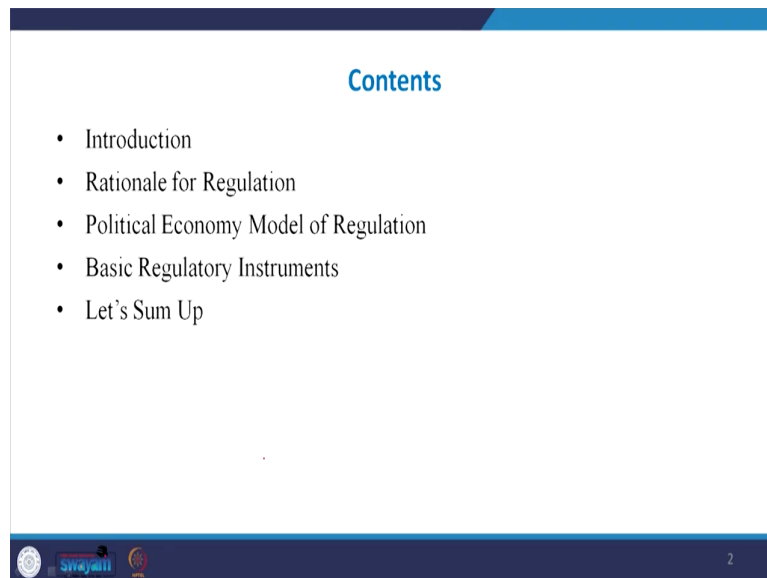


Introduction to Environmental Economics
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Lecture – 50
Environmental Regulations and Basic Regulatory Instruments – I

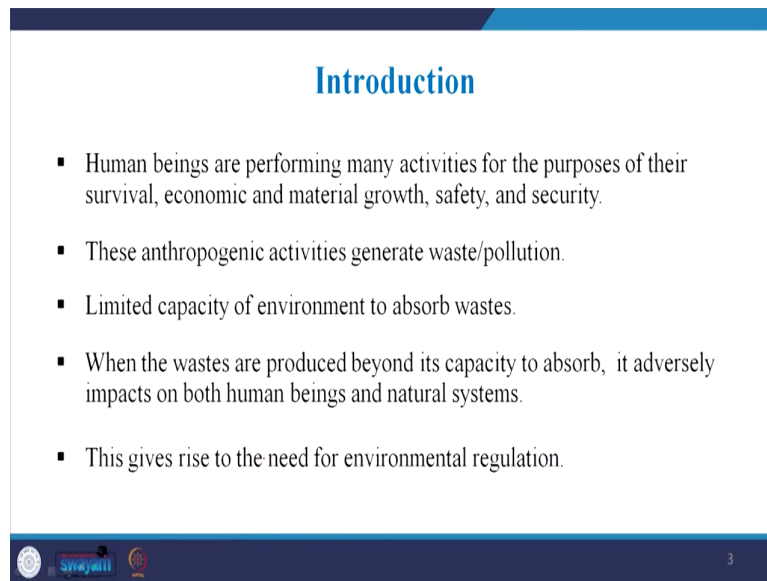
Dear student, today I will take a new topic that is on Environmental Regulations and Basic Regulatory Instruments. In this lecture, I will explain why is regulation required, what is the political economy of regulation.

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And then in briefly I will also introduce some instruments that can be taken to regulate the environment and then we will wind up the lecture.

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Introduction

- Human beings are performing many activities for the purposes of their survival, economic and material growth, safety, and security.
- These anthropogenic activities generate waste/pollution.
- Limited capacity of environment to absorb wastes.
- When the wastes are produced beyond its capacity to absorb, it adversely impacts on both human beings and natural systems.
- This gives rise to the need for environmental regulation.

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Human beings are performing many activities for the purpose of their survival, economic and material growth safety and security.

So, we know that human being perform different kinds of activities to satisfy the human needs. And when we produce different kinds of goods and services to meet our requirements obviously, some waste are also released into the atmosphere. And many times in the absence of regulations, we ignore these waste and we may not treat these waste before releasing them into the atmosphere. That is why these anthropanic anthropogenic activities generate different kinds of waste or pollution in the economy.

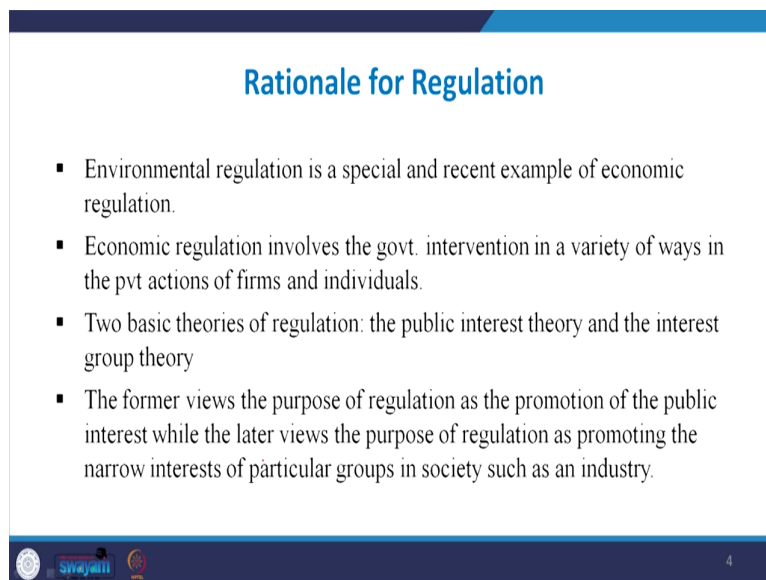
And in the absence of the regulation these waste may not be taken seriously by those who created or who generated this waste. Environment has limited capacity to absorb these waste

in the preceding lectures; I have several time discuss the assimilative capacity of the environment.

So, assimilative capacity of environment is limited when we release certain kind of waste into the atmosphere. The environment absorb these waste or environment clean itself up to a certain extent, but if the load of the pollution in the environment is beyond the carrying capacity of the environment then, it becomes a serious issue and that can be dealt with a strong regulations. When the waste are produce beyond it is capacity to absorb it actually not only adversely affect the environment, but also affect our well being.

So, our well being our welfare is also adversely affected due to generation of pollution into the atmosphere and this generation of pollution also affect the carrying capacity of the environment. And also various kinds of ecosystem services which the environment provide are badly affected due to the release of waste into the atmosphere. And that is why it makes a strong justification for making the environmental protection or environmental regulations so that we can take care of the environment and we can treat the waste efficiently.

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Rationale for Regulation

- Environmental regulation is a special and recent example of economic regulation.
- Economic regulation involves the govt. intervention in a variety of ways in the pvt actions of firms and individuals.
- Two basic theories of regulation: the public interest theory and the interest group theory
- The former views the purpose of regulation as the promotion of the public interest while the later views the purpose of regulation as promoting the narrow interests of particular groups in society such as an industry.

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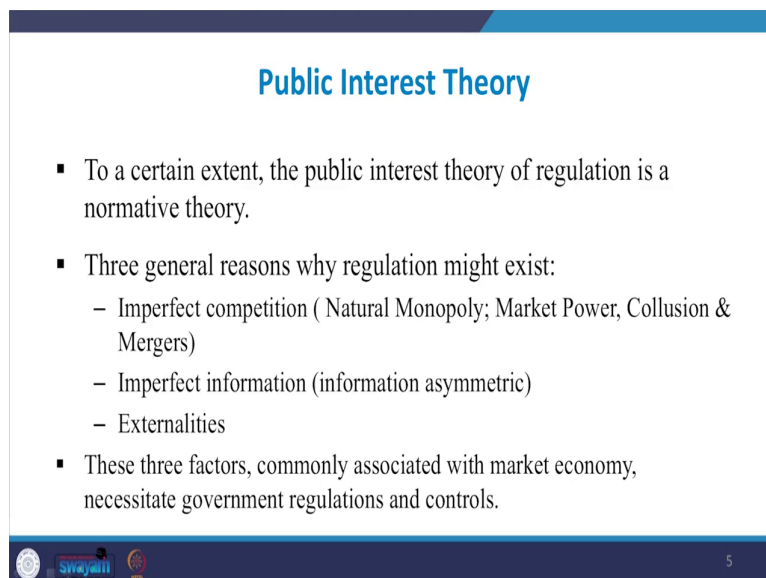
Let me now explain why is regulation required. We know different kinds of regulations, in any economy different kinds of regulation occurs. In fact, in our daily life we face different kinds of regulation; when you are a student then in educational institutions also we have PhD regulation, we have attendance regulation.

So, why these regulations are required? Similarly, when we go to the market to buy a particular product we are not aware about the quality of the product etcetera. So, that is why in order to ensure that the quality of the product is up to the mark certain kind of regulation is required. So, that the producers can produce the product as per the specification mentioned on the product. So, economic regulation involves the government interventions in a variety of ways in the private action of firms and individuals. Not only the regulation is required to

regulate the activities of producers, but sometimes we also want regulation to control the activity of consumers.

So, consumers also release certain kind of waste and that is why some regulation is required. There are two basic theories behind regulation. First is known as public interest theory and second is called interest group theory. I will explain these two theories in detail. First theory that is public interest theory; the main purpose of regulation is to promote the public interest while the interest group theory is justified to protect the interest of a specific group. I will explain in detail why the regulation is required on the basis of public interest theory.

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Public Interest Theory

- To a certain extent, the public interest theory of regulation is a normative theory.
- Three general reasons why regulation might exist:
 - Imperfect competition (Natural Monopoly; Market Power, Collusion & Mergers)
 - Imperfect information (information asymmetric)
 - Externalities
- These three factors, commonly associated with market economy, necessitate government regulations and controls.

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A to a certain extent, the public interest theory of regulation is normative theory. In economics you might have studied about two kinds of approaches one is positive economics and other is the normative economics.

So, normative economics deals with what should be or what out to be while positive economics deals with what is like, if I say why our rivers are polluted that is a positive aspect. So, public interest theory and interest group theory these are the two theories for justifying the regulation. To a certain extent the public interest theory of regulation is a normative theory while interest group theory is a positive theory. Public interest theory justify the regulation, on the basis of 3 key aspects. First is imperfect competition.

So, in our real lives market is not competed to or market does not work efficiently because of market distortions there may be monopoly in the market or oligopoly in the markets. So, due to presence of oligopoly, monopoly or market imperfections market cannot deliver these goods efficiently and that is why to protect the interest of the consumers some regulations are required.

For instance, sometimes government deliberately create the monopoly for a particular firm because sometimes monopoly is justified to minimize the cost or to achieve the economies of the scale. Take the case of electricity distribution in a particular city. So, if you allow more than one distributor then it may not be economically viable then you have a multiple pole, multiple wire to supply electricity to the households.

So, it will not be economically viable. So, government through regulation may create monopoly for the electricity, but at the same time government will control the price of the electricity. So, that the welfare of the consumers will be protected. So, sometimes monopoly is created to protect the interest of the consumer. Sometimes government makes regulation to create competitiveness in the economy.

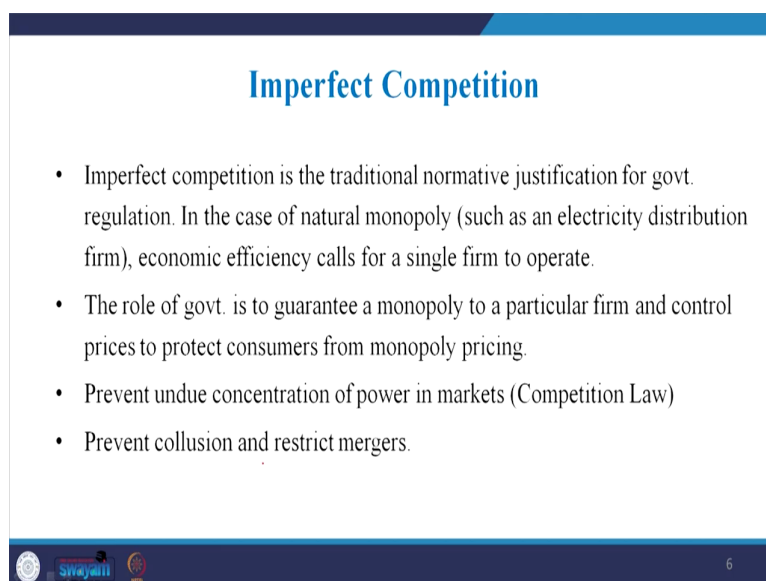
So, market power can be controlled through regulations, collusion and mergers maybe control so that they may not exercise monopoly power and exploit the customers like in different countries antitrust laws are there in India we have earlier MRTP Act. Now it is competition law.

So, under the competition law anybody can shoot a case against any company if company is exercising monopoly power and the competition commission work like a court and can give decision against the company if company is exercising monopoly power. So, in that sense, consumers welfare can be protected through bringing some regulation.

Similarly imperfect information is also one of the reasons why regulation is required and third is externality. I will take these three aspects in detail. These three factors commonly associated with the market economy and that necessitates the government regulation and control over the economic activities. Similarly externality is one of the important reasons why should we have the environmental regulations.

So, let me take in detail imperfect competition. So, in real market we do not have complete competition.

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Imperfect Competition

- Imperfect competition is the traditional normative justification for govt. regulation. In the case of natural monopoly (such as an electricity distribution firm), economic efficiency calls for a single firm to operate.
- The role of govt. is to guarantee a monopoly to a particular firm and control prices to protect consumers from monopoly pricing.
- Prevent undue concentration of power in markets (Competition Law)
- Prevent collusion and restrict mergers.

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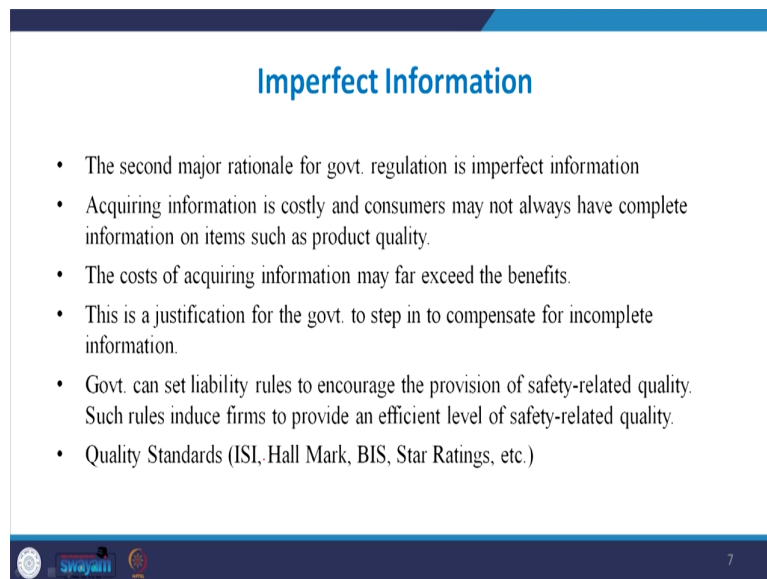
So, if there is a competition in the market, then price of the product will be determined at the level where the average cost is equal to market price. And at that point marginal cost and average cost both will be equal to the market price and only the company will earn normal profit and that is actually the situation of the pareto optimality or efficiency in the market.

But, in real market we do not have this ideal situation. In real market, we have certain kind of imperfection as I already told you like there may be natural monopoly as the example of electricity I cited and in that case economic efficiency calls for a single firm to operate. Same example may be given for natural gas distribution of gas and many other examples; where government deliberately create monopoly for a particular firm to improve the economies of a scale and generate efficiencies, but at the same times the price is controlled through regulation to protect the welfare of the consumer.

So, role of the government in this regard is to guarantee a monopoly to a particular form and control the prices to protect the consumer from monopoly prices. So, this is one reasons why we should have regulation. Similarly we can also prevent concentration of market power like through competition law we can do this. We can prevent collusion and restrict mergers so that the companies may not collude together and exercise the monopoly power and exploit the customer.

So, first argument in favor of regulation is that the market is imperfect and due to the market distortions there may be possibility of exploitation of consumers. So, to protect the interests of the consumer or citizen at large regulations are required.

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Imperfect Information

- The second major rationale for govt. regulation is imperfect information
- Acquiring information is costly and consumers may not always have complete information on items such as product quality.
- The costs of acquiring information may far exceed the benefits.
- This is a justification for the govt. to step in to compensate for incomplete information.
- Govt. can set liability rules to encourage the provision of safety-related quality. Such rules induce firms to provide an efficient level of safety-related quality.
- Quality Standards (ISI, Hall Mark, BIS, Star Ratings, etc.)

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Second argument is that imperfect information. Information as a matrix so, we as consumer or citizen of any country do not have access to the complete information. For example, when you

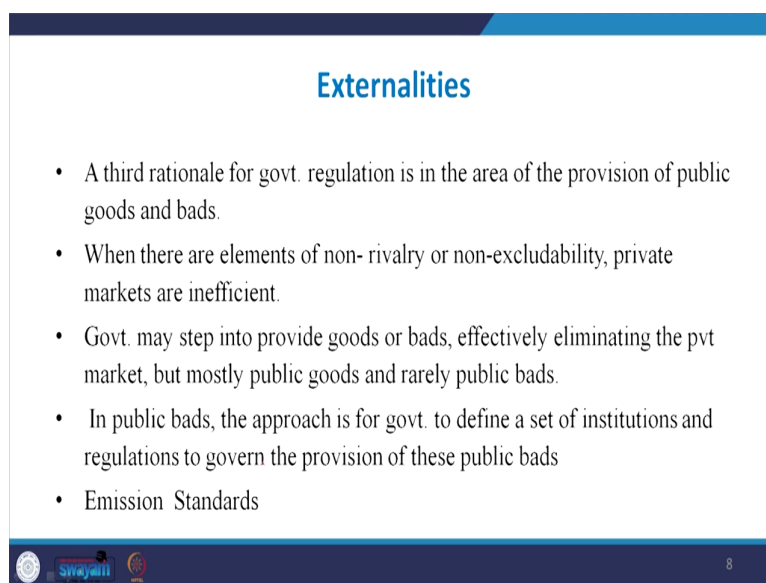
go to the market to buy a particular product you do not know what is the quality of the product. You do not know what exactly the cost of the product. But and if you start collecting information about all these aspects then collection of the information would be very costly and it will not be practical or feasible to collect detailed information on the product which you are going to buy.

And sometimes cost of collecting information actually exceed the benefit of getting such information. So, in that sense it becomes the responsibility of the state or government to protect the interests of the consumers and that is why certain quality standards are set up. We can see ISI mark. So, by looking at the ISI mark of the product we can ensure that the product is of good quality. Similarly hallmark or BIS or many other standards are set up by the government and the consumer can easily understand whether the quality of the product is good or bad. And if the product is not as per the specification then liability is of the producers and producers may provide compensation to the consumers in case the quality is not up to the mark and if the particular product harm the consumer etcetera.

So, that is why since we do not have access to the complete information and information collection for the individual level is very costly. So, we have to have regulation. And government can set liability rules to encourage the provision of safety related quality such rules induce firms to provide an efficient level of safety related quality. So, quality standard can be set by the government like star rating in case of refrigerator or for this ACs etcetera or other electrical appliances etcetera can be done by the government.

So, second argument in favor of regulation is imperfect information or asymmetric information or customers are not having access to the complete information about the products. And third and most important is externalities; this term we have explained in the past. Externality means unintentional harm or benefit received by a person not directly involved in the activity. So, externality may be positive externality may be negative externality, but we are more concerned here negative externality that is pollution or generating the bad products.

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- A third rationale for govt. regulation is in the area of the provision of public goods and bads.
- When there are elements of non-rivalry or non-excludability, private markets are inefficient.
- Govt. may step into provide goods or bads, effectively eliminating the pvt market, but mostly public goods and rarely public bads.
- In public bads, the approach is for govt. to define a set of institutions and regulations to govern the provision of these public bads
- Emission Standards

So, that is why the third rationale for government regulation is to protect the interest of the society from the adverse consequences of pollution generated in the economy. When there are element of non-rivalry or non-excludability and most of the environmental bad products are non-rival and non-excludable. And in that case private market fails to treat or deliver these kind of good or bad environmental product and that is why role of the state role of the government becomes very very critical to deal with such kind of issues.

And government may step into provide goods or bad effectively eliminating the private market, but most public goods can be provided. But really the public bad are provided that is why in public bads, the approach is for government to define a set of institutions and regulation to govern the provision of these public bads. And here to deal with externalities certain kind of standards are set by the government.

So, government formulates certain kind of regulations like quality standards can be set, emission standards can be set and technology standards can be set, ambient standard can be set by the government. So, regulation is also required to take care of the externalities generated by the private players, private entities while producing the good product they also generate negative externality in the atmosphere. Therefore, these must be treated effectively by formulating certain kinds of regulations.

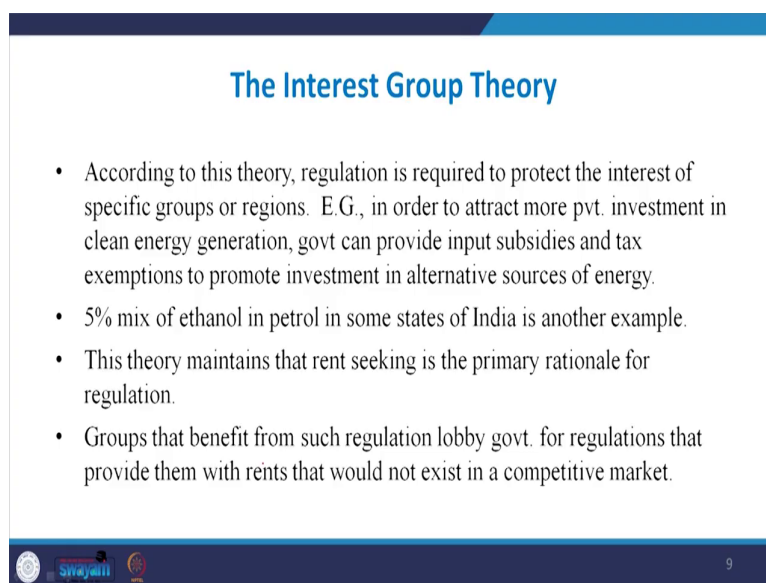
So, let me again just briefly explain you that under the public interest theory environmental regulation or regulation as such is required because we do not have access to the information. Second market is not perfect there is a market imperfection and third is externalities. So, these are the 3 key reasons why environmental regulations are required. Second theory is interest group theory.

Under interest group theory, environmental regulation is required to protect the interest of a specific group of the society or a specific industries or specific firm etcetera. And this interest is protected through bringing some regulations and that is why rent seeking is one of the main features of interest group theory.

So, when a group of companies, group of people or organization put pressure on the government to formulate the policies or regulation in such a manner that they get extra benefit or extra rent through that regulation, this process is known as rent seeking. So, rent seeking means getting extra benefit by a group of industries from the government through certain kind of regulations. I can give you a few example regarding this. Take the case of sugar industry.

In india ethanol is produced by the sugar mills and 5 percent ethanol is mixed in some states in petrol. Now, this is possible through regulation and now there are conflict of interest of various stakeholders; because molasses is used to produce industrial alcohol molasses is also used to produce portable alcohol and molasses can also be converted to produce ethanol.

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The Interest Group Theory

- According to this theory, regulation is required to protect the interest of specific groups or regions. E.G., in order to attract more pvt. investment in clean energy generation, govt can provide input subsidies and tax exemptions to promote investment in alternative sources of energy.
- 5% mix of ethanol in petrol in some states of India is another example.
- This theory maintains that rent seeking is the primary rationale for regulation.
- Groups that benefit from such regulation lobby govt. for regulations that provide them with rents that would not exist in a competitive market.

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So, when government formulate such kind of policy, that 5 percent ethanol will be mixed in petrol in some states where sugarcane is mostly produced then what happens? In that case less molasses would be available to produce industrial alcohol or portable alcohol in that case prices of these product will increase, but at the same times indirectly farmers will be benefited. So, through this sugar industries is protected through this act or some extra benefit is provided to the sugar industry through this kind of policy. Similarly I can give you another example take the case of solar energy.

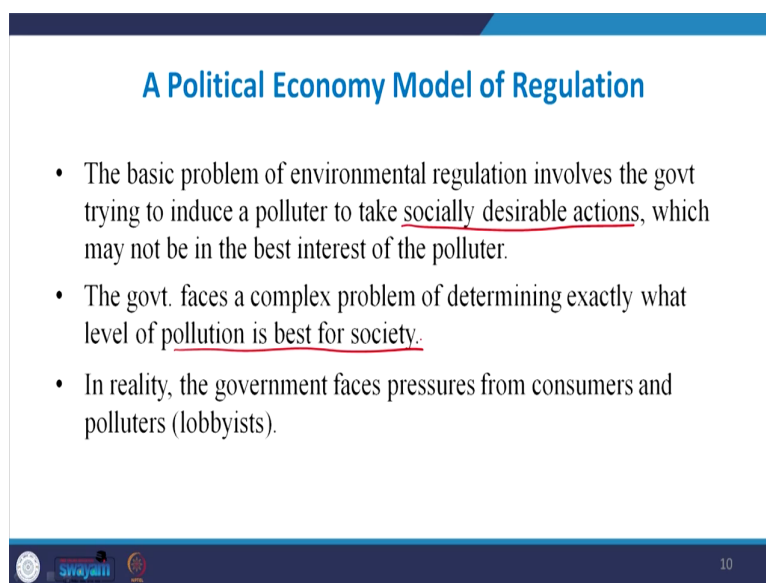
Now, if government want to protect the interest of environment. And if energy is generated through fossil fuel and if that kind of energy is generating more pollution, but solar energy is more clean, but at the same times the comparative price of solar energy and the thermal energy is different.

So, in order to make the solar energy more competitive government can provide subsidy or government can protect the interest of those who are producing solar energies. And in this way the competitive prices or comparative price of energy generated through solar energy and this thermal energy will change and it will be an incentive to the producers of energy through solar energy systems.

So, that is a kind of incentives given to a particular group of firms, which are producing energy through solar system. So, that is also a case of rent seeking or protective interest of the specific group. The interest group theory is actually the is based on the positive theories positive approach and here groups that benefit from such kind of regulation they lobbying in with the government. So, actually lobbying is a very important things in under the interest group theory. Many business houses they lobbying with the government and try it to mold the regulation in their favor.

So, when a group of people put pressure on the governments to formulate the policy in such a manner that provide interest to that specific group that is called rent seeking or you can also term it as a positive theory of environmental regulation.

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A Political Economy Model of Regulation

- The basic problem of environmental regulation involves the govt trying to induce a polluter to take socially desirable actions, which may not be in the best interest of the polluter.
- The govt. faces a complex problem of determining exactly what level of pollution is best for society.
- In reality, the government faces pressures from consumers and polluters (lobbyists).

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Let me now explain you a political economy model of regulation. Regulation or any policy is more a political process rather than the economic process. So, there may be some politics behind the regulation. The basic problem of environmental regulation is actually involving the government trying to induce the polluters to take socially desirable action. So, that is very important why regulations are required. So, the regulation is required in any economy so, that the polluters may take socially desirable action.

What are the socially desirable actions? Obviously, those actions which are accepted by the society and societies welfare is improved by these actions like if you are treating the waste before releasing it into the atmosphere certainly the welfare of the consumer will or welfare of the society will improve.

So, obviously that kind of action on the part of the companies or polluter is socially desirable which may actually not be in the interest of polluters. Why it is not in the interest of the polluter? Because if polluters take these socially desirable actions then it will increase the cost of the production and competitiveness of the product may be badly affected or profit of the company may be affected when, social cost all these externalities included in the production process and instead of considering the private cost if entire social costs is taken into consideration then cost of overall cost of production will go up and there it may not be desirable by the company.

So, these socially desirable actions may not necessarily be in the best interest of the polluter or the company which is polluting the environment. So, government faces a complex problem of determining exactly what level of pollution is best for the society. So, this is very important to know what level of pollution in the economy is socially desirable; because some pollution is inevitable. If you are trying to get the 0 pollution in the economy then you have to stop all kind of economic activity. And obviously, the welfare of the consumer will be affected because consumers will not be able to consume conventional goods.

So, when we are consuming conventional goods then certainly we release certain kind of waste and therefore, there should be a proper balance between conventional goods and environmental goods. So, in that in reality government faces pressure from the consumers as well as polluters so, or companies and the citizen of the country.

So, here there are various stakeholders and these various stakeholders interact each others and also put pressure on the government to formulate the policy in such a manner that the interest of the particular stakeholder is met ok. So, they are lobbying with the government.

So, lobbying here in this case there may be two kinds of lobbying. One lobbying may be done by the citizen of the country other lobbying may be done by the corporate sector. So, corporate sector lobbying with the government to formulate the policy in such a manner that the interest of the polluters is protected. Similarly, citizen of the country lobbying with the government in such a manner that welfare of the consumer is protected. So, this is very

important aspect and I will take this aspect the political economy model of regulation in the next lecture ah.

In brief I can summarize what I have just discussed today. I explained why regulation is required. There are two important theories behind the regulation. One is public interest theory and other is the interest group theory. Public interest theory is based on a normative theory while interest group theory is based on positive theory. I will take political economic model of regulation in the next class.

Thank you.