Energy Resources, Economics and Environment
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Lecture 11
Utility and Social Choice- Part 1

So far we have talked about individual preferences and for an individual choice between two goods, and then we represented it in terms of a preference and then an indifference curve and then looked at utilities and looked at substitution. We are now extending this to the real world. We want to look at, when you have a society of a number of individuals, how does the society make choices and specifically we are interested in choices which relate to environment and development.

So, you may want to look at, there is a good textbook by Kolstad, Charles Kolstad on Environmental Economics, some of this material is based on that. So, we want to ask the following questions in environmental policy, what is the right balance between environmental protection and use? How much of environmental protection should we have?

And this question is not an easy question to answer. It is a social and a political question. We will see in concept, how do we aggregate and how do we translate the individual preferences into something which results in a group or a societal choice.

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So, in order to do that, we will first start with some of the, let us look at some of the kind of choices that we have. So, in Kolstads book, he talks about three examples of environmental choices. The first example is from Chile, a city in Chile, Santiago. Santiago is one of the busiest cities in Chile in Latin America, and it has a severe air pollution problem.

And most a lot of this problem is happening based on diesel private vehicles, as well as diesel buses. And there are many different possibilities, the buses are used by the poor and they have relatively low prices, there are in Chile, like many of the developing countries, it is a, there is a significant amount of inequality. So there are small proportion of the population which is rich and the rich population is more concerned about the air pollution than the poor, the poor are concerned over much more immediate concerns but the health impact happens to everyone who stays in the city.

And so the question is, how much investment should the city do in terms of pollution control, can it modernize its bus fleet, if it modernizes its bus fleet, the cost of public transport and the fares may increase, it may not be affordable for many of the poor to travel in the bus. And so this is one of the choices that is there. It is a very clear choice in terms of air quality, environmental damage, and then the kind of value and the value proposition and the price.

The second example, that Kolstad talks about is an endangered species. It is a small bird, the California Gnatcatcher, which is located in one area of Southern California and this is also an area, the area around it is a area, which is highly industrialized. There is a lot of business and there is a possibility of using that space for development.

However, that is the habitat of the California Gnatcatcher and the question is that should it be declared as a protected area with the result that of course, it will affect the local community in terms of that area will not be available for building up and for development. However, the species will be preserved and then the environmentalists as well as the individuals who are interested in preserving the species, the ecosystem from that point of view, that this would be beneficial.

But the question is, who are the stakeholders in this case? Is it only the people who live in that area, is it the people who visit, is it the people from the entire state of California? And so there are questions in terms of who are the stakeholders, what kind of matrix, what are the kind of tradeoffs?

The third example that Kolstad gives is the largest electricity dam project in the world. It is a Three Gorges Dam in China, which is in the large scale, at the Giga watt scale. The reservoir is 500 kilometers in length. It had a lot of opposition initially, but the Chinese government went ahead and built it, there is a large, it is on the Yangtze River, there is a large amount of land which has been damned. The benefits of this will go for the electricity generation, as well as the development of the country.

In terms of losses, it means that the local population gets resettled and then there are several other issues because of this large dam of water. And these kind of issues globally are affecting almost all large hydro projects and in many countries, this has resulted in severe delays and sometimes even cancellation of some of these projects. To take this back to now, let us look at a few examples from India, the Narmada Valley project.

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Now, if you look at the Narmada Valley project, and you will find that this is one of the largest hydroelectric projects, both for electricity as well as for irrigation in the country, it involved the whole set of different states. There are states downstream and upstream and the benefits accrue to a set of farmers and a set of regions and the losses are occurring to people who are in the project affected zone.

There was a very strong movement called the Narmada Bachao Andolan, and there was several court cases, the heights of the dam were reduced and overall the project was delayed significantly by several years which resulted in cost overruns. Now, depending on the kind of literature that you see, you are either for the project or you are against the project. And it almost seems like there two different stories.

But when you look at projects like this, this is where there is this choice of development and environment. How do you assess, how do you decide to make a social choice and

what are the kind of ways in which you can do that. There is a project in Kerala, the Pathrakadavu hydroelectric project and this was very near the Silent Valley. And this is the habitat of the Lion tailed Macaque, which is a particular monkey, which is available whose habitat is in that region.

And the opposition to this project was that this will affect their habitat and it would affect the biodiversity. The project went through several iterations and was stalled and again, I think it has been revived, it is not yet, we are not yet clear about what is the final status on this. The third example that I give you, is an example that you will find very interesting bit it is unique in its context.

So, one of the largest companies in the world Vedanta has been mining bauxite for when you look at aluminum and you have aluminum refining and bauxite mining, they wanted to extend this to the Niyamgiri hills in Orissa and the Niyamgiri hills was one of the few habitats where there are tribals who actually, the protection of the hills and the habitat, and the trees in those hills have a religious value to them.

And so there were several NGOs who are opposing it, locals and there was a standoff between the project proponents and the project opposer. And this is where the courts got involved and finally this was the one example in which it was decided by the ministry and the courts that the residents, the villages who were affected in these hills, there would be an election.

And the project was to be decided, there will be voting on whether the project would be a yes or a no. And it would be done at each Gram Panchayat level. There were observers coming in, this is widely reported and there are videos and newspaper reports, you can read about it. The first time this was done for an environmental project and interestingly each and every village rejected this proposal, and with the result that this bauxite mining proposal was installed. So this was an interesting kind of example.

Iron ore mining in Goa has become a sort of political issue. The mines were closed and then so because of environmental damage and land use and so, again this is again another open kind of issue, the advantage any mine or any industry that you talk off will create

jobs, will create development, but on the flip side is that it will have a impact on the land use, it will have an impact on the environment and we have to make tradeoffs between this.

In Mumbai there is a large coastal road project going all the way to South Mumbai and again this is a heavy investment and this had been this again has had several opponents and I believe that with the change in government, this may again be reviewed. The most cities in India now are going in for expansion of public transport with metros and metros of course are that way environmental friendly because they are reducing the local emission, they are reducing the congestion as well as the CO2 emissions.

For the metros, whenever you have the metros, you will have to have locations where the metros will be parked and that means there is sheds which will take a reasonable amount of land area, in a city like Mumbai, you do not have large tracks of land which are still not, which is still available, the metro shared is planned Aarey and Aarey colony is one of the few green patches in the city.

And so there have been, there has been opposition to the metro shed in Aarey, there were protests and there was this case, Supreme Court case. Some trees were chopped down and this was an issue in the elections, and subsequently, this is again going to be reviewed with the change of government. So, as you see, these are some of the examples which illustrate to you that there are many different aspects when we look at many of these projects.

There is always this tradeoff that we think in terms of when we look at development and the environment. So, we will try and see how we analyze this, what are the kind of ways in which we can look at the framework that we have talked of in terms of utility and look at individual choices and comparing individual choices with this. Before we do this, we need to understand what are the perspectives or the individual beliefs based on which we are going to do the analysis. So you can read up about most of these projects. If you just Google them you will get details.

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So, this is for instance, the Pathrakadavu Hydroelectric Project, some details that I get from the public domain in terms of the review, if you see this, the 70 megawatt project cost of about 420 crores, similarly, you can look at the technical details as well as the environmental impact, most of these projects would have some environmental impact assessment.

And then normally there is a process where they invite public comments and then, but many times they get mired in some kind of a controversy, but we are trying to look at this in terms of how do we compare and how do we choose.

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So, we would like to look at the kind of different philosophical perspectives. So, we look at essentially three perspectives, biocentrism and which basically focuses on the fact that every living organism has an intrinsic value. Then there is a second perspective, which is a sustainability perspective where we want to preserve the health of the ecosystem.

The third perspective is a human centric, or anthropocentrism. So, depending on your value system, whether it is biocentric or sustainability or anthropocentrism, it will result in different kinds of choices.

And of course, in general people will have a multiplicity and you will not be extreme on any of these, but it is good to understand philosophically what are the differences between these three perspectives, and then precautionary principle if you know that there are likely to be problems you may want to just take the safe we out and try to see that we can preserve the environment and yet have some development.

In the case of biocentrism, we will talk about intrinsic value and instrumental value and they will define what is biocentrism.

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So in biocentrism we are saying that the biologic world is the center of the value system, all living beings have intrinsic value, regardless of their instrumental value. So, what is instrumental value? Instrumental value refers to the usefulness of an object or of an individual or of a being. So, it is the instrumentalness is the usefulness that if it can serve as an instrument for achieving some useful objective and that is what is an instrumental value.

So, only those things which can serve some useful objective will be said to have an instrumental value and in the case of biocentrism, we say that all living organisms have an intrinsic value, irrespective of whether or not they have any use, irrespective of whether or not they have any instrumental value. So, something can be totally useless and still have intrinsic value.

Example, the smallpox virus so in a biocentric world, the smallpox virus has a value and you would not want to destroy it however we consider that to be the smallpox virus is useless and actually has a negative value and damages but we in the biocentric world we think that, all life, all of life is important and we want to perceive, we want to preserve life.

So, in a similar fashion if you have a biocentric view of the world, even if you have someone who is a known murderer, you would not prescribe a death sentence because you feel that life itself has a value. And even though that person has a negative value in society, you would still continue to keep that person in prison, but you would not destroy it because life itself has an intrinsic value.

And we would like to, so, this is one extreme, and this would mean that if you have a biocentric viewpoint of the world, you would try to not only preserve individuals, but you would also like to preserve all kinds of all the organisms. And so that is, one kind of perspective, philosophical perspective one which one we have. The second perspective that we talk about is the sustainability perspective.

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Sustainability perspective initially was proposed by Leopold, way back in 1949, talks of the land ethic, the health of the ecosystem is of paramount importance. So, you want to make sure that the land remains fertile, that the land remains beautiful and we would like to keep it in that fashion. So, in the case of sustainability, we are looking at an environmental policy being right, only if it preserves the integrity of an ecosystem and wrong if it does not.

So, the question is, is this consistent with natural resource use for humans? It could be, so, it depends on it provided the use does not degrade the environment. For instance, fishing is acceptable but overfishing is not because if you overfish, the entire population of fish in the rivers would vanish and that is not sustainable. The logging is acceptable, cutting of trees, but provided the long term health of the forest is not affected or it is not jeopardize.

And so this is consistent however, if you look at fishing, fishing will not be consistent with the biocentric view of the world because the life, living fishes have their own value and you will not be allowed to damage that. Sustainability term is commonly used but often not precisely defined.

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We often approach sustainability from the point of view of what is not sustainable. So, a few decades back the Brundtland Commission define sustainability as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. And this is of course, mostly a human centric definition but when we are talking of the land ethic and the sustainability, we are looking at also the sustainability of the overall ecosystem.

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Robert Solow has defined sustainability as making sure that the next generation is as well off as the present generation and ensuring that this continues for all time. What are the

two aspects of sustainability that are important? The first is the degree to which natural capital can be viably replaced by human capital. So, we always started with having things available in nature.

We have a number of different processes and natural cycles, the history of human development have been where we have made our own ways of doing things and mimicking nature. So, we replace natural capital by human capital, by technology, by materials, by devices. And so this is to what percent to, you know to what extent can we do this and we do this essentially to make our lives more comfortable.

The second part of sustainability is that we, the present generation has an obligation to future generations and so we also looking at sustainability in terms of how do we fulfill that obligation, so that future generations can enjoy at least the same quality of life that we enjoy. So, the man made capital, when we talk of machines, building.

So for instance earlier we used to have day lighting and you can have ventilation but now we create lights, artificial lights, we condition the air in the buildings, and then we imitate nature and we are able to do that so, that we can control and we can increase our comfort. So, manmade capital and most importantly now we are looking at knowledge and information as being substitutes for natural capital, particularly natural resources.

There are limits to this of course and there are physical requirements which are not necessarily going to be substitutable. So, the question is, are sustainability and biocentrism consistent? In many cases, they are not so, for instance, hunting can be acceptable from a sustainability viewpoint, it may be desirable to reduce the overpopulation and there may be a limiting condition in which different ecosystems and different species can coexist in a certain.

So it may be natural from an ecosystem and a sustainability viewpoint to have hunting but it is not acceptable for biocentrics. So, we saw two different perspectives, the first one was biocentrism, the second one was sustainability.

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Let us look at the third, the third perspective, which is anthropocentrism. So, anthropocentrism is basically a human centric viewpoint and the thinking is that only human beings matter and the environment is only there for one purpose, to provide material gratification for humans, this is also an extreme kind of thing.

But if you see the way in which human civilization have been progressing, we behave as if everything is there for us and we are doing, we can exploit it as long as it serves our purpose. So, anthropocentrism only provides an instrumental value to the environment that means the environment is important only so far as it is useful to us. So, if there is air pollution which affects human health, then we should be concerned about it.

But if we are polluting the ecosystem and it does not affect humans, but it is affecting the rest of these civilization then we are not concerned about it. So, this is an extremely selfish and human centric viewpoint, which is often which is actually fairly reflects the way in which development is occurring today. The other slight variant of this is utilitarianism, where we talk about the wellbeing that people attained from the environment and this could be materialistic, spiritual, instrumental or intrinsic.

So for instance, if the Californian Gnatcatcher if we talked about, which was talked about as a example in Kolstad book is something which does not have an environmental, useful value. And we are not very clear about its contribution to the ecosystem in terms of what is the impact to the humans. But it may have a utilitarian value because several people may be happy that we have this species and it has not become extinct.

People may come and visit and see the California Gnatcatcher even if you are not in that locality, the very feeling that we have actually, the perception that it has been saved and it is there is there is a forest may give you a good positive feeling and you may get a utility of that and that is from a utilitarian perspective.