

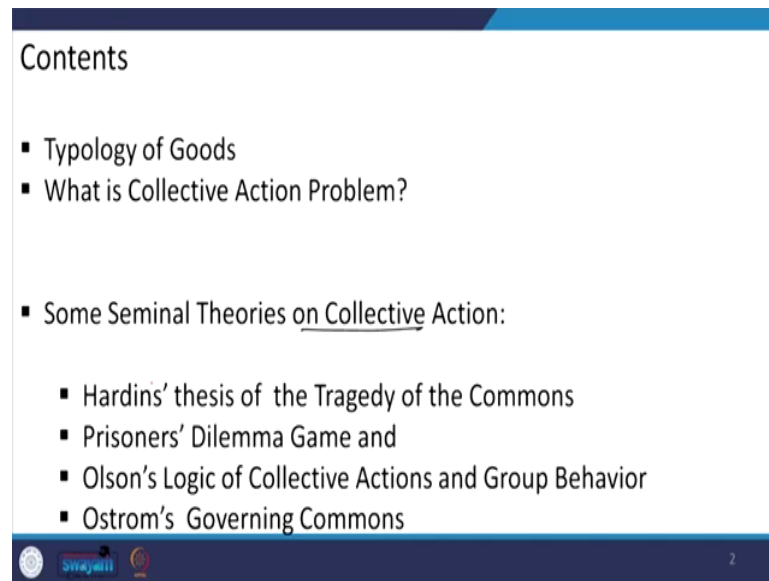
Introduction to Environmental Economics
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Lecture – 05
Commons and Collective Action Problem: Seminal Theories-I

In the last model; we have already discussed the problems of the environmental issues and problems. And in this context, we have already discussed the trade offs as well as the terms these concepts. And in this context, we have taken into account the interdisciplinary systems disciplines like, environmental economics environmental policy ecological economics. And by taking the micro economics concepts as well as and the welfare economics concepts, we have also talked about the theoretical tools that we have used in explaining the environmental issues and environmental problems.

So, having best having discussed all these all these in the first module. Now I will be talking about the commons and the collective problems by taking into account some seminal theories. So, first of all, we will be discussing the typology of the goods that will be helpful in understanding the problems and then will you can actually explore about; what kind of theories that can be applicable for solving this environmental issues.

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So, in this context, broadly our contents would be the typology of the goods. Discussing different types of a goods, then we will be discussing what is the collective action problems by again discussing what is the collective action itself and in which context this collective action is applicable. Then we will be discussing about some theoretical aspects some seminal theories on the collective actions.

So, first we will be it talking about the Hardin's thesis of Tragedy of the Commons. So, it will be followed by the Prisoners' Dilemma Game and the third one that we will be discussing about the Olson's Logic of Collective Actions and how the group behavior is important in explaining this collective action problems.

And lastly, the recent one among all these the collective action problems and theories that we have discussed that is the Olson's governing commons. So, because of which they got the Nobel Prize in 2009. So, have you kept this contents in this not (Refer Time: 02:43)

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The slide is titled "Typology of Goods" and contains the following content:

- **Public Goods:** Non-excludable and non-rival
 - Non-excludability:** may be defined as the cost of keeping non-payers from enjoying the benefits of the good/service is too high that no one can be excluded from using the good.
 - Non-rivalrous:** it may mean consumption of a good by one individual does not reduce availability of that good for consumption by others.
- Example: Light house, national defence, knowledge, environmental goods-biodiversity, fresh air in the atmosphere

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Now, let us have a look on the typology of the course that will be helpful in explaining that; how the nature of the goods itself its giving rise to the problems of collective actions. So, if you see the economic literature generally, this goods are divided into 4 parts 4 categories. And these goods are categorized based on these two attributes. The first one is known as non excludability. This is the first quality and the second one is non rivalness. And this these two attributes is first of all explained by in 1969 article.

And based on this attributes, now we can explain; what is public goods, what is 5 private goods, what is common goods or collective goods along with what is the club goods. So, let

us talk about this public goods. So, what is the public goods? Generally, the common perception is that; the public goods means, who the goods which are provided by the government or the government agencies or the authority itself. And because of ways for the provision of ways, the audience or the consumers they do not have to pay anything. So, it is a kind of free of cost.

And so, for the technologically, if you want to define this public define this public goods, then you can say that it must be satisfying these two qualities. The first one is non excludability and the second one is non rivalness. So, what is non excludability? And what is non rivalness? And how this two concept would be helpful in explaining and defining these public goods?

So, if you say this non excludability. So, in a general sense it may mean that if a particular consumer is consuming a good and it is not forbidding the second one or the second consumer to consume the same, then there is no problem. So, it is a case of no excludability or sometimes, we are saying non excludability. So, in this context; if you have to define it, then you can say that; this non excludability means the cost of keeping the non payers from enjoying the benefits of the goods and services which is very high. Because of which no one can be excluded from using that particular good.

The first thing that we want to highlight that the cost of this provision of this public good is too high. Because of ways the kind of fast consumer who wishes to consume cannot actually prevent the second consume a second consumer to consume the same good. That is why, this is the good is actually open to the both of the consumers. And if you see the second characteristics of this public goods do, it is non rivalness.

So, what is non rivalry in this in this context? So, in general you can say in the common parlance you are saying when it is rivalry; that means, when one is consuming then second cannot actually consume the same. That means, it is the conception of the first, the conception of the first person will reduce the availability of that particular good for the second person. That is why it is subject to rivalness.

And if these two qualities are satisfied for a particular good, then you can say that this is a case of public good. And in this contest by take into account these two attributes. Now, we can take some examples that would which one would be the fitting examples to describe the public goods. So, we can take into account the in the case of lighthouse or the national defense case that expenditure that we are incurring on the national defense or you can say the case about the knowledge itself spreading knowledge or the case of the environmental goods like our biodiversity or the national park or the amount of land cover or the fresh air in the atmosphere.

So, there are many examples existing for the public good itself. So, why we are saying that these examples or these examples are the examples of the a public good itself. Because, it satisfies these two characteristics; one is your non excludability criteria and the second one is non rivalry criteria.

If you take into account the lighthouse case. So, the lighthouse can direct the military safe as well as the safe which are meant for the private business. Then you are going for fishing in the deep sea they can also take the advantages from the lighthouse and the get the directions to reach at the destinations.

So, it does not actually differentiate; whether, you are the ship is a military safe or it is a private safe which actually had gone for fishing in the deep in the ocean. So, in this case; if the first safe military safe is accessing and getting the benefit of the lighthouse, the center second one it is not in excluded for getting the benefit and the same time. That is why you can say it satisfies the first criteria of the public good that is known as excludability. And the second one is the second criteria is non rivalness or non rivalers.

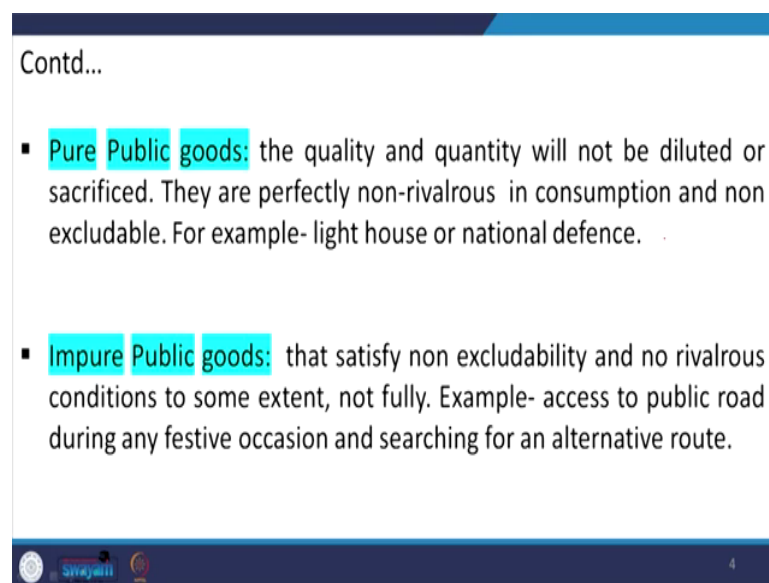
So, how it is also qualify? The lighthouse case; if you are taking into account, then you will be finding that they when they first safe that is the military safe. It is actually taking advantages of getting the directions. Then, at the same time; the second one that is the private safe who is has gone for shipping in the deep in the sea, it can also take the advantages and the first one is not actually reducing the availability of the lighthouse service for the second

one. That is why in this case you can say that this lighthouse actually qualifies both the criteria then you can say that this is a case of your public good.

And for all the examples, rest of the examples, so you can actually say that; you can actually argue that whether it is qualifying these two criteria or not and accordingly you can say whether it is a public good falls on at the (Refer Time: 09:05) a public good or not.

And if you take into account and if you were actually go into understanding the deeper meaning of the public good, then public good can also be of two types. The first case is the pure public good so, and the second one is impure public good.

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- **Pure Public goods:** the quality and quantity will not be diluted or sacrificed. They are perfectly non-rivalrous in consumption and non excludable. For example- light house or national defence.
- **Impure Public goods:** that satisfy non excludability and no rivalrous conditions to some extent, not fully. Example- access to public road during any festive occasion and searching for an alternative route.

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So, what is pure public good? That means, it strictly qualifies these two one qualities; that means, the quality and quantity will not be diluted or sacrificed.

So, they are perfectly non rivalness in consumption and non excludable. So, you can we have already taken the case of your lighthouse by explaining that; how the lighthouse is the is qualifying both the qualities strictly. And the second one; if you take into account then you can say this public goods can be of impure types. That means, the particular public good can satisfy these two qualities partially or to some extent. It actually does not fill fulfill the two conditions fully.

So, we can take an take into account the access to the road. So, as all of you know that this public road is also a public good, because it also satisfies that everyone can get the access and no one cannot actually exclude you for accessing the same. And the second one is that if you are accessing, then you are not actually preventing the access of the second the second person or whosoever is desiring to have its travel on that particular road.

But, however, if you see during the festive occasions in a particular region or regional occasions or you can say cultural occasions, then in a particular road we can find congestions. That means, you are in this case; we can find although the public road is a case of public good, but still it is not fulfilling the two criteria that is you are non exclusive excludability and non rivalness in a fuller extent.

So, that means, in this case during the festive occasions, when a vehicle is driving on that particular road and like 10 or 20 people there also willing to pass through the road then; obviously, it will be going to be congested. So, in a particular crowded features on our particular occasions in this case, it the access to of the first person or the first rider will be preventing or congesting the access to the second person which is leading to a partial case of rivalness in driving your vehicle on that particular road. That is why it is a case of impure public goods; that means, which is partially fulfills these two criteria. That is a excludability and the second one is non rivalness.

So, the second category of goods that we can understand if the private goods so, here when you say that private goods; so, it is a kind of common goods that we purchase by paying money right.

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- **Private Goods:** having ownership right/property right- Excludable and rival
Example: Burger, Book, Shoes, house etc.
- Moreover, we can also identify the nature of the good whether public or private by the level of competition for the good and the possibility of excluding its consumption
- **Pure Private Goods** which display the characteristics of excludability and rivalry

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So that means, here you can to say that a particular consumer is having ownership right or property right because it is paying for the same right. And in this context; if you are paying for the same and you do have the property right ownership right, then obviously, you are excluding others for using the same and when you are purchasing it then; obviously, it is you only who purchased and it is you only who can enjoy these things.

So that means, the second person who is over interested to purchase the same he cannot because the good is not available to that person the same good is not available to the person. That is why it is a case of rivalry. And in this case the in case of private goods it satisfies these two criteria, that is excludability and rivalness and it does not satisfy the first the criteria like known excludability and non rivalness that are applicable to the public goods itself.

So, for example, you can take into account any day to day life consumption that we are incurring on like your consumption of burger or you can say you have purchased a particular book let us an app of India or you have sold our house. So, these are all examples of your private goods. And more over, the easiest way to find that whether a particular good is a public good or a private good it depends upon the level of competition for that same good.

So, if you take into account the level of competition for the burger here so that means, when you are paying for burger and you are getting. So, if you see any of this parlor burger parlors let us say it is a case of your Maggies ,Mc Donalds, then you will be finding that you are in a queue right. And when you are you are trying to purchase;,you get the token and the second person is in queue, just behind you and he is also trying to habits order for the burger itself. That means, here there is a huge or high competition for the good right. And that is why by identifying in the level of competition for the good you can also identify whether the good is a public good or a private good.

But, if you take into account any public good let us say, let us take the case of fresh air. You get up in the early morning and you just wanted to have fresh air. Then what you are doing, you are actually going for a morning walk in those areas covered by the trees or open spaces right. And when you are neighbor is also doing the same. So, it is not a kind of competition rather you can you cannot say that competition is happening here because, no one is actual snatching your rights. And you can also equally access the benefits that they that your neighbor is also trying to see.

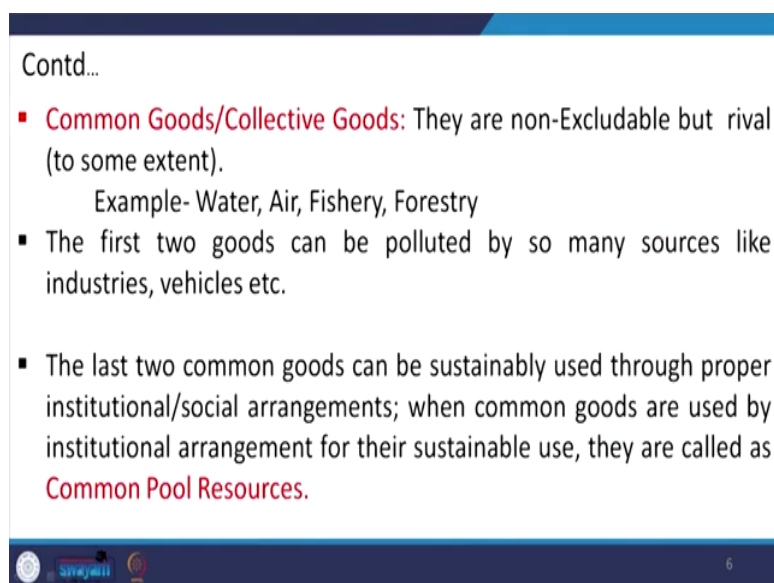
So, in this context if you are taken to account any public good, then it is less competitive for us; if you are taking to account any private good, then you are finding a great competition for the same good. And the second thing is that; you need to take into account the possibility of excluding is consumptions. In the first case that we have taken into account the case of burger what happened that; lets when you are in the first you are in the queue in and even in the first one in the queue and when you order for a burger what happened there is a possibility that your order will be excluding the consumption of burger for this second person right.

So, that is how you can actually say that whether it is in the case of public good or it is a case of your private good. And just like your public goods, these private goods can be of your private good and impure private good. And if you see in your life examples, then this pure private goods or pure public goods are the extreme cases.

So, we in real life we are finding the cases of mixed one. So, if you want to define these pure private goods, then it also have the characteristics of excludability and rivalness. But, and in case of this impure private goods, then the good will be displayed displaying the qualities of excludability and rivalry to some extent, but not fully.

So, in this context; what will be the characteristics? So, it will be like this, in case of this impure private good. So, the good would be displaying the characteristics that is partial excludability and rivalry or partial excludability or partial rivalry or both the case which will be partial one.

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- **Common Goods/Collective Goods:** They are non-Excludable but rival (to some extent).
Example- Water, Air, Fishery, Forestry
- The first two goods can be polluted by so many sources like industries, vehicles etc.
- The last two common goods can be sustainably used through proper institutional/social arrangements; when common goods are used by institutional arrangement for their sustainable use, they are called as **Common Pool Resources.**

And the next category of these goods, it is known as the common goods. Sometimes, we are also saying it is the case of the collective goods. So, how to define, how to recognize this goods? So, they do also satisfy the by taking to account this 2 terms; that is excludability and the rivalness, that we can also identify or we can also define that how to say this is whether this is the case of common good or this is the case of the collective goods.

So, if you see these two characters; if then you can say that these common goods are collective goods and they do how they do satisfy the cases the qualities of non excludability and they are rivals. And they are rival in the sense to some extended they are rival. So, in this case you may be confused about sometimes we get confused the common goods with the public goods.

But, remember that in case of public goods they satisfy the case of non-excludability and non-rivalness, but here the good satisfies the first characteristics this is the similar one that is non-excludability, but in case of this good the non-rivalness is not applicable fully; that means, here the good is satisfying the case of rival.

So; that means, here you are saying the rivalry conditions is they are existing to some extent. So, if you take into account some examples these distinctions will be clear. So, if you take the case of open air, so it is a public good because when you are using accessing and you are using for breathing purposes. The second person who somebody is there he or she is also easily using this oxygen or from an open air at that place so; that means, you are not excluding the first person and the first person is not excluding the second person in accessing this the good.

So, that is why opening your air is a case of your public good. But; however, when you are saying air and air in a particular case and that is that; we are saying that it is a case of air pollution in a particular locality. Then, here it will be case of common goods. Why it will be a case a common goods? that means, it is rivalry the conditions of a rivalry let us say that in a particular region; we are now imagining the case of a local region maybe your local town or your local cities or your village then if there is there is an industry or any kind of manufacturing units at the here then it is very difficult to have pressure here over there right.

So, in this case; so, if you want to consume fresh air then obviously, you have to actually make retaliations or the quality of air would be decreasing. If the production would be increasing in this particular case in this particular manufacturing units So, that is why in this case you are saying and that this air in this local region is a case of common goods or a case of collective goods we displayed the characters of non-excludability and; however, it is rival.

And the other examples can be your fishery forestry right. And if you see the case of fishery in a particular area let us say that fishery in a particular lake. And this particular lake is actually having a definite size smaller size or you can say the case of village pond fishery in a village pond.

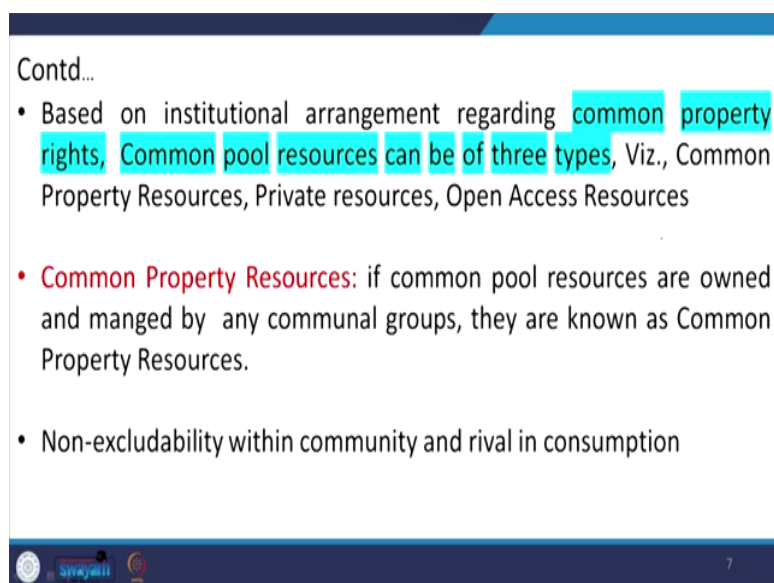
Then you can say that although it is known excludable; that means, within this community or within this village everyone can get the access to the spacing, but; however, when you are when you are fishing a particular amount, the same amount is demesne for the second person who is also living in your village or in your a particular area. And who is also a member in your group.

If you take into account here we are discussing these 4 examples on the common goods and collective goods. And if you are take into account the first two water and air, then you can say it can be polluted given a particular situations. And if you take into a account the second and third one, then these two common goods can actually be sustainably used. If there would be a certain kind of mechanism existing or there would be if there will be some kind of arrangements maybe, it is the case of institutional or social or social norms arrangements. Then you can say that this particular thing particular good can actually be sustainably used.

And, if there is the presence of any institutional arrangements in providing this particular good sustainably that means, that right now you can get the benefits out of it and right now your neighbor and his neighbor and his neighbor can also get the benefit. And as well your children future children are off springs and your neighbor's future children or your there of off strings they can also get the benefit out of it then this is the case of sustainable use. And if there is any kind of sustainable arrangement present over they are in case of your common goods then it is known as the common pool resources.

So, common pool resources is a its a kind of common goods or collective goods. Here the only different is that; this is your subset, this common pool resources is a subset of the common goods or collective goods. And the only thing is that in case of these common pool resources institutional arrangement is present, but in case of common goods there is no such institutional good, which actually will lead to sustainable use of the resources.

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- Based on institutional arrangement regarding common property rights, Common pool resources can be of three types, Viz., Common Property Resources, Private resources, Open Access Resources
- **Common Property Resources:** if common pool resources are owned and managed by any communal groups, they are known as Common Property Resources.
- Non-excludability within community and rival in consumption

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And based on the institutional arrangements; regarding this common property rights that who is having right to that particular property out of a particular good. This common pool resources can be of certain types.

So; that means, when you are saying that the common property rights is on the national government or the state government or the local government then it will be a case of your public good. When based on the same traditional arrangement and regarding this common property rights. If the common pool resources is owned by and let us say a private person or a community or it is not owned by anyone. Then these following kinds of following types of goods can happen.

The first case is the common property resource problem or common property resource case the second one is private resource case and the third one is open access resource case. So,

what is common property resources? So, here you are saying that; the common pool resources are owned governed managed by particular communal groups.

So, maybe you are villagers a particular village, maybe a particular community, maybe a particular tribe, maybe a particular locality, right. And this if this is so that means, the property, a common property rights is based on these goods then it is a case of air common property the resources. And what is the characteristics of this common property resources then? Then obviously, when you are saying that this property or this good belong to a particular community, then it is a case of non excludability within the community. So that means, whosoever would be the member within this community they can get the access no one will be excluded.

And the second one is that; however, if you see the extraction of resources if I am a member and you are also a member. I am be trying to use the particular good and you will be trying to use the particular good, then; obviously, degradations in the good will happen. So; that means, whatever are we consuming it will actually demines the availability of that particular resources for you. So, this is a case of arrival in concepts on.

So, the common property resources therefore, satisfy these two qualities the first one is. So, it displays the quality of non excludability within the community and the second one is it is travel in nature in consumption. So, we have already discussed that what can be the examples of these common property resources, you may think about some other examples existing in your locality.

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- **Club Goods:** Excludable but non-rivalrous

Example- toll road (generally non-congested), cable TV, social religious clubs, cinemas

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And the second one is that; if the ownership is not bestowed on anyone; that means, no one is having common property rights on that particular good then it is a case of open access resource. So, the examples can be the fishery in the oceans are the same because, sea and open is not actually owned by any one so, it is open. So, in this case this if you are still talking about this fishery case, then this fishery is a case of open access resources.

So, the last of this kind in economic theory so far the goods classification is concerned, it is the case of the club goods. So, what is club goods? So, that means, you are deliberately or you are artificially limiting the goods. So, what can be if the characteristics if this is well the case that you are artificially limiting the availability or quality or quantity of the goods.

Then it will be displaying the characteristics of excludability. That means, if you are paying for it or if you qualify certain criteria, then you can get it get the benefits of that particular

good and if you are not then; obviously, you will be excluded from enjoying the particular good.

However, this good will be non rivalness. Because, within this particular group. So, you can you can actually consume and the second person whose over is interested he can also consume without the diminishing the availability of the particular good. So, example this type of your good you can also find in our area like examples. So, it can be the case of the toll road. So, why toll road? The newly constructed road when you are actually the construction is over. Then you will you will be finding a kind of toll tax, if you have to use that particular high road.

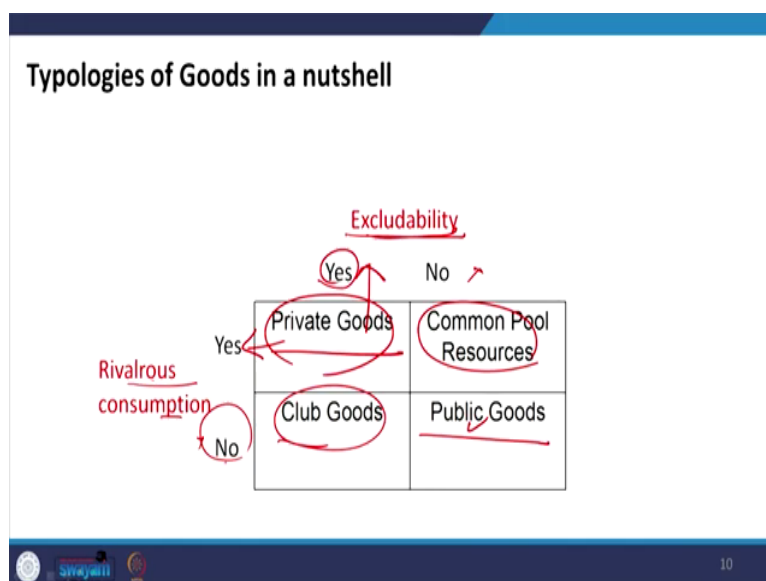
So, whosoever is a will be paying this toll tax, he will be eligible to ride on that particular road right. And thereby and whosoever is not ready pay this toll tax; obviously, he cannot actually use this particular road. So that means, this toll road is excludable in nature. If you are paying the toll tax you are included and if you are not paying the toll tax, then; obviously, you will be excluded.

So, and it this toll road will be considered are the clubgoods until we accept the point of non conscious ones. That means, if there is no concessions. So, far we will get the point of consciousness then you can say that if I am paying I will be riding those road and if a node is not willing to pay the toll tax then; obviously, he is not permitted to use the sameor you can say in the case of the (Refer Time: 30:06).

So, in the eighties and nineties perhaps you have seen the case of the case of national Davies. So, in national Davis what happened that whosoever is having TV and antenna then he can or she can have the access for this? But, what is cable TV? if you are playing this particular amount then these are the channels available to you and if you are not paying, so these channels will not be available in your TV. So, this is the case that of your Club goods.

So, accordingly the typology of these goods so, you can actually discuss in a nutshell take into account the criteria of excludability and you are rivalness in kind of zones.

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So, if you see this; if you are talking about these private goods. So, what is private goods? If it is satisfying the quality of excludability; that means, the private goods are excludable in nature and simultaneously, it also its rivalness. If you were consuming then; obviously, the second the same amount of good or same good is not available for the second person who is ready to pay and ready to get.

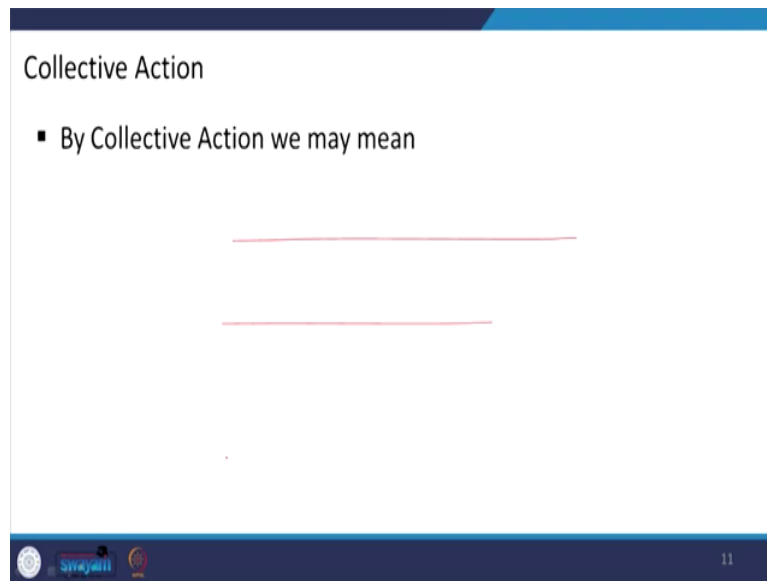
So, that is why the private goods they do have this characteristics of excludability and rivalness. And if you are take into account the common pool resources, what happens? What would be their characteristics based on these two criteria? So, if you will say that the case of excludability can you exclude you cannot actually exclude because it is non excludable. So, that if you are member of a particular group. So, you are accessing this particular thing. And this your neighbor he is also a member and he is also accessing this thing. So that means, you

cannot exclude your neighbor from accessing the particular good that is why this non-excludability is not applicable.

So, it is not non-excludability is not applicable or excludability is not applicable and simultaneously if you see the case of rivalness in consumption yes it is rival it will satisfy it does satisfy the something and in case of public goods. So, as you understand that it is non-excludable. So, this excludability criteria is not satisfied know and this rivalness or criteria is also not satisfied for this public good, right.

And if you talk about the last one that we already discuss; that is the club goods here it satisfy the quality of the excludability, you can exclude it if you are paying for the toll tax right. And if you are not paying for the toll tax and if you pay then; obviously, he is eligible for right in the store and. So, for rivalrous consumption is concerned it is not rivalness during the point of consumption is reached.

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So, based on these, now we will be discussing about the collective actions. Here we just will discuss about what is collective action and what is collective action problem. Then we will be discussing the rest of the theories based on this to explain the solutions for the collective action problem in the next lecture.

So, let us discuss about this collective actions; that means, here you are saying and that for a particular action to be said as collective. So here, these are the kind of actions or the behavior of the individuals in a particular organization or a particular group and why these behaviors and these actions are targeted for achieving a common purpose common objectives.

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Collective Action

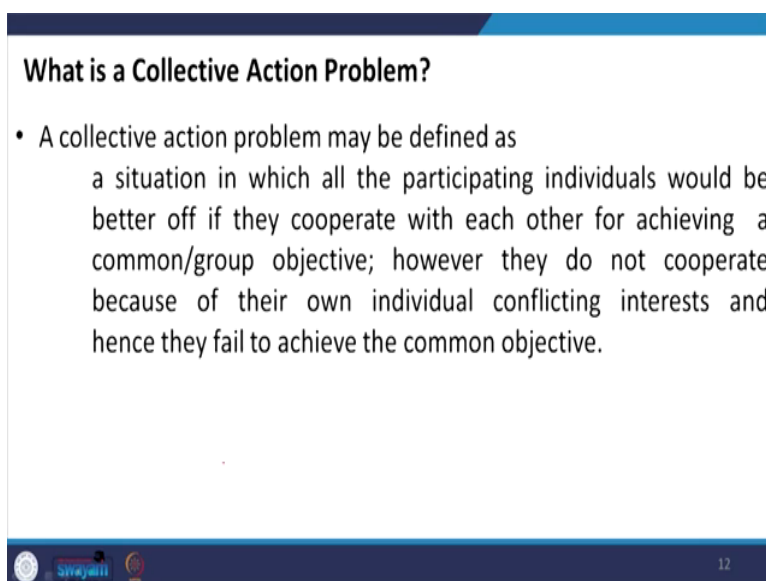
- By Collective Action we may mean

any form of organised behaviour or actions of individuals in a group to work together for achieving their needs which is known as common group objectives .

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So, if your behavior and actions are motivated for achieving a common objectives, then it is known as the collective actions. Then what is a collective action problem?

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What is a Collective Action Problem?

- A collective action problem may be defined as a situation in which all the participating individuals would be better off if they cooperate with each other for achieving a common/group objective; however they do not cooperate because of their own individual conflicting interests and hence they fail to achieve the common objective.

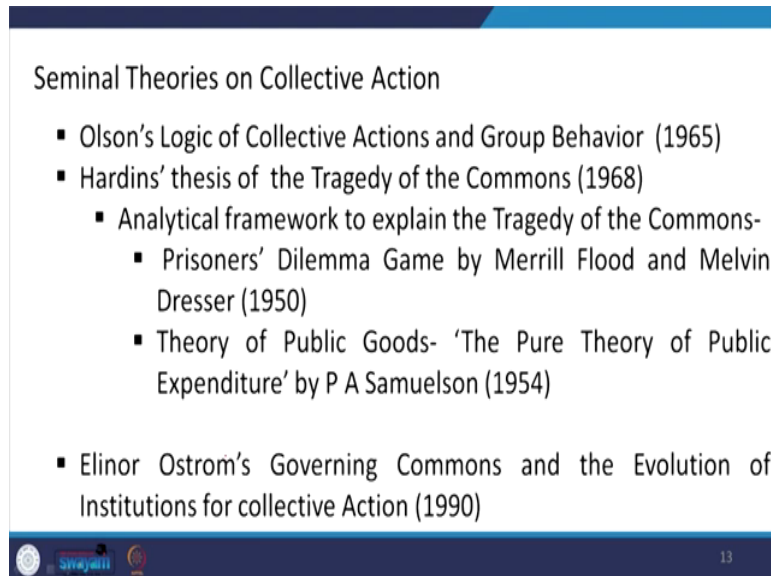
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So, there should not be any problem; that means, if a group of a persons; they are trying to achieve a common objectives. Then and accordingly their behavior or their actions are oriented towards this. Then what is the problem? The problem is that; no one is ready to cooperate.

So, in this context; a collective action problem can be defined as a situation in which all the participating individuals in a particular good. They would be better off, if they are ready to cooperate right. But, however, if they do not cooperate the reality is that they seldom cooperate because there is a class conflicting interest between their own interests and the interest of the common objective itself.

So, this actually led to be the evolution and the emergence of the theories on collective actions that how this problem can actually be corrected or what are the variables and what are the factors responsible for this collective action problems.

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Seminal Theories on Collective Action

- Olson's Logic of Collective Actions and Group Behavior (1965)
- Hardin's thesis of the Tragedy of the Commons (1968)
 - Analytical framework to explain the Tragedy of the Commons-
 - Prisoners' Dilemma Game by Merrill Flood and Melvin Dresser (1950)
 - Theory of Public Goods- 'The Pure Theory of Public Expenditure' by P A Samuelson (1954)
- Elinor Ostrom's Governing Commons and the Evolution of Institutions for collective Action (1990)

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So, based on this in our lecture in our in this model will be discussing these seminal ideas or seminal theories on collective action the first of the kind which is propounded by Olson's in 1965; that is the logic of collective actions and group behavior. That we will be discussing in the next class.

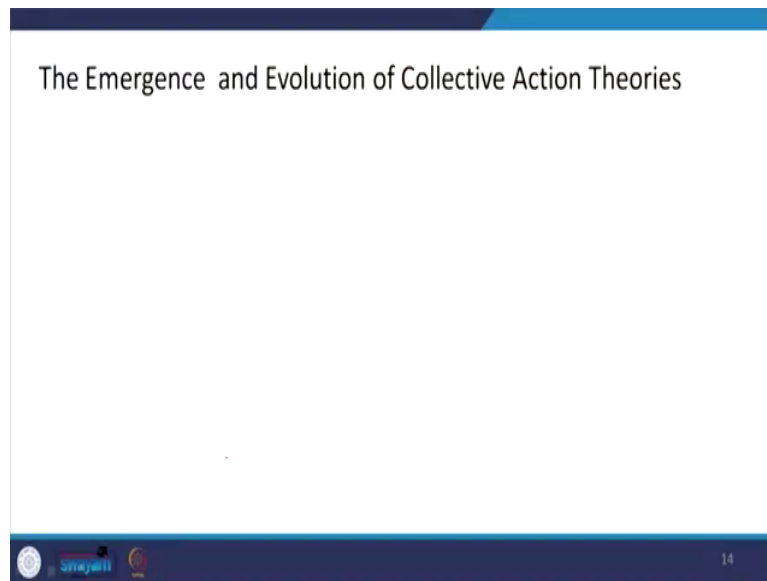
And after from these, the second one that is actually painting the case of conservation and the management, but the commons which actually raises the questions on this and the interference state interventions and which is actually advocating for the privatization of these commons a common property resources that is talked about. However, actually wanted to me

that what would be the solution for this whether this state interventions or the privatization is like a panacea for all this problem that we are facing in the collective action problem it is known.

So, that led to this kind of problem; actually, led to the evolutions for now getting the theories like the case of Eleanor's Eleanor autumn's *Governing the Commons* by emphasizing on the evolution of the institutions. And based on this now in the next class; we will be discussing that; how these three theories are actually having the first kind of ideas, fresh ideas on solving this collective action problems. Apart from this you know to prove this hydrants, thousands of tragedy of the commons will be taken to account the analytical framework of prisoners dilemma game by the Merrill Flood and Melvin Dresser.

And the second one is we will also be looking to the theory of public goods by explaining by actually emphasizing on the Samuelsson Singh assembles P A Samuelsson's master phase the pure theory of the Publics Expenditure in 19 (Refer Time: 37:07) which was which he actually proposed in 1954.

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And so, we will be talking about all these collective action theories in the next class itself. So, in the next class; we will be talking about the emergence and evolution of this collective action theories by emphasizing on tragedy of the commons by Garrett Hardin still the Illinois stomps the governing of commons by emphasizing on the case of institution itself in the governance part. So, that is what we will be discussing in the next class.