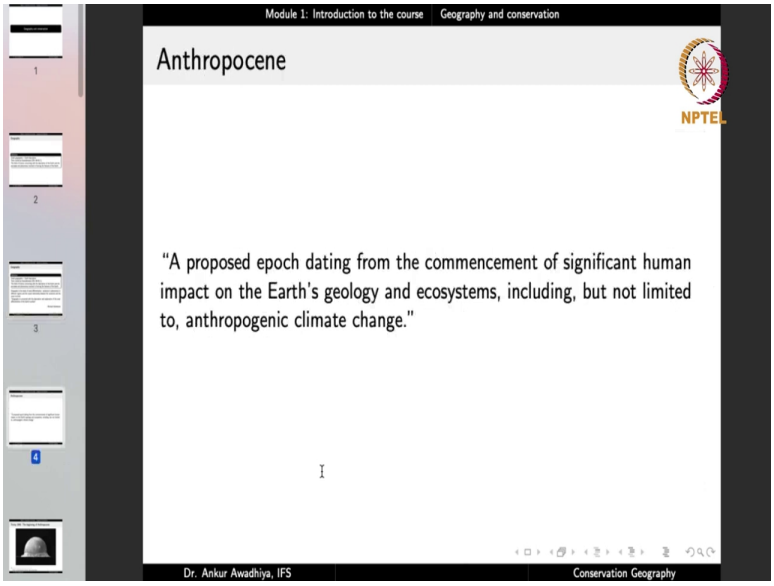

And Geography has become very important in the current geological time period of anthropocene. Now, anthropocene comes from the word anthropos, which means humans and cene is a period of time. So, this is a period of time that is dominated by humans. A proposed epoch dating from the commencement of significant human impact on the Earth's geology and ecosystems, including but not limited to anthropogenic climate change.

Meaning that, in the current geological time period of anthropocene, the humans or the anthropos are the dominant factors. They are regulating and they are impacting most of the processes on this planet, including processes such as the climate of this planet. So, when we talk about things like global warming or global climatic change, this is what we are talking about.

So, this is a proposed epoch dating from the commencement of significant human impact. Before anthropocene, we did not have a significant human impact, but now we say that there is a very high human impact on the Earth's geology and ecosystems.

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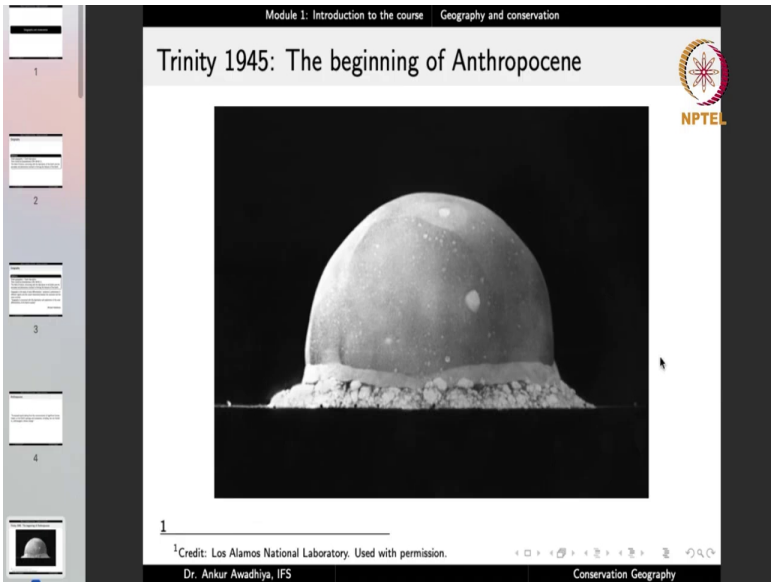

So, what kinds of human impacts, things like the detonation of atomic weapons. So, traditionally, we take the Trinity explosion of 1945 as the beginning of anthropocene, because we can divide all the time into the time of the nuclear age and the time before the nuclear or the atomic age and the atomic weapons are now taken to be a representation of the significant human impacts. So, from 1945 onwards, we say that this is the anthropocene time period.

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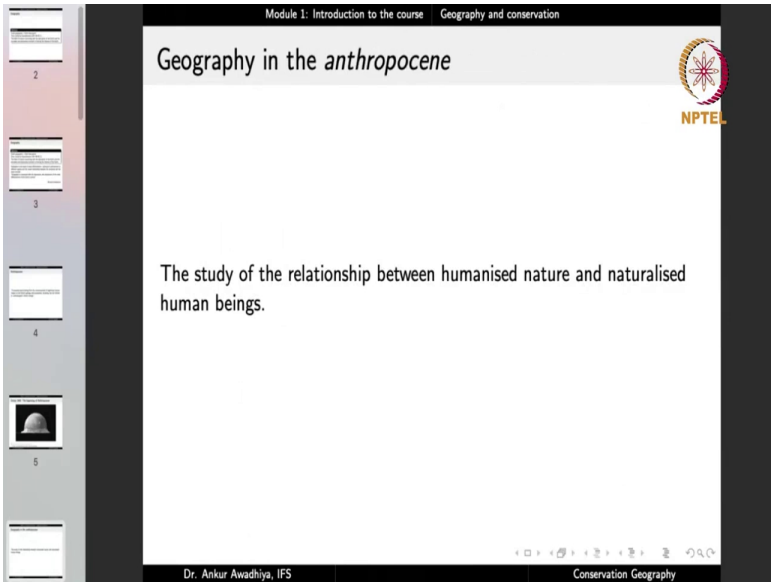

And in the anthropocene, we can write that Geography is the study of relationship between humanized nature and naturalized human beings. Why, because we have had so much of impact so high an impact that now nature is no longer a natural thing. It has become humanized. If you look around yourself, you will find that whether you are living in a town or whether you are living in a city or whether you are living in a village, you will find that the majority of the structures that you see around you are built by the humans.

Now, before, if you went somewhere, you would have observed things like hills or valleys or mountains or rivers, but now we are finding that there is a distinctive impact of human beings on all of these. So, if you go to a hill or a mountain, you will find that in a large number of areas, there will be mining or there will be roads, and for that we are cutting up the hills, we are cutting up the mountains.

If you look at a river, we will find that there will be huge damps that have been built on various rivers. If you look at the river banks, you will find that there is a regular extraction of minerals like sand from the riverbeds or from the river banks. So, anywhere you go or wherever you go, you will find that there is a huge impact of human beings.

And so, now the nature itself has become humanized. That is there is a large amount of impact of human beings on nature. So, nature is no longer the primitive natural nature that we had before

the anthropocene. And when we say that we are looking at the relationship between nature and humans, nature has become humanized and the humans have become a bit naturalized.

That is, if you look at different places, you will find that the costumes of human beings, the kinds of dresses that we wear, the kinds of houses that we build, the kinds of infrastructure that we build, are somewhat dependent on the kind of Geography that we have in those locations. So, for example, if the area is very cold, you will find that people are wearing very warm dresses. People are wearing things like fur or things like wool.

Whereas, if you go to warmer areas, you will find that people are wearing cotton. And so, there is an impact of nature on human beings, which means that human beings are also naturalized and nature has become more and more humanized. And Geography in the anthropocene concerns itself with the study of relationship between humanized nature and naturalized human beings.

So, we are looking at the relationship between humans and nature, because in the anthropocene, the impact of the humans is so large that we are the dominant forces on the nature. And so, when we have to study about Geography, a very big subtopic of Geography today concerns the various varied impacts of humans on different areas on the planet. And so, in the anthropocene Geography is the study of relationship between humanized nature and naturalized human beings.

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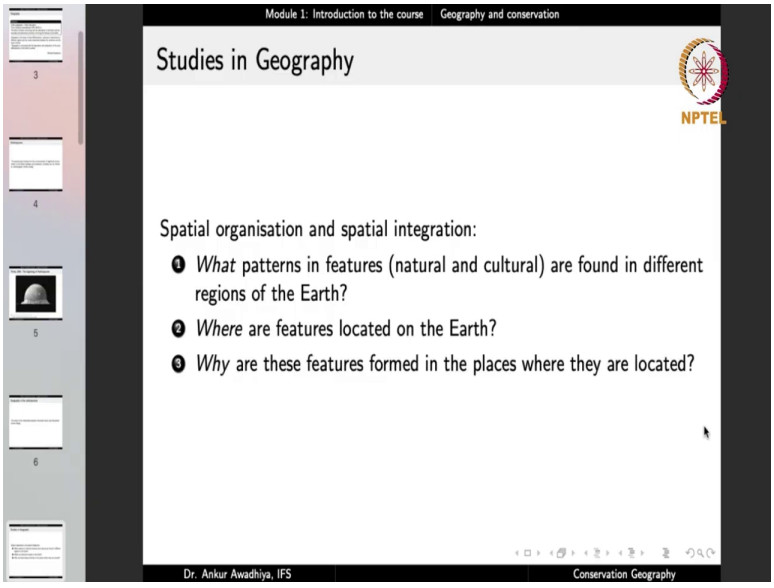

Now, when we do a study in Geography, we are trying to discern the spatial organization that is organization over the space or organization over a large area and we are trying to look at spatial integration, how different things are integrated over a large area. And in studying both of these, we asked these questions; what patterns in features natural and cultural are found in different regions of the Earth.

So, when we see that we are describing the Earth, Geography being the science of description of Earth, we are asking what are the different patterns that are found in different regions of the Earth? And these different patterns concern the natural patterns or the patterns in natural features and the patterns in the cultural features, and by cultural features we mean the humanized features.

So, we are asking what are the differences in different locations, not just in nature, because nature also has become humanized, but also in the human beings. So, in describing the Earth we are looking at various patterns in different areas. Now, once you have found out a pattern, the next question is where are features located on the Earth?

That is, suppose you are looking at our country India and you ask the question what are the various features in the naturalized landscape of various places in India. Now, in that case you will say that we have a mountain the Himalayas on the north, then to the south of the Himalayas, we have the northern plains which are very plain areas, then towards the south we have the plateau area, the Deccan plateau, we have the coasts on both the flanks and we have Thar desert.

Now, if you only look at these patterns, then the next question is we have Himalayas which are mountains, what are the other locations on Earth where you have such mountains? Or if you look at planes, the next question will be, where are the other locations where we have planes on this planet? So, the first thing was what patterns are found in different regions?

And once you have found out a pattern where are features located on the Earth, what are the other locations where do you find such similar features? And once you have found out both of these, the next question is why? Why are these features formed in the places where they are located? That is, if we have the Himalayas to the north of our country, why do we have the Himalayas in the north of the country?

So, you are asking these three questions; what is found? Where are things found? And why are they found where they are found? Now, in one of the later lectures, we will see that the Himalayas were found, were formed when the Indian plate moved and collided with the Eurasian plate. And in that case, there was a collision and because of collision of tectonic plates there was an uplift, and this uplift resulted in the formation of Himalayas.

So, we are looking at various features various phenomena and we are also looking at the causal factors of that particular features or phenomena. So, in Geography, we asked three questions, what is formed? Where is it formed? And why is it formed where it is formed? So, these are the kinds of studies that we do in Geography.

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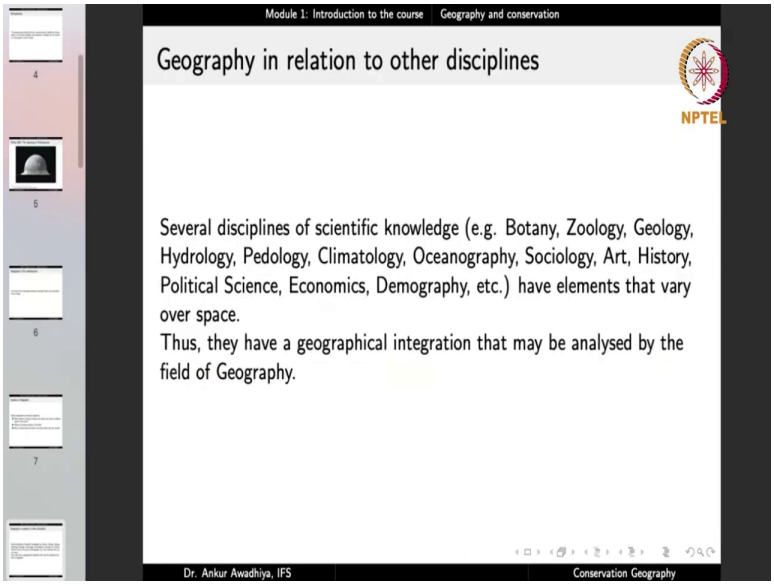

Now, when we look at features on the earth, we can find features that comprise several different disciplines. So, for example, we began by asking the question, what are the different kinds of landforms that are found in India, where we said that in the north we have the Himalayas, then the northern plains, then the Deccan plateau and so on. But you could also ask the question, what are the different kinds of vegetations that are found in India?

Now, in this case, we are looking at the areal distribution of various vegetations. So, we are asking the question, what vegetations are found in India. Now, in this case, if you look to the north of the country, you will find that the areas are very cold. And there you find things like alpine grasslands, you find things like alpine forests.

Then moving towards the lower areas or lower altitudes, you will find that we have, now the forests, we will have broadleaf forests or we will have the moist deciduous forests and the dry deciduous forests. Then in the desert areas, we will find this scrub forests. In the northern plains we will find different kinds of grasslands.

Now, here again you are asking the same thing, what vegetations are found in India. Then the next thing would be, if you find the alpine vegetation in the Himalayas, where are the other locations where they are found? Now, in that case, you will find that, we also find some amount of alpine kind of vegetation in the other high altitudes in our country and also in the world. So, where would give us the same kinds of answers?

And the third question is, why are they found there? And then we can see that, the coniferous trees are found in high altitudes, because this is an adaptation against snowfall, because if you have the leaves in the form of needles, then the snow is able to come down from the trees, the snow does not accumulate on top of the trees. And if the snow were to accumulate then the weight of the trees would increase on the top and the trees would break down.

So, to avoid the breakage of trees, we find coniferous trees in the cold areas. So, here again, we are asking the same thing; what is found? Where is it found? And why is it found where it is found? But now, we are looking at the differences in vegetation. Now, similarly, you could ask the question, what are the different animals that are found in different areas?

So, here we will ask the question, what are the animals found in India? Where are they found? And why are they found where they are found? Similarly, you can ask things about culture, you can ask things about languages, you can ask things about climate of different areas. Now, in all of these cases we are asking about or we are studying the areal differentiation of different phenomena that are primarily the topics of different disciplines.

So, when we ask what vegetations are found in different areas, we are talking about say botany. When we are asking the question, what animals are found in different locations, we are talking about zoology. When we ask things like what are the different cultures in different areas, we are asking things like anthropology.

And so we can correlate different areal patterns of different fields. And so, Geography has a very close relationship with several other disciplines, because several disciplines of scientific knowledge have elements that vary over space. And if you have anything that varies over space, you can study that in Geography.

So, we can include the disciplines of botany, zoology, geology, hydrology, pedology, which is the soil science, climatology, oceanography, sociology, art, history, political science, economics, demography. Demography is the science of demos which is people.

So, for, in each and every of these disciplines, if they have elements that vary over space, then we can study them in Geography. And thus these different disciplines have a geographical integration that may be analyzed by the field of Geography.

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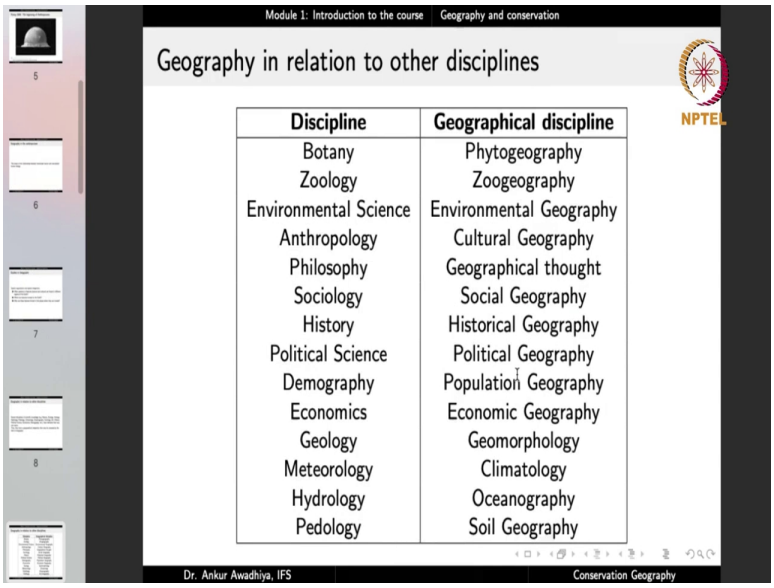

Discipline	Geographical discipline
Botany	Phytogeography
Zoology	Zoogeography
Environmental Science	Environmental Geography
Anthropology	Cultural Geography
Philosophy	Geographical thought
Sociology	Social Geography
History	Historical Geography
Political Science	Political Geography
Demography	Population Geography
Economics	Economic Geography
Geology	Geomorphology
Meteorology	Climatology
Hydrology	Oceanography
Pedology	Soil Geography

And because of that, we have several disciplines in Geography. So, when you study botany, when you study the elements of botany that vary over space, we have the geographical discipline of phytogeography, phyto means plant. So, we are asking about plant Geography. What plants are found in various locations? Where are a particular species or a particular kind of plants found? And why are they found there?

If you take the discipline of zoology, which is the study of animals, we have zoogeography. Now, zoo is animal. So, here we have animal Geography. What different animals are found on

this planet? So, in this case, you will say that, animals like polar bears are found in the polar areas, animals like camels are found in the desert areas.

So, here we are asking what animals are found where? The next question is, where are they found? What are the other locations where you will find polar bears? And the third thing is, why are they found where they are found? What are the kinds of adaptations that these animals have that make them suitable for those specific locations.

And so we have the discipline of zoogeography. If you take the discipline of environmental science, we have the discipline of environmental Geography. Similarly, anthropology can be studied in cultural Geography, elements of anthropology, which is the study of human beings that are spread over different areas. And these elements show themselves up in the form of cultures have different areas.

So, here again, the same three questions, what different cultures are found? Where are they found? And why are they found where they are found. In the case of philosophy, we have a geographical discipline of geographical thought. So, we take the elements of philosophy, combine them with Geography, and we ask these three questions. Sociology is related to social Geography. History is related to historical Geography.

Political science is related to political Geography. So, we can ask questions like, what different policies are found in different areas? Where are they found? Which are the areas where you find things like democracy? Which are the places where you find monarchy? And why are they found where they are found? So, that is political Geography. Then with demography, we have population Geography.

Economics is related to Economic Geography. What is the level of income that is found in different areas? What are the means of production that are found in different areas? Where are certain means of production found? Where do you have industries in India? Where do you have say mines in India? Where do you have ports in India? Again, the same thing. Now, things like industries or mines or ports are a part of the discipline of economics.

Thinks like the amount of income that people have, GDP per capita that is a field of economics. But in Geography we can ask the question, what is the variation in GDP per capita in different

areas of India? Where are those locations where we have a high GDP per capita? And why are those locations having a high GDP per capita? So, we are asking the questions of economics, but in a geographical context. So, this becomes the field of Economic Geography.

Similarly, if we take the field of geology, the geology is the science of the Earth, which studies what are the different processes that happen on Earth. Now, if we combine this field with Geography, we get the discipline of geomorphology, geo is Earth, morpho is form and logy is study, which is the study of the earth forms. Now, here we ask the question, what are the different features that are found on the earth?

Now, we will get the answer we find hills, we find mountains, we find plateaus, we have hills, and so on. The next question is, where are a particular feature found? Where do we find hills? And then the third question is, why do we find hills where they are found? So, here again, we are talking about these three questions of areal differentiation, but in the context of geology. So, this is the discipline of geomorphology.

Then we have the discipline of meteorology, which studies the science of the atmosphere, the kinds of processes that happen on or in the atmosphere. And if you look at the geographical or the areal differentiation part, we get the science of climateology. So, this is the discipline which asks the question, what are the different kinds of climates that are found? Where is a particular kind of climate found?

So, for example, if we take the Mediterranean climate, it will ask the question, which are the places or where do we have the Mediterranean type of climate? And the third question is why do we have a Mediterranean type of climate in these locations? So, that is the science of climateology. Hydrology, hydro is water.

So, this is the science of water. And the geographical discipline becomes oceanography, writing about the oceans or describing the oceans. Pedology is soil science and here we have the related sub-discipline of soil Geography. What are the soils that are found in India or in the world? Where is a particular kind of soil found?

For example, where is black soil found or where is forest soil found or where is arid soil found? And the third question is why is it found there? Why do we have arid soil in Rajasthan? Why do

we have black soil in Gujarat? So, here we are asking about the areal differentiation related to the science of soils and so we have soil Geography. So, we have a large number of geographical disciplines that are related to several other disciplines of study.

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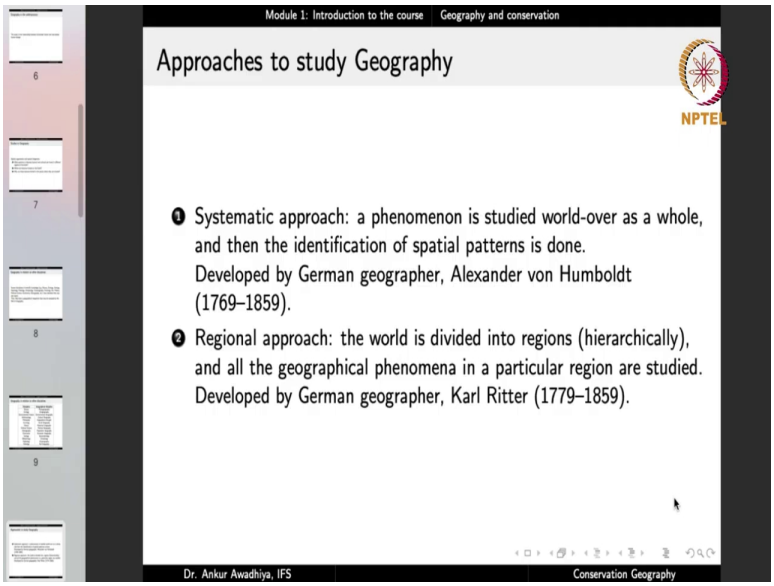

Now, there are two approaches to study Geography. We have the systematic approach and we have the regional approach. Both have their origins in German geographers. Now, systematic approach is a phenomena is studied world over as a whole and then identification of spatial patterns is done.

So, in this case, you study a phenomenon all over the world and then you identify which spatial patterns are found in which areas. So, you are studying the phenomena in a worldwide manner, not in a particular region of Earth, whereas in regional approach, the world is divided into regions hierarchically and all the geographical phenomena in a particular region are studied.

The systematic approach was developed by Alexander von Humboldt, who was a German geographer and the regional approach was developed by Karl Ritter, again, a German geographer. And you can see that both of them lived nearly at the same time. So, these are two different approaches to study Geography.

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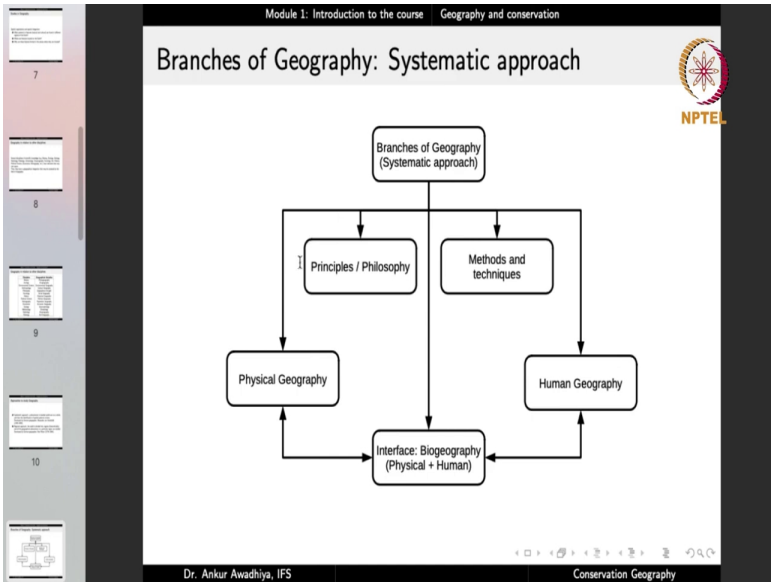

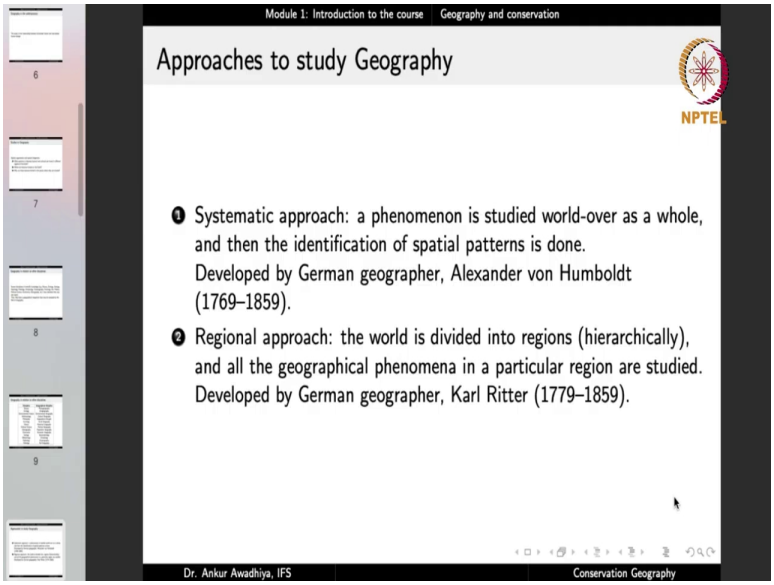

And based on these approaches, we have different branches of Geography. So, in the systematic approach, we have branches like physical Geography. We have branches like Human Geography. We have a branch of principles or philosophy of Geography. We have a branch of methods and techniques of Geography. And we have an interface branch, which is Biogeography, which is a combination of physical Geography and Human Geography.

Now, in this case, when we study physical Geography, we study the patterns that are found all over the world. We are not studying physical Geography in a very specific region. We are asking about the processes that result in various different landforms or geographical phenomena in

various parts of the world. So, for example, if we study earthquakes, earthquakes are the same whether we studied them in India or we study them in Germany or we study them in Canada.

So, the earthquakes are the same. And in the case of the systematic approach, we take the phenomenon and we take the readings or we take the studies all over the world to synthesize the workings of the earthquakes. When we study things like Human Geography, if we study things like settlements, so here again we will ask the same question, what are the different kinds of settlements that are found all over the world?

So, we are studying the patterns of settlements all over the world which makes it a systematic Geography or a systematic approach to Geography. When we ask about the principles of philosophy of Geography, here again we are asking a worldwide question.

If you look at methods and techniques of Geography, if we take things such as the use of geographical information systems, then they are the same anywhere in the world. If we take the interface things like Biogeography, again, we have the same principles that apply all over the world. So, this is systematic approach. And in the case of systematic approach a phenomenon studied world over as a whole and then this identification of spatial patterns is done.

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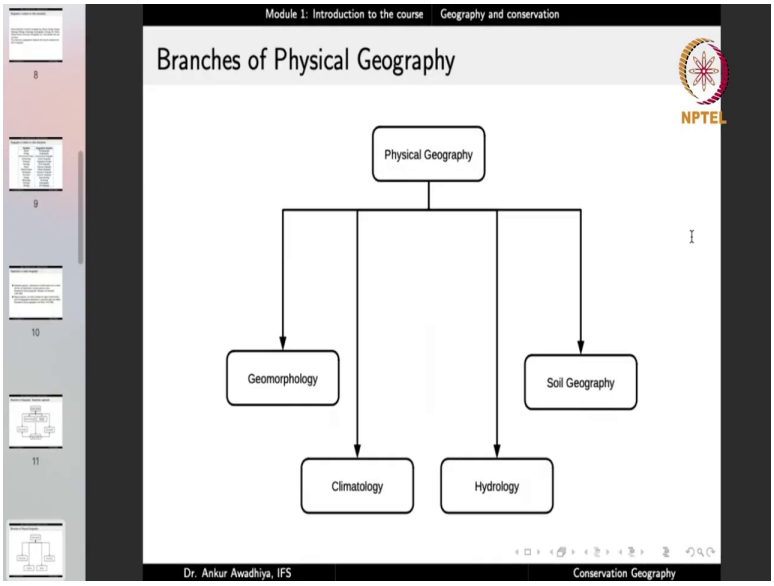

Now, if you look at each of these branches, we will have certain sub-branches or sub-fields of study. So, in physical Geography, we study things like geomorphology, which is the study of the

earth forms, we have the field of climatology, which is the study of climates, we have hydrology, the study of water, we have soil Geography, the study of areal differentiation in soil.

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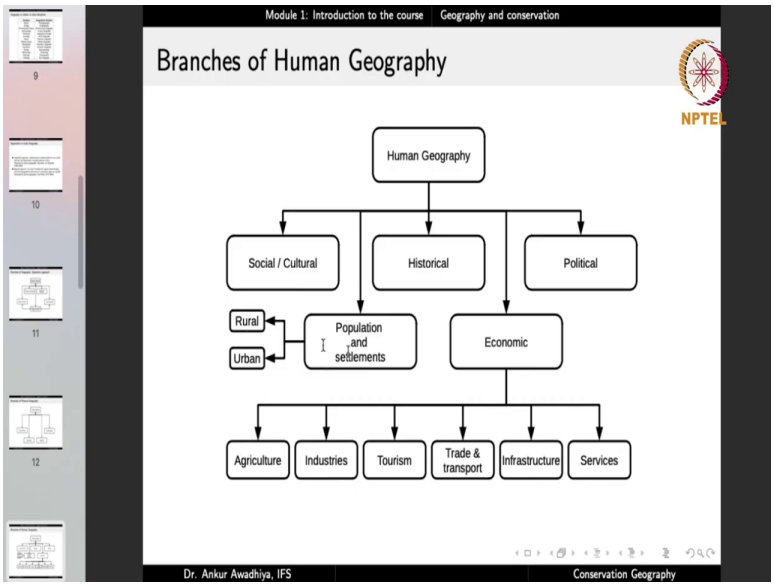

In Human Geography, we have the sub-disciplines of social and cultural Geography. We have the sub-discipline of population and settlements, where we can look at rural settlements and urban settlements. We ask things about historical Geography. So, that is also a sub-part of Human Geography. We have political Geography. We have Economic Geography.

And in the case of Economic Geography, we have several sub sub-disciplines like agricultural Geography, Geography of industries, Geography of tourism, Geography of trade and transportation, Geography of infrastructures, Geography of services. Now, in the case of any of these, we will ask the question, what are the different kinds of infrastructures that humans have built? Where are a particular form of infrastructure found?

And why are those infrastructures found in those areas where they are found? So, in the case of infrastructure, we can ask same questions, but this is a sub-discipline of Human Geography.

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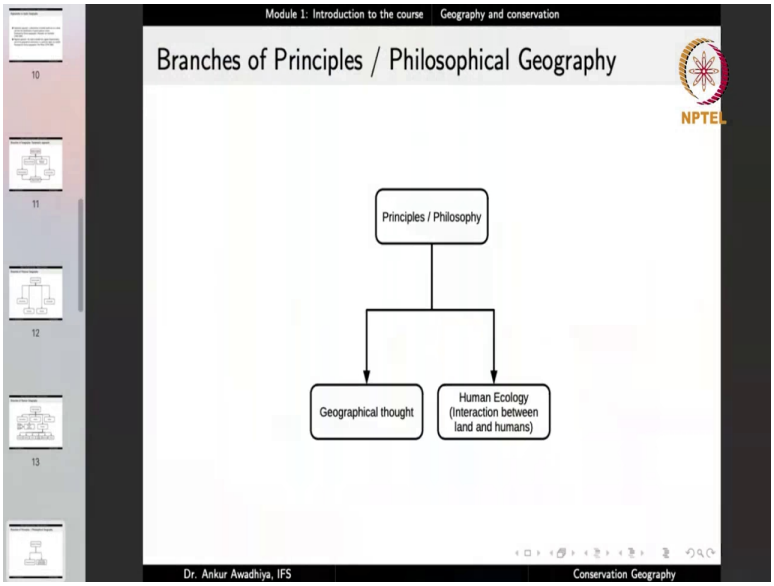

In the case of principles of Philosophical Geography, we have the subfields of geographical thought. How did the geographical thought evolve over time, because in the beginning there was no Geography. How did somebody think that we should study about areal differentiation? How did we come to know or how did we come to arrive at two different approaches that is systematic Geography and Regional Geography. So, things like these are studied in geographical thought. Then we have human ecology, which is the interaction between land and humans.

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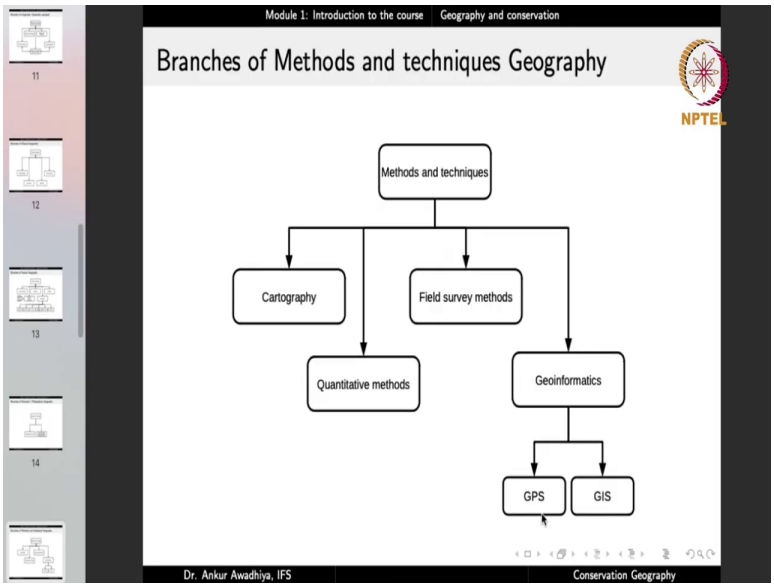

In methods and techniques, we have the sciences of Cartography. Now, Cartography is the science of making maps, so making maps is a method and technique in Geography. We have quantitative methods. How do we analyze things in a numerical form? We have methods of field survey. We have geoinformatics, which is the informatics applied to the Earth, where we make use of things like global positioning system or geographical information systems.

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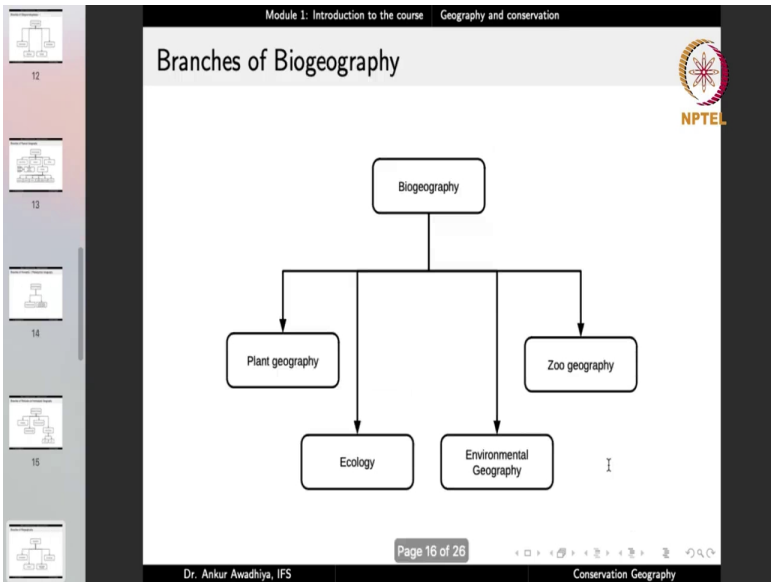

In the case of Biogeography, we have things like plant Geography, animal Geography or zoo Geography. We can study ecology or the elements of ecology in a geographical context. We can study environmental Geography.

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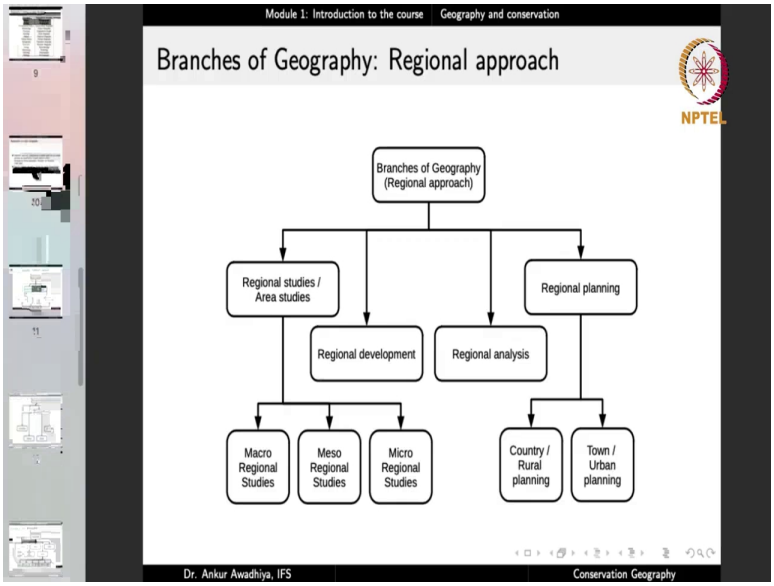

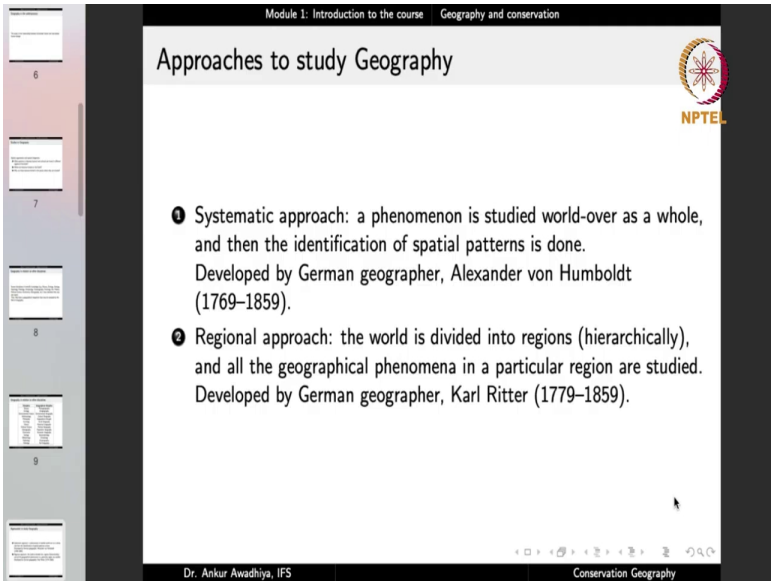

So, these are various branches based on the systematic approach. Now, in the regional approach, what we do is that we take a region. So, in the regional approach, the world is divided into regions hierarchically, and all the geographical phenomena in a particular region are studied.

That is, we can divide the world into say continents, and we can study all the geographical phenomena in a particular continent or looking at a more finer level we can look at all the geographical phenomena in a particular country or in a particular state or in a particular district or in a particular city or town or village.

Now, in this case we are not looking at phenomena in a worldwide manner, but the first thing that we have done is to constrain ourselves in terms of the region that we are going to study. So, for example, in the case of renal Geography, if we take the Geography of Mumbai, then we will ask the question that in Mumbai what all different geographical phenomena are found?

What are the Economic Geography aspects that are found in Mumbai, what are the cultural geographical aspects that are found in Mumbai, what are the physical geographical aspects that are found in Mumbai. So, we are studying all the phenomena, but putting our concentration in the city of Mumbai. So, that is Regional Geography.

And in the case of Regional Geography, we have several branches. So, in the regional approach, we have things like regional studies or area studies. That is we do a study of the whole area or the region which can be of a macro region that is a large sized region, mezo region that is a middle sized region or a micro region which is a small sized region. So, these are regional studies.

Then we can look at regional development or regional analysis or we can look at regional planning. In the case of regional planning, we can look at rural planning or country planning, and we can look at urban planning or town planning. So, this is a regional approach. The first thing that we do is to constrain ourselves to a particular region and then we study that region in total. So, that is the regional approach.

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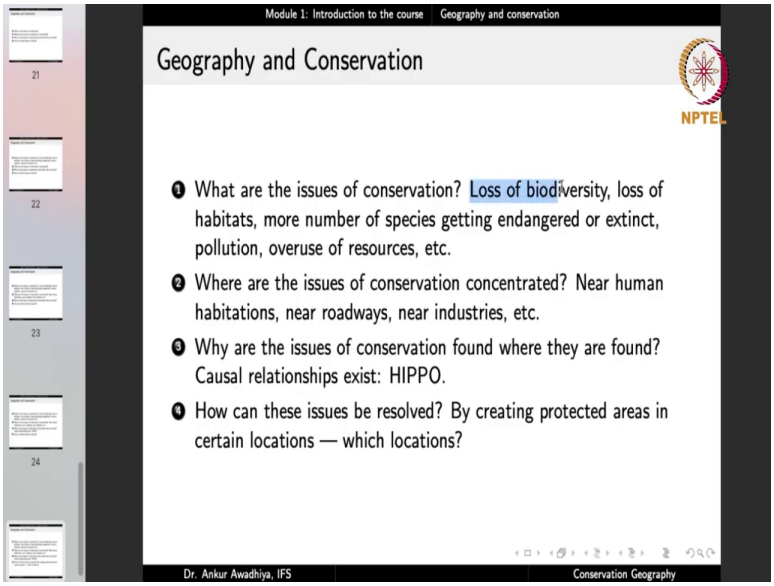

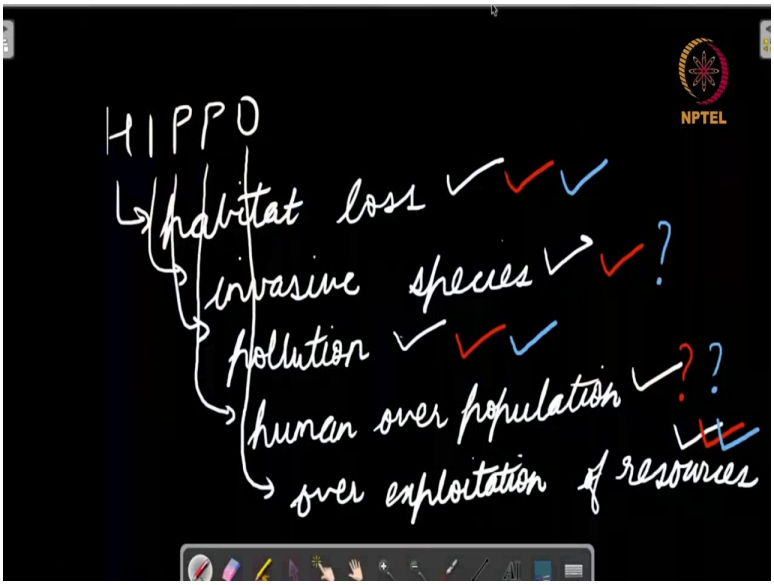

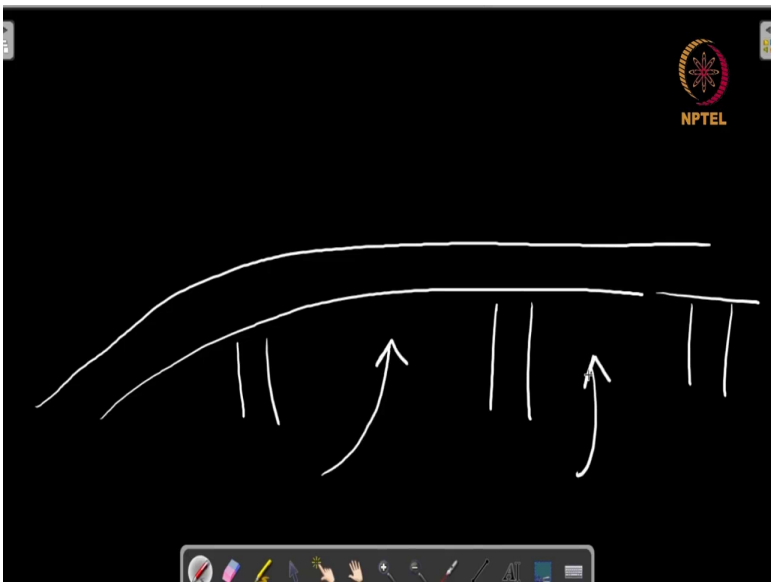
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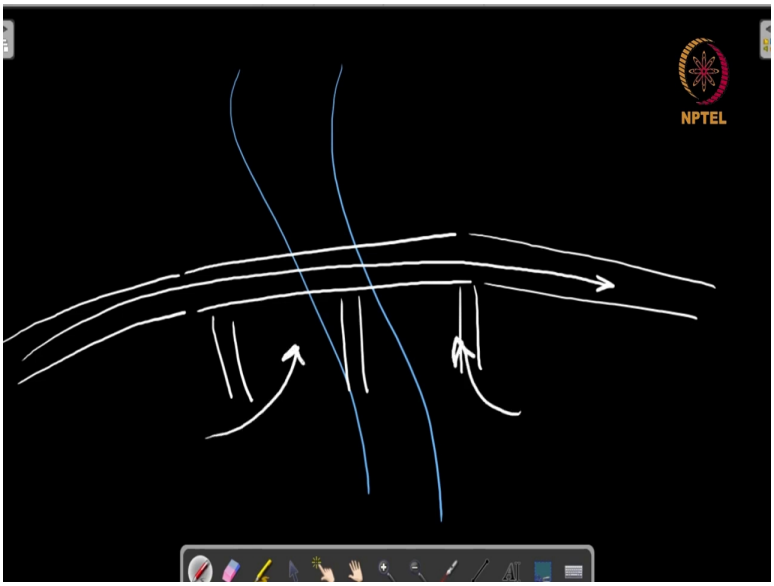
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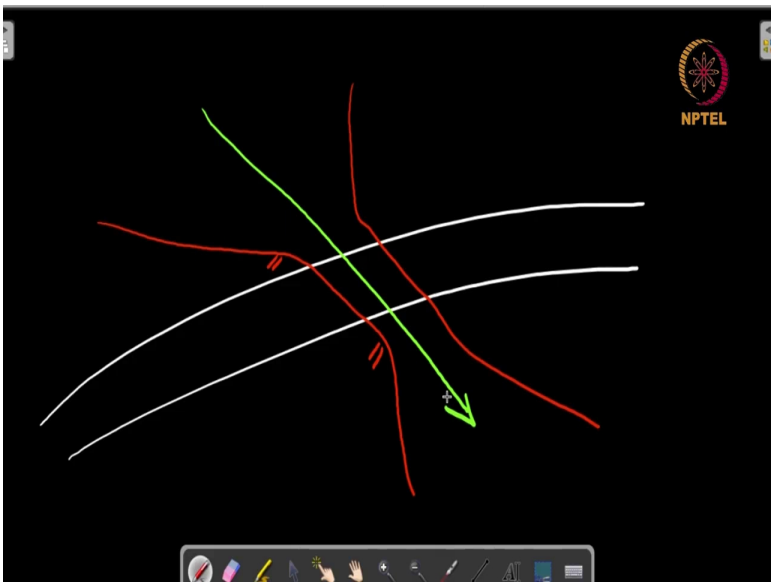

Now, talking about conservation, how is Geography related to conservation? So, when we look at conservation and looking at the questions in Geography, we can ask the question, what are the issues of conservation? So, the first question is what. Second is where are these issues of conservation concentrated, why are they found where they are found? And then looking at the planning aspect we can ask the question, how can these issues be resolved?

So, when we talk about Conservation Geography, we are asking the same questions but in the context of conservation, what are the issues, where are they found, why are they found where they are found. And once we understand these, then only we can solve the question of how to solve these issues or how to abrogate these issues.

So, in this case, if you look at the issues of conservation, there are several issues of conservation, things like loss of biodiversity, that is a large number of plants and animals and insects and microorganisms, they are all becoming extinct. So, loss of biodiversity is a factor in conservation. So, this is an issue in conservation. We have loss of habitats, more number of species getting endangered or extinct, pollution, overuse of resources.

So, there are several issues of conservation. And we can ask the question, what are these issues and where are they located? So, if you look at the locations where you can get the answer that a large number of these are located near human habitations, near roadways, near industries, because when you have a human habitation nearby, then people would require certain resources.

To get those resources, they will get the resources from the nature. If the population size is large, if the affluence is large, if they have the requisite technology, then they will overuse the resources. They will over exploit the resources. So, near human habitations we find large number of conservation issues. Similarly, we find large number of conservation issues near roadways, near railways or things like linear infrastructure.

Now, if you think about a road, then roads kill organisms in a large number of ways. There can be a direct hit of a vehicle with the road or it can fragment the habitat into smaller portions and each of those smaller portions might not be suitable for the species or it may hamper the movement of species, making them constrained in a small area, which would lead to inbreeding and genetic diseases.

Or once you have the roads, then you make access to people so people can enter into your area and they can kill the animals, they can poach the animals or the roads can increase access for diseases, because the people who are getting into the forest they might be having certain diseases like tuberculosis, that can be spread to the animals or the roads can bring in the exotic and invasive species.

Because we can have the seeds of a particular invasive species that come into the area, because they are sticking with the tire of a vehicle or they can increase access to pollution. So, we can have large number of things that are associated with roads. Similarly, every year we hear the news that so many elephants got into accident with trains and they died.

So, there are a number of conservation issues that are related with railways. In the case of power lines, a large number of birds when they are flying, they are unable to judge the power lines and they just bump into the power lines and they die out of this coalition, because when they are moving at a very fastest speed and they bump with a power line, then that results in fracture, that results in a breakage of things, that results in concussion.

And once the birds have fallen to the ground, they might very easily be eaten by certain other animals like dogs. So, we have line number of issues that are related with these linear infrastructures. Similarly, when we talk about industries, industries are often associated with pollution. So, you will have air pollution, water pollution, noise pollution and so on.

So, when we ask the question, where are these issues of conservation concentrated we can find several answers. Some of these issues may be concentrated near human habitations, some may be concentrated near roadways, some may be concentrated near industries and so on. So, now we are doing a study of the areal differentiation of these issues of conservation.

Then the next question is why are the issues of conservation found where they are found? Now, in this case, we can look at the causal relationships, such as the HIPPO factors. Now, HIPPO, H-I-P-P-O stands for habitat loss, I stands for invasive species, P stands for pollution, the next P stands for human overpopulation and O is related to the over exploitation of resources.

So, when we have any of these things, when we ask the question, why are the conservation issues located near human habitations? They are located near human habitations, because the human habitations in most cases lead to a loss of the habitats, because the humans have cut the forests, they have destroyed the grasslands to make way for themselves.

So, when you look at a city or a town or a village, when the city or town or village did not exist, we would probably have had a forest in the area or a grassland in the area. Now, the human habitation is closely correlated with the loss of habitats. In a large number of cases we also find that the cities and towns they have been expanding with time.

If you look at your town or city or village and if you ask your parents and grandparents, they will tell you that sometime back this was a small town, now it has expanded because the human population has been increasing. So, in the case of human habitation we have a human overpopulation. Now, if you have an overpopulation the population size is increasing then people require more resources, they require more food, they require more water, they require more fuel wood and so on. And so this will lead to an overexploitation of resources.

Overexploitation of resources will also lead to pollution in the area. Why, because there are so many humans and so there is a large amount of sewage that is getting generated. When you have so many humans that are there in the area, there will be a large amount of plastic waste that is getting generated. So, many living means that they will be having vehicles which would result in air population or sound pollution or light pollution.

So, with the increase in the population size, the amount of pollution is also increasing. And at the same time, we are also getting invasive species, because the humans have this tendency to get beautiful plants and animals from other areas and grow them in their own homes or in their localities. Or in certain other cases when people are moving from one place to another place then even without knowing they can be carrying certain organisms from one place to another place.

And so when we ask the question why are the issues of conservation found near human habitations we are getting that because of all five of these factors. If you ask the question why are the issues of conservation found near the roadways. Now, near the roadways what do you find? Do you have a loss of habitat near the roadways? Yes, because to make the roads you had to cut down certain trees. So, there is a loss of habitat.

There is also a fragmentation of the habitat because of the road. Now, do roads result in pollution? Yes, they do result in pollution, especially air pollution and noise pollution. Do roads bring in invasive species? Yes, they bring in invasive species. Do roads result in an overexploitation of resources? Yes, they result in an overexploitation of resources because they allow people an access to the forest.

Before the roads existed, people could not have entered into the forest areas. They would not have dare to enter because of a threat of the wild animals. And even if somebody entered and say cut down a tree, how would that person take that tree out of the forest. It is very difficult. But once you have a road, it permits the overexploitation of resources, because now anybody can come through this road, enter into the vary interiors of the forest, cut a few trees, load them into the vehicle and take them away.

Get into the forest, perform poaching, take a few animal carcasses away from the area. So, it facilitates the overexploitation of resources. And if you ask about human overpopulation does a road lead to human overpopulation. Well, it is questionable, but in some parts, yes, because the roads permit us to bring more resources to people and once you have resources the population size is tend to increase.

At the same time, when roads provide access to people then people can start a small settlement somewhere inside the forest and slowly the population will start to grow. So, it can facilitate the

human overpopulation though not directly but in certain ways, yes. If you ask about the why the issues of conservation are found near industries, then do industries lead to a loss of habitat?

Well, in some cases yes, but not always, but we can put a take, because for a large number of industries you need land and this land can only come through the loss of certain habitats. Do industries result in more number of invasive species? Not always, certain industries do increase the invasive species, for example, an industry that is concerned about importing organisms from other areas, say importing things like dates or other fruits from other countries or say vegetables from other countries.

Now, along with the fruits and vegetables it can also import the insects of those countries, because those insects that are, have bared themselves inside the fruits they will also come with the fruits. But in a large number of cases they do not increase the invasive species load, especially when we talk about the manufacturing industries.

Do industries lead to pollution? Yes, they do lead to pollution. Do industries lead to overpopulation of humans? Not always, but yes they do facilitate the overpopulation in a regional fashion, because if you have industries in an area, people will have more incentives to be in the area, because industries provide jobs, industries provide a better living standard to people and so the human population in the vicinity will tend to grow.

Do industries lead to an overexploitation of resources? Yes, most of the industries, because industries require things like electricity, industries require water, industries require raw materials and with the industries you will have an overexploitation of resources. So, we can study these causal relationships and get the answer of why are the issues of conservation found, where they are found. The fourth question is how can these issues be resolved?

Now, the resolution of these issues can be done in several ways. So, for example, if we know that near the roadways we have the problem of the loss of biodiversity so we can now put up certain solutions to this problem. We can say that on this road the speed limit will be set so that you do not have animals getting into accidents. So, we can set up things like road breakers or speed breakers so that the speed of the vehicle is reduce.

We can put up sign or we can say put up a rule or regulation that any vehicle that is tying on this road is not permitted to honk in the forest area so that there is less amount of sound pollution or we can install sound barriers in the area so that the sound gets absorbed and the animals are not that disturbed or we can go about making certain other interventions like underpasses.

Now, in the case of underpasses what happens is that, if you have the road, in certain locations the road is elevated and the area that is beneath this road is put on pillars so that the animals can move beneath the road, so this becomes an underpass. If you think about the bridge, you get the idea of an underpass.

So, in the case of a bridge, suppose you have a river that is flowing and you have a road, now to cross this river there will be a bridge that gets constructed and then you have the road on the other side and these are the pillars. Now, the vehicles can move over the bridge and the animals can move under the bridge. So, in this case, the habitat fragmentation is avoided, because animals can move from one place to another place.

In certain other cases, we go with overpasses, meaning that if you have this road, then we can have a construction of an overpass which would be a structure like this. So, in this case, we have created a bridge over the road and in this case the animals can move over this bridge to cross to the other areas. So, once we know the kinds of issues that are there, we can suggest certain solutions. So, we can resolve these issues by certain interventions.

When we know that there is a large amount of loss of biodiversity, loss of habitats that has been happening we can create protected areas that is we can set up areas like national parks or wild life sanctuaries or conservation reserves or community reserves. Now, these are areas where the habitats are protected and are conserved for the wild animals.

So, the wild animals are able to live in these areas. And so we ensure that the biodiversity is not completely loss. There are at least some areas where the biodiversity gets conserved. There are at least some habitats that are getting conserved. But once we have decided that we are going to create protected areas the next question is at which locations, because our funds are limited, our resources are limited and so we will have to optimize on the funds are resources.

We will have to choose those areas where we can have the biggest bank for the buck. So, in that case again we will have to look at the features of Geography. We will have to take lessons from Geography. Which are those locations where in a very small area you can have more and more number of habitats? You can support a large amount of biodiversity.

How are these areas connected with other areas so that your habitats are not getting fragmented? So, these kinds of answers will again be provided by Geography. So, essentially, Geography is very intricately related with conservation. So, in this lecture we looked at the discipline of Geography. We looked at two approaches to study geographical problems, the systematic approach and the regional approach.

We look at the various disciplines of Geography and how they are related with other disciplines of study. And we also looked at how geographies very closely related with conservation, because the issues of conservation are localized and because they are localized we can perform interventions in the most optimal mannered in those particular locations so that we can perform our task of conservation in very optimum manner.

So, that is all for today. Thank you for your attention. Jai Hind!