Infrastructure Economics
Department of Social Sciences
Prof. Nalin Bharti
Indian Institute of Technology Madras

Module – 08
Lecture - 33

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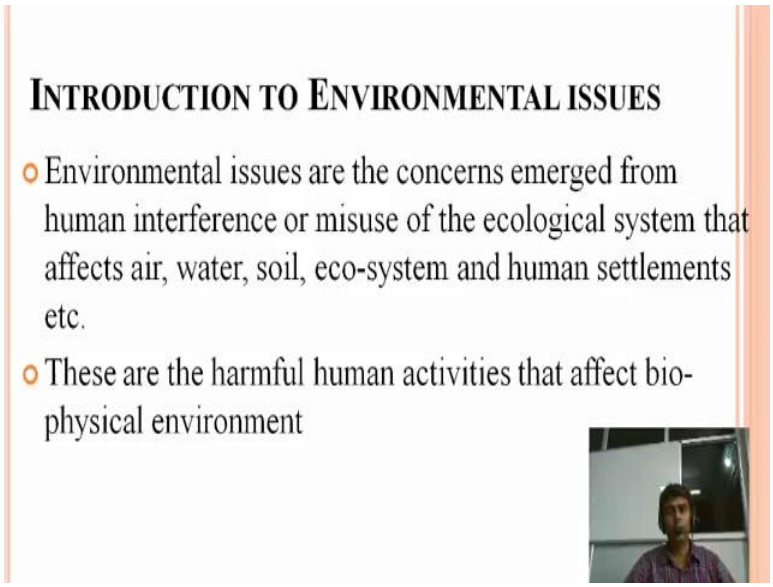

Environmental issues are the concerns emerged from human interference or misuse of the ecological system that affects the entire environment which includes air, water, soil, eco-system and human settlements. These are the harmful human activities that affects bio-physical environment.

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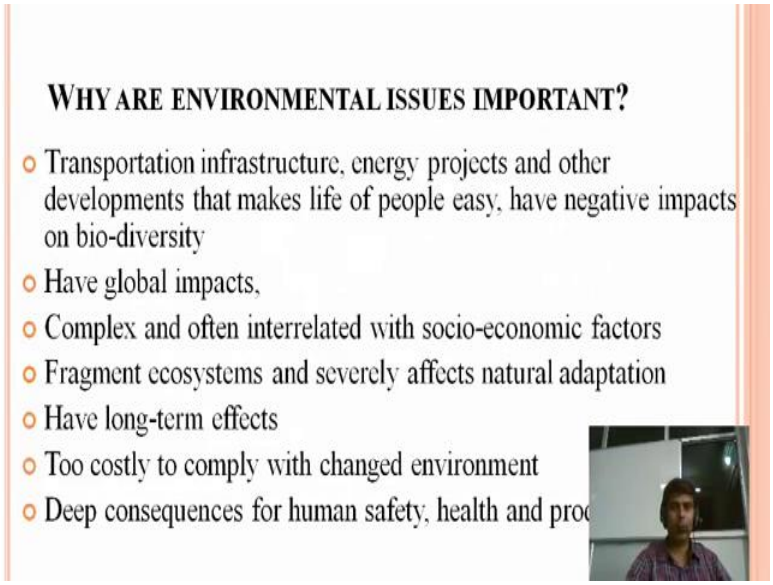

When we are discussing environmental issues in relation to the infrastructure development, it is important to notice that, why are environmental issues important? One of the important point to notice here is the, it has the negative impact on biodiversity. Transport infrastructure, energy projects and other development that makes life of the people easy. It also really have the negative impact on the available bio-diversity of that region. At the same time, the environmental issues are important because, it has the global impacts. It is complex and often interrelated with other socio-economic factors.

Fragment ecosystems and severely affects natural adaptation and it has the long term effects. Environmental issues are too costly to comply with changed environment and finally, the deep consequences for the human safety, health and productivity.

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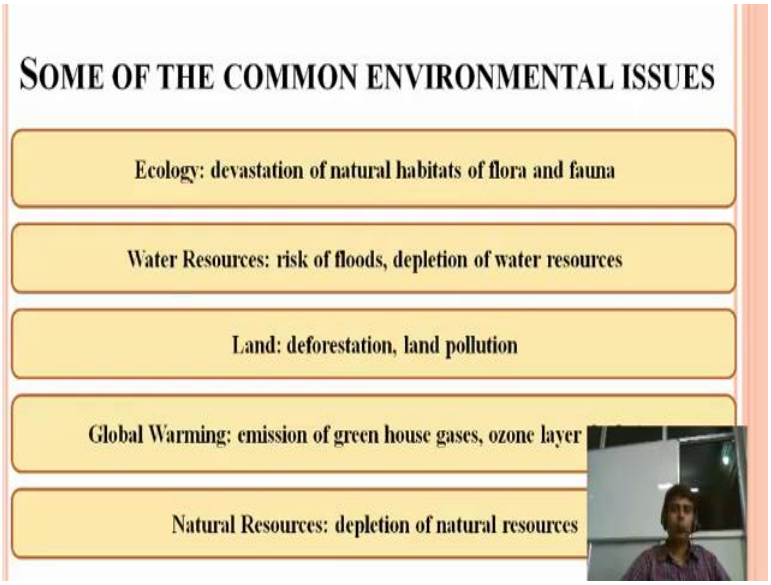

So, some of the common environmental issues are: the ecology- devastation of natural habitats of flora and fauna, water resources- risk for floods, depletion of water resources, land- deforestation and land pollution, global warming- emission of green house gases, ozone layer depletion and natural resources- depletion of natural resources.

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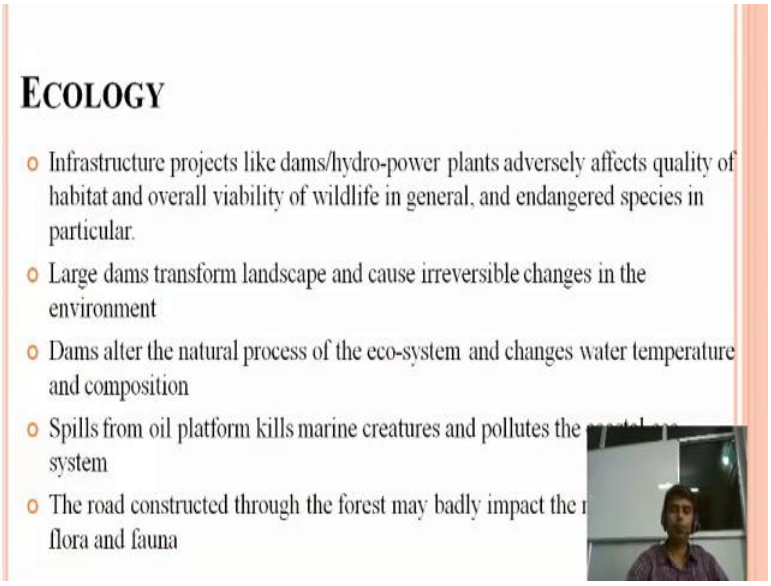

One by one, we can see here that how the different issues are important, while we are really involved in the infrastructure development projects. Infrastructure projects like dams, hydro-power plants, these are adversely affecting the quality of habitat and the

overall viability of the wildlife in general and endangered species in particular. Large dams transform landscape and cause irreversible change in the environment. It has been observed through various examples in the world that dams alter the natural process of eco-system and changes water temperature and composition. The spills from oil platform kill marine creatures and pollute the coastal eco-system. The road constructed through the forest may badly impact the natural habitat of the flora and fauna.

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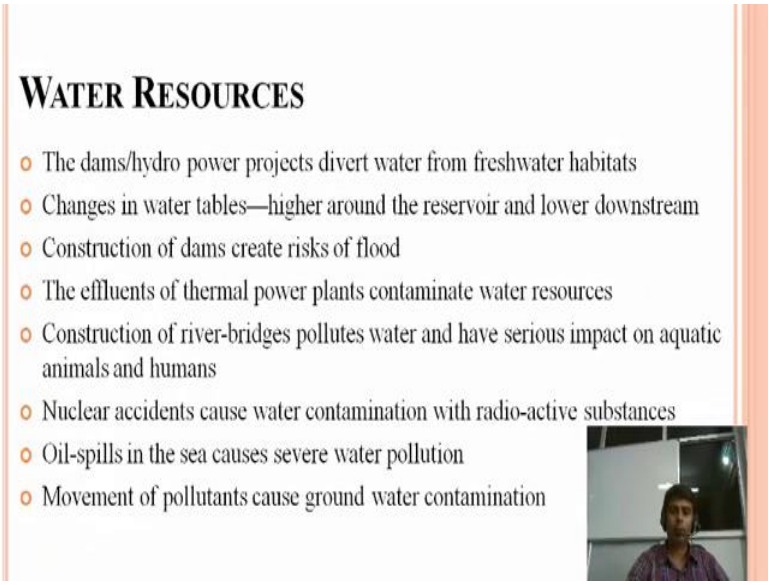

In terms of water resources, the dam hydro power projects divert water from freshwater habitats. Changes in water tables, higher around the reservoir and lower downstream. Construction of dams create risks of flood. The effluents of thermal power plants contaminate water resources. Construction of river bridges pollutes water and have serious impact on aquatic animals and humans. Nuclear accidents cause water contamination with radio-active substances. Oil-spills in the sea causes severe water pollutions and movement of pollutants cause ground water contamination.

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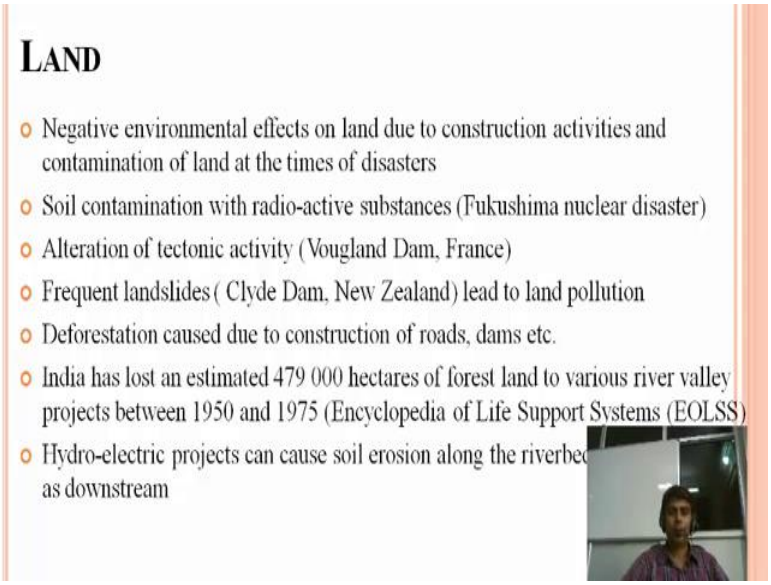

Apart from this, if we can see the impact of environmental degradation on the land and how land is one of the major issues, when we are really developing the infrastructure. One of the negative environmental effects on the land due to the construction activities and contamination of land at the time of disasters. Soil contamination with radio-active substances. Fukushima nuclear disaster has proved this.

Apart from that, we have examples from other countries also in case of alteration of the tectonic activity. Vougland Dam in France is one of the example. Frequent landslides (Clyde Dam, New Zealand) lead to land pollution. Deforestation caused due to the construction of roads and dams etc. India is one of the example in the world, which has lost an estimated 479000 hectares of forest land to various river valley projects between 1950 to 1975. Hydro-electric projects can also cause soil erosion along the riverbed up stream as well as the downstream.

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One of the major challenge today is the global warming and raising the average temperature of the earth. It causes a rise in the sea levels, which effects the marine life. The rising sea levels cause land erosion and harms the habitat of the animals. Global warming melts polar ice and leads to shrinking of the arctic. Infrastructure projects, like thermal power stations emit large number of heat and pollutants in the atmosphere and are responsible for global warming.

So, again construction of roads, railways, airports, ports, etc is also responsible for emission of green house gases like methane and chlorofluorocarbons that deplete ozone layer and increase the temperature of the earth. Transport sector alone accounts for nearly 14 percent of the green house gas emissions globally and this shows that, how infrastructure development, we are adding more projects infrastructure projects.

But, at the same time, we are also adding more global warming situations and this is one of the major issue, when we are going ahead with new infrastructure projects all over the world. We have to really consider the global warming as one of the issue. At the same time, we have to really consider the land, another ecological issues involved in the environment and without taking care of such protections.

Now, it will be really difficult to survive a very eco-friendly infrastructure development projects and if any country is not really in the position to sustain such development, that

is not only going to challenge that particular economy, but that is also going to have the challenge for other countries of the world.

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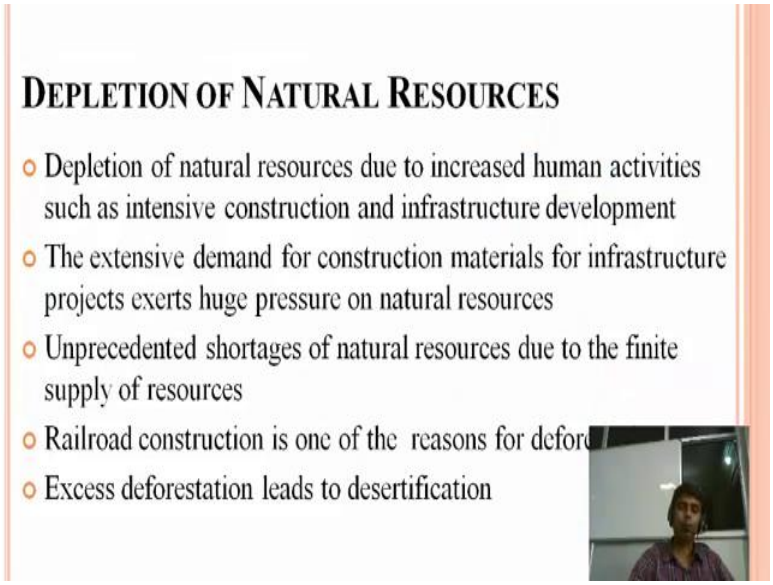

The next one is the depletion of the natural resources. Depletion of the natural resources due to increased human activities such as intensive construction and infrastructure development is happening today. The extensive demand for construction materials for infrastructure projects exerts huge pressure on the natural resources. We have seen that many dead rocks are now broken into the small stone chips and that has really carried out from a different place to the construction areas.

And it is just basically in the name of development and infrastructure projects. We are really taking advantage of those natural resources without considering the natural imbalances occurred due to such deforestation and demolition of the old rocks and other things. So, unprecedented shortages of natural resources due to the finite supply of resources. Railroad construction is also one of the reasons for deforestation and excess deforestation leads to the desertification in the country.

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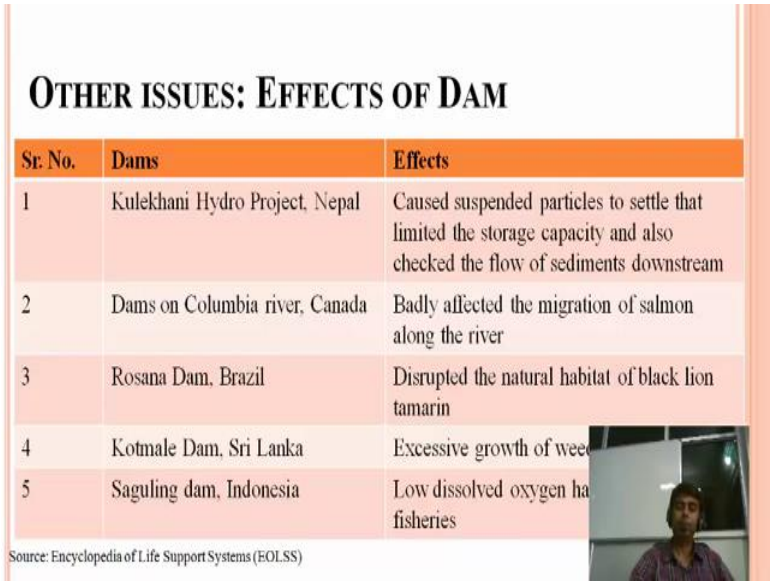

Apart from that, we have experiences from Nepal, Canada, Brazil, Sri Lanka, Indonesia where we can see that, they are certain dams which has different effects, environmental effects. Kulekhani Hydro Project in Nepal that cause suspended particles to settle that limited, the storage capacity and also checked the flow of sediments downstream. Dams on Columbia River Canada badly affected the migration of salmon along the river. Rosanna Dam in Brazil disrupted the natural habitat of black lion tamarin.

Kotmale Dam in Sri Lanka; excessive growth of weeds and Saguling Dam, Indonesia; low dissolved oxygen hampered to fisheries. These are some of the examples from different part of the world, which can be placed here as one of the effects of dam on the eco system or on the environment.

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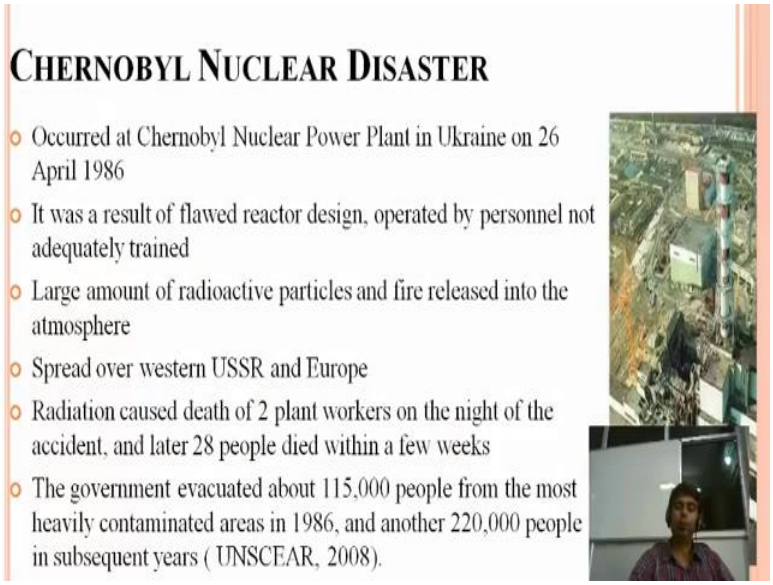

One of the example, one cannot miss here from the Chernobyl Nuclear Disaster, which occurred in Ukraine on 26th April 1986. It was a result of the flawed reactor design operated by the personnel not adequately trained. Large amount of radioactive particles and fire released into the atmosphere, which has spread over to the Western USSR and Europe. Radiation caused death of 2 plant workers on the night of the accident and later 28 people died within a few weeks.

The government evacuated about 1 lakh 15,000 people from the most heavily contaminated areas in 1986 and another 2 lakh 20,000 people in subsequent years. This is one of the major example, which can be seen as a part of the environmental damage and the threat to the life of the people in a particular areas, where such nuclear projects has been developed.

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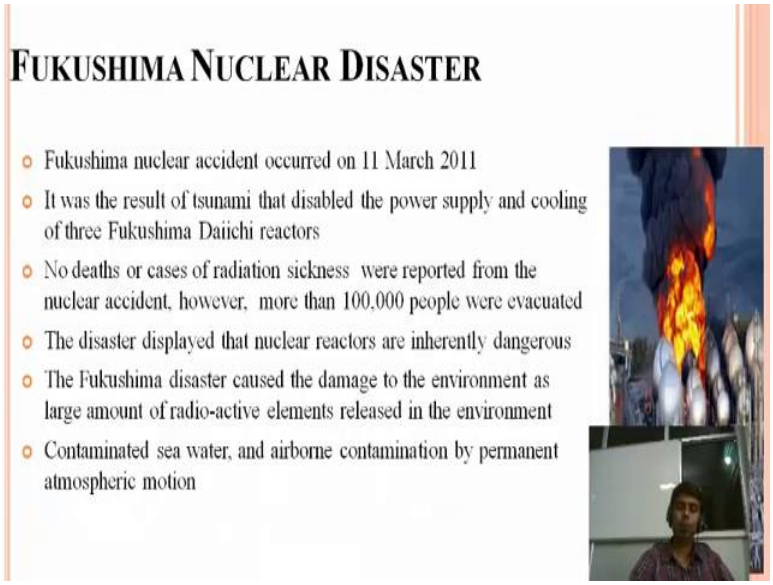

Fukushima Nuclear Disaster which occurred after that… after the Ukraine problem, which occurred on 11thMarch 2011. It was the result of Tsunami that disabled the power supply and cooling of three Fukushima reactors. No deaths or cases of radiation sickness were reported from the nuclear accident. However, more than 1 lakh people were evacuated, the disaster displayed that nuclear reactors are inherently dangerous. The Fukushima Disaster caused the damage to the environment as large amount of radio-active elements released in the environment, contaminated sea water and airborne contamination by permanent atmospheric motion.

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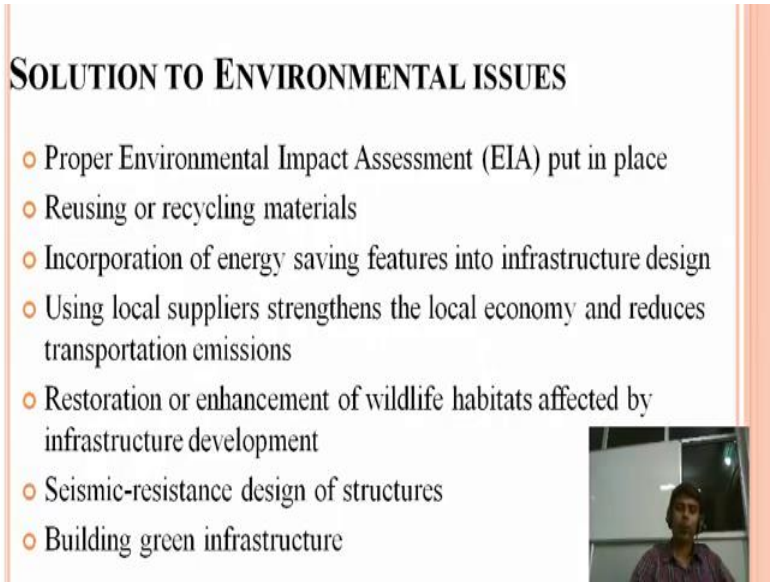

Solutions, what are the solutions to these environment issues? Proper environmental issues impact assessment put in place, when we are really developing infrastructure projects, especially the roads or dams, flyovers and nuclear plants, airports and ports. Reusing or recycling materials, incorporation of energy saving features into infrastructure design, using local suppliers strength, the local economy and reduces transportation emissions.

Restoration or enhancement of wildlife habitats affected by infrastructure development, seismic-resistance design of structures and building green infrastructure. These are the some of the points, which one can highlight here. One of the best example, which can be sited here from Chile, which has a very thoughtful contribution in terms of risk free earth quake from constructions, that is one of the example for many country to take.

And there are many natural disasters, which really increased the number of deaths, but the increase of the death is not really because of the natural disaster. But, it is because of the poor construction of the infrastructure and it is indeed important to take necessary actions while infrastructure developments are being constructed. Local economy and how to reduce the emission at local level, even if that will be consider, we will really reduce the emission, carbon emission at the global level.

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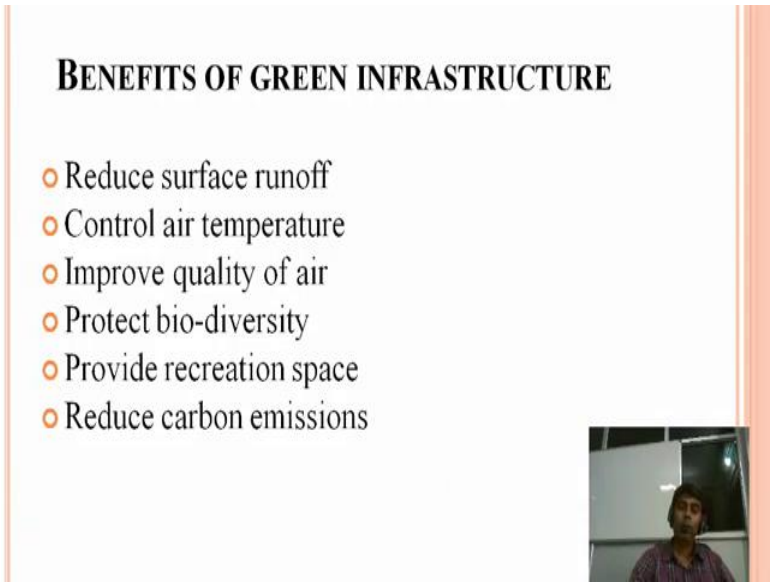

What are the benefits of green infrastructure, environmentally fit infrastructure, because it reduces the surface turnoff, it controls the air temperature, it improves the quality of

air, it protects the bio-diversity, it provides the recreation space and it reduces the carbon emissions. So, these are some of the benefits of developing infrastructure with a proper care of the environment.

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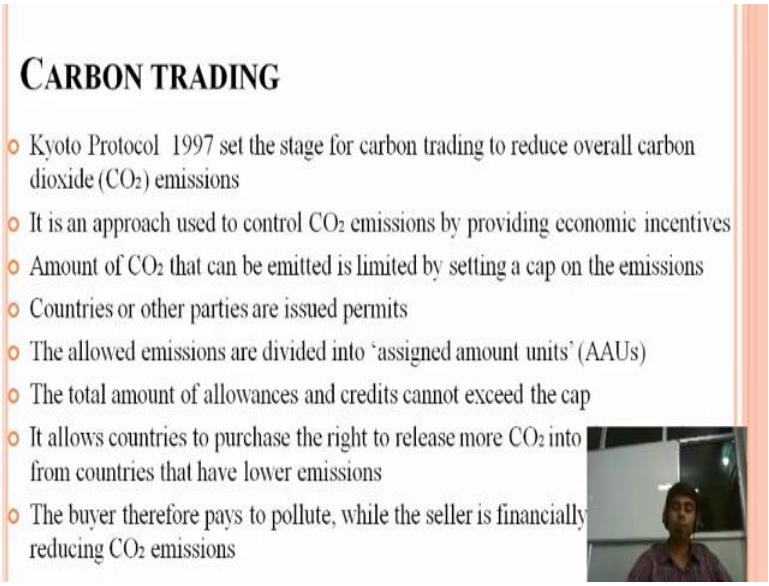

One of the new term, which is being used after the Kyoto Protocol in 1997, which has set the stage of carbon trading to reduce overall carbon dioxide emissions. It is an approach used to control CO_2 emissions by providing economic incentives to the countries. The amount of CO_2 that can be emitted is limited by setting a cap on the emissions and countries or other parties are issued permits.

The allowed emissions are divided into assigned amount units, the total amount of allowances and credits cannot exceed the cap. It allows countries to purchase the right to release more CO2 into their atmosphere from countries that have lower emissions. The buyer therefore, pays to pollute, while the seller is financially rewarded for reducing CO2 emissions.

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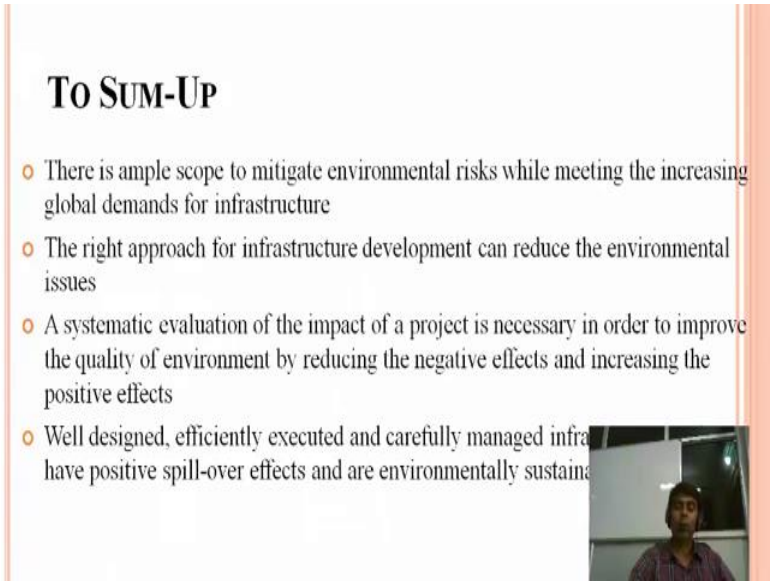

To sum up, we can really say that, there is ample scope to mitigate environmental risks, while meeting the increasing global demands for infrastructure. The right approach for infrastructure development can reduce the environmental issues. A systematic evaluation of the impact of a project is necessary in order to improve the quality of environment by reducing the negative effects and increasing the positive effects.

Well designed, efficiently executed and carefully managed infrastructure projects have positive spill-over effects that are environmentally sustainable. So, as we have discussed in past that environmental infrastructure development is a very challenging task and it is a long run task. And when it is a long run exercise, we cannot really avoid the environmental risk and the environmental issues today, which is considered as one of the serious issues for majority of the country in the world today. But, still there are many steps, which is underway and that has to be progressed as soon as possible. When, we need the environment and when, we really going ahead with more infrastructure projects.

Thank you.