Introduction to Environmental Economics
Prof. S. P. Singh
Department of Humanities and Social Sciences
Indian Institute of Technology, Roorkee

Lecture – 03
Environmental Economics and Other Sub-Disciplines

Today you will study about the relationship between Environmental Economics and Sub-Discipline of economics. Let me tell you the outline of the today's lecture.

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I will briefly explain you what I had discussed earlier, then I will also explain the difference between environmental economics and traditional economics. You will also know the difference between environmental economics, and ecological economics; environmental economics and natural resource economics. You will also study about the environmental economics and energy economics and we will also examine the relationship between other

sub disciplines and other subjects. Like how the environmental science is associated with environmental economics etcetera.

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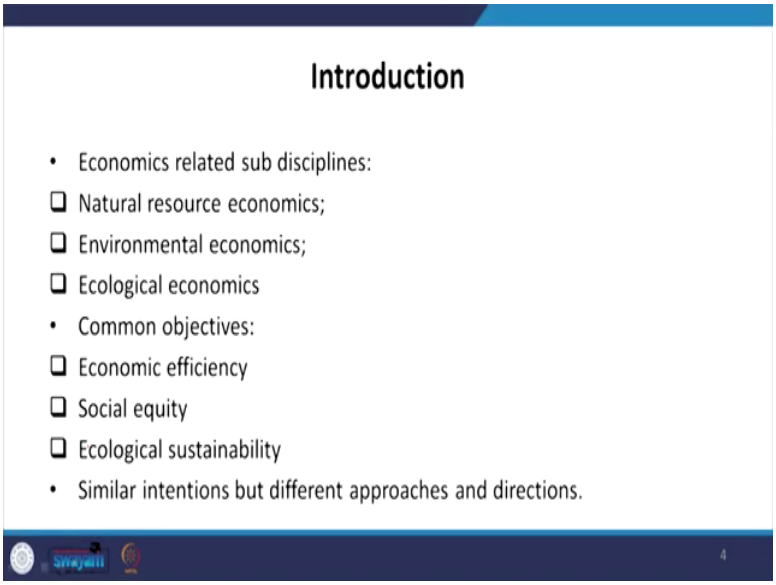

Apart from this you will also study you will study about the difference between environmental economics and general economics. In environmental economics major focus is on how to estimate economic efficiency, how to achieve social equity, and how to achieve ecological sustainability. So, efficiency, equity, and sustainability these are the key challenges which are addressed by environmental economics.

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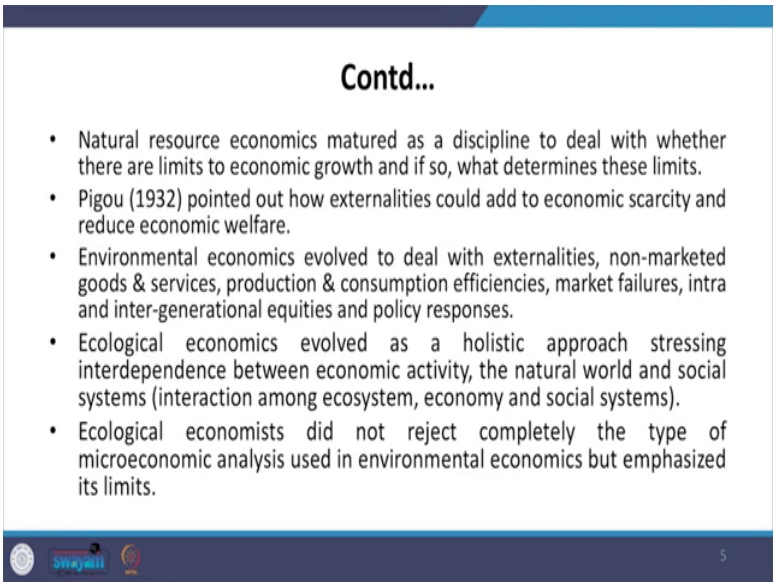

And in natural resource economics, we also study about how the natural resources are utilized, how to optimize the use of natural resources. And in environmental economics as a discipline we also study about the externalities, non marketed goods and services, production and consumption, efficiencies, market failures, intra and inter regional equities, and also the policy responses towards solving various environmental problems.

Ecological economics evolved as a holistic approach is stressing interdependence between economic activity, natural world and economic systems. So, in ecological economics we study the interaction among ecosystem, economy, and social systems. So, these are the three key systems we have ecosystem, we have economic systems, and we have social systems. So, these three systems are studied in ecological economics and ecological economist did not

reject completely the types of macroeconomic analysis they are used, but approach is different.

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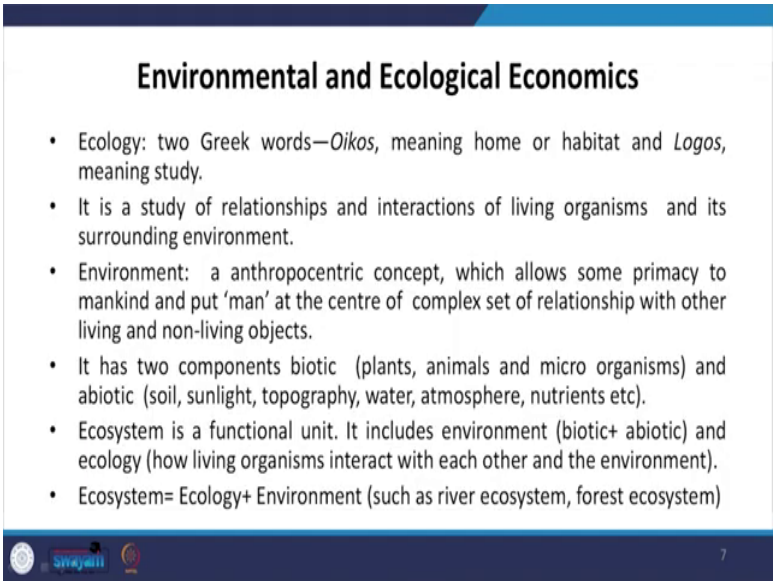

So, let me tell you the difference between environmental economics and ecological economics in detail. But, before that to understand the difference you should know what is ecology, what is environment, and what is ecosystem. So, without properly understanding these three terms we would not be able to understand the difference between environmental economics and ecological economics.

So, what is ecology? Ecology is made from two Greek words; Oikos which means home or habitat and Logos which means steady. So, literally meaning of ecology is a study of habitat, habitat includes animals, living as well as human beings. It is a study of relationship and interaction of living organism and its surrounding environments.

So, ecology actually studies the relationship and interaction of living organ organism and the surrounding of environment. Environment as a concept is more close to anthropocentric or we focus more on anthropologic activities within the environment which allows some primacy to mankind.

And put men at the center of complex set up relationship with other living and non living objects, so this is the basic difference. When you look at ecology; so ecology focuses on the study of habitat while environment takes into consideration the men at the center and everything revolved around the human kind or mankind.

Environment has two components, biotic which includes plants, animals, and micro organisms. And a biotic which includes soil, sunlight, topography, water, atmosphere, nutrients etcetera. Now, the third term is ecosystem; ecosystem is a functional unit it includes environment which has two component, biotic and abiotic and also include ecology.

So, you can simply say that ecosystem is equal to ecology plus environment and ecosystem maybe a large ecosystem and the earth maybe called as a ecosystem. Ecosystem maybe a very micro ecosystem, we may have different kinds of ecosystem like river ecosystem, forest ecosystem, man growth ecosystems, desert ecosystem, so there may be different kinds of ecosystems which we have.

Now, understanding these three concept; now you would be able to understand clearly what is the subject matter of ecological economics, and what should be taught in environmental economics as a subject. Only economics is sophist here ecological economics and environmental economics.

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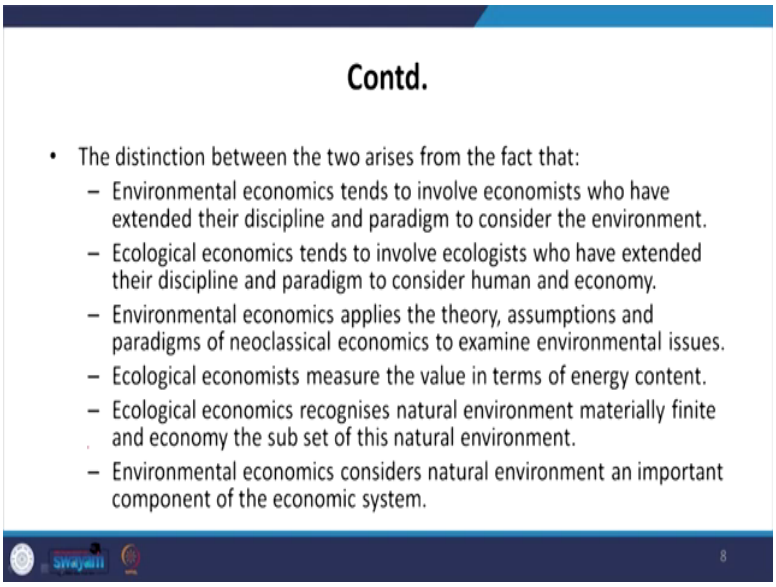

So, now the major distinction between these two subjects are first environmental economics tend to involve economist who have extended their discipline and paradigm to consider the environment. So, I can say that the origin of environmental economics is from economics, while the origin of ecological economics is from the ecology. And ecological economics tends to involve ecologist who has extended their discipline and paradigm to consider human and economy.

Now, when you try to understand environmental economics and ecological economics the basic difference is that in ecological economics economy and society they are considered within the larger set of environment. While in environmental economics economy, society and environment they are considered three different systems which are interacted to each others.

And therefore, if we want to improve our living conditions, if we want to increase our GDP, then we have to accept the natural resources, we have to use our natural resources, and environmental resources. But at the same times if we are exploiting our natural resources at the rate more than the rate of regeneration then these resources will be disappeared. So, entire focus of environmental economics is how to make use of these resources optimally. While in case of ecology economy is eh a subsystem of overall environment; similarly, society is a subsystem of overall environments.

So, therefore, all the theory are in environmental economics considered as a interface or interaction between the theory. And mankind or human welfare is in the center when we study the environmental economics. For example, we may think of environmental protection because our survival is at the stake.

So, why people are bothered about environmental protection, because if there is a environmental degradation the existence of the human being would be affected. So, therefore, policymaker makers, environmentalist, environmental, economist all are focusing on how to maintain a proper harmony between environment and economic activities.

And therefore, environmental economics deals with different kinds of trade off between environmental concerns and the economic activities. Environmental economics consider natural environment an important component of economic system. While ecological economics recognize natural environment materially finite and economy the subset of natural environment.

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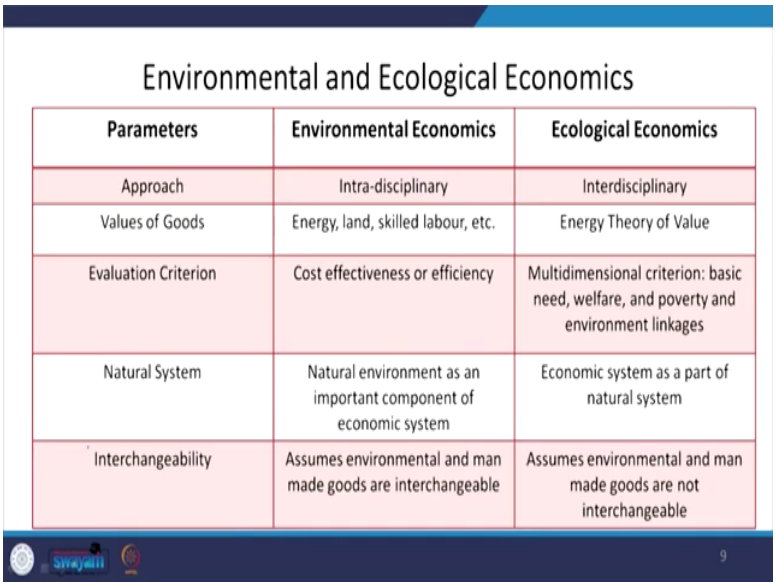

So, this is the basic difference between the environmental economics and ecological economics. Using table we can make a comparative difference between environmental economics and ecological economics. If you take approach of the two sub disciplines, then in case of environmental economics approach interdisciplinary while in ecological economics the approach is interdisciplinary.

So, you can say that in ecological economics not only ecological sciences economics, but also the social issues ethics all these are studied in ecological economics. As far as value of goods are concerned, environmental economics focuses on the use of energy, land, skilled labor to produce the finished products.

While, in ecological economics major emphasis is on energy theory of value. What do you mean by energy theory of value? Means in all kinds of activities ecological economics

considered how much energy is used to produce a particular product. So, more focus of ecological economics is on energy utilization in different kinds of activities.

So, when we are producing certain kind of goods and services how much is the energy utilization in different kind of goods and services that is studied in ecological economics. Then evaluation criteria, so on the basis of evaluation criteria you can make a difference between the two discipline.

In environmental economics cost effectiveness and efficiency is given more focus. So, focus in environmental economics is how to minimize cost, how to maximize returns on the scarce resources, how to achieve production as well as consumption efficiency. So, efficiency, and productivity, and effectiveness these are the things which are studied environmental economics.

While in ecological economics we study about the multi dimensional criteria, we follow the multi dimensional criteria where we study about the basic needs, welfares, poverty, and environmental linkages. So, on the basis of evaluation criteria also these two subjects have some dis similarities.

As far as natural system is concerned, in case of environmental economics natural environment as an important component of ecosystem. So, we considered natural environment as an important component of ecosystem; while in ecological economics we study economic system as a part of natural system.

So, I already explained these things that in ecological economics society or social concerns, and economic concerns are the within the part of the larger environment. While in environmental economics we studied these three systems in inter lated manners, how the economy is affecting the environment. If environment improves how the economy is going to be affected, how the welfare of the society is going to be affected.

So, the interface or interaction among these three key parameters one is economy, second is society or social welfare, and third is overall environments. So, interface between economy,

environment, and society are study in environmental economics; while society and economy they are considered the subsystem of overall larger environment.

Then inter changeability, if we taken as a parameter environmental economics assume that environmental and man made goods are interchangeable. So, manmade and the environmental goods are interchangeable; what does it mean? It means that there is a some sort of trade off. If more or more investment is made to create conventional goods, less money or resources will be available to generate environmental goods.

So, therefore, either society can think of a better environment, a high quality environment, and lesser known environmental goods or conventional goods. Or a society can have a target of having high level of GDP, high level of economic activities, and low level of environment.

So; in fact, in ecological economics earth is concerned as a closed system and that is why whatever is being produced, whatever is being used that remain in the orbit of the earth. As we know in science when one form of energy is change in into another form like the law of thermodynamics. Then thus the change of the energy may be converted another energies, but all material remain on the orbit of the earth.

So, therefore, earth is considered like a spacecraft where whatever you are producing, whatever you are consuming that remains on the earth. So, in ecological economics actually the focus is on limit of the growth; that earth has limited capacity you do not think that earth has tremendous capacity to produce and consume or to do goods and services for the human beings, so this is a basic difference.

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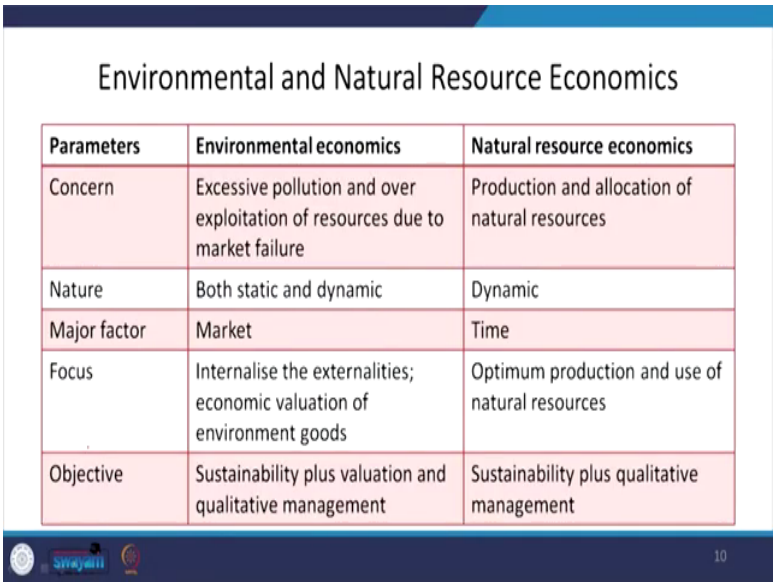

Then we can also make a difference between environmental economics and natural resource economics. Although they are also very close and in environmental economics we also study the resources; in fact, due to limit of the resources most of the economic problem occurs. And that is why in environmental economics we study how these scarce, natural, human, and physical resources are used in the production process. But, certainly when we study the these two subject separately then focus of these two subjects are focus is different.

Like in natural resource economics, the focus is on production allocation of natural resources, and how to augment these resources, how to make efficient of these resources. If we are planning these resources whether resources are non renewable or renewable; these resources if utilized beyond the certain limit then they may not be made available for the coming generation.

So, therefore, here the focus is on protecting, conserving and making the sustainable use of our natural resources. While in environmental economics we also use these resources, but focus is on pollution and over exploitation of these resources due to the market failure. We know that in case of environmental goods either market does not exist or market fails.

So, how to correct the market how to create the enabling conditions under which market can work and solve the problem of externalities etcetera that is you studied in environmental economics. As far as nature is concerned both environmental economics is both static and dynamic.

While natural resource economics is dynamic in nature on the basis of major factors then environmental economics emphasizes on market, while natural resource economics emphasizes on time. Focus of environmental economics is on how to internalize externality. In the first or second lecture you have studied about the concept of externality. Externality means unintentional harm or benefit received by a person not directly involved in the activity.

Like pollution, when we are running a car we are enjoying our car, but the smoke released by the car is consumed by a person not directly involved in the activity and that is a kind of negative externality. So, negative externality is a major challenge and how to internalize that externality is study in environmental economics; like polluter pay principle can be followed.

So, you will study all these things later on there may be various methods how to internalize externality and these methods are study in environmental economics. Moreover in environmental economics we also study how to value environment. So, environment provide us various kinds of goods and services.

So, how to make the economic valuation of these environmental goods and services are also a study in environmental economics. While in case of natural resource economics we study optimum production and use of natural resources. So, mostly focus of environmental resource economics is on optimal utilization of natural resources how to generate natural resources, how to protect the natural resources.

But externalities, economic valuation, and interlization of externalities they are largely covered in environmental economics. As far as objective of the disciplines is concerned; in case of environmental economics sustainability plus valuation and qualitative management is the main objective of environmental economics.

While natural resource economics focuses on sustainability plus qualitative management of natural resources. Next we can also study the relationship between energy economics and environmental economics, I think you already know the content of environmental economics. So, what is environmental economics we had discussed it in detail.

Now, let you know what is energy economics? Energy economics deals with the allocation and use of different kinds of energies. How the different kinds of energy are produced, how they are utilized, how what is the market of different forms of energies all these things are studied in energy economics.

So, mainly in energy economics the focus is on energy power like how to create market for different kinds of energies, what is the implication of the energies on environment all these things are studied environmental economics. So, in energy economics we study about the method of generating energies, we also study about energy markets. Even the futures market in energies all these things are studied in energy economics. And since energy is one of the important component which is used in the production process.

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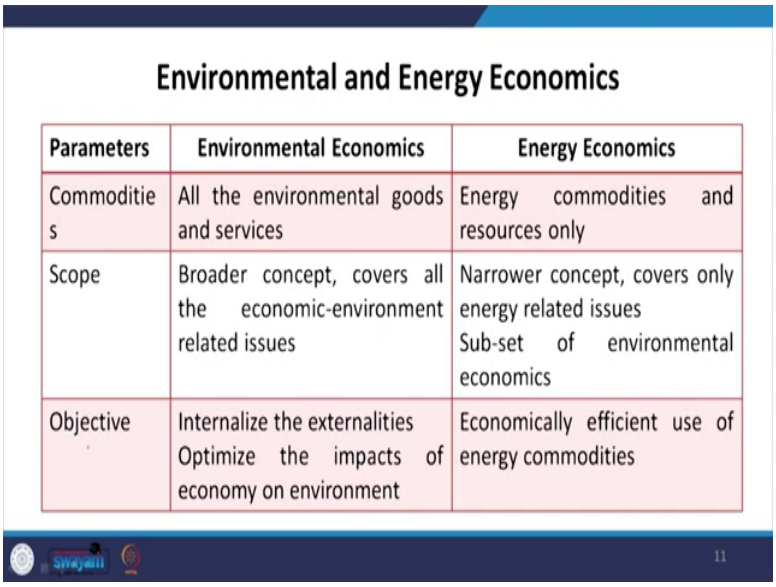

So, energy is also studied as input in conventional economics, and since energy intensification of different kinds of activities are increasing over a period of time. Obviously, the pollution also becomes a significant issue which is a study in environmental economics.

So, this is actually the interface between energy economics and environmental economics as energy intensification increases in different kinds of activities. These energy intensification also generate positive externalities; and how to deal with positive externalities are studied in environmental economics.

Let me take a simple example in India over a period of time the share of mechanical and electrical engineering in agriculture has significantly increase, and share of animal and human energy in agriculture activity singularity decline. So, now you can understand the implication

of energy intensification of farm sector on pollution; as we are using more or more energy certainly more or more pollution will also generate.

Similarly if you look at globally the energy used in different kinds of activities as many our production operations become more electrified automation. So, more energy is used and due to this we are generating these energy either using fossil fuels and there may be depletion of fossil fuels or some alternative sources of energy. And it is a debatable issue whether these alternative sources of energy are truly clean source of energy, or still they also have some sort of emissions in the form of disposal of different kinds of solar panels etcetera.

So, therefore, if you look at the trends of energy consumption across the globe and if energy consumption is increasing, then CO 2 emission is also increasing. So, there is a close relationship between the energy consumption and CO 2 emissions and directly related to the climate change. And advanced countries per capita basis are consuming high level of energy. And now, the emerging economies which are also increasing their GDP and then their GDP becomes are more more electric or power intense use.

Then they are also consume more or more energy and that is creating pollutions in the global economy leading to the climate change in global warming. So, in that sense you can establish the relationship between energy economics and environmental economics. So, you can roughly say that energy is also studied as a one of the component in environmental economics.

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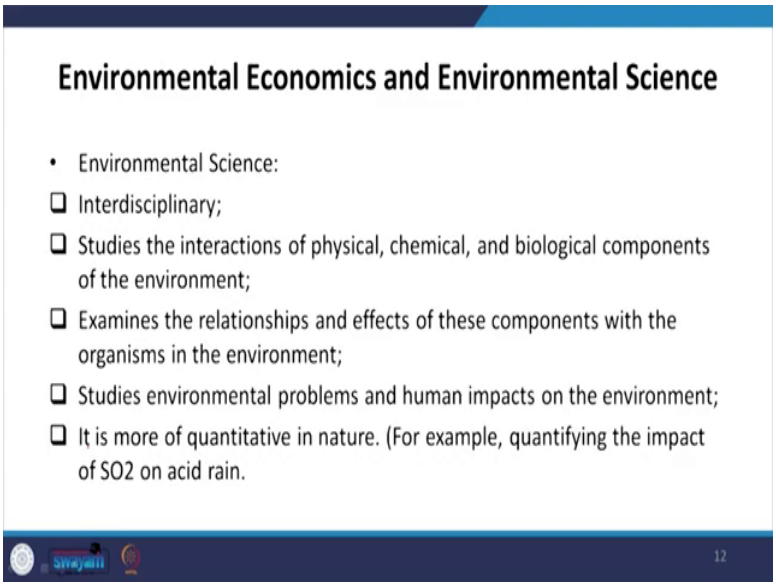

Next environmental sciences; as in the very beginning I told you that the origin of ecological economics is from natural sciences ecology. And environmental economics also get input from environmental sciences; in fact, in environmental economics we get inputs from micro economics, macro economics, welfare economics, and natural sciences including environmental sciences.

So, environmental science is interdisciplinary it includes the inputs from many natural sciences, it study the interaction of physical, chemical, biological component of the environment. It examines the relationship and effects of this component with the organisms in the environment.

And environmental science also studies the environmental problems and human interaction on the environment. But, focus of environmental engineering environmental engineering or

environmental science is more on how to estimate the pollution. Pollution maybe gaseous pollution, pollution maybe water pollution, or pollution maybe solid pollution.

So, solid waste, liquid waste, or gaseous waste they can do the chemical analysis, physical analysis, biological analysis of different kinds of waste and can identify the regions for increasing this kind of waste into the atmosphere. So, that the appropriate policy actions can be taken; and when we talk about the policy action we enter into the environmental economics.

So, therefore, environmental economics get sufficient inputs from natural sciences like even physics, chemistries, and many other sciences, like physical sciences or environmental science. It is more of quantitative in nature for example, quantifying the impact of CO 2 on acid rain.

Now, many cities are placing the problem of CO 2, so and creating the problem of acid rain. So, we can understand the level of pollution through studying the environmental sciences and that is all in this topic.

Thank you.