**Urban Governance and Development Management (UGDM)**
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Lecture - 36
Managing Urban Environment - 1

Welcome to lecture 36. In this week, we are going to discuss some very critical and very important elements of the urban governance and management. One is environmental controls, even though we had preliminary lectures earlier on environment and ecology but few more elements will be required to know under this course. So one will be environmental control and second will be the transportation and the mobility which is also another backbone of a city. So today we are going to have the first lecture on the environmental element of the city.

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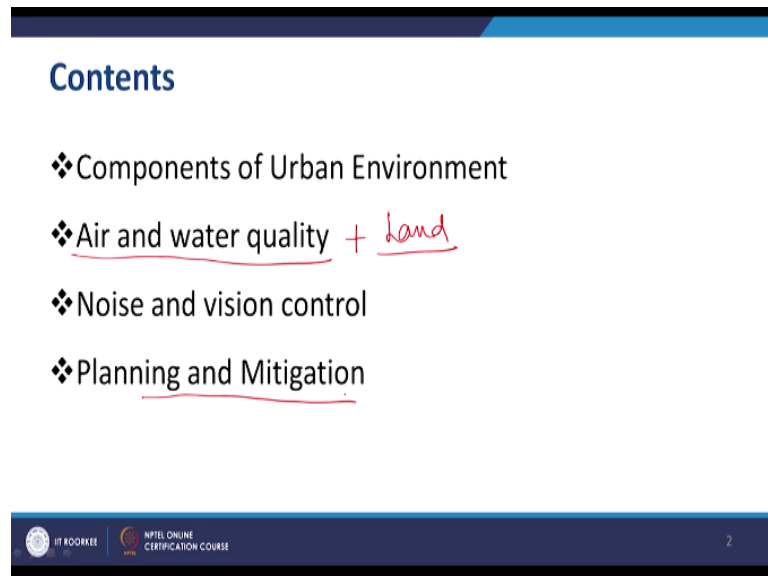
So our contents of this lecture will be the components of the urban environment at the district component and out of that will discuss air and water quality and its management and also will have a few discussion on the land and the land cover component and then will have noise and vision control in a city and then lastly will discuss the planning and mitigation stages, how we can plan for all these environmental controls and mitigate that.

In the first lecture, we are going to discuss air and water quality and some amount of discussion of noise and vision control. Then, next lecture will discuss mostly the land surface land cover control especially the elements of blue and green infrastructure. So let us start.

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Now in the components of the urban environment, when you say urban environment that means it is a created environment. So in the created environment, there are two elements, one is natural elements which is maintained and there are some manmade elements which is created and then also maintained. Now because of the imbalance or wrong planning, there are lots of implications in environment.

For example, there could be air quality degradation and the air pollution, there could be water quality degradation and pollution, there could be noise and quality of the vision and the aesthetics and its pollution and there could be pollution of land and land cover element. So what we need that a better plan and control over that so that all development and management is performed in a regular way in a scientific and a systematic way. So out of that we are going to discuss air quality and controls.

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Now let us see few pictures before I start discussion. In the coming winter, you will see this kind of picture; this is from Delhi, city of Delhi, so this is not an isolated picture. I hope the whole Northern India will be covered with similar kind of situation in most of the cities. Now my question is, is it a natural phenomenon or a manmade phenomenon?

The amount of the pollutants in the air during the winter like in the month of December and January is excessively high and because of that there are a lot of physical conditions. So this kind of situations will arise in the Northern cities, Northern Indian cities for 2 to 3 months or more than that and then this is another picture.

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You can see that the school going kids they are not able to breathe properly.

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DELHI'S TRYST WITH BAD AIR
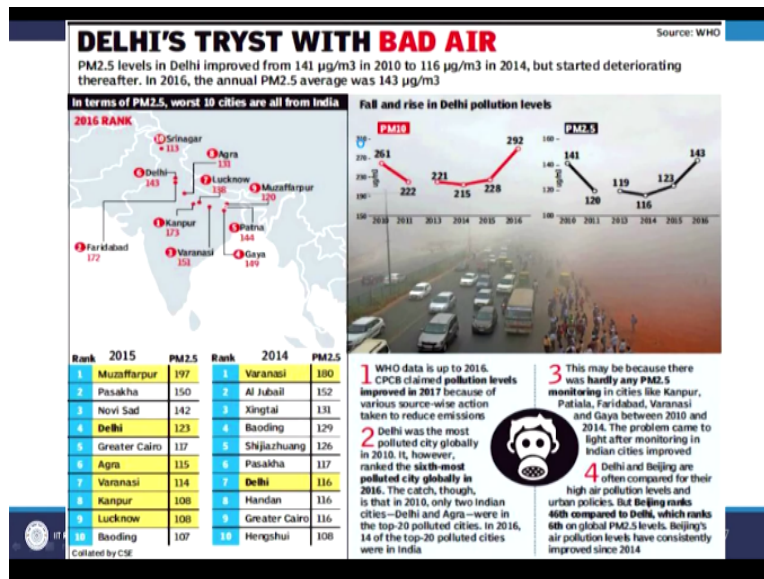
So based on that there are lot of discussions on the Delhi's bad weather. We are taking Delhi as a reference but this is not an isolated case. In this example, you can see some relative ranking and the status of the air quality for all the cities. You will find that mostly the Northern Indian cities having severe condition of the pollutants and here also you can see that in this graph you can see that the various types of pollutant which is going rise like from 2015 to 2016 and they are going to rise.

And there are some amount of improvement which is recorded by WHO in 2017. So these are the marginal improvement but the point what I want to make here that the pollution in the air is dependent on human interventions, human actions. It is not a magical thing which grows instantly. So therefore if we can identify the interventions or the actions which can create or which is creating this kind of conditions.

And we can control that probably we can avoid and mitigate this type of situations. Now because of this bad air, there are various implications and the impacts.

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For example, usually air is defined as elastic, invisible and tasteless but there could be very adverse effect of the air if it is not pure, it is having contamination of the pollutants. Then, it is mixture of gases that surrounds the earth and air pollution. For example, air pollution can be resulting from activity of the man present in sufficient concentration and time and then it can affect your comfort, health, enjoyment, damage to the property, etc.

Various airborne diseases for example the Anthrax, Chickenpox, Influenza, Measles, Smallpox, etc all these are diseases which is caused by air pollution. Apart from the diseases, there are conditions, medical conditions like breathing problem, allergic conditions. These are very much common in urban areas and also there are various other kind of pathogen based conditions. Now this is not isolated and irregular, this is a recurrent problem in all our cities.

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So here the approach for addressing air and environmental impacts will be basically first is you have description, you have to of describe the existing air environment condition. Now do we have a baseline study of our city that what kind of air pollution is there, what kind of air quality is there.

So first job in our city government will be to address the air pollution is that a baseline study describing its present condition of the air pollutants, present condition of the air quality in various locations. That is the first job what we do. Second is that identification of air quality impacts. Now what is the possible impacts in various zones and intensity? And what are the triggers and causes?

Then, procurement of relevant air quality standards, it is possible to procure the relevant air quality standards and equipments so that you can compare the data and take the actual real time data in a more refined manner, more realistic manner and you can compare with the standards and assess that what is the level of pollution in your city.

Then, it is also important to predict the impact in near future. If the current trend goes what is the kind of impact which is going to happen in your future, impact in terms of the human life and community life both because it hampers each and every activity. If you want to travel by train, travel by aeroplane, travel by bus, everything is hampered due to this pollution and non-visibility due to pollution.

And at the individual level, you are having medical conditions, your kids are suffering, so many things are there. So it is possible to predict. Next is the planning controls and enforcement. Then, what are the controls and enforcement you can design, you can develop and adopt in you city which will be binding for the people and which will ensure that people confirm with the practices which do not emit the pollutants, do not emit the severe pollutants and add the pollutants.

So several reasons are like air pollution is due to your emissions from the car, emissions from the various other factories and industries, the burning of various kinds of elements during winter season, then construction sites, construction sites are very much contributor in this air pollution. So those kind of planning controls and enforcement are required to streamline the activities to mitigate or to reduce the amount of the pollution.

Then, identification and incorporation of mitigation measures in all level, so these are the broad approach in addressing the air pollution in our cities. Now here out of all these activities, the more important activities is the last one that is the identification and incorporation of the mitigation measure which needs lot of actions at your end. Now this action should not be taken when already the air is polluted.

So it is advisable that it becomes that whole year program and activity and you take all the activities considering the possible effect in the respective months and before the winter season you take adequate measure so that during winter season, the air pollution is not going to high and before that if you can give (()) (11:08) effort for another few years or maybe one decade, your city could be better in terms of the air quality.

For example, in Delhi, we have started the discussion with the picture from Delhi. Twenty years back when there was lot of more pollution like say or most of the vehicle were using the petrol and diesel and now the most of the private vehicle and also some public vehicle they are using CNG. So because of the change of the policy decision from petrol, diesel to the CNG which is basically a better in terms of the pollutant in terms of the compared to petrol and diesel.

So after that the air quality has improved significantly but in the recent years due to some other activities like construction sites, burning, then during the Diwali there are fire crackers, so many factors are there which contributes largely. So you have to have a better enforcement and its action and its implementation. Then, we come to the water quality. Water is another very important aspect in our city life.

Because if you see all the civilizations of the city, the 90% of the cities are developed either on the bank of river or bank of the coastal region or bank of a canal front. The simple reason is that from morning to night every actions human actions need water starting from your taking bath, washing your face and your gardening everything, drinking is also there. So water is very important.

And because of that if we fail to maintain water in a better way, water becomes disease prone and the disease prone water is harmful for the cities. There are cases of cholera's and other

waterborne diseases. So those kind of situations need to be avoided. So let us see that what are the waterborne diseases and implication of that.

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This picture is taken from some suburban areas of India; you can see that how water I mean stagnant water basically is polluted. You can see that animals and the human beings especially the kids they are using the same water. They are interfering with the same polluted water.

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Next, you can see this picture. This is one canal in one of the cities the canal fronts and the riverfronts are polluted without so you can see the dumping is the very common phenomenon in Indian rivers and the canals. Then, no control in canal front, you can see the unscrupulous building has come up in the canal front and also no maintenance of water quality. So these are

related to your solid waste management, your waste water management so many things but this is what we see in Indian cities. Let us see few more pictures.

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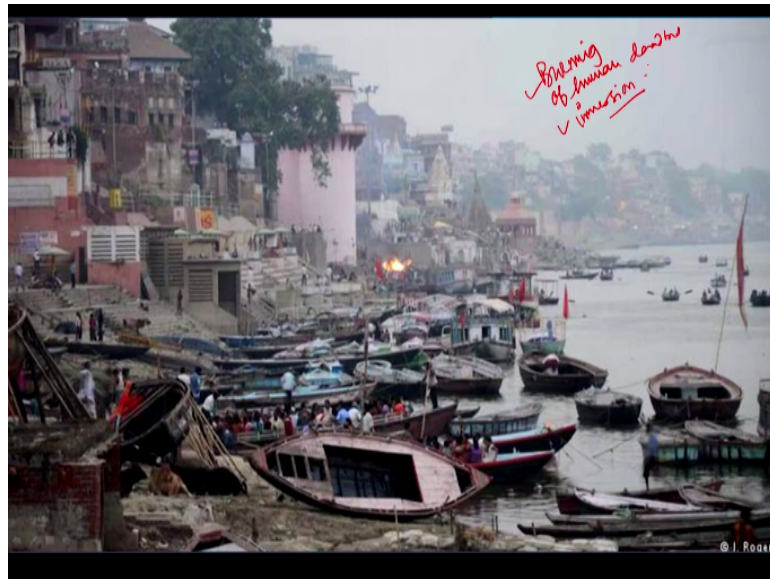
This is one of the pictures taken from another Indian cities and here you will find that the burning of human dead body and immersion of the ashes, this creates a significant pollution in the water in all the rivers including the river Ganges.

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Then, you can see this is another picture of river Ganges. So this is the pollution created due to immersion of idols which is used during the pooja time. This is somewhere from the Kolkata or nearer place. So you can see that this creates also significant pollution in water quality.

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So what are the implications of the water impacts and what is the further approach? Let us see, so waterborne diseases are linked to significant disease burden worldwide. So it is not an isolated phenomenon for Indian condition, it is the phenomenon which is available or which is predominant worldwide cities and then waterborne diseases like diarrheas are responsible 2 million deaths each year as per the World Health Organization.

So diarrhea is a very common disease which we find in the slum areas, which we find in the suburban areas or peri-urban areas where water is mixed with the pollutant. Now one way how the water is mixed with pollutant is that people extract water from the ground and also with the near vicinity people make holes and make the sanitation condition without scientific approaches.
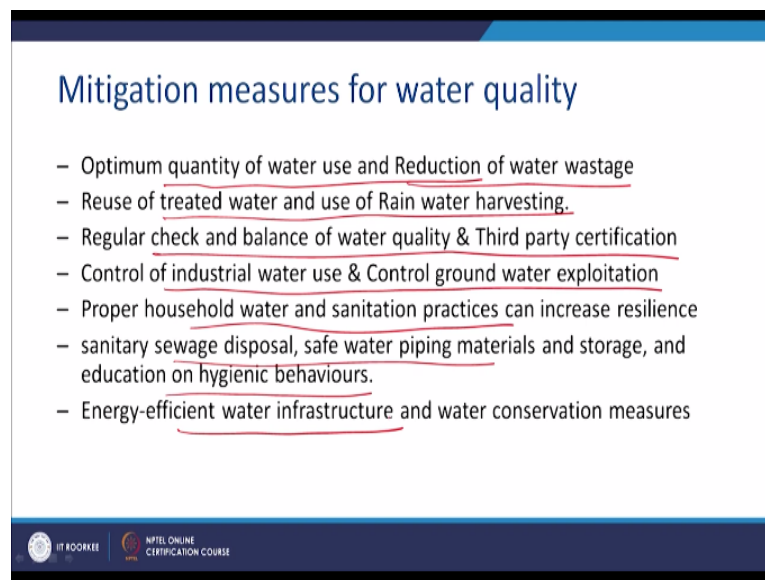
And due to that sanitation approaches, the contamination from that sanitation it may be an open latrine or open kind of sanitation practice. That mixes with the soil and that is transmitted to the tube well or any other water sources and that create the diarrhea or similar diseases. Few decades back, there was occurrence of cholera in some of the Eastern cities and other cities.

And that time people use to call some cities as cholera city. So diarrhea, cholera all these diseases are very common due to waterborne diseases. Then, there are climate change-induced flooding, we have seen in the recent past in the Indian cities and other cities. Then, flooding can disperse fecal contaminants, increasing risks of outbreaks of waterborne diseases.

So these are not recurrent or the regular problem throughout the months but during the rainy season there could be urban flooding because of the water logging and other phenomenon and that urban flooding during that urban flooding water mixes with the fecal contaminants that also create the pollution and the disease and water shortage due to drought also can increase risk of diarrheal disease.

So it is not the abundance of the water due to flooding. Sometimes during the flood condition when the water level goes significantly below the water and it can be contaminated in some situation also. So how we can mitigate the water quality degradation and we can come out from that condition and we can create some better situation.

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First is that the optimum quantity of the water use to be decided at the city level and for that you reduce the water wastage during your planning time. Reuse of treated water and use rain water harvesting as a main stream water source. Regular check and balance of water quality and if required third party certification could be required. Control of industrial water use and control of ground water exploitation is required.

Excessive exploitation of the ground water sources could lead to connection with the pollutant so that should be that must be controlled and industrial water use control also required. Proper household water and sanitation practices can increase resilience. Now as I told that use of water underground water and use of sanitation unscientific sanitation practices has a direct link of the public health.

That is why it has to be treated in an integrated manner and at every household level this has to be done properly. Under Swachh Bharat Mission, we discussed earlier that the sanitation practice has given top most priority in our country to ensure scientific sanitation and to mitigate the open defecation in our country for the 100% within few years. Then, sanitary sewage disposal, safe water piping materials, storage and education on hygienic behaviours.

These are all allied actions which can be taken. Energy-efficient water infrastructure could be adopted, so these are the few approaches and strategies required for the water resilient or water sensitive urban development in our cities.

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Then, the problem of noise, noise is a very important problem you have seen in our cities. So noise is a kind of the outcome of haphazard or unplanned urbanization and also noise creates physical conditions which leads to medical conditions as well okay. So to mitigate noise we need to do again some control and planning action. Let us see what are the actions. So at the planning level basically we assess the intensity at various zones and the locations.

Then, we take the strategic selection of the operational infrastructure. For example, some of the operations like bus, train any other operation also creates public vehicle, the local transport, paratransit and the non-motorized transportation. Sometimes they also create lot of noises, so selection of those kind of modes based on the noise also another criteria. We should select which emits very less amount of the sound.

Use buffer zones, noise barriers, noise free zones in the cities those kind of strategies is required at the land use level at the area level planning. At the management level, we need appreciate regulations and strict enforcement. We have all the required regulations at the central level, state level, we have supreme court orders to maintain the noise intensity during night, during day time in the city as per various land used loans. So please maintain and go through that. I am not going into much details for the noise.

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Then, for the visual and aesthetic control, sometimes we fail to understand that visual and aesthetics is a very important part of a city which also create significant impact in our mind how we perceive the city. We had a detailed discussion on the image of the city. Now visual and aesthetic control is another element which matters a lot.

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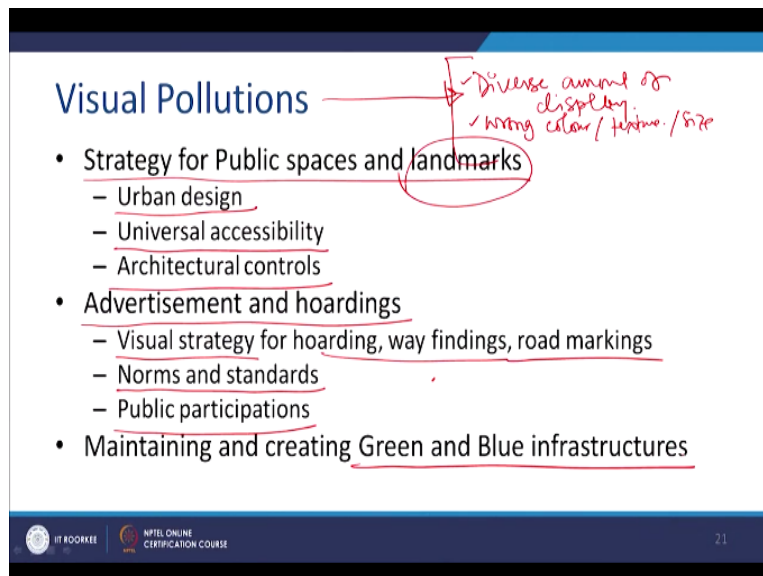
Now for the visual and aesthetic control what we do? Basically, visual pollution is created by diverse amount of display and wrong color or texture or size selection. So this we find this is found when there is no control and no strategy at the city level to select appropriate display size, categories, its color code everything.

So this we can avoid if we plan for the displays and the visual elements, we can plan for the urban design for the city places in a better way, we can avoid and we can make city beautiful. So the actions required for the visual to avoid visual pollution. So strategy for public spaces and landmarks. Public places like the terminal areas, the public squares, the intersections of the road, the station areas, the community centers, etc.

And the landmark buildings which creates which acts as an identity and the iconic structure of the city that can be used as a strategically meant for urban design, we can use universal accessibility in the urban public spaces and architectural controls. Architectural controls is rarely used in India but please take a note that unless we bring at least some amount of architectural controls in terms of facet control, in terms of the color or texture or the pattern it is not possible.

And also please take a mental note that the India was under the colonial rule for 200 to 300 years and the more than that 300 years so because of that we might have forgotten we might have overlooked our traditional practice of the architecture and the city planning. So it is important that every city should look into their predominant architectural and town planning practice, what is the physical manifestation of the form, color, texture, etc.

And that should reflect the architectural control in terms of their building bye-laws and the development control regulation and that will make the city a natural beautiful. The city do not have to copy an image or copy architectural control from any other European or American cities or any other cities. So city itself can immerge as s fantastic and beautiful city and then at the control level for the advertisement and hoardings we can make a visual strategy for hoarding, way findings, road markings, etc.

And we should follow for that norms and standards we have for the road markings and way findings, we have IRC standards, similar standards are there. So we should follow that and we should make a strategy for other elements as well. Now strategies we get to combine each

and every visual element in a concerted way so that everything does not look like isolated element.

Then, public participation, in recent years we have seen that in some of the cities that people are contributing in the public art in the representation of their thoughts, ideas making their city beautiful. We have seen that people are painting the roads, painting temporarily, painting some of the elements, Ghats. All those are activities which sometimes involves people and make the city beautiful.

But as a city level you need to have an overall strategy for the aesthetics and then you need to maintain green and blue infrastructure apart from the because blue and green infrastructure itself is a natural and created infrastructure which can create an aesthetic and a visual pleasure in human eyes and mind. We will have a dedicated lecture on the blue and green infrastructure. Therefore, I am not detailing this.

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And for land and land cover we have basically large amount of land and land cover. Here it can be a natural element, so in the natural element again the blue and green infrastructure could be there that we will discuss later. So maintaining existing natural land cover like blue and green land cover, recreating elements of ecosystem, whenever we urbanize some area definitely we will be disturbing some existing ecosystem.

So we have to replenish or recreate those ecosystems to maintain the overall harmony of the environment and to bring a quality of life. So that is very important in maintaining the

ecosystem. Blue and green infrastructure I have told, then preserve and conserve the infrastructure, regulation and enforcement and meaningful selection of landfill site, whenever landfill sites are there meaningful selection need to be there and compact development to achieve the economy of land value.

Land is a very scarce element so that is what is required. So wherever you develop, it should be a compact development. Remaining area should be left as green and blue and whatever is natural and created green areas.

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Now in the planning and mitigation what we do is the baseline study with the linkages with the other component. Identification and assessment of the polluters at all levels and all zones, use local knowledge and wisdom. Sometimes we forget to talk with the local people, local representative, they also have experience of staying that particular area for years, so that local knowledge and local wisdom should be used.

Relevant case references, similar case references from the Indian context, other context need to the taken, innovative mitigation strategies and here we make several options and compare, then assess impacts of new projects. Sometimes when you make new projects or new development, we have to assess the impacts. It can be a standalone project in particular one site of premises.

It can be a large development of infrastructure whatever it is for the new project you have to make the environmental impact assessment and based on that assessment we have to take

some mitigation measures and we have adequate rules and regulation to ensure the impact assessment, reduction of emissions, I have talked about this before and strict control and enforcement are also there. So here some amount of planning and mitigation both are relevant.

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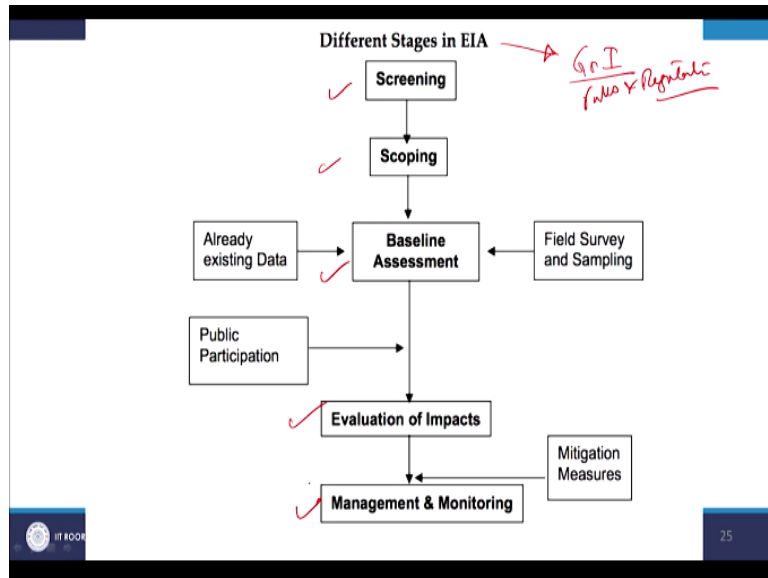
Now I just show the basic stages of environmental impact assessment. Now the environmental impact assessment is mandated by the government of India rules and regulations. I have talked about the Environment Protection Act and rules under that, so under that these are the general description and the methods.

So this method have some kind of screening, scoping, baseline assessment, evaluation of the impact, management and monitoring. So these are simplified methodology, please go through the rules and regulation, you will find the detailed methodology.

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Stages in Social Impact Assessment
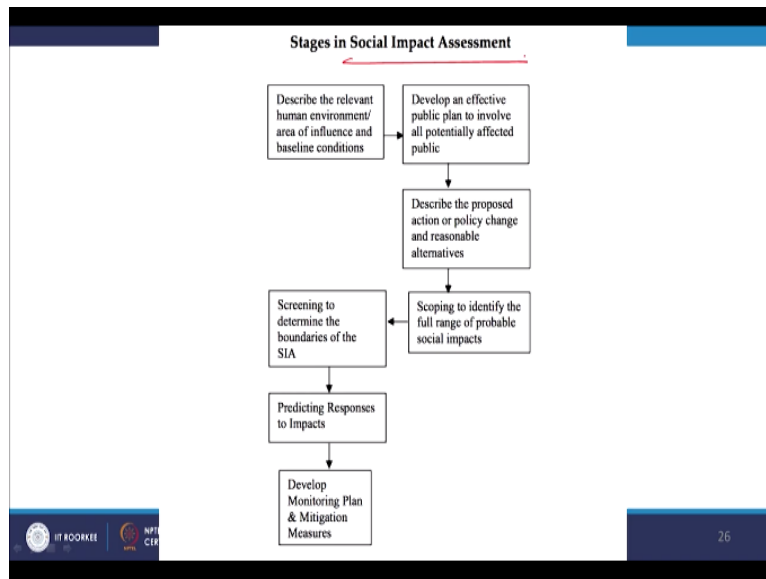
Similarly, there could be there is a streamline that a social impact assessment apart from the natural environment impact assessment there could be social impact assessment that also have several stages. So go through the rules and regulation, you will get more idea about the basic method. So having said that I would like to conclude today's lecture. So today we mentioned very important aspects of the environment which becomes crucial due to haphazard or non-planned urbanization or when some urban areas is not better maintained.

So those kinds of implications are like air pollution, water pollution or pollution at the sound level, noise pollution and pollution at the visual level, aesthetic controls and also land and land cover contamination. So all these we have talked about giving some current situations of the air pollution, water pollutions and we have seen that we can do or take some actions at the planning level, some actions at the management level.

And if it is taken at appropriate level for all the zones of the city, city can become and can offer a healthy life and a peaceful life to the citizens. Out of that one portion we could not detail out in today's lecture that is the land cover and the blue and green infrastructure. That part we are going to discuss in the next lecture.

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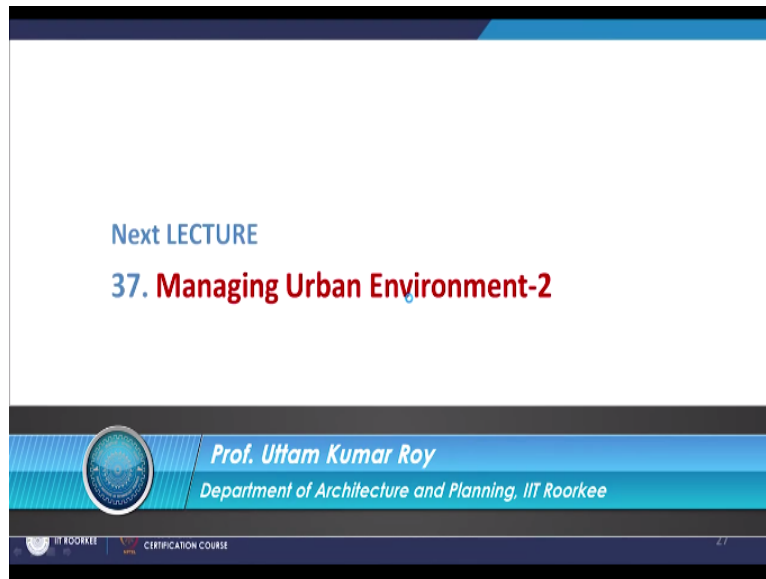
In the next lecture, we are going to discuss the mandates of the blue and green infrastructure whose sole responsibility is to maintain the ecosystem of our city. So with this, I conclude today's lecture. Thank you very much.