**Ethics in Engineering Practice**
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**Lecture – 22**
**Responsibility of Environment (Contd.)**

In this session we will focus on environmental leadership. So, who are environmental leaders? Environmental leaders are those who look at environmental problems in light of their own experience and moral values and are committed to leveraging, their area of expertise to realise sustainable development in the professional and private lives and exercise leadership in fulfilling their social responsibilities.

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So, this is a definition given by United Nations Decade of Education for sustainable development.

So, there are two types of people who are required to attain sustainable development, like environmentally conscious citizens, people whose lifestyles have a minimal effective environment and environmental leaders means who have the ability to make the socioeconomic system more harmonious with the environment, through environmentally friendly products, services, businesses, technologies and policies. So, we will look into further details of it.

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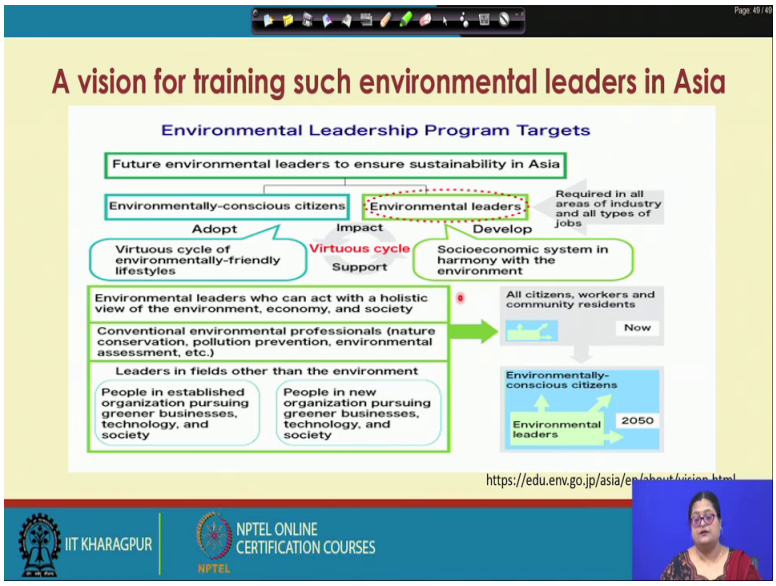


So, what we have find like if we have to make future environmental leaders to ensure sustainability of India in a sustainability in Asia. We have to take into consideration environmentally conscious citizens and environmental leaders. So, who are environmentally conscious citizens are those who adopt virtuous cycle of environmentally friendly lifestyles and environmental leaders would develop socioeconomic system in harmony with the environment.

So, environment leaders act with an holistic view of the environment economy and society and then they. So, that they all citizens workers and community residents are like in harmony with the total environment. So, this is the focus where they try to like integrate the socioeconomic system in the harmony with the environment through the product design services etcetera.

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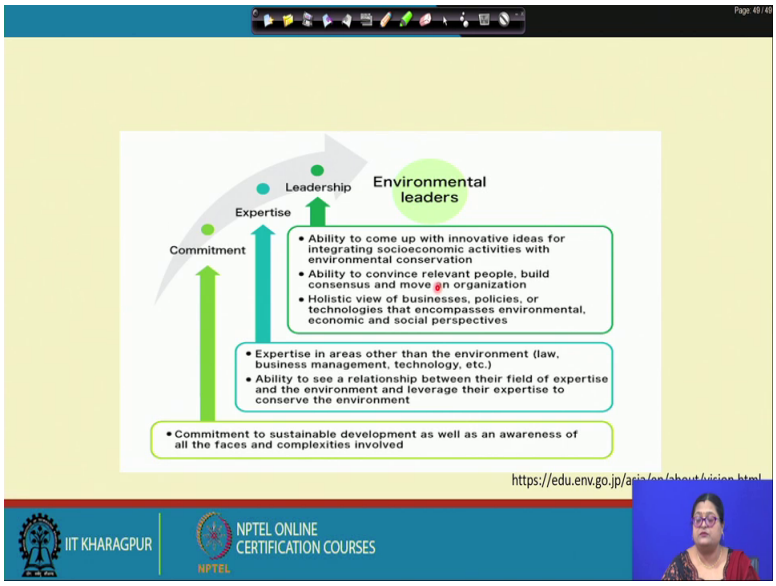


So, who are environmental leaders and what do they have is what we find over here at the base is of course, the commitment. Commitment at the base is of course, the commitment.

Commitment to sustainable development as well as the awareness of all the faces and complexities involved because there could be challenges in adapting this environmentally friendly designs in terms of maybe the cost involved. Who is going to pay for those things, how to absorb that cost because these designs are somewhere costly in order to do it. Then are the client's going to pay for those things or not? These are some of the practical questions that engineers may face while designing environmentally friendly products and services.

And they should like we focus in R and D, which can bring in certain design, which can be produced at a lower cost also. So, these is a cycle of events and these are challenging events, but first what is required is the commitment to sustainable development that we are committed for this purpose and whatever hurdles come we are above should be able to find out ways to overcome this hurdles.

Next when you talk of expertise, it is a expertise in areas other than environment, law, business, management, technology, etcetera and ability to see a relationship between their field of expertise and environment and leverage their expertise to conserve the environment and like at a higher level is the leadership. Means, ability to come up with

innovative ideas for integrating socioeconomic activities with the environmental conservation, ability to convince relevant people build consensus and move an organization. Holistic view of businesses, policies or technologies that encompasses environmental economic and social perspectives.

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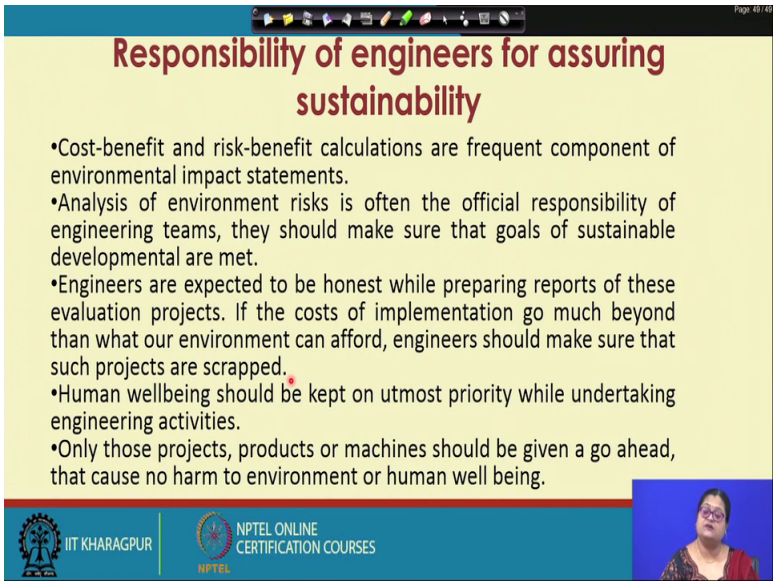


So, what are the responsibilities of engineers for assuring sustainability are, cost benefit and risk benefit calculations are frequent components of environmental impact statements.

Analysis of environment risk is often the official responsibility of engineering teams. They should make sure that the goals of sustainable developments are met. Engineers are expected to be honest while preparing reports of this evaluation projects. If the cost of implementation to go much beyond that what our environment can afford, engineer should make sure that such projects are scrapped.

Human wellbeing should be kept on utmost priority while undertaking engineering activities. Only those projects, products of machine should be given to go ahead, that cause no harm to environment or human wellbeing. Here also we need to like focus on like this should be environment and human wellbeing.

Sometimes, it what happens as we discussed in invisible hands and the tragedy of commons. Sometimes you thinking of the human wellbeing, we overlook into the like

the rights of the environment and our duties to protect the rights of the environment in it's for its own sake.

Environment is a very important stakeholder and it has a right to exist in the form as it is and to be less harmed. Now the there may be a debate like if we are not acting on the environment and we are not getting the resources, then how do we proceed with our projects and all this things?

Environment should not be seen as a means to the end of human welfare, but here what we are trying to say the protection of the environment is itself important because import a environment itself is a very important stakeholder, which has its right for its own survival in the form it is in existing.

And that should be an end in itself taking care of the environment, the species in the ecosystem is an end in itself and we should not focus on taking care of the environment because it is providing as a resource for the human wellbeing. Because then sometimes if it comes to like which welfare to give a priority to the human or the environment.

It may so happen sometimes we overlook the needs of the environment and become more concerned of the wellbeing or the needs of the human being at the cost of like providing harm to the environment. But where we are the do discussing environmental ethics, we need to understand like it is a part of our responsibility to take care of the environment itself as a very important stakeholder and it is a caring perspective towards the environment, it which talks of the mutual coexistence of the human beings and the environment at large together.

And the coexistence this energy should be such that it is a balanced coexistence for the presence and future. If it is required to like maybe exploit the natural resources for the products and services, focused towards human prosperity and wellbeing. Then it is an equally part of responsibility of us to replenish those back to make good for the lost, the harm that we have provided to the environment and to take up such designs which are like providing less harm to the environment and less exploitation to the environment and still we are getting our end products.

It is challenging, but that is where the commitment to the sustainability development lies for like ethical and environmental leadership.

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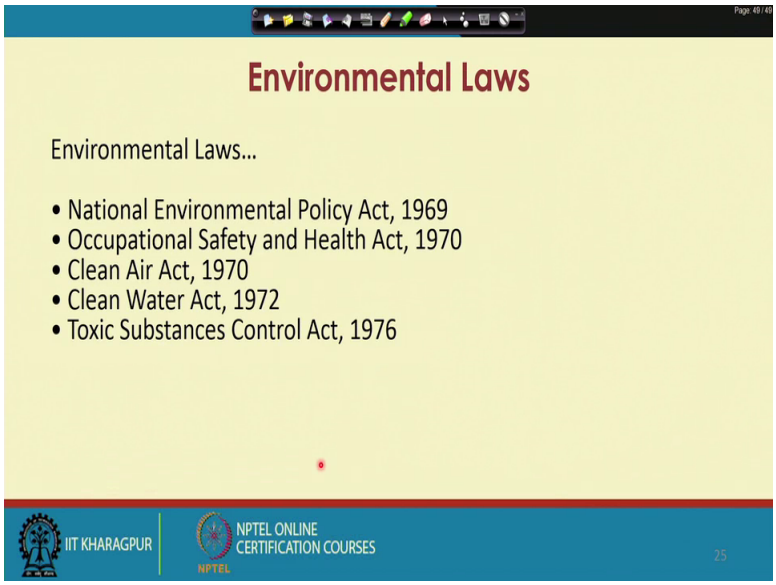


So, there are laws which guides towards how we should be acting towards the entities in the environment. Like, National Environmental Policy act 1969, Occupational Safety and Health Act 1970, Clean Air Act 1970, Clean Water Act 1972, Toxic Substances Control Act 1976.

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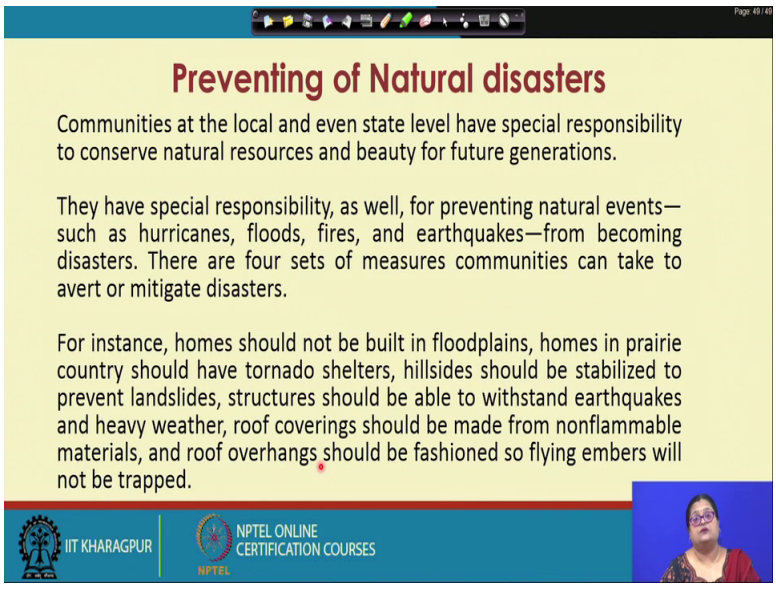


So, what we can do for preventing of natural disaster? So, what we see that the communities and local and even state level have special responsibility to conserve natural resources and beauty for the future generations. They have special responsibility

as well for preventing naturally events; such as, hurricanes, floods, fires and earthquakes from becoming disasters.

There are four sets of measures communities can take to avert or mitigate disasters. For instance, home should not be built in floodplains, homes in prairie country should have tornado shelters, hillside should be stabilized to prevent landslides. Structure should be able to withstand earthquakes and heavy weather, roof coverings should be made from non flammable materials and roofs overhangs should be fashioned so flying embers will not be trapped.

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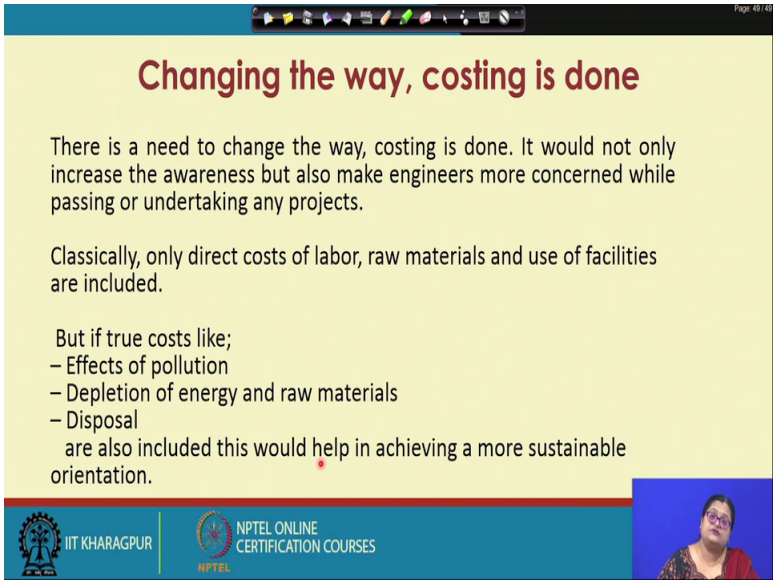


And also, so, these were some of the measures and we have to focus on changing the way that the costing is done also because for whatever activity that we are doing there is a cost involved in it and the social cost for activity is there and though somewhere in the end price of the product, we need to in buy those cost also.

So, do the cost gets reflected like the in the production process and the end price that we are paying for it? So, there is a need to change the way casting is done. It would not only be not only to increase the awareness, but also to make engineers more concerned while passing or undertaking any projects. Classically what happens? Only direct cost of labor, materials and use of facilities are included, but there are the cost also and that is very important. These are the effects of pollution, depletion of energy and raw materials,

disposal of waste products are also included and this will have a more sustainable orientation and we need to understand like who is going to pay for it.

Sometimes, what happens the if the water gets polluted by maybe the products that we are producing and we are throwing our waste into the stream and the river flows and maybe people from very distant place away from where a factory situated gets affected the ecosystem in the river, the fishes, the plants gets weeds gets affected. Then there is a great social cost to it. These people may not even use the product and these fish and the plants, weeds, they not even taste the product, but they are bearing the pains of producing this.

Then who should actually pay for it is a question and of how to like design and how to like pricing of your products? Because they are sharing the paying part of it, they are paying a cost without even getting a benefits of it. So, how to take care of this how to balance this and who is going to pay for it and how to account for it? These are questions which the way the costing is done need to take care of it.

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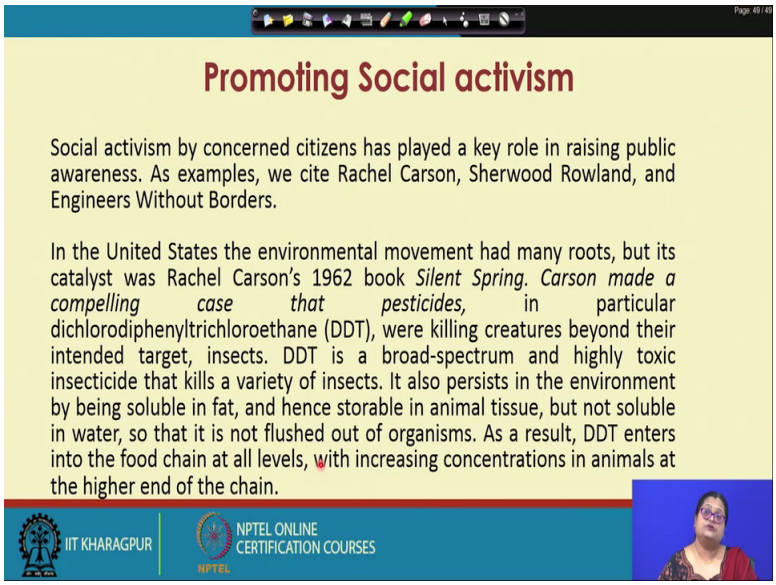


We should promote social activism is to make people aware of the rights of the environment and the importance of the mutual coexistence hence energy in the ecosystem, for the benefits of all entities present.

Social activism by concerned citizens has played a key role in raising public awareness. As example, we said Rachel Carson, Sherwood Rowland an engineers without borders.

In the United States, the environmental movement have many roots, but its catalyst was Rachel Carsons, 1962 book on Silent Spring. Carson made a compelling case that pesticides, in particular DDT, were killing creatures beyond their intended target insects.

DDT is a broad spectrum and highly toxic insecticide that kills a variety of insects. It also persists in the environment by being soluble in fat and hence storable in animal tissue, but not soluble in water, so that it is not flushed out of the organism. As a result DDT enters into the food chain at all levels with increasing concentration in animals at a higher end of the chain.

So, what we find over here the impact of pesticides on entities in the ecosystem where it is to whom it is not intended for and they are bearing the pain of it. And then what is the responsibility of the engineers designers for making it specific for the target group for what it is intended to and minimizing this part of the harm that is caused to the environment at large and other stakeholders is were again a balanced approach is required.

So, with this we come to the end of this session and we thank you for your interaction and we hope to see you again in the next discussions which will bring in further issues related to ethical issues in engineering practice.

Thank you.