Environmental Impact Assessment
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Lecture 49
EIA Methods-Socio_Economic Impacts (SIA) – Part I

Welcome to the course Environmental Impact Assessment today we will cover methods for Socio-Economic Impacts, and under the larger ambit of methods under EIA.

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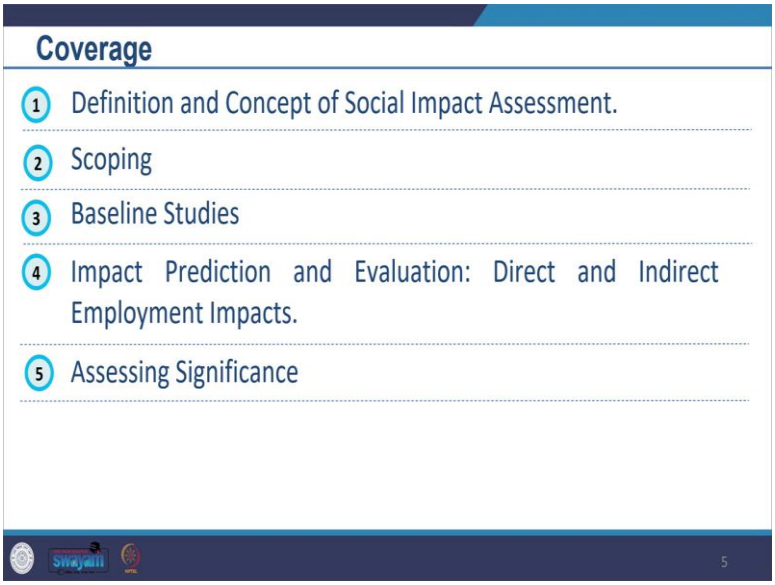

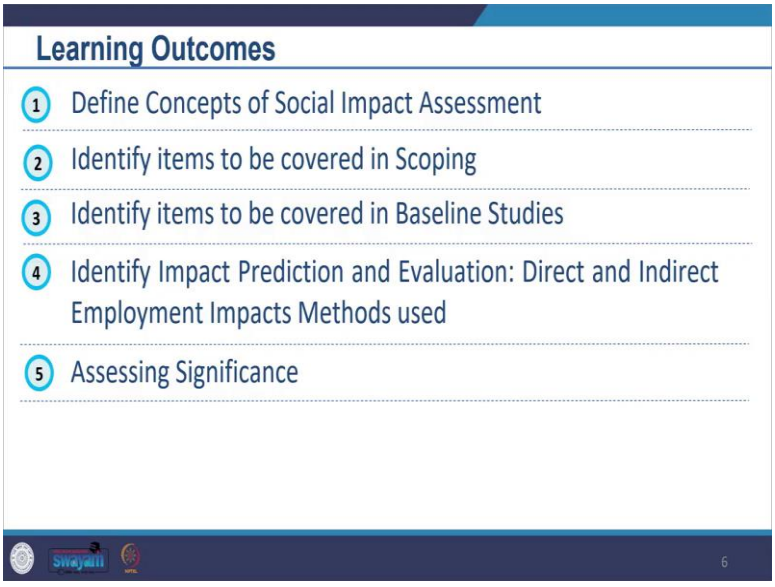

So accordingly, our coverage would include that we will first look at definitions and concepts of Socio-Economic Impact Assessment, then we will look at what are the key aspects when we undertake scoping about socio-economic impact assessment, then we will similarly look at what we undertake, and how do we go about baseline studies. Then, we will look at how we undertake impact prediction and evaluation. And we will look at the direct and indirect impacts of it. And then we will look at, how we assess the significance of socio-economic impact.

So, we will be doing this in two parts. So today, we will cover the first part of it. Looking at the learning outcomes, so, what is expected out of you after you complete the session is that you would be able to define

the related concepts here and then you should be able to identify the items to be covered in scoping, and then you should be able to similarly identify what you should cover in baseline studies and how do you approach that.

Further, you should be able to identify various possible impacts, which are possible in this domain, and then look at various data source methods, that are involved in predicting and evaluating impacts, and how you should be able to discuss and identify various steps involved in assessing significance. So that is what learning outcome is expected from you.

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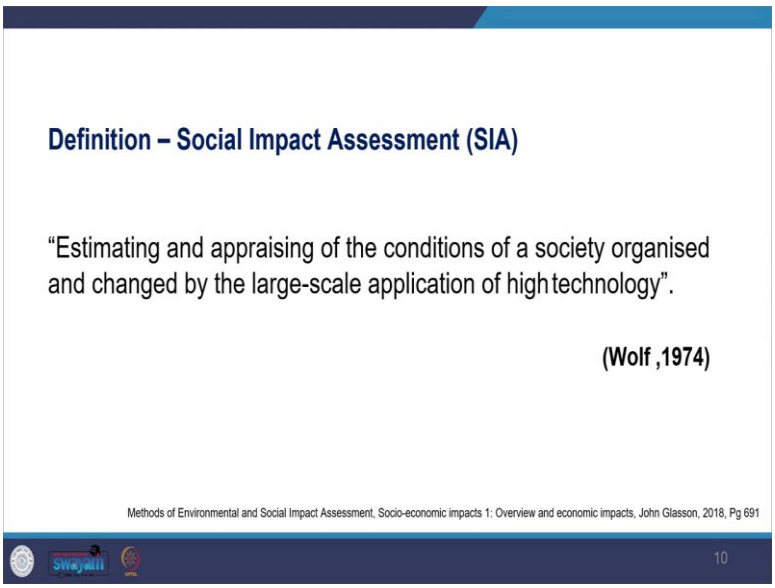

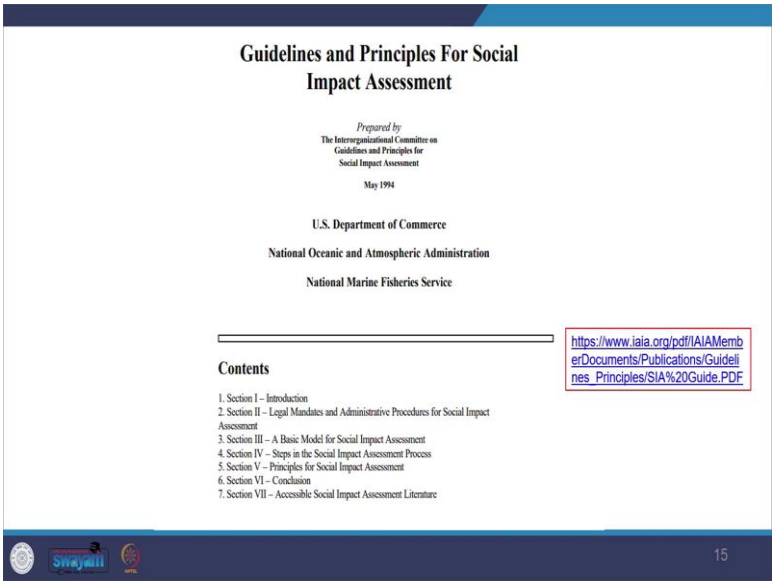

So looking at the definitions and concepts of socioeconomic impact assessments, it is this particular domain, developed in the 1970s, and 1980s. It developed majorly in the context of nuclear power stations in the US, and hydro-electrical schemes in Canada and other parts of the UK. So, that is the context where it started and there is still an ongoing debate, on how you solve the health impact assessment, whether socio-economic impact assessment should be part of EIA, or should be an independent study in itself. So that goes on, and it is been approached in different ways. So, now looking at the definitions of the SIA there are some key definitions, we will look at this to understand what it means and what the scope of it is.

So SIA is said to be estimating and appraising the conditions what is happening of the way the society is organized and is changed by what kind of project is going to come up. So that is said to be SIA. Likewise, we see another definition, which says that SIA the assessment is a systematic, advanced appraisal of the impact of day-to-day quality of life.

So it is very simple, how it affects people's lives and communities when the environment is affected by development or policy change. So what happens to their day-to-day life, because of the changes in the environment, because of the project, which is going to come up? So likewise, we see another definition, by the Interorganizational Committee of Guidelines and Principles for Social Impact Assessment.

We see that it talks about consequences, what kind of consequences will happen to the human population have any public or private actions, and alter how people live, work, and play, again addressing day-to-day aspects of life, and how they meet their needs and generally cope as a member of society. So it also addresses the stress elements, it is talking about coping as a member of society.

So you see how wider the domain is and it is mostly dealing with the softer part of the society here. So you can look at these guidelines and principles for social impact assessments and I have also given you the link so that you can have a detailed look at it if you would like to do that.

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Definition – Social Impact Assessment (SIA)

"process of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment".

(Guidance for assessing and managing the social impacts of projects, IAIA 2015)

Methods of Environmental and Social Impact Assessment, Socio-economic impacts 1: Overview and economic impacts, John Glasson, 2018, Pg 692

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https://www.iaia.org/uploads/pdf/SIA_Guidance_Document_IAIA.pdf

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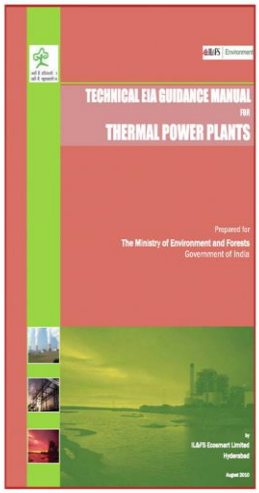

- Social impact assessment is the instrument used to analyze social issues and solicit stakeholder views for the design of projects.
- Social assessment helps make the project responsive to social development concerns, including seeking to enhance benefits for poor and vulnerable people while minimizing or mitigating risk and adverse impacts.
- It analyzes distributional impacts of intended project benefits on different stakeholder groups, and identifies differences in assets and capabilities to access the project benefits.

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So, we see another definition, by IAIA in the guidelines, which they have come up with and if you recollect, we saw this part in the legislation aspect time also when we were covering that, so how do they define it? What do they talk about? So obviously, they call SIA a process of analyzing so you are looking at the aspects and then also looking at the monitoring and managing the intended and unintended social consequences.

So there are certain things you are doing intentionally trying to bring change, but then there would not be certain changes, which would be unintended. Further, it talks about both the positive and negative of the planned intervention and it is again, not just talking about the physical components of the project, but also the policies, program plans project, and any social change processes resulting because of those kinds of intervention.

So, do you see that the primary purpose the key purpose of this process of analyzing is to understand or to target a more sustainable and equitable, biophysical and human environment? So, the main goal is again, as we have been seeing a sustainable development goal, equitable development. So, I have also given you the link to this particular report here.

So, if you look at one of our manuals, then we see that social impact assessments have been taken from the MOEFCC site, though, it talks about social impact assessments as an instrument to analyze the kind of social issues and their arguments or it propagates the idea to undertake stakeholders view for the design of the project.

So, how you engage with them and take the consideration into the design of the project, social assessment helps make the project aligned with the social development concerns and then looking into improving the conditions of particularly the poor vulnerable people and trying to minimize and mitigate risk and any kind of negative impact.

So, through this process, you analyze the distributional impact we have seen that any kind of impact would be not universal, it would be positive for somebody, negative for somebody, weaker for somebody, and very strong impact for somebody. So do analyze the distributional impact of the project what you are targeting and then how you would take care and engage with the stakeholders and identify differences in what kinds of assets and capacity they have to take the benefits of the project.

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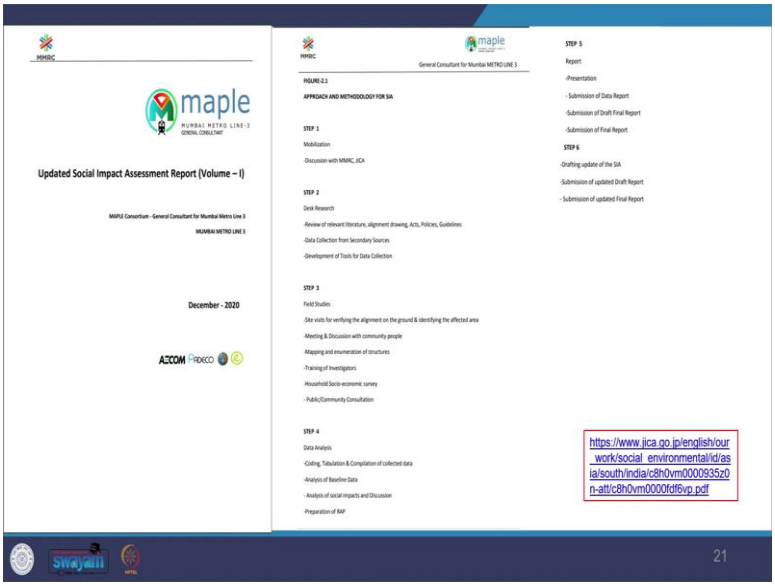

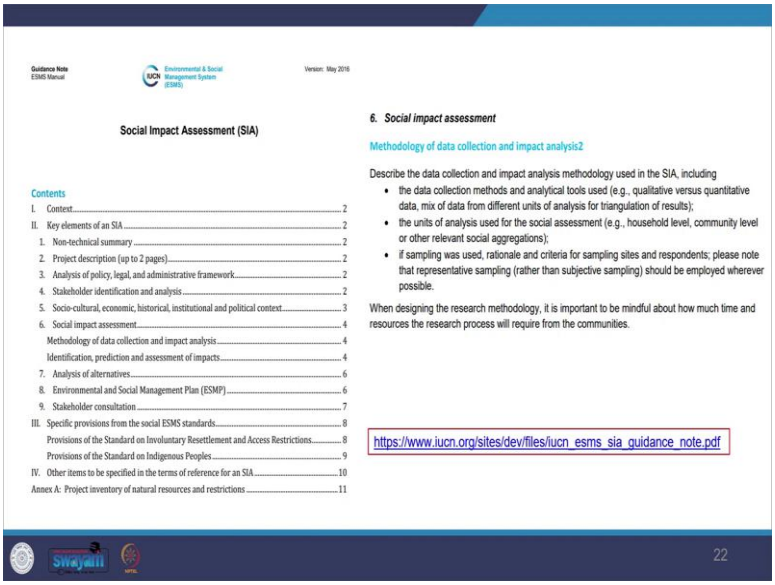

Another example I have taken from Mumbai Metro line 3, so you can see here, is done by Maple, there is a social impact assessment report created for GECA for the funding agency. So, here you can see how they have undertaken the entire SIA, process here you can see the approach and methodology which they have adopted they are undertaking the desk research, and then they are also undertaking the field study, then they are undertaking the data analysis and then the report has been prepared and the draft report and then reviews.

So you can see that this is one independent social impact assessment report along with the complete project report, which has been done for funding purposes. So, here you can see what kind of approach, you can see a lot of similarities in what we have been seeing and all the methods section.

So here I have put another snip for you where you can see that the IUCN also gives you guidance on social impact assessment, you can look at various aspects of assessment like methodology, how you analyze the alternatives and look at the environmental and social management plan.

And then how do you undertake these stakeholder consultations? And how do you take care of the resettlement voluntary and involuntary? And how do you take care of the indigenous people? They also specify methodology for data collection and impact analysis. So, the data collection methods and analytical tools, you mostly in this particular segment, you will see qualitative data is much more used, and then you take a combination of data as well qualitative and quantitative.

And you have a mix of data and different units of analysis and what is suggested is triangulation of results. When I say triangulation of results mean trying different methods, looking at different data, and trying to draw conclusions and see whether those conclusions reinforce your findings or not.

So, from every angle, if you see every approach method, if you see and if it points to the same aspect then you would consider that to be your strong conclusion. The unit of analysis can also vary you can see that here example it calls for household level, community level, and other socio-aggregation, you can do, and then it also talks about what kind of sampling you can do.

So kind of different criteria you can adopt. So there are a lot of completely distinct domains also where you can look at how these social aspects are reviewed, and how the analysis has come in, that is a very well-established domain. Then we are going to focus a little on the environmental impact side, how do we integrate it with that?

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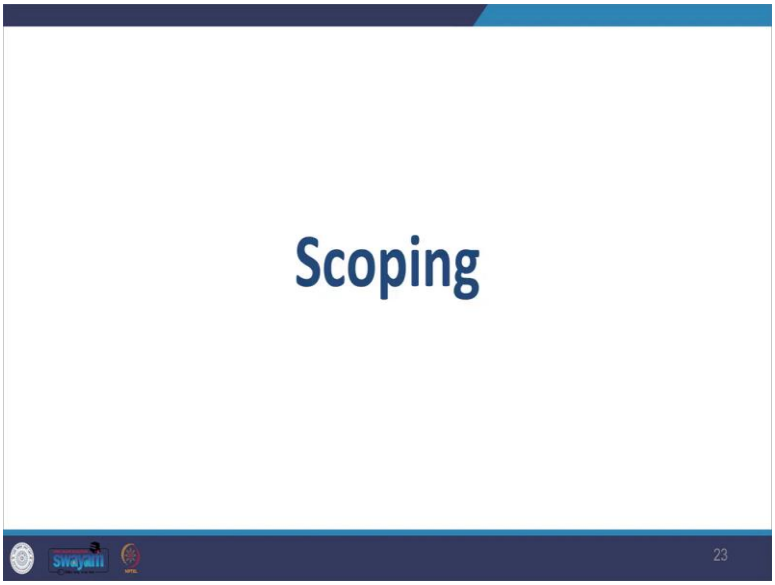

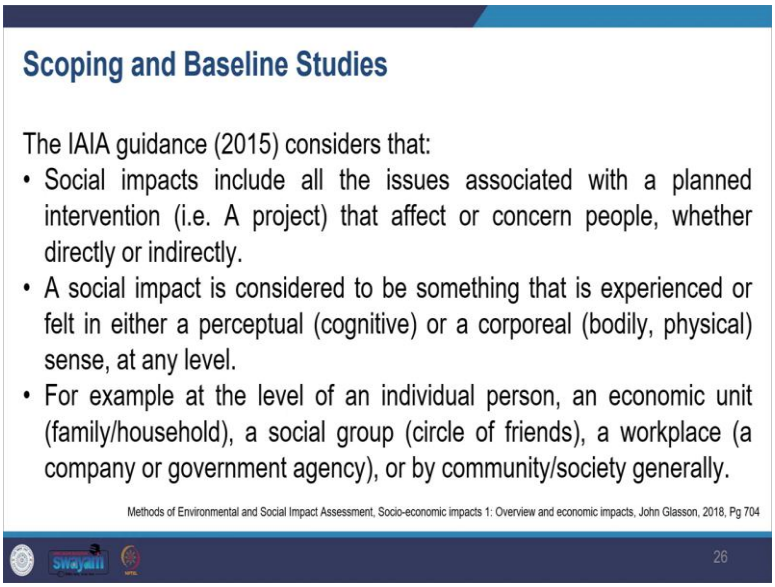

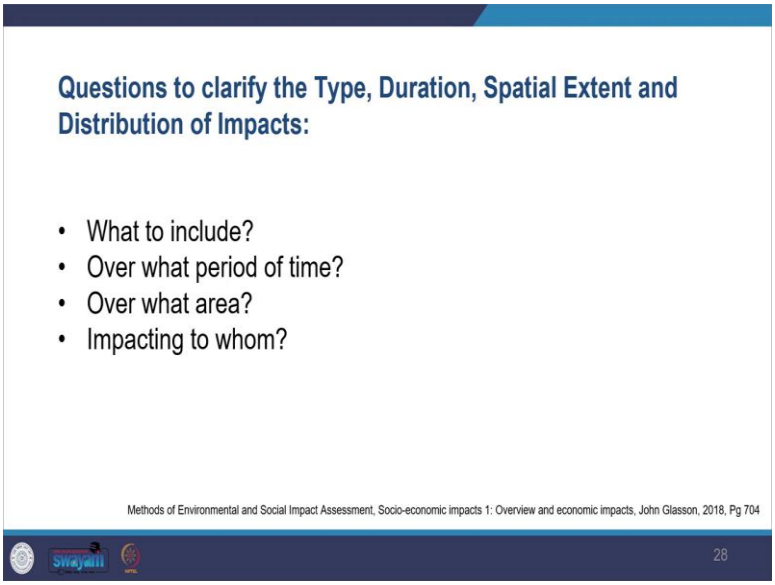

So, that was a little brief on the methodology part here. So now moving on, and looking at the scoping components, looking at these scoping aspects, we see that as per the IAIA guidance, we are required to look at what kind of issues are associated with planned interventions. And what are those concerns of the common people, the local people, and what kind of impact would happen to them directly or indirectly?

So, all those aspects you have to see and you have to see one, you want to find out what are the concerns, and then you are going to cover not only a very formal system but then you will also look into the experiences or what the feeling or the felt experience, even in terms of even if they are perceiving or even if they are feeling it having a sense of it.

So all these aspects, the tangible and intangible and relatively softer aspects are also covered. When you look at this, so you need to determine while doing scoping to what extent you are going to go but then usually you would also have to take into consideration even if it is perception like the people perceive that this benefit is going to happen or even if they perceive this negative impact is going to happen to them whenever industry comes up, they might think that they might get job or they might think they might have to remove or it might impact their view of life. So even if they perceive and if it might not translate into facts then also you need to undertake all those considerations while you are doing it.

So whether you will take it or not you will determine in your scoping stage and then at this stage you will also find out what level you are going to work on. So when you are dealing with socio-economic things, you can work at the individual levels of the individual per person level and then you can also work at an economic unit level; you can look at at the family level or household level, then you can also decide to look at the social group level particular community, groups.

Then you can also look at the workplace like companies, and governmental agencies, and you can also look at the community society in general or the larger, you might not have fine-grained granular details, but you can decide to go in a broader aspect also. So, that is what you decide, or the scoping level.

So, when you look at these different levels, you will see that there are impacts at different levels and the impact might also vary, and the effect might also vary, and that can be different from one person to another person. So, while you are undertaking socio-economic impact in EIA, then you need to clarify at this stage of scoping what type of impact is going to happen, what will be the duration of impact? What geographical area you are going to study? And what will be the distribution of impact?

To understand this, you need to ask questions like what to include, what we will, as a team cover within this, over what periods our analysis will take place, what kind of data will be collected, what kind of geographical area will take immediate footprint or larger footprint and whom we are going to look at? Because there will be a range of people involved in and around the project. So, you need to focus on all the decisions questions you have to make, and decisions you have to take.

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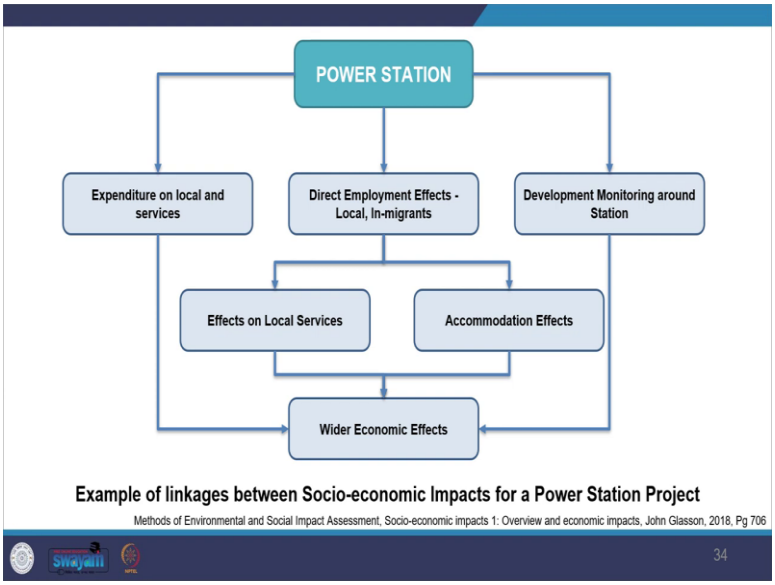

So, if you look at what to include, you can see in this particular diagram, that there are certain examples related to the socio-economic impact assessment. So you have a direct economic impact, such as you can have local employment, or you can also have nonlocal employment. So it is quite possible that in your project, you are saying that local employment will be created, but then that is quite possible that no local job is created.

Further, it is also quite possible that you are creating a setup where you will be bringing migration would be happening. So what economic impact is happening, whether it is local or not, and what kind of employment is generated? Then, what is the characteristic of employment? Whether it is a skilled group, unskilled group, or highly skilled group? And do you have labor supply and training available in this and what is the level of wage in that area?

Then, you can also look at the indirect wider economic expenditure and for that, you can look at the employees, and how much they spend. So, maybe that spending rate might increase, and then look at what kind of supply chain is there. What is the labor market pressure are the human resources available or not? Then what kind of how the economy works there, what kind of multiplier effects are there, and then what

can happen? What is the potential of that area to take effect? What will happen to that area? What is the capacity of that area to take different effects?

Then, you would also look at the demographic aspects. So, what is the change in population size, temporary and permanent? You can look into changes in other population characteristics like what will happen to the family size, income levels, socioeconomic groups, settlement patterns, and then what would have now, you could also look at the housing, various housing, what types of housing are there public and private housing, house prices, what is that the rent might go up or go down? What will happen to homelessness and other housing problems?

So that all you can see in this and then other services also you can look at the public and private sector services, what it what impact it can have on the educational services, health services, and safety and other support system and what will happen to the local finances the urban governances finances to take care of it when there is an increase in population or increase in the activity in your area.

Likewise, you can also look at the sociocultural aspects you might include; you might include the lifestyle, quality of life, gender issues, social problems, community stress and conflicts, and community character, how that character or the image would change.

It can happen in both negative and positive manner and then you may also include the distributional effects, which means the effect on specific groups, so, not just looking at the umbrella effects, but you can also look at how the impact would be on individual groups. So, you can look at by the virtue of gender what might happen to women with that kind of change, will it be positive and negative, will it make them much more vulnerable, what will happen with the different ages, religions, languages, ethnicity, and location, so all that aspect can be seen.

So, here in the diagram, you can see the example of this project and then you can see how it generates expenditure on the local goods and services; it can make it expensive or cheaper. Then you can have direct employment affect local and then you can also have in migrants, then you can also have the monitoring which will take around the place.

So, the direct employment effect can also affect the local services; it can affect the accommodation, and the housing requirements, and then altogether can have a wider economic impact. So, when you are looking at local area, but then the socio-economic impact can also happen at the wider regional level or national level as well.

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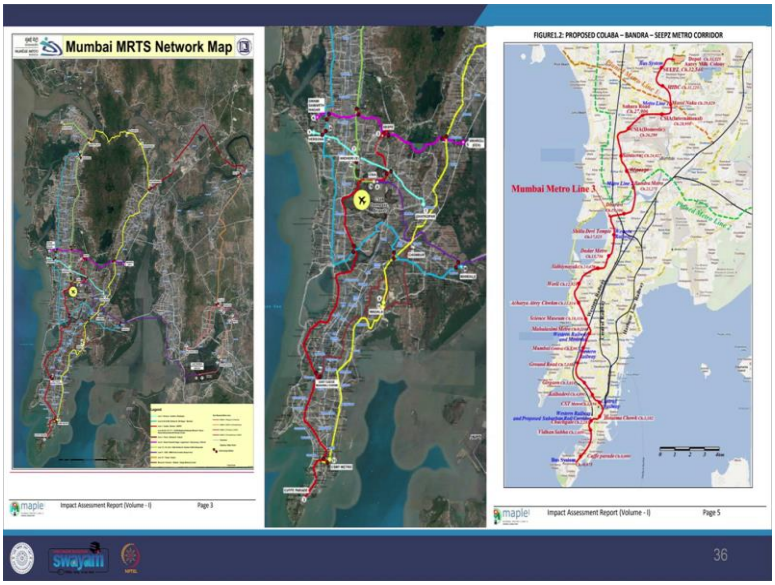

So, we are going to look at briefly this again the Metro Line 3 proposal from Mumbai, the social impact assessment aspect here. So, you can see in this case that they have posed a metro rail, which will facilitate commuters and travelers to travel from South Mumbai to the airport via the Mahim Bandra Kurla complex. So, you can see that plane there and then that Southern Mumbai connecting to the airport here, so this report is about that.

So, in the scoping stage, you will also determine the period of all the stages of the project in particular, even if you are looking at the distributional effect, then you will also need to see at what phase and what period those impacts would happen. So, it can happen at the operational stage, it can also happen in the decommissioning stage. So, when the industries fall out, and no longer work then also it has a lot of negative impact when it shuts down.

So, we often do not look at it, but one needs to look at it at the operational phase, construction phase decommissioning phase. And then at the scoping stage, you also need to look at the geographical extent to cover. So, you have to identify the impact zone and then also you will identify phase-wise, like what will be the impact zone during construction, what will be the impact zone during the operation, what will be the

impact zone during the decommissioning of the project and all this needs to be undertaken, but it will also depend on the availability of data or what kind of policy environment is there.

So that all will guide and further in the scoping you also need to identify affected people. So, who will be the affected people, will it be the local people? Will it be the people visiting like tourists, and then it will be elderly people affected or young people affected, or whether it be women who are affected?

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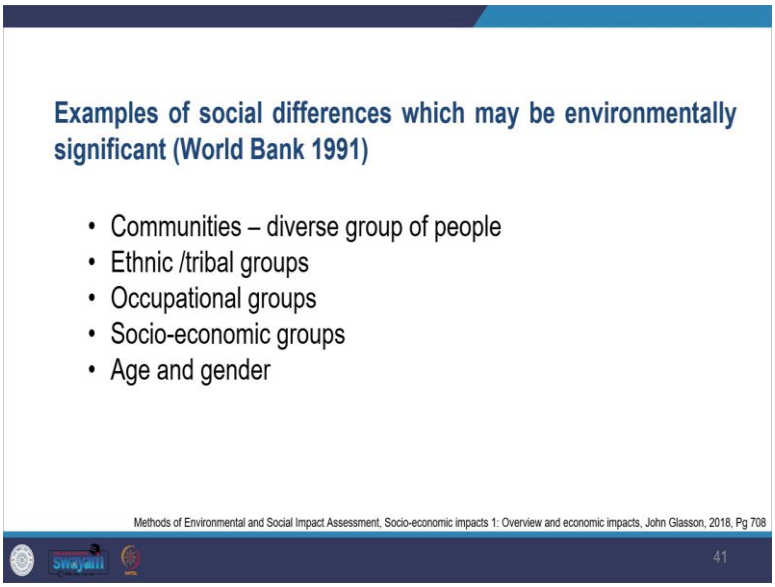

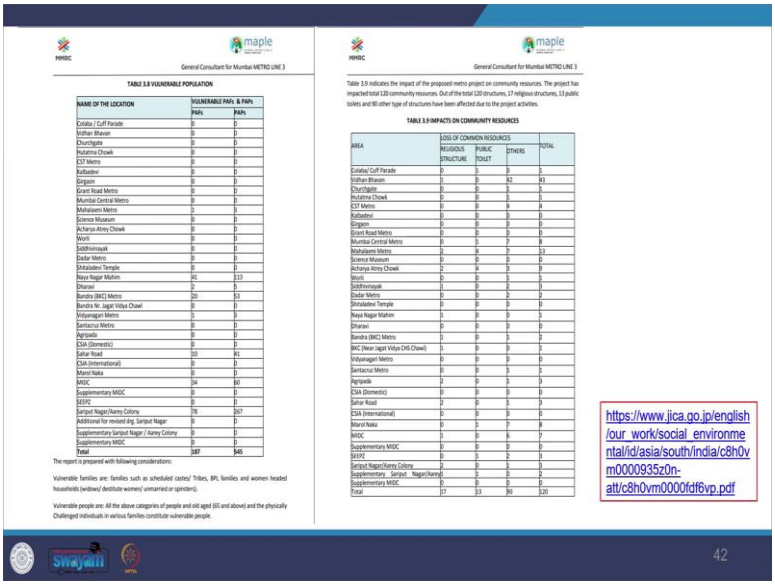

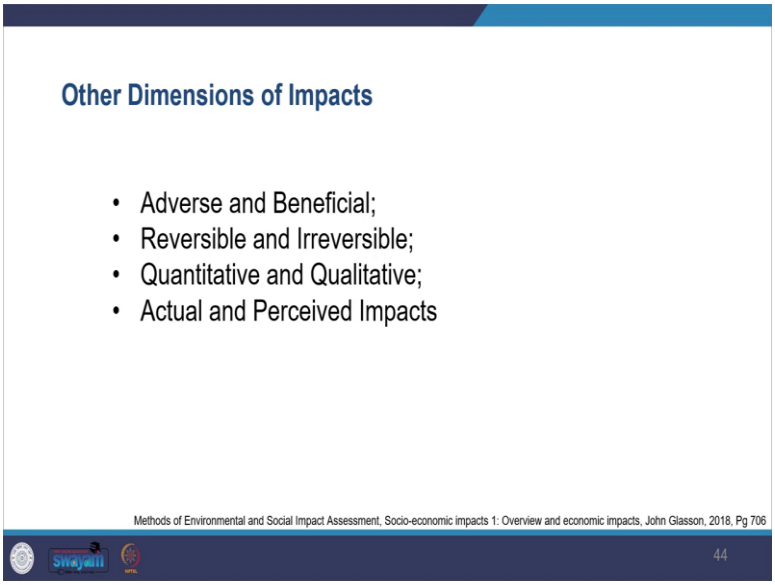

So, the World Bank provides you with this direction, identification of different groups that can be of concern and especially of concerns from the EIA perspective. So, you can see communities, it identifies the term communities where it refers to diverse groups of people. And then it also emphasizes recognizing the ethnic tribal groups and then looking at different occupational groups, skill-wise, education-wise, look at the different occupational groups, and then look at socio-economic groups as well and look at age and gender. So, this World Bank also provides you and it is key from the EIA perspective.

So, here you can see from the Mumbai Metro line 3 examples, you can see how they have identified vulnerable populations, communities, or resources and you can see the source of data as from the census. And then you can see is, they have identified vulnerable populations, such as families scheduled caste tribes, below poverty line families, women-headed households, like widows, destitute women, and married or spinsters, and also vulnerable groups, they have included people about 65 age, and also included physically challenged individual.

So you see how they have tried to identify groups that might vary from context to context and also depend on what kind of data is available. And then you are also looking at how it is impacting the community resources.

Apart from this, you might also have to consider while looking at these, while dealing with scoping, whether the impact would be positive or negative, and then whether it will be reversible or irreversible, whether it will be quantitative or qualitative, can you qualitatively capture that or can you capture quantitatively? And then you also need to look at what is the actual impact and what is the perceived impact.

So all also needs to be considered and many times there are both kinds of, actual issues, but then even the perceived impact influences the success of a project or how the future projects are accepted? Or what is the behavior of the local people towards the development? So those things are also important and so that has to be taken care of and then when you look at the perceived impact, it is more subjective. And when you look at actual, that is a more objective assessment, of what we do.

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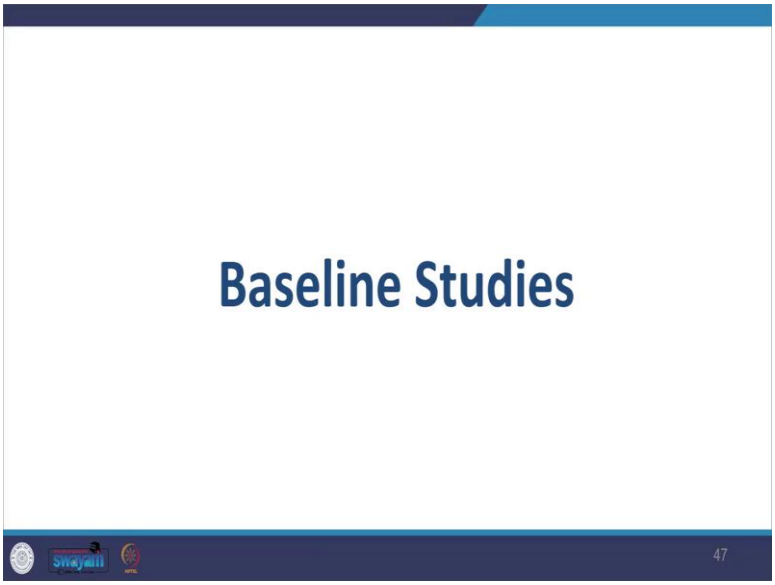

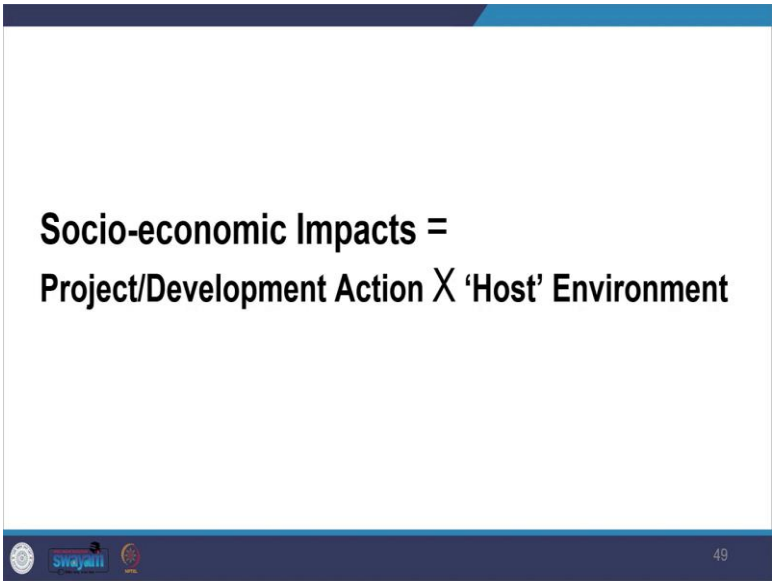

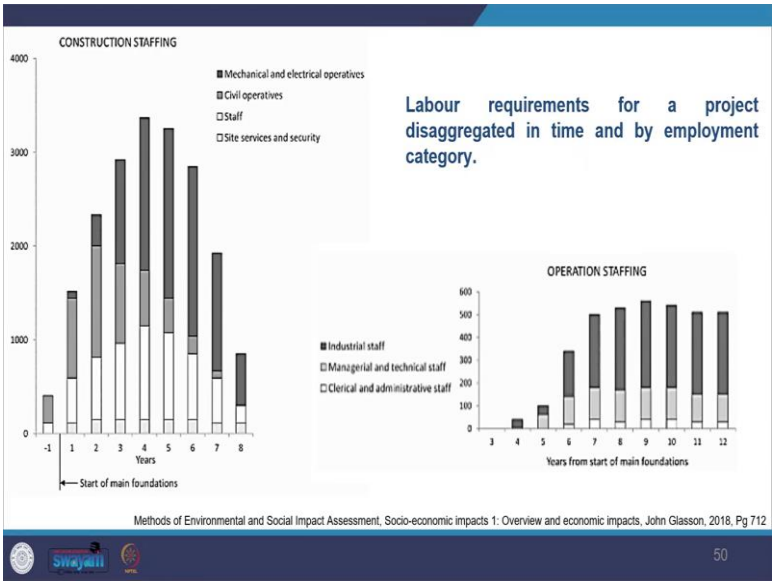

So that was about scoping; now looking at the baseline studies. So if you try to understand socio-economic impact, it is said to be the interaction between; what development activities will happen, and what kind of actions will be taken because of that. It is interaction; it is multiplication with the client of the characteristics of the host environment.

It is said that it is important that you try to collect data on both these aspects, like what the project activities, and project related to, what the character of the project, and what is the character of the host environment and how those are going to interact. So you need to collect that data, and you need to see what will happen. So that is what is targeted as the baseline study.

Here you can see in the diagram, that they have projected the labor requirements for or for a project, and how they are looking at the disaggregated data as per the time and my employment category. So you can see how the, during the construction staffing, how year wise how the staff would be time-wise. And then you are looking at the lower parts of the graph, you can see industrial staff, managerial staff, clerical and administrative staff.

So, also year-wise how that variation would also be there, so you can see how the top one industrial staff are wearing and then clerical staff also you can look at, so that kind of data you have to look at.

And whenever you are dealing with SIA there can be little difference in opinion, what the impact would be. So you can see quoted from one of the London Gateway bridge examples. So the purpose was to link the two ends and improve the connectivity and the argument was that it would give benefit to the residents and being able to cross the river and then that would increase the employment opportunity.

The other curve, the cross argument, was that a bridge would not improve the economic condition of the people unless people are trained or built to take the benefit of that, whatever is created, whatever opportunity is created, so that might stand true.

Think of all the cases we have come to come up with where really when the products come up how many jobs do the real jobs local people get? I have seen, that we will find that the local people are not trained enough, there is not enough capacity building, or their education level is not there, then they do not get good employment opportunities.

So though the intentions of the project can be good but then there can be problems with the way they are designed; designed for engaging with the local people. Some projects may have significance in terms of national and even international employment implications and job creation can happen at different stages in scale also like the construction stage and so on.

While also looking at the characteristic the host environment we will also look in the second part of the lecture we will look at certain examples but right now just briefly looking at some of the methods how to look at the characteristics of the host environment the most suggested approach to this is to go for a triangulation method.

That means as I had already explained that you look into a variety of data sources so you do not conclude just one source but you look at a variety of data sources, and you investigate from different angles and then if you are getting the same kind of scenario you can conclude that. So not only for those numbers but you

also look for the theory part of it and how the people are and what kind of problems are there and then you do not look also for theory from one angle, but you also have multiple perspectives.

This means you look at the same social conditions from different people's perspectives and then it is suggested to use multiple methods and public participation is key to developing the characteristics of the host environment. So it should not be that the researchers and the team working on it developed the characteristic of the host environment, but it should also come from people's opinion of themselves, what they think about their socio-economic situation, or how they experience it.

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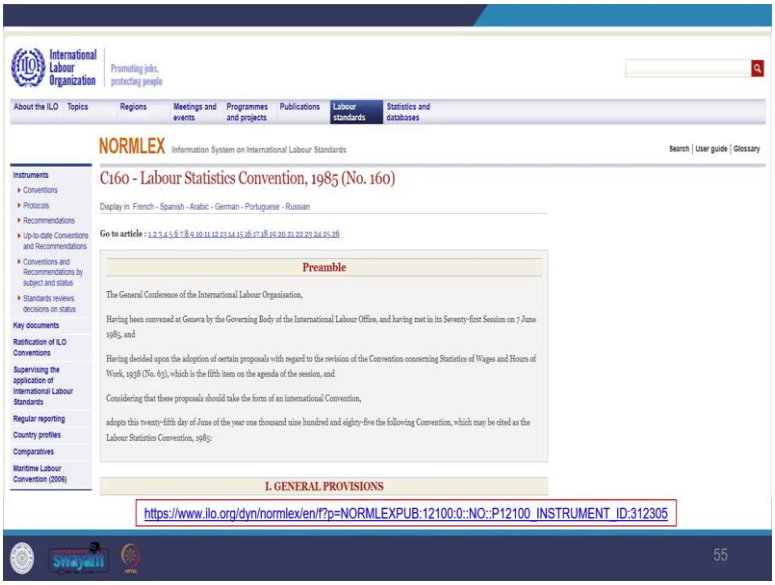

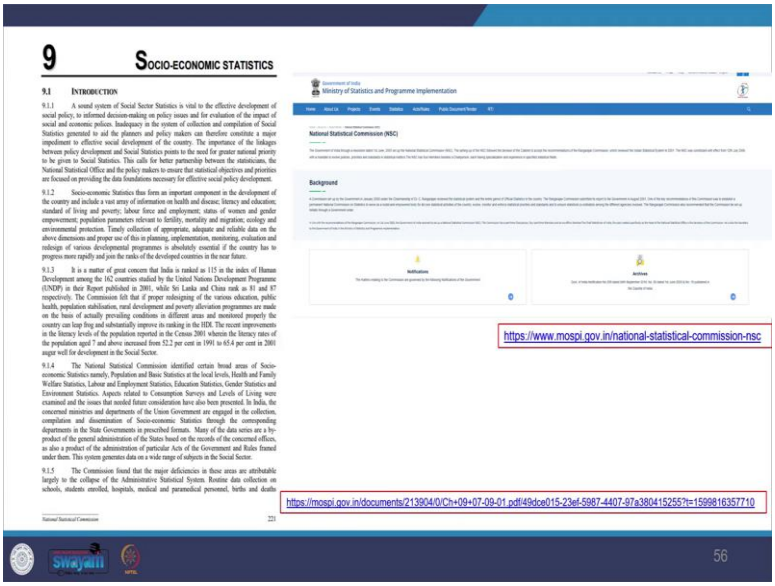

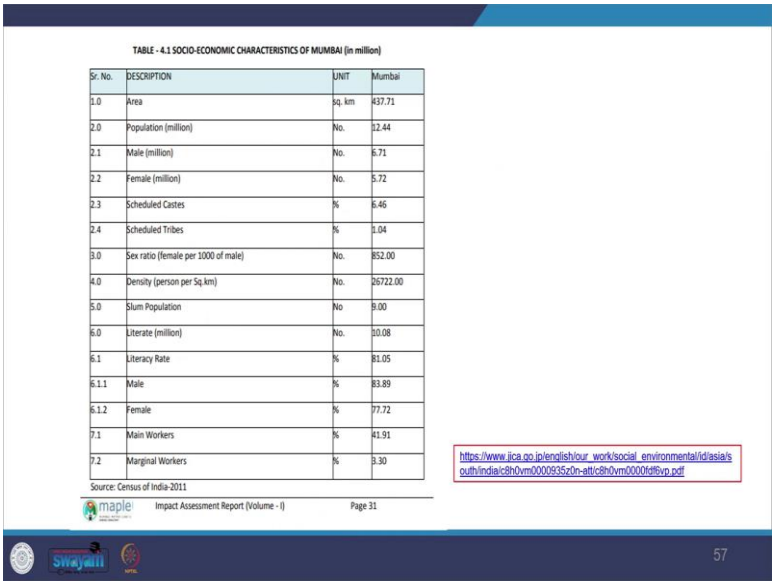

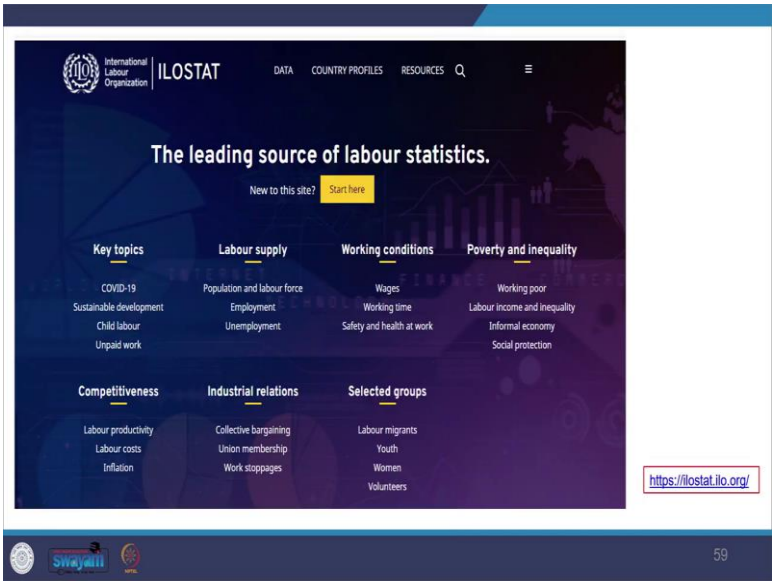

The possible data sources that are standardly used for this are the UN International Labor Organization, ILO data labor statistics and they also provide you occupational classifications which you can see also there is also at the Indian level, you can also find national statistical commissions and then census of India gives you a lot of information.

So I have also given you the link to explore the data. Here you can see again the Mumbai case, how they have explored the socio-economic characteristics of Mumbai like looking at the area, population, male, female, scheduled sand te, schedule types, and then their source of data is a census of India 2011 from which they have created this profile characteristic of the host environment.

You also find some of the international sources, so we have already seen the ILO, and then you also have ILOSTAT which provides updated labor data they use a hundred indicators and capture data from 165 countries. So I have given you that link as well to explore.

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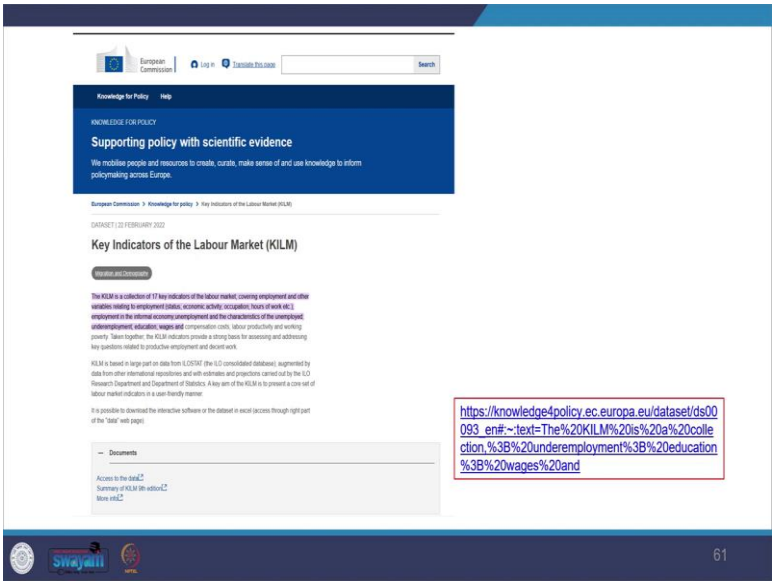

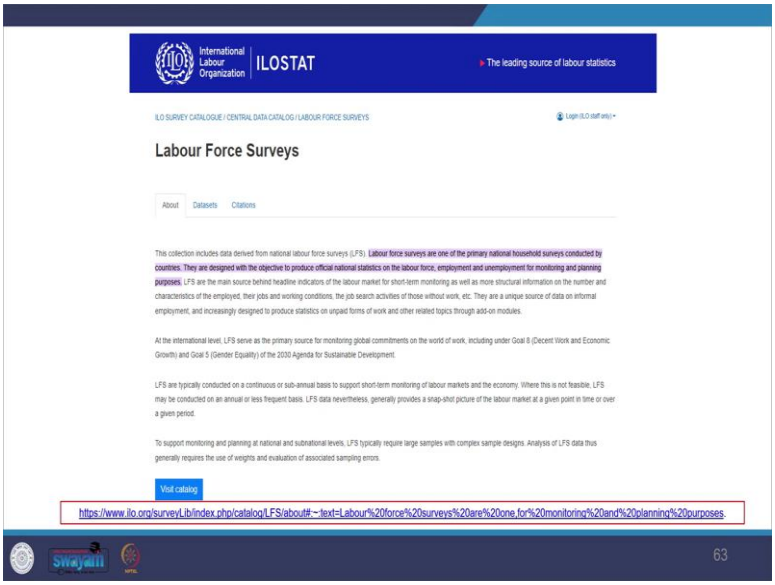

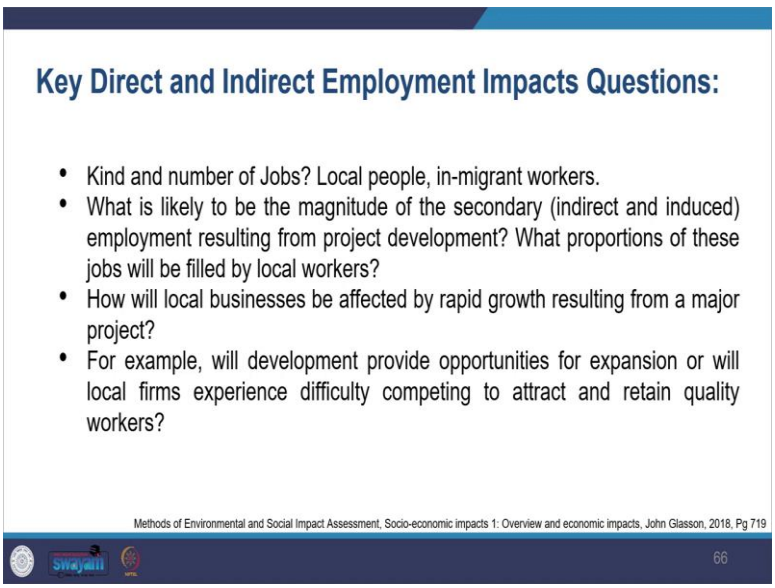

Then you also have key indicators of the labor market, KILM is also a multifunctional research tool and it is also done by the ILO Department of Statistics. So they also use certain sets of country-level data and then indicators like17 key indicators for the labor market, so you can also look at that and they cover topics like labor force participation employment, hours of work, what is the share of unemployment, what is the scenario about wages, what is the scenario about labor productivity, and income distribution and so on?

So you can look at it, I have given you a link to this as well. And then you also have a labor force survey so this also keeps compiling the website and keep the data statistics all available, so I have given you a link to that as well so you can have a look at that.

And when you are looking at these aspects you need to look at what are the kinds of direct and indirect jobs which are going to come up. So then what will be your key questions for which you will try to find our answer, you will look at the kind and number of jobs that will be created what kind of job will be created for the local people, what kind of job will be created for the in migrants workers, and what would be the scale of magnitude of indirect and induced employment? Because of the development to what scale it will happen, what will be the share of that and then what will be the proportion of those jobs getting filled by the local people?

So if there are 100 jobs created how many jobs will be created for local people, 1, 2 or 30, 40 out of 100? So you need to also understand that kind of proportion and whether will it help local businesses or it will help them boost the local business or called if a mall is coming it is quite possible that the local business struggle to cope with the new environment, and if there is an industry coming up then maybe they are getting more opportunity to sell their products and services and that kind of things can happen, so you need to have a look at what is happening.

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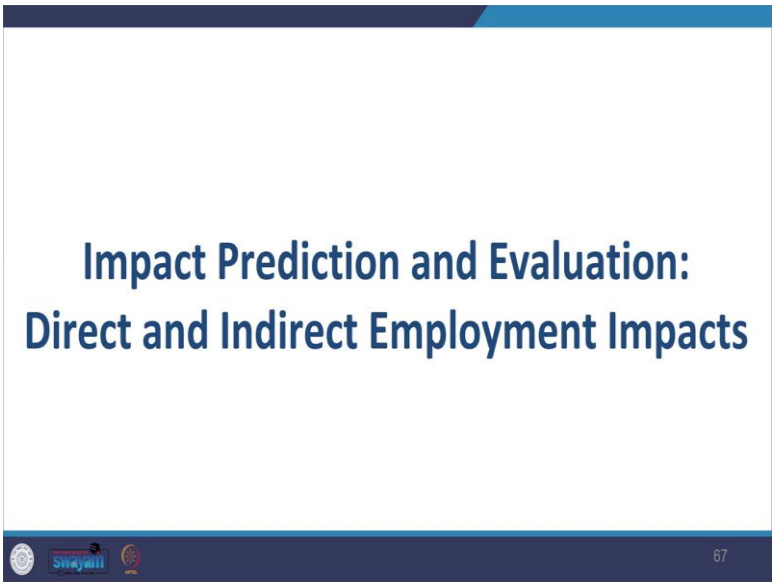

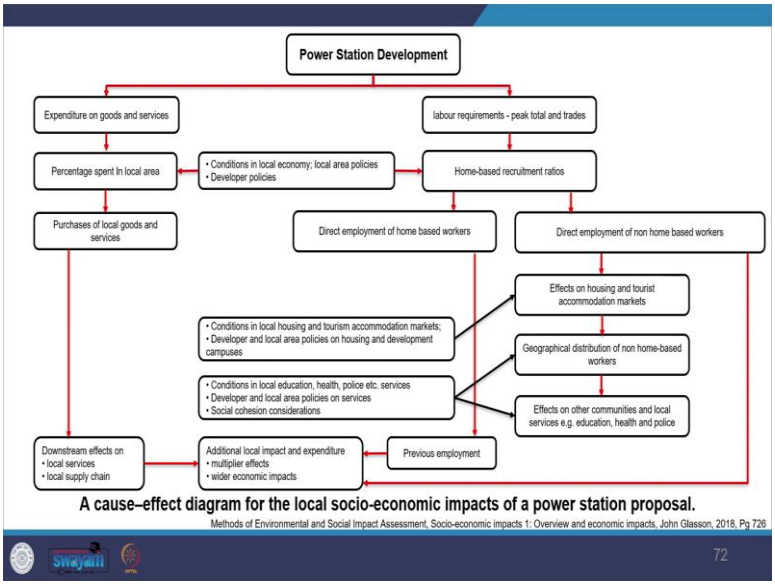

A cause–effect diagram for the local socio-economic impacts of a power station proposal.

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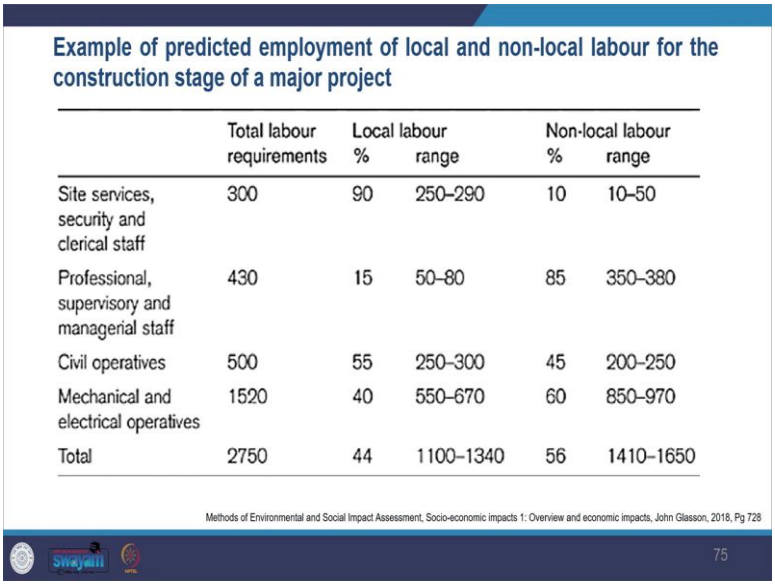

Example of predicted employment of local and non-local labour for the construction stage of a major project

	Total labour requirements	Local labour %	Local labour range	Non-local labour %	Non-local labour range
Site services, security and clerical staff	300	90	250–290	10	10–50
Professional, supervisory and managerial staff	430	15	50–80	85	350–380
Civil operatives	500	55	250–300	45	200–250
Mechanical and electrical operatives	1520	40	550–670	60	850–970
Total	2750	44	1100–1340	56	1410–1650

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Now looking at the impact prediction and evaluation, looking at direct and indirect employment impact we are just going to look at the economic aspect in this section. So impact prediction and evaluation, you need to look at what will be the nature of your prediction and how consistent, what kind of prediction methods you are going to use, and then you will also look at what are the direct and indirect impacts. So indirect predictive approach; when you are doing indirect predictive approach that means you are not sure but you are assuming what is going to happen in the future. Then you use extrapolative methods, so you may pay attention to this extrapolative method.

You look at the past trends what happened 20 years down the line, 30 years down the line, and then based on that you present the present data and then you project the scenario of what kind of things will happen in the future, so that is an extrapolative method. Another method is normative and when we say normative based on the norms or the standard.

So such methods work backward, whatever the standard is if the local policy says that if the development is coming, 30 percent of jobs have to be given to the local people, so you would be working on the reverse background. So you will follow the norm and you will back calculate well how many jobs you need to create for the local people, so that would be a normative method.

And then the other method would be an effect relationship and you will be looking at different aspects that will be involved. So here you can see one of the diagram causal effect diagrams for local socio-economic impact with the example of power stations. So you look at the arrows going to expenditure on goods and services that would lead to economic opportunity, the percentage spent in the local area, purchases of local goods and services, and downstream effects on local services and the local supply chain.

So is it creating pressure or it is boosting the local economy that you have to see? Likewise, on the right-hand side, you can see the low labor requirement and then home-based recruitment ratios, what is happening in direct employment and then direct employment for non-home-based workers, and so on.

So that is how you would look at a causal effect you can also create causal effect diagrams and try to understand indirect jobs that would be created. Further, while predicting local and regional direct employment impact so for you can simply calculate the number of jobs that would be created.

Further, you can also look into the disaggregation of different project stages like at different locations, different periods, and what kind of jobs will be created. So here in the table, you can again look at another example, so you look at total labor requirement and then how much proportion of that will be the local labor and how much proportion of the same total jobs would be non-local labor equipment and then you see look at the range of job sites service security, professional supervisory, civil operators, mechanical and electrical operatives.

And then you see how with change in the positions, the percentage of local labor also reduces or varies you can see that and how non-local labor increases when the mechanical, electrical operators things are coming so you can see 10, 85, 45, 60, 56. So the proportion is increasing as the different levels of your skills which are required. So that is also said to be a problem in a lot of places where eventually training and capacity buildings are not there, so local people cannot take benefit of the vertical upliftment, which people can have. So that is the narrower topic within the economic impact, but you can also capture the wider economic impacts.

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Measuring wider Economic Impacts: The Multiplier Approach

The three methods most frequently used are

(a) The Economic Base Multiplier Model
(b) The Input–output Model
(c) The Keynesian Multiplier

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The Economic Base Multiplier

- Founded on a division of local (and/or regional) economies into basic and non-basic activities.
- Basic activities (local/regional supportive activities) are seen as the 'motors' of the economy;
- Non-basic activities (regional dependent activities) support the population associated with the basic activities, and are primarily locally oriented services (e.g. Retail services).
- The ratio of basic to non-basic activities, usually measured in employment terms, is used for prediction purposes.
- Thus an 'X' increase in basic employment may generate a 'Y' increase in non-basic employment.
- The model has the advantages, and disadvantages of simplicity.

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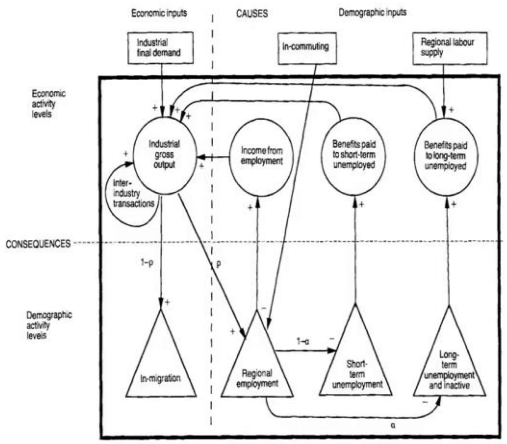
Flows in the Extended Input-output Model



(Peter W. J. Batey , Moss Madden & Graham Scholefield (1993) Socio-economic Impact Assessment of Large-scale Projects using Input-Output Analysis: A Case Study of an Airport, Regional Studies, 27:3, 179-191)

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So now looking at how we measure wider economic impacts and then what kind of multiplier effect would happen, you take the multiplier approach. So there are three methods you see one is the Economic Base Multiplier Model and then the other is the Input-Output model and then you have the Keynesian multiplier we have seen this before also.

So when we look at the economic base multiplier, the idea of this is based on that, you divide the local economy into basic and non-basic activities. So you see that basic activities include local regional supporters activities and is seen as the basic activity will lead to another kind of activities, which would trigger another kind of activities. So whatever the hardcore activity will happen because of that particular project that would be the basic activity and that would lead to another non-basic activity and that would be at the regional dependent activities.

So which would support the population related aligned with those basic activities and it could be commercial activities, services, and things like that. So the ratio of basic to non-basic activities is usually measured in employment terms as used for prediction purposes. So then you see that if there is a certain number of increases in the employment then it will generate Y amount of non-basic employment so this is the way it is calculated so you have a certain proportion which goes with it, and this model also has certain limitations and advantages.

The other method is the Input-Output model, Input-Output table you have a balancing metric of financial transactions between industries or sectors, so you look at it. Here you can see the input output and how they are working it out.

In this example, you can see input-output analysis to look at the socio-economic impact of the airport project, so you can see how they are assessing here. You can see economic input, industrial final demand so what kind of demand would be there so industrial gross output will happen and because of that you will have in migration and then you see that there will be regional employments, income from employment would come and then it will again link there and then because of the regional employment there would be short-term unemployment would reduce and then that would lead to benefits paid to short-term unemployed.

So you can take care of that as well, and then regional employment you can see that it would also link to long-term unemployment and inactive, so it would also reduce that and that would also lead to the positive impact of benefits paid to long-term unemployment and that would also improve the regional labor supply and so on. As you can see here, this is also the input-output way, you can understand what kind of multiplier impact can happen, so these ways also it is shown.

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The Keynesian Multiplier

"a money injection into an economic system, whether national or regional, will cause an increase in the level of income in that system by some multiple of the original injection".

$$Y_r = K_r X J \qquad \ldots\ldots (1)$$

where:
Y_r is the change in the level of income in region r.
J is the initial income injection (or multiplicand).
K_r is the regional income multiplier.

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Five Important Leakages Are:

- ***s***: the proportion of additional income saved.
- t_d: the proportion of additional income paid in direct taxation and national insurance contributions.
- ***m***: the proportion of additional income spent on imported goods and services.
- ***u***: the marginal transfer benefit/income ratio.
- t_i: the proportion of additional consumption expenditure on local goods which goes on indirect taxation.

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The multiplier can be formulated as follows:

$$K_r = \frac{1}{1-(1-s)(1-t_d-u)(1-m)(1-t_i)} \qquad \ldots(2)$$

Substituting (2) into (1) then gives:

$$Y_r = \frac{1}{1-(1-s)(1-t_d-u)(1-m)(1-t_i)} J \qquad \ldots(3)$$

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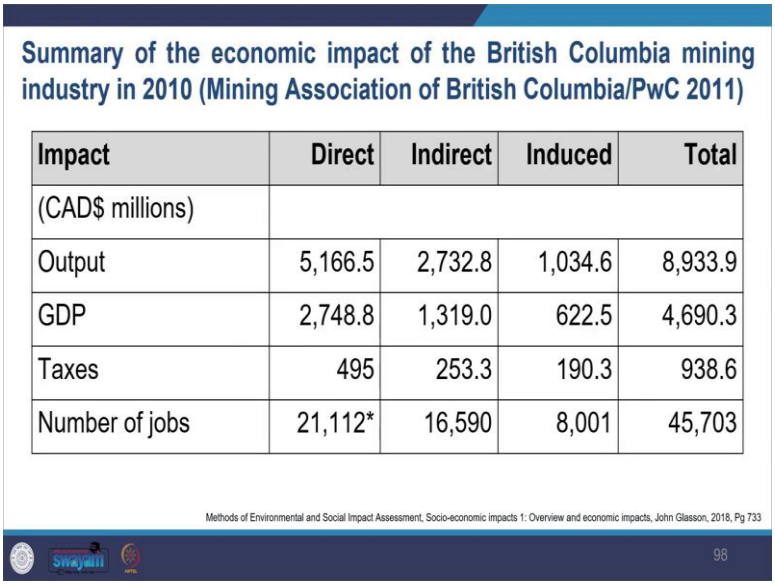

Then you have Keynesian Multiplier so the basic theory behind this is that whenever money is invested into an economy in a place at the national or regional level then it allows facilitated increase in the income and that creates a lot of positive aspects. So you can see that in this simple formula where Yr is the change in the level of income in the region J is the initial income injections, how much money you are investing through that particular project and Kr is the regional income multiplier, so what its potential to multiply that based on that it will calculate the change in the level of income in the region.

So if the initial injection of money is given and if you see that usually, it multiplies that it might multiply theoretically might multiply it every level then it can have an infinite positive impact, that is not true but there are a lot of leakages which happen in the system.

And just to try to understand what leakages mean, so there are certain types of leakages so the proportion of additional incomes saved, so people will not really spend they might save and then a proportion of additional income paid in direct taxation, the taxation would increase the proportion of additional income spent on imported goods they might not buy things from the local economy but to get imported goods.

Then they can also have marginal transfer benefits to their; they would send home the money to their native places and then the proportion of additional consumption expenditure on local goods which goes on indirect and taxation also.

So that kind of leakage can also happen, so usually those all are submitted and divided in that in the formula. So that ways you can have a realistic estimation of that, you can also see here another summary of the economic impact of how they are calculating indicating direct indirect, and induced impact in this particular case. You can see what is the GDP tax, the number of jobs, and the output that is happening here.

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Assessing Significance

Assessing the local significance of socio-economic impacts: extracts from a nuclear power station decommissioning project

Type Of Impact	Negligible Impact	Slight Impact	Moderate Impact	Major Impact
Demographic				
Change in local population level	No measur-able change in local population level	Change in local pop-ulation of less than + or − 1%	Change in local population of + or − 1–2%	Change in local population of more than + or −2%

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Assessing the local significance of socio-economic impacts: extracts from a nuclear power station decommissioning project

Type of Impact	Negligible Impact	Slight Impact	Moderate Impact	Major Impact
Direct and indirect employment impacts				
Change in site (direct) employment levels	Change of less than + or − 10% on baseline site employment levels	Change of + or − 10–20% on baseline site employment levels	Change of + or − 20–50% on baseline site employment levels	Change of more than + or 50% on baseline site employment levels

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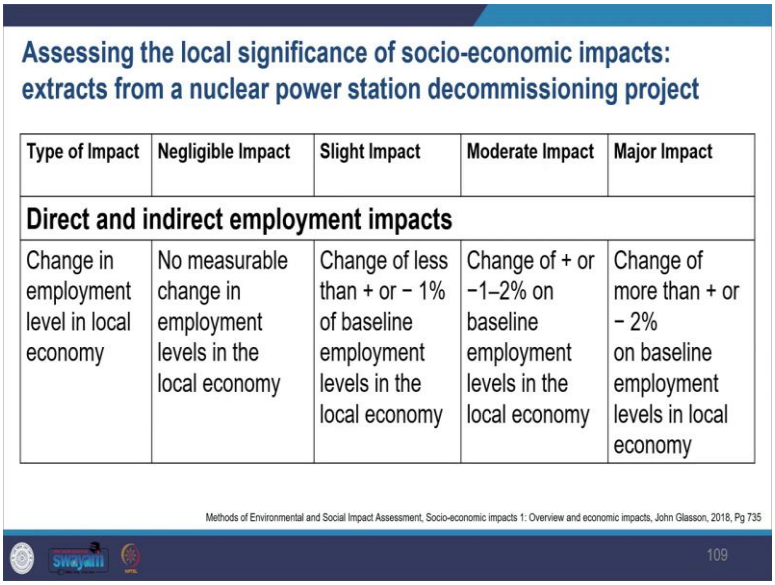

Assessing the local significance of socio-economic impacts: extracts from a nuclear power station decommissioning project

Type of Impact	Negligible Impact	Slight Impact	Moderate Impact	Major Impact
Direct and indirect employment impacts				
Change in employment level in local economy	No measurable change in employment levels in the local economy	Change of less than + or − 1% of baseline employment levels in the local economy	Change of + or −1–2% on baseline employment levels in the local economy	Change of more than + or − 2% on baseline employment levels in local economy

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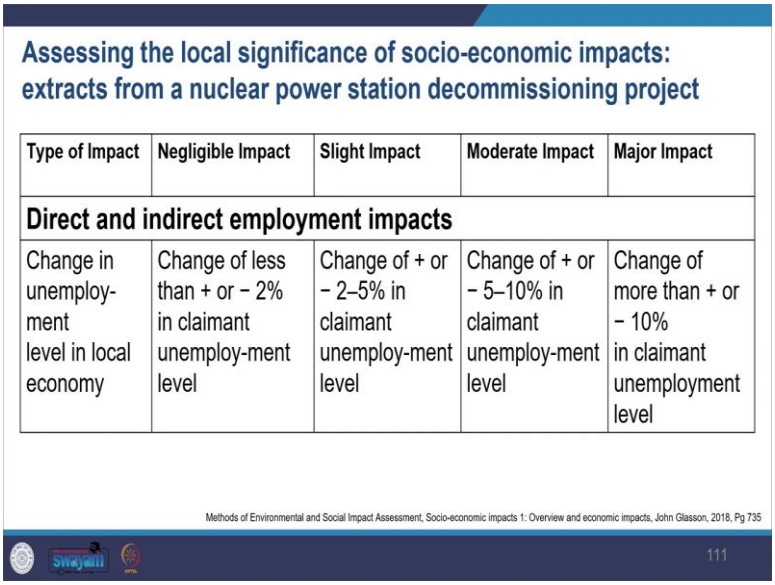

Assessing the local significance of socio-economic impacts: extracts from a nuclear power station decommissioning project

Type of Impact	Negligible Impact	Slight Impact	Moderate Impact	Major Impact
Direct and indirect employment impacts				
Change in unemploy-ment level in local economy	Change of less than + or − 2% in claimant unemploy-ment level	Change of + or − 2–5% in claimant unemploy-ment level	Change of + or − 5–10% in claimant unemploy-ment level	Change of more than + or − 10% in claimant unemployment level

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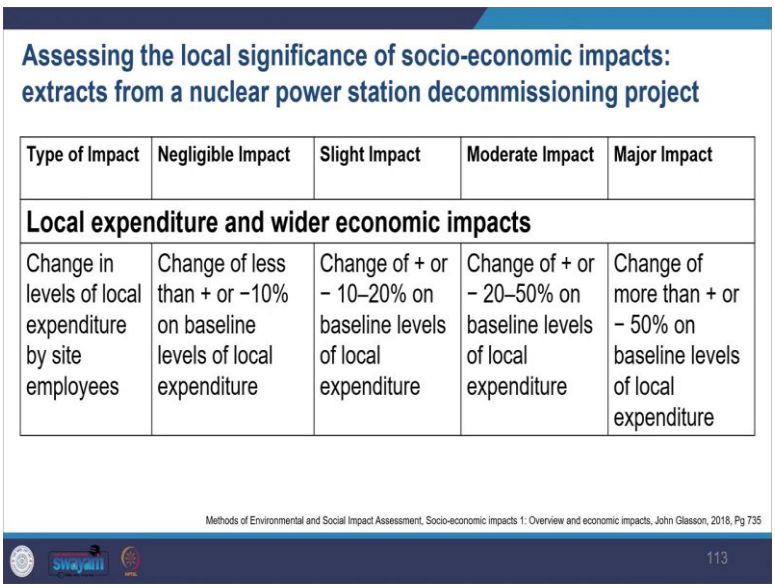

Assessing the local significance of socio-economic impacts: extracts from a nuclear power station decommissioning project

Type of Impact	Negligible Impact	Slight Impact	Moderate Impact	Major Impact
Local expenditure and wider economic impacts				
Change in levels of local expenditure by site employees	Change of less than + or −10% on baseline levels of local expenditure	Change of + or − 10–20% on baseline levels of local expenditure	Change of + or − 20–50% on baseline levels of local expenditure	Change of more than + or − 50% on baseline levels of local expenditure

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Now looking at assessing the significance, there is no standard in this domain to recognize what is the significance. A lot of judgments are made so and it also depends on the political and arbitrary scenario one can have a threshold or steps for what kind of changes are taking place and then look at it comprehensively. So depending on the sensitive area, how are the receptors you make those decisions, and usually how higher sensitive people work and lower sensitive people work?

So you can look at another example here you can see the change in local population level and a negligible impact, slight impact, moderate impact, and major impact. So how you can make the judgment and look at it, so that is the example here so that was what we saw. In this, we majorly looked at the economic aspect and then in another part, we will look at the social aspect.

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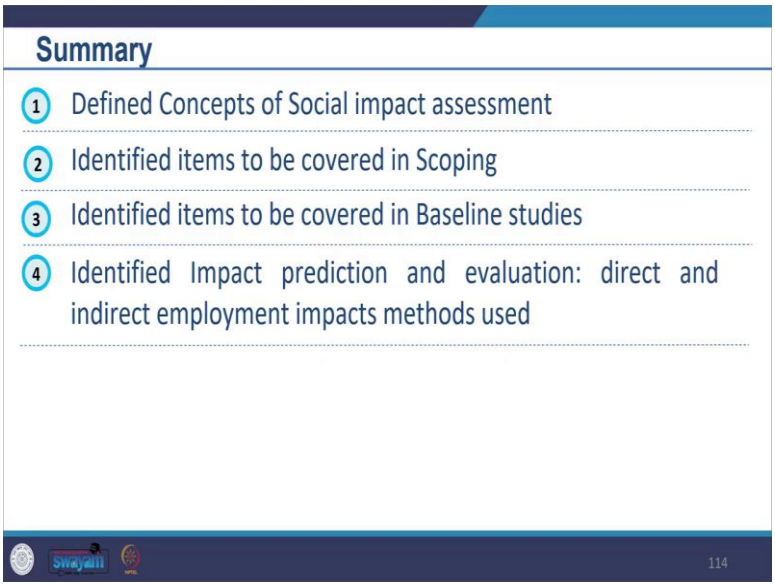

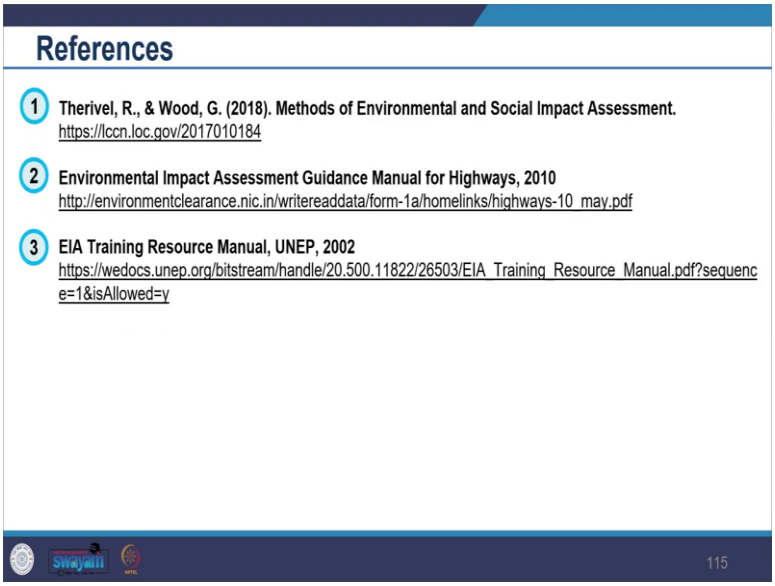

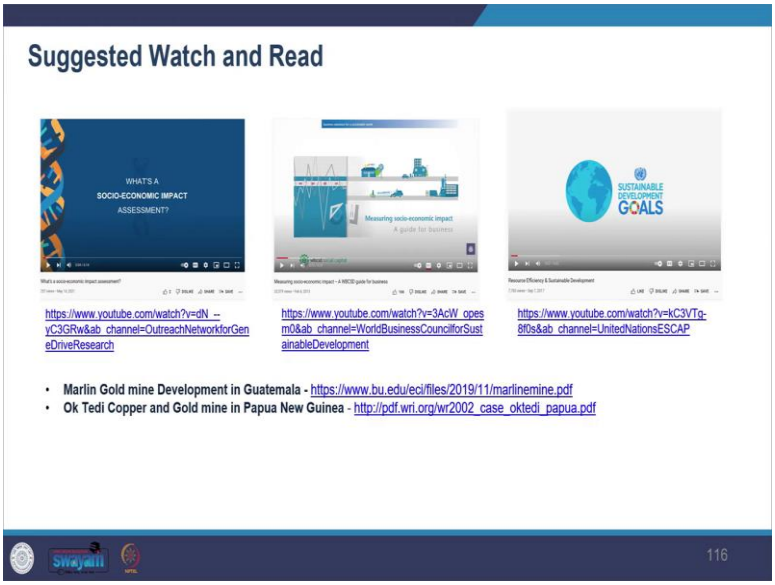

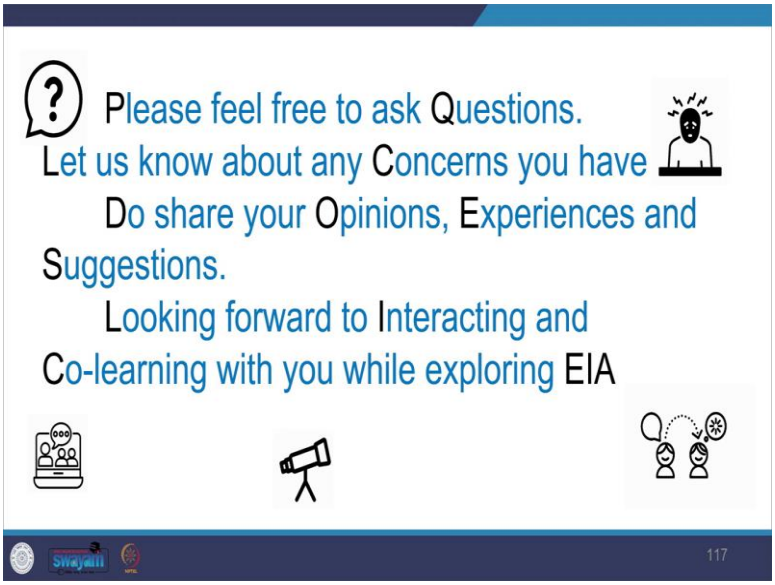

So, today we covered the concepts of social impact assessment; then we identified how we undertake scoping; then we looked at the baseline studies, and then we looked at the impact prediction and evaluation aspect, what kind of direct and indirect impact would happen, and then we looked at how we assess the significance. So these were our key references and these are the suggested watch and read which you can look at. Please feel free to ask questions, and let us know about any concerns you have. Do share your opinions, experiences, and suggestions, looking forward to interacting and co-learning with you while exploring EIA, thank you.