Environmental Impact Assessment
Professor Harshit Sosan Lakra
Department of Architecture and Planning
Indian Institute of Technology, Roorkee
Lecture 48
EIA Methods - Health

Welcome to the course Environmental Impact Assessment. In today's class, we are going to cover methods for Health Impact Assessment under the larger ambit of methods under EIA. So for this particular session, we are referring to chapter 16 of the book, Methods of Environmental and Social Impact Assessment by Riki Therivel and Graham Wood.

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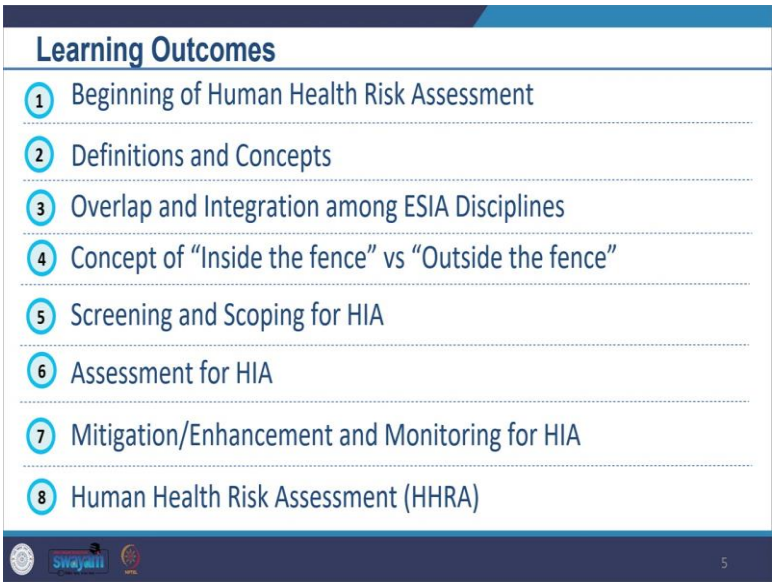

Accordingly, our coverage will include that we are going to look at the concerns related to human health risk assessments. And then we will look at key definitions and concepts involved in this. How do we understand the overall concept of health? And then we will look at how one undertakes EIA in this particular domain and how it overlaps and integrates with the other domain of EIA.

Then, we will look at various other concepts which are involved like where do you perform the study? So, the concept of inside the fence and outside the fence, and then we will look at different stages of EIA about health. So the screening and scoping and then how do we assess health and then what are the mitigation measures and then the human health risk assessments how do we undertake that.

So, accordingly, the learning outcome expected learning outcome after completion of this particular session is that you should be able to review and discuss the changing perspective in human health, and risk assessments, and then you should be able to define and conceptually explain various terms used and concepts use, and then you should be able to also make judgments, how you have to go about this particular domain and then related with decision making about whom to engage and then where all the study has to be conducted.

Then also your ability to decide what will be done in the screening stage, scoping stage, and what kind of methods are available to you for the assessment of health as well as what steps are taken for mitigation purposes, and then you will be able to tell the key aspects of human health risk assessment.

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So looking at the concepts of human health risk assessments, wherever you will see in practice, whenever we do it, concerning EIA, physical aspects are given much more significance, even though they are indirectly connected with health. So, wherever the impact is concerned, you will look at what happens to the physical health, of the environment.

So, you will see that initially, the emphasis was more on the physical aspect of the environment. But later, we see that the concern shifted towards the socio-economic, institutional, and other aspects of health. Also determinants also in the area of health impact assessment. If you see that we have at the beginning of the class, we had seen all the timelines when we covered NEPA and everything.

So the initial emphasis was on health when the environmental risk aspect came up, we were more concerned about what threat it has on the human health. But in practice, more emphasis was actually on the physical part of the environment and less was concerned about health though there is another perspective that says that if one takes care of the environment, it would]take care of the health. But health is said to be a significant part of EIA. We see that irrespective of how this entire EIA came up. Still, biophysicals have more emphasis in the EIA process and we see that it is indirectly contributing towards the health benefits.

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So we say that it was in the 1970s and 80s. There were certain health disasters like you can see Love Canal and the Bhopal Gas Tragedy, that public health was given attention. So, it was that time that public health had got weightage. So, from then our exposure, we started looking at what kind of exposure we have to the toxic chemicals, whenever the development is happening what kind of development is happening, and what kind of exposure will happen.

So, I have given you the link to the documentary movies that you can see about the Love Canal project and you can also look at the Bhopal Gas Tragedy. So, it was this time, this incidence that we started to focus on the health aspect of EIA.

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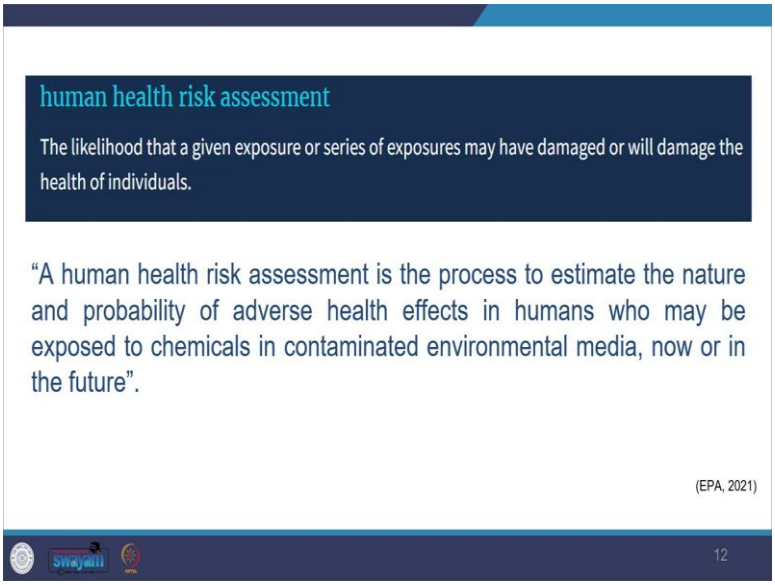

So, the initial tool for assessments we see in human health risk assessments HHRA within the EIA framework, this helps us to evaluate various health hazards, what kind of health hazards are there, so, human health risk assessment, this would when you do undertake health assessment, it will tell you the likelihood of whatever exposure is happening to you series of exposure and what kind of damage it is doing to you already or is likely to do on individuals health. So, that is what is done in human health risk assessment.

Human risk assessment is said to be a process where you estimate the kind of impact that will happen and the nature of the impact, then you also look at the probability of that impact. So what is the nature of the impact, and what is the probability that that impact would happen on your health and especially when we are dealing with human health risk assessment that is confined or more focused on chemicals, contaminants in the environmental media?

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So, broadly speaking, human health risk assessment has 4 steps, which begin with planning. So, here you have step 1, where you have hazard identification, you try to find out what hazard is there, then you also look at step 2 dose-response assessment. So, you see what kind of, for what dosage, what kind of response happens from the human receivers, and then you undertake exposure assessment, to what exposure, what kind of impact will happen and then you categorize all the risks. So, that is what you do here, these are the key 4 steps you see.

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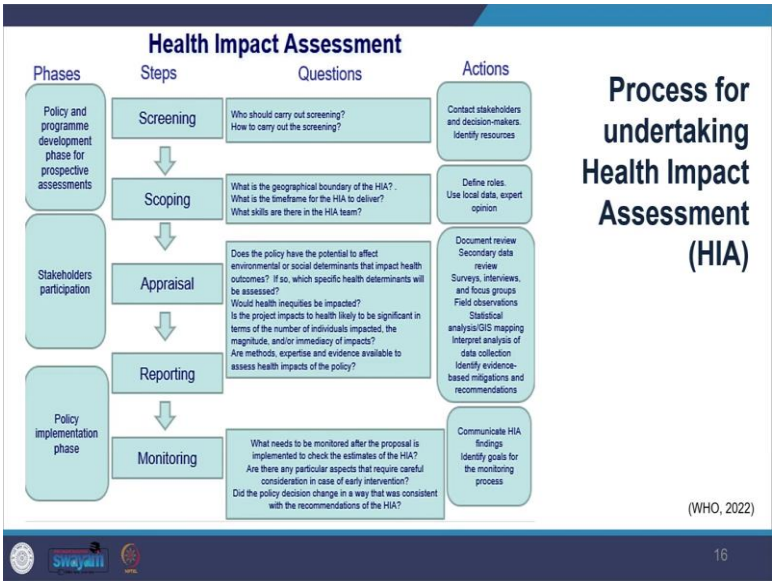

We also find that apart from this human health risk assessment, you also find the Health Impact Assessment HIA tool, which is developed by WHO and is from the perspective of health assessment. So, Health Impact Assessment, HIA is said to be a practical approach, and where you judge the potential health effects of not only just the chemicals, but about the policies, programs, or projects, what kind of impact they will have on the people, and especially on the vulnerable or the disadvantaged groups. So that is what the health impact assessment tool by WHO helps you to look into.

So in this image, you can see a graphical presentation of the tool, you can see different phases of process steps, questions to be asked and actions to be taken. So you can see here, what are the steps of a Health Impact Assessment, it is very similar to what you see in screening scoping, appraisal reporting, and monitoring when you take health impact assessment. You will see the phasing, a phase which you have like at the policy program level stakeholders participation and policy implementation, and then what kind of steps are taken and what kind of questions are reviewed within this.

So who should carry out screening, how to carry out screening, and then questions are like in the scoping stage, what is the geographical boundary of a Health Impact Assessment? What is the timeline for the Health Impact Assessment, what skills are there in the team who need to take the Health Impact Assessment, and so on?

So you have sets of questions which you look into and then in the last column, you can see the actions which have to be undertaken like if to find those answers like you need to contact these stakeholders, and then in the scoping, you have to define roles and connect with experts. And then the appraisal you need to have a document review and look at all those things.

And then at the last stage, you need to communicate about the health impact assessment, that is what we see that initially, we started focusing on the physical environment, then we started looking at the exposure to chemicals. Now we have come to the Health Impact Assessment, where we look at the overall health of the community concerning not just the chemical exposure, but also the policy and kind of intervention or development projects that take place. So that was about our one part.

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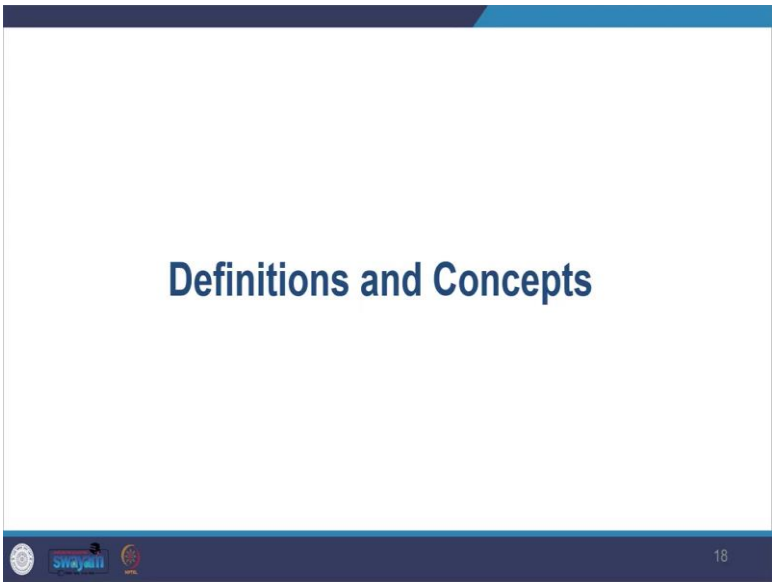

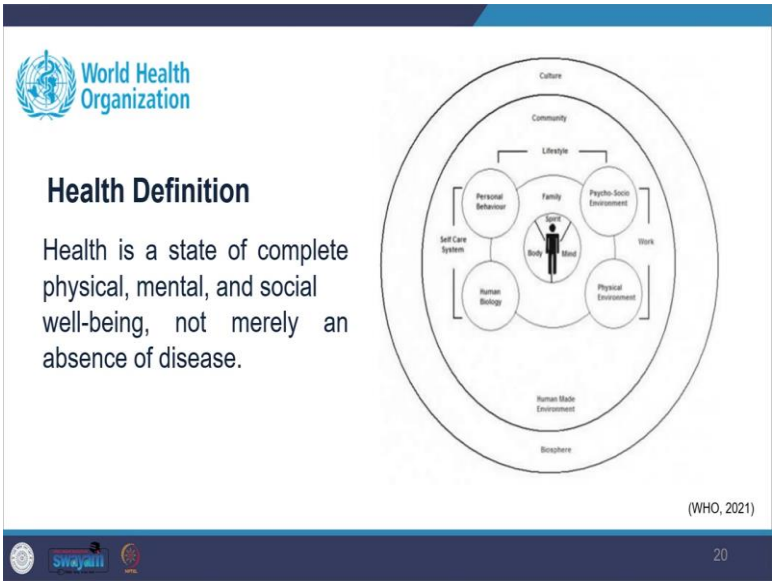

Now moving on to another domain, we are going to look at the definitions and concepts. So here we will see what we mean about health when we say health. So, health, if you look at is complex, and health can vary with the societies with the context, and we cannot have a very uniform standard.

So what might be considered in one country, similar problems might not be considered in the other countries or may not have similar standards for the same health. And further health is not just, that you are ill or you are sick, but health also has a lot of meaning in terms of physical strength, mental strength, the social well-being. So all these are seen as health.

So and then just not your capabilities, but also your personal and environmental, economic and social factors, how they create the environment for health. So, if you look at healthy people, would be the people who can cope with everyday activities and adapt to their surroundings.

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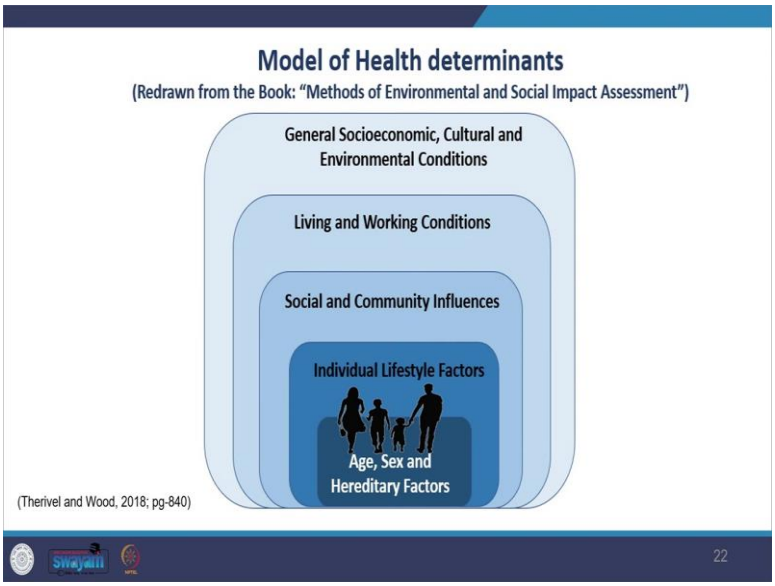

So, in the diagram, you can see determinants of health ranging from individual lifestyles, which are influenced by social and community, and which further depend on the living and working conditions, which further influence the socio-economic, cultural, and environmental conditions. So you think of health conditions in your city or your village? Think how it varies within what conditions you live in, what is your age, what is your gender, your culture, and what lifestyle you follow.

So wherever you are, what the culture is, which condition you live in what your health condition would vary a lot and how you see your health condition would also vary. So you look at the complexity involved, and in the process, the action that can be taken beforehand, and the multi-dimensional factors one needs to look at. So you look at that complexity involving health when we talk about health.

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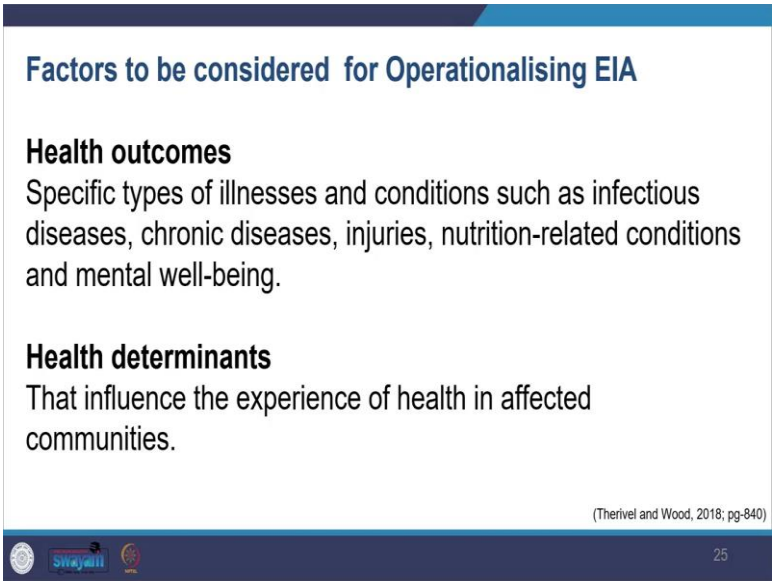

So to put Health Impact Assessment, like to put it into practice, you need to consider both health outcomes. This means when we say health outcomes, it means specific types of illness and conditions such as infectious disease, the range of chronic disease injuries, nutrition-related conditions, and mental well-being.

And there is another term where you look at health determinants. So health determinants are factors that influence the experience of health, and the affected communities.

So when I am ill, that is the outcome, but what kind of experience I go through because of that, my illness in a particular context is the health determinant. So that is how we understand health outcomes and health determinants the difference between the two. So since the subject is complex, and it is also like you see how there are a lot of things, the context, the socio-economic infrastructure policy, all that would be influencing it.

So there will be a lot of crossover overlap among disciplines. And you will need a lot of integration with the team so when you have to do a health impact assessment, you have to collaborate with people from different domains.

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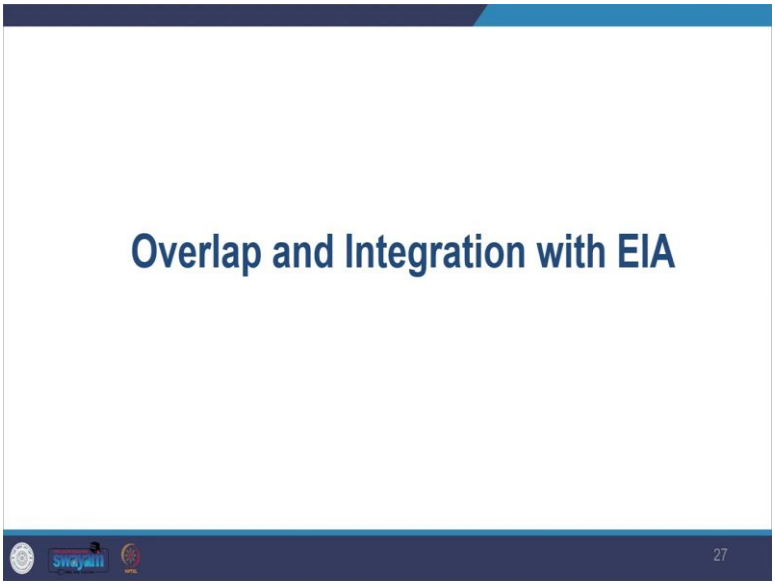

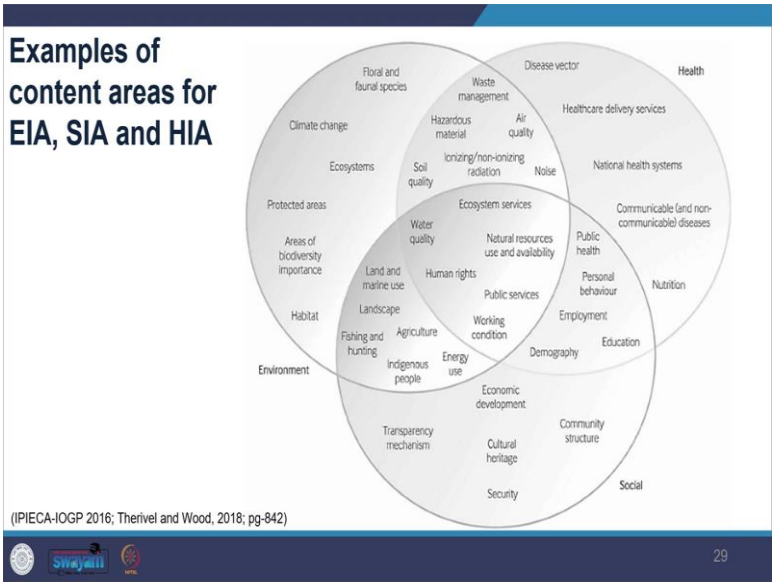

So here in the diagram, you can see how EIA Social Impact Assessment and Health Impact Assessment there are so many domains, which overlap so you can see how health can overlap with your environment of

waste management, hazard material, air quality, soil quality, water quality, human rights, public services, working conditions, natural resource use and availability, ecosystem services.

And then it would also overlap with social, you have like the public health, personal behavior, employment, demography, education, then also the environmental aspect land and marine use, landscape, fishing and hunting, agriculture, indigenous people, energy in us.

So you see how much the domain overlaps with each other. So what condition is there, what is the physical environment, what kind of that it has on health, what social environment is there, what kind of impact it will have, and what it might lead to when any kind of impact happens?

So, like, it is frequently suggested that when you are doing a health impact assessment, you can create one separate chapter for Health Impact Assessment in the report, and the key idea is irrespective of how you make an independent report or structure it within all the chapters. The key idea is that it should help the decision makers to look into the health aspects so that you have to take care that the purpose is resolved.

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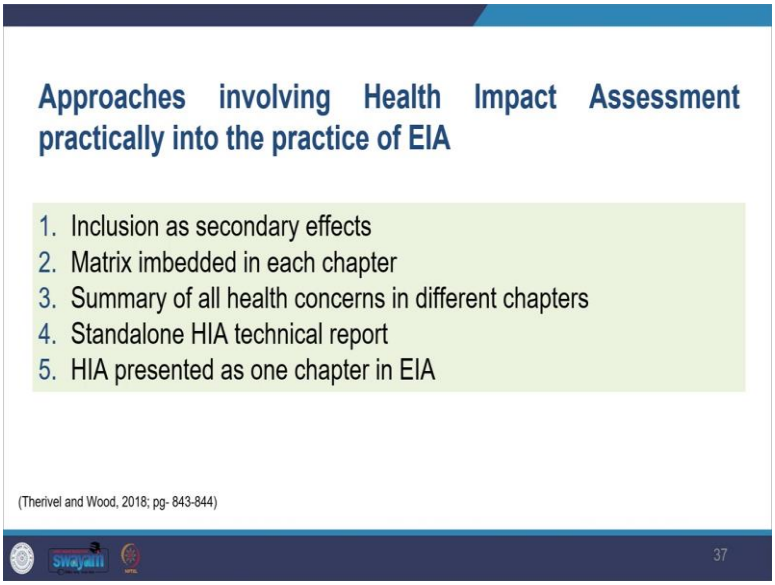

So while doing a health impact assessment, you can give the information as the secondary effect of the environmental assessment also. So while you are discussing the form of metrics on human consumption of fish would appear in the EIA section on fish and fish habitat. So, so, it can also come as a secondary impact on health, and then you can also express that like, if with the consumption as like indirect impact also that can be shown. But while you take this kind of approach, you have one problem all the information you will be putting across health information, so the Health Information will spread across the report.

So when you do that, it will dilute the significance of any health-related things and any information done without the expert might also lead to diluted inferences, you might think that you might conclude that the impact would be negligible, whereas it might be significant when you see it in a collective form. So, you can see that you can also provide a health impact assessment as a standalone document as part of or as part of

the EIA report. So, if you do this, you have the benefit of providing health information easily and facilitating discussion of health issues about one another.

So also you can take another approach, which you can take is to have a standalone HIA technical report. So the benefit of doing this is that all health issues can be completely evaluated you may not be limited to the layout of EIA. So that benefit is there. However, the drawback of this is that health concerns may not be because it is a separate document, you might not receive considerable attention in the EIA process.

And if you know that the EIA has to be made public then health impact might not be made public, because it is not part of the EIA disclosure. So you can compose one chapter for a health impact assessment with an EIA report and the benefit is that it allows you to understand the health concern it also becomes a part of the decision-making process.

But that also has its limitation that you might have to stick with the format of EIA. So mostly, it is said that the first approach where you spread across the chapter or you can have one chapter as an EIS, Health Impact Assessment is considered a very practically feasible option. So it is up to you or your team, how you adopt, you can adopt any approach, but you must maintain strong integration between the health and the other discipline while you are dealing with EIA.

So it is good that you undertake an integrated approach from the beginning of the assessment procedure itself, while you gather data when you are doing analysis. So you look into all the aspects of that all you have to take care of while you are doing Health Impact Assessment along with EIA.

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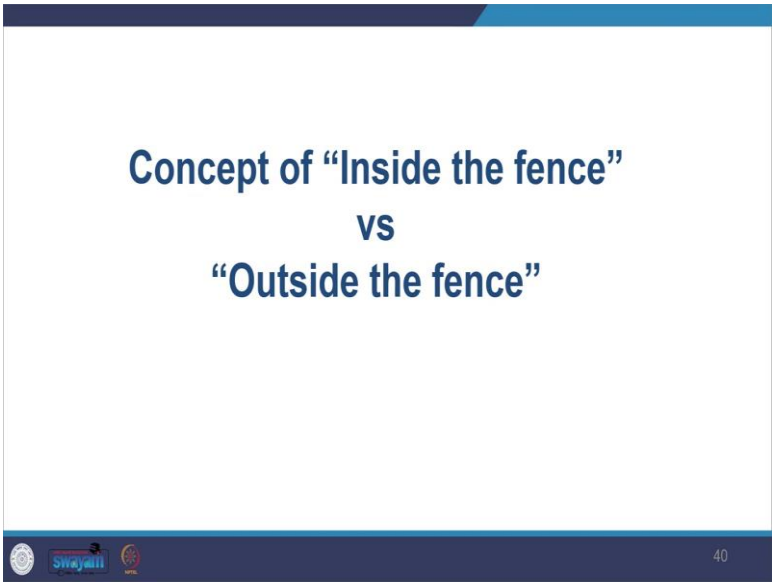

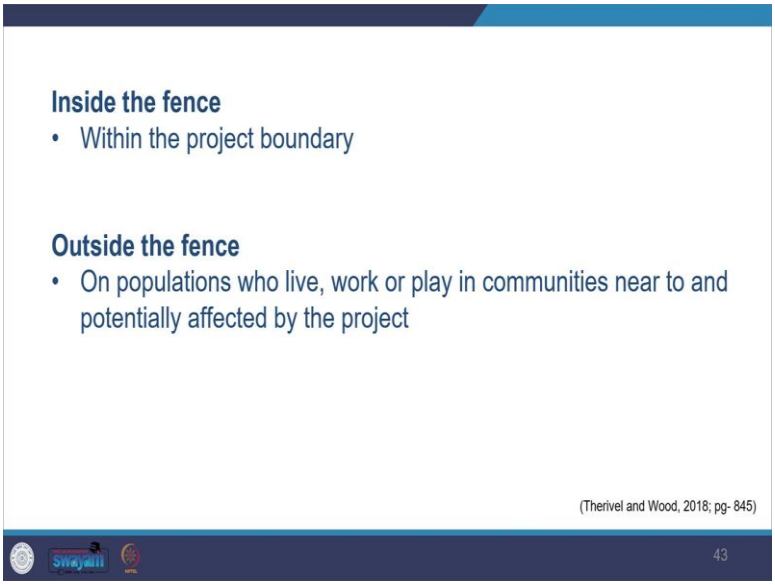

So now let us see who all are considered while undertaking a Health Impact Assessment. There is a concept of inside the fence and outside the fence. So in the case of Health Impact Assessment so far, when we were looking at all other domains, we generally took the area where our project area was and with a certain radius but in the case of health, you might have to look into whether you want to look into the study area or within the project area or outside that project area. So while looking at, while undertaking Health Impact Assessment, health impact assessment looks into the population who live work, or play in the communities near to or potentially affected by the project outside the project area.

So while we do our HIA, we look outside the project area, and not at the people who are working on the project that is a different domain altogether. But here you look at the people outside the project area, and who are not involved in your project. So people who are dealing with the industries who are working so Occupational Health and Safety takes care of those aspects.

But the practical challenge is that sometimes these inside-outside fence boundaries are not very clear in terms of how you will discriminate between them, for example, you like any interventions, you do for preventing malaria for workers might need a large area level area to work on.

Also, sexually transmitted infections can originate from inside the fence workforce, so the workforce that is inside can also be infected with the sexually transmitted infections. So the idea under HIA is to evaluate what kind of impact will happen because of the project proposed project on the local community.

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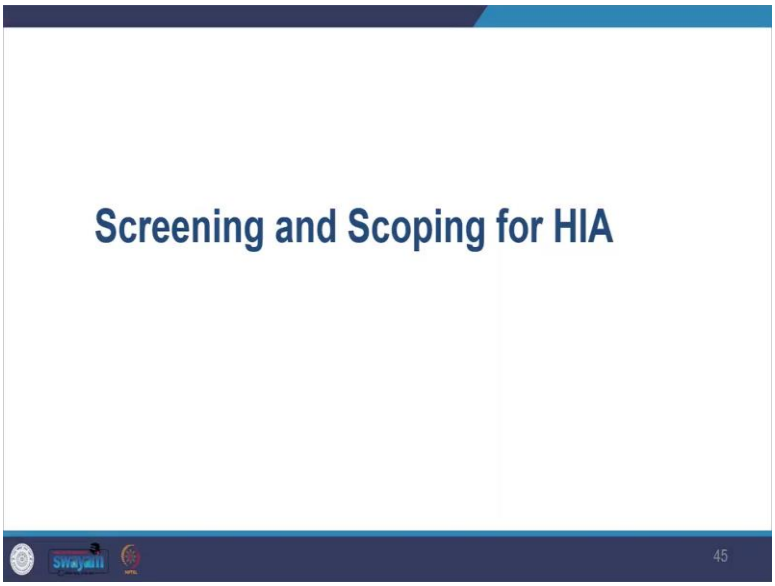

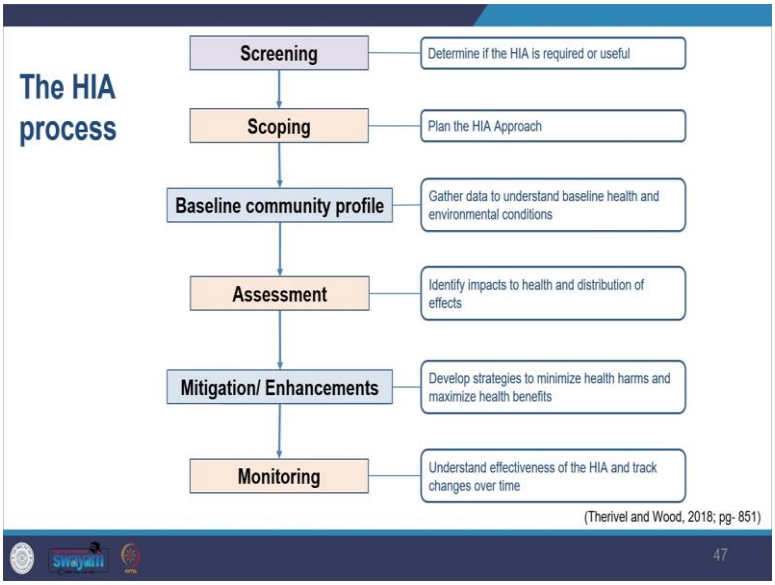

So now moving on to the next segment, we will look at the screening and scoping stage for Health Impact Assessment. We see that the Health Impact Assessment is also very parallel to EIA. So you have similar like screening scoping, baseline community profile, assessment, mitigation, enhancement, and monitoring. So in screening, you define if HIA is required or not. And then in the scoping, you plan out how you are going to undertake Health Impact Assessments, and what all things will be covered.

And then in the baseline data community profile, you gather data to understand the baseline health and environmental condition of the community. Then in the assessment, you identify impacts to health and distribution of effects. Then, in the mitigation and enhancement, you develop strategies to minimize the health harm that your project will cause no matter what kind of interventions you will take, and then how you can maximize the health benefits and how you are going to monitor the effectiveness of health impact assessment and track changes over time. So, that is what you will see here.

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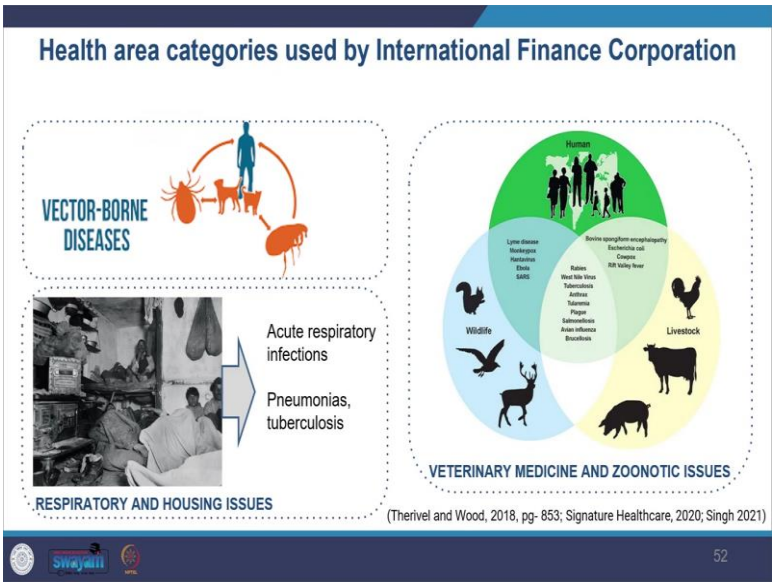

So here, we see what are the different approaches taken the by International Finance Corporation and the International Council of Mining and Metals, we will see here. So they provide a framework for identifying health outcomes and health determinants. And so, we see the 2 approaches here.

So, here we are just looking at health area categories, which are given by IFC. So here you see that they are defining the health outcomes. So you can see the health area vector-related diseases, such as malaria, schistosomiasis, dengue, and so on, and then you see respiratory and housing issues or acute respiratory infections, pneumonia, tuberculosis, and so on.

And you see veterinary medicine and zoonotic issues sexually transmitted infections, soil and water and sanitation related disease. So, you see IFC identifies health concerns with the health outcomes.

Likewise, you see food and nutrition-related issues, which are like stunting, wasting, anemia micronutrients, disease, change in agriculture and subsistence hunting, fishing gathering and practices, accidents, and injuries you can see health areas by road traffic-related spills and releases you will see construction and drowning will happen. So all these health impacts you can see, another area you can see exposure to potentially hazardous material pesticides, fertilizer, road dust and so on.

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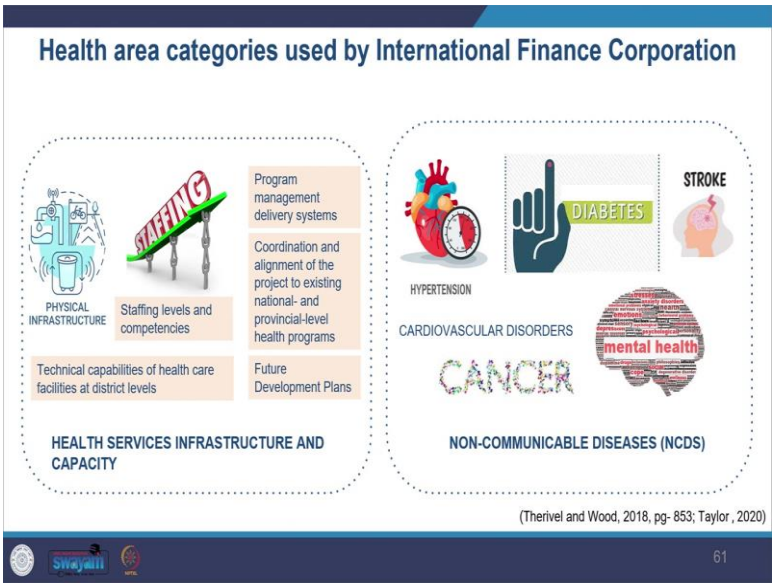

Then you have social determinants of health SDH, the psychological social production of disease then you have cultural health practices, rules of traditional medicine providers, indigenous medicines, and unique

cultural health practices. So what? So those categories are there. Then you also see health service infrastructure and capacity then you have noncommunicable diseases.

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So, that was from IFC now we are going to look at categories provided by the International Council on Mining and Metals. So, here you see what are the health outcomes they identify. So here, they look at infectious disease, chronic disease, nutritional disorders, physical injury, mental health, and well-being. So there are examples also put for those health outcomes.

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And now, they also provide guidelines for modifiable determinants of health. So you are looking at the health determinants. So the health determinants include individuals and family, like their physiological condition, behavioral conditions, social economic circumstances, like if you look at the physiological conditions like their vaccination status, what is the nutrition level? What are the behavioral aspects like the lifestyle and daily routine of physical activity, use of tobacco, alcohol, and so on? And socio-economic

circumstances? Like what is the income and wealth? What is education and learning Employment and Economics?

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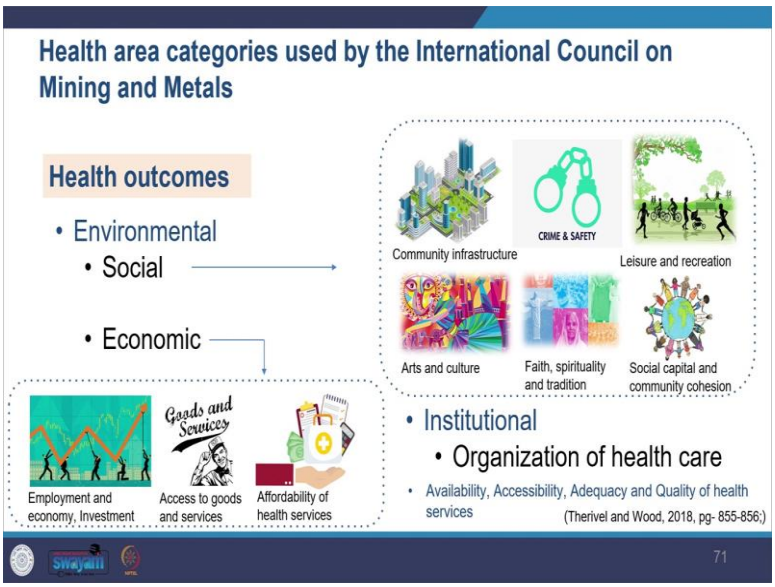

And then you look at another environmental aspect, the physical housing, how is the housing scenario? What is the transport? What is the exposure to chemicals, agriculture, and food supply? And then you look at the associated other areas like you have determinants social, which includes community infrastructure, crime, and safety, then you also have employment and economy.

Then you also have institutions and policies that also influence institutions involving social care, what kind of care? What are the policy services, and emergency services, how are they in any given context, and then the policies about governance, public policy, and industrial health, what kind of policies there how it control the environment? So that is when you do scoping, you also identify according to the different categories. So we saw how you have different categories based on health outcomes, and then also health determinants.

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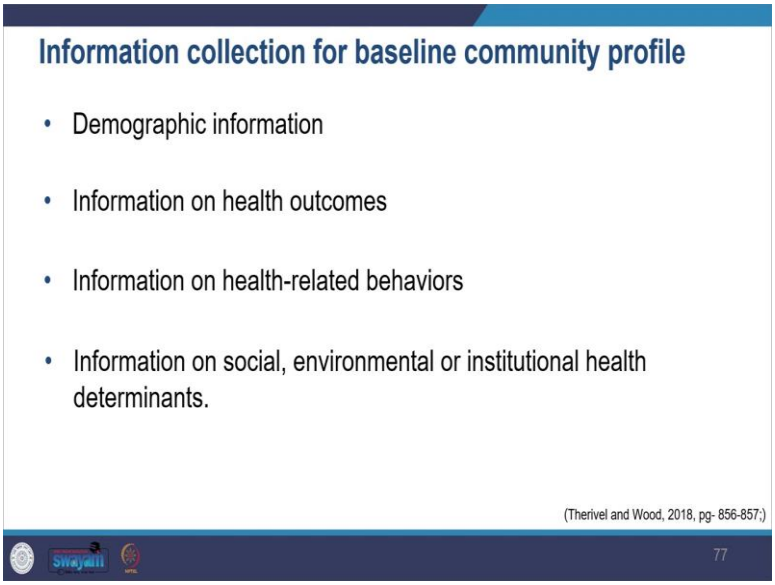

So now moving on, we are going to look at the baseline community profiling. So when we do a baseline, this is the 3rd step, we are looking at screening, scoping, and baseline. So here, the key purpose is to develop a baseline profile and community profile to categorize current conditions relevant to health for the affected people. So we set up the current health conditions.

So for this purpose, the kind of information that you need is like you look at the demographic information, what is the population size? What is the, how is the age distribution? How is the gender distribution, then you look at different information on the health outcomes, like what is the life expectancy rates of specific diseases, rate of injury, and so on.

And then you look at health-related behaviors, smoking, physical activity, and all. So, the range what we saw that so when you do the profiling, you look at all those aspects here. And then, you also look at social, environmental, and institutional determinants, which we discussed about housing, health care, services, income, and education. So you also evaluate those aspects. So those aspects are seen here.

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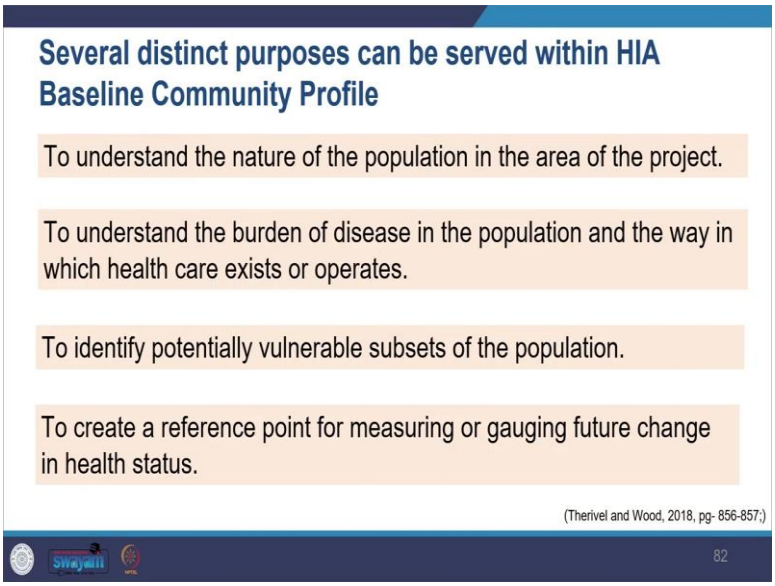

So within the Health Impact Assessment, HIA, you prepare the community profile, and it has several purposes. If it is helpful to you, it will help when you will do the community profiling, when you will prepare this profiling, it will help you to understand what is the nature of the population in the area where you are studying.

And what is the kind, size the distribution of it? Are people rich or poor? Do they have facilities or not what kind of institution and environment is there? And then another key idea here is that you should be able to measure what kind of changes are happening so that with your project, you would be able to track whether it is getting worse or improving the health conditions and improving.

So such kind of information like all this information is important for accurate prediction. And it is important to take mitigation measures also so you can take appropriate mitigation measures depending on the context, and what kind of impact is happening, and then all of these will also vary with the context.

So you would understand a different country would have different social systems, policy systems, different industrial laws, and all those infrastructures. So their conditions would vary according to that. So, it also helps us when we do this, we also understand the burden of disease. So, when we say the burden of disease is like how much burden is there on any context health in the health care system, and how much it will be capable of taking care of those things.

So, we saw so much during the COVID time, what kind of burden of the pandemic was there on the existing health infrastructure. So, while you are looking at the burden of disease, in any kind of population, you mostly look into the chronic conditions like, you also check what kind of burden is there or what is consuming most of the infrastructure and energy.

So, is it like hypertension or cancer or they are basic problems, which are large-scale problems like mosquito-borne illness, malaria, or it is nutritional deficiency, and so on? So, you also need to understand the character of burden, which is there in the system. So, you also need to understand what kind of

healthcare system is there in a particular context. This is very important for ensuring that the project does not worsen the current scenario. But it improves the health.

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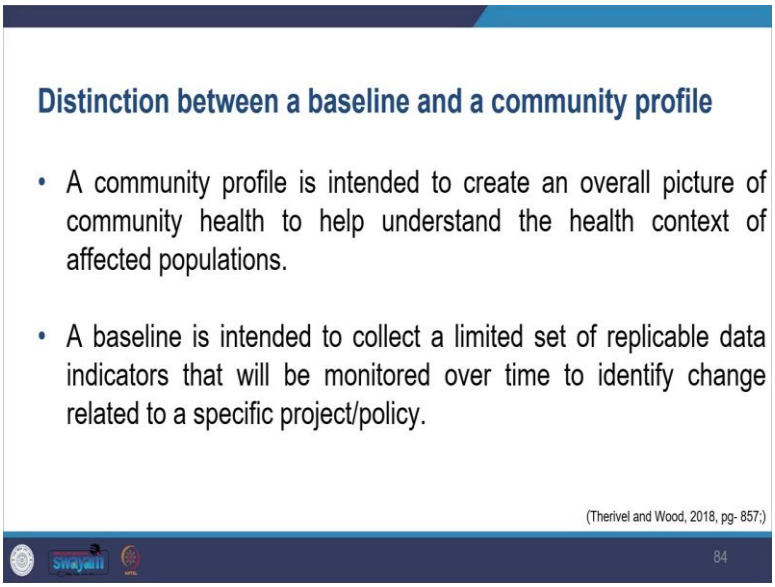

This particular community profiling also helps you to identify potentially vulnerable subsets the group of particularly vulnerable people, so they can be friends, children, women, people with disability, people with food insecurity, and also different medical conditions. So it will help you to identify that. And then it will also help you to create a reference point to measure whether it is getting better or it is getting worse off. There is one that we saw is about community profiling. But there is also an idea about the baseline.

So if you see the community profile as per the definition, and the purpose, it is intended to create an overall picture of the community's health, and it is created to help us understand the health context of the people who are going to get affected, and the other is the baseline. And this looks like looking at very limited information. And you would be only monitoring and looking at the indicators over time, and look at what is happening to those people. So, in practice, we see that community profiling is mostly used.

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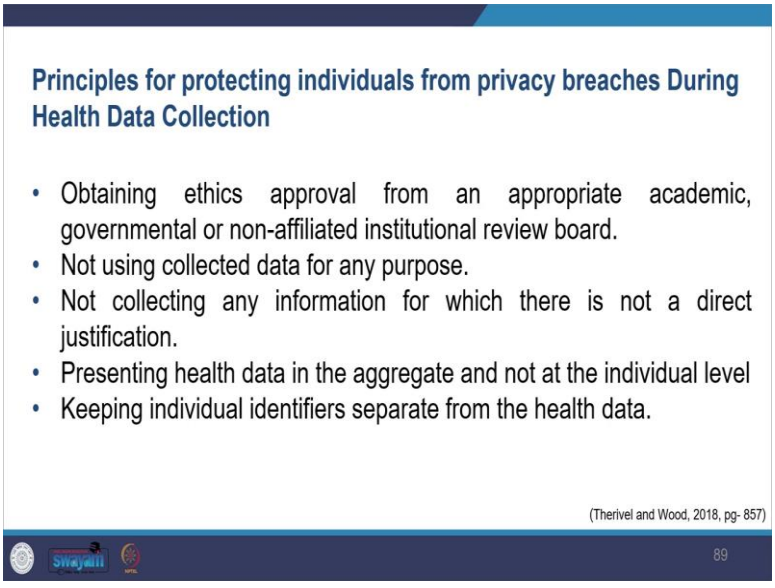

Another important point, which we have not seen in any other domain is the ethical issues around health data collection. So whenever we deal with health data collection, we have to deal with ethical issues because there can be unique laws and issues that might come in so you have to abide by the contextual policies which are there.

You might While collecting the data might be interfering with the privacy and confidentiality of the people whom you are serving. So, most of the time, health-related data are very confidential and private and data can be sensitive. For example, they can be HIV-related information, even immunization-related information, which can be used for discriminating among individuals when they are hiring or traveling, and so on.

So such kind of information can be sensitive and can be used against them. So one needs to take care that it is not even accidentally released and you need to have confidentiality undertaking and you need to abide by all the legal aspects of it. You might have, to take care of this you need to obtain ethics approval from whatever appropriate institution or government setup is there in your context.

Then you have to get the consent of the people whether they want to participate in your survey or not, and then you have to ensure that you do not use the collected data for any other purpose apart from the purpose you have mentioned.

And then you also do not collect anything other than what you intend to analyze whenever you present health data, so you do not disclose individual data or community data, but you present only aggregate data. So, always talk in terms of aggregate information, and you do not, by any mistake, show individual data. So, other, you also take care of avoiding any kind of individual identifiers, like what is the name, date of birth, and so on. So that has to be kept separate while you are dealing with it. So that was about the privacy and ethical issues about health.

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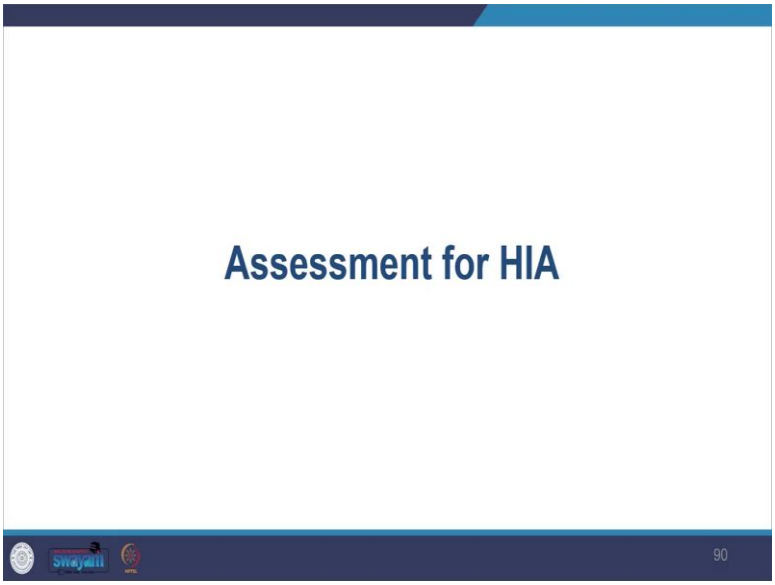

So now moving on, we will look at the assessment for health impact assessment. So, when we deal with assessments, we collect information from various sources, so that we can predict what kind of effects would happen from the project, and what kind of health concerns will be raised.

So, mostly the source of information is the secondary source, which we have been talking about from the literature, from the information sources from like stakeholder groups, you can get it from the past project from the case studies and so on. So, while you doing the assessment, you will be looking at both the potential for positive health benefits, as well as negative health consequences, that might happen.

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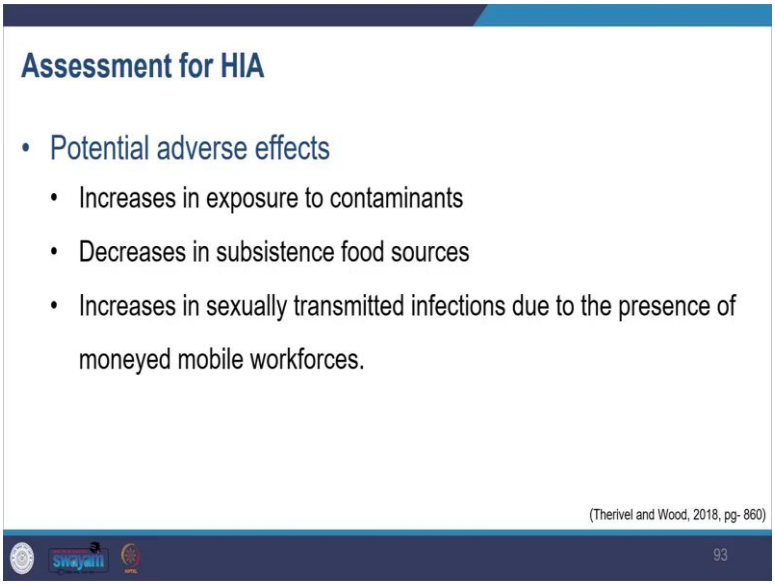

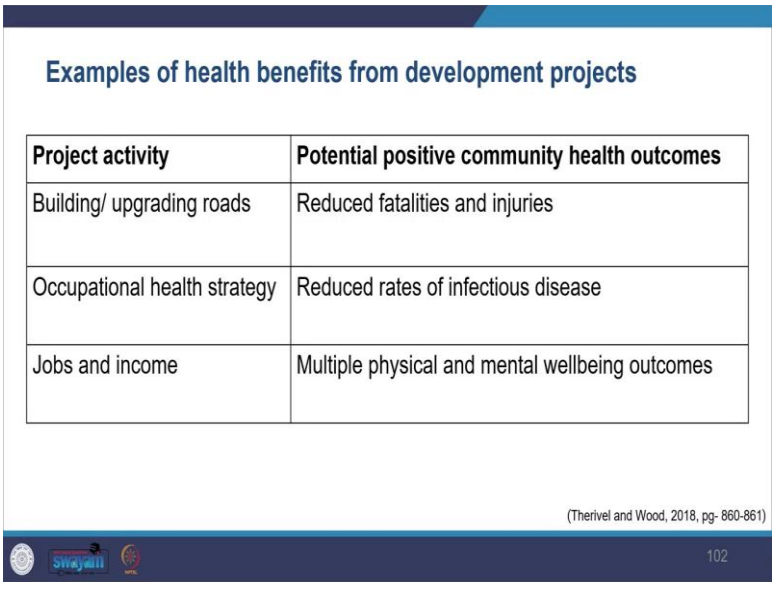

So, potential adverse effects can be worked out as you can have, based on the exposure to the contaminants, a decrease in the subsistence food sources, increases in sexually transmitted infections and because of the mobile workforces, however, when you deal with positive health benefits, it is a little complex concerning identifying from the project.

So we see some of the examples of health benefits from the development project. So when we are building upgrading roads, so it reduces fertility and injuries, then you have occupational health strategies, which

reduces rates of infectious disease, then you have jobs and incomes, so multiple, physical and mental well-being outcomes, with improved job and income that were about the assessment.

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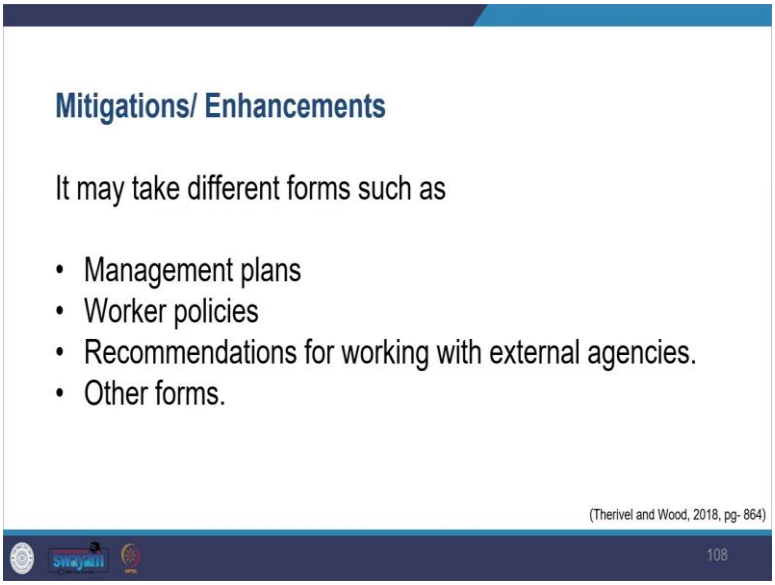

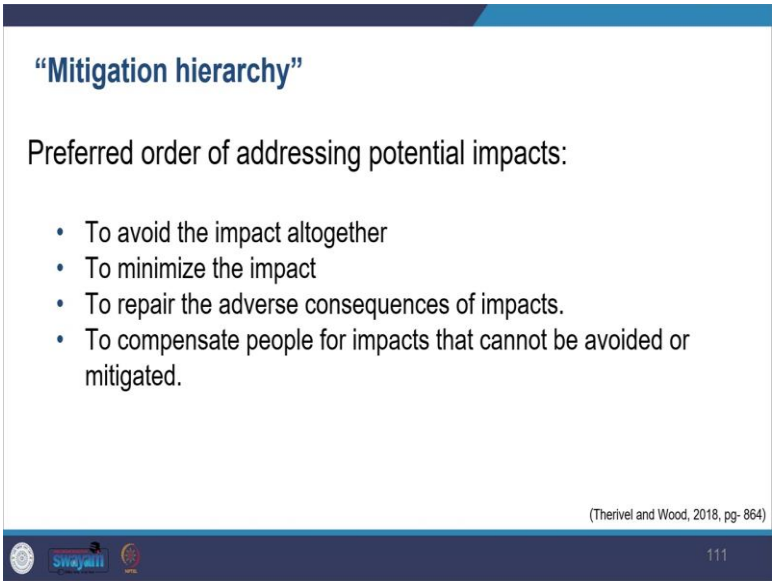

And now looking at the mitigation and how you can improve and monitor health impact assessment. So, this can be done in the form of management plans. And it can also be done through the worker policy recommendations for external agencies and other forms. So you also have good health practice principles that have to be adopted, which also leads to positive health consequences wherever the negative impact might happen, it is advisable to avoid the impact altogether.

And then the effort is to minimize the impact, then if that impact is happening, you need to repair the negative impact. And then in worst cases, you compensate people for impacts. So that is what an approach strategy we have seen. So as part of mitigation, we prepare a plan for monitoring, which is developed.

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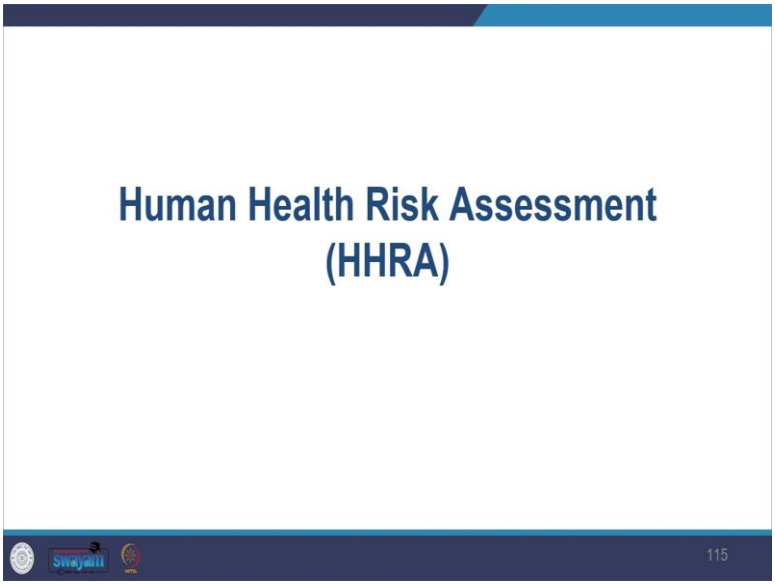

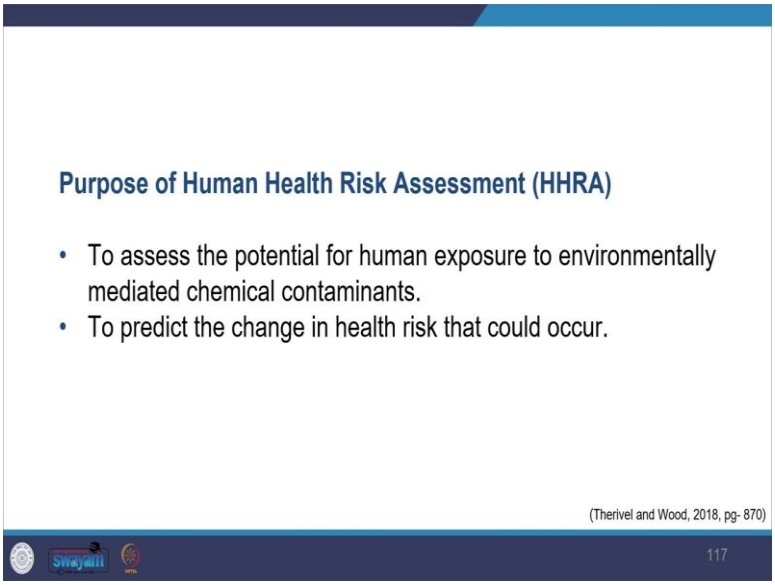

Now we will look into human health risk assessments. So the method which is used to conduct human health risk assessment, HHRA, is very specialized. And it is very different from a health impact assessment. So we saw the Health Impact Assessment. Now we are looking at human health risk assessment. So it is very specialized, and it is very different. So the purpose of human health risk assessment is to look into the

potential what kind of exposure humans can have to environmentally mediated chemical contaminants and to predict the change in health risks that can occur because of that kind of exposure to the contaminants.

So this HHRA brings together information on the population that will be exposed the kind of dose which they would be exposed to and how toxic the substances are and based on that, it will provide an estimation of what kind of human health impact will happen. So, you can use HHRA to model increases in the number or rate of specific diseases, like what would be the increased rate of cancer respiratory disease or it can be used for providing information to determine what kind of regulations we will have for exposure to certain contaminants. So, that is how it can be used.

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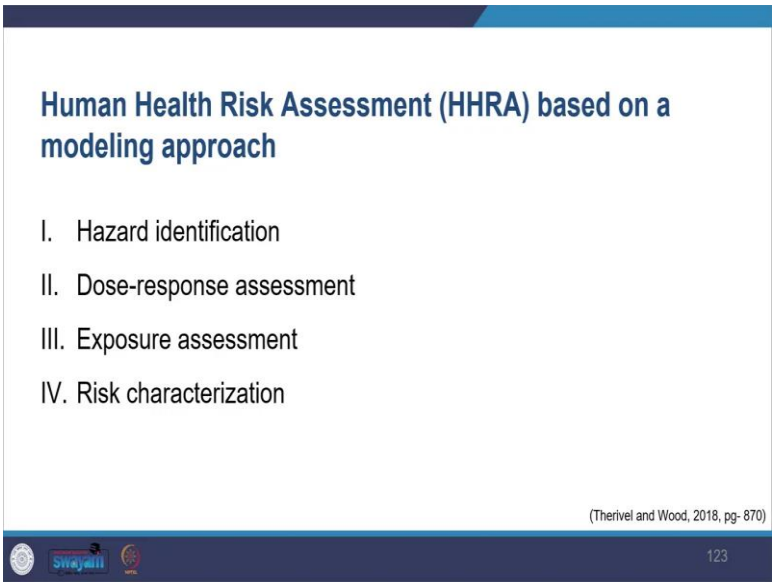

So, if you look at how you undertake HHRA you can have the modeling approach, which is again, four steps. So, you first undertake the Hazard identification, and where you identify in the given project, what kind of chemical substance will be produced and what kind of potential they have to cause damage or harm to humans.

Then you will look at the dose-response, what dose-response information that like, how the human body reacts to what kind of exposure level, and then you will look at what the total long-term and short-term exposure levels are happening and based on that, how frequently the exposure is happening, what frequency the exposure is happening for how long the exposure is happening, you will understand who all are exposed, how much is the exposure and that will help you to understand it.

So, based on that you would find out the risk and then you would categorize those risks and draw conclusions from that. So, you have many, many countries have like laws for this we have already seen the range of laws in our context also. So, they provide technical tools for HRA, and then the standards are also given there. And that would be a baseline for your bench marks are shown to compare and see whether you are exceeding that exposure level or dosage level.

So, you will be looking at the guidance or the technical tools, and then you will see the dosage exposure level and what kinds of regulations are there. And then based on the exposure and dosage limitation, you would be deciding what interventions have to be done or taken. So, these are these are the four step things. So that is all that we have seen for today under the Health Impact Assessment.

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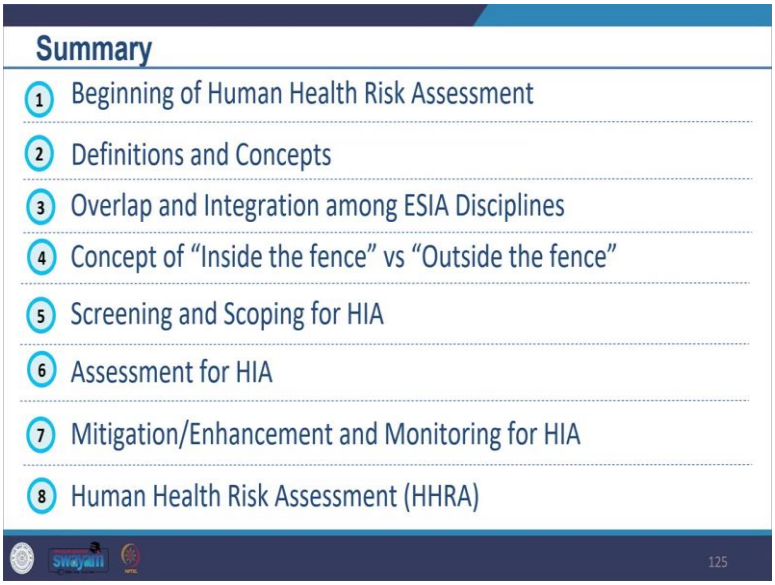

So summarizing what we covered today. So we looked at how this health concern started and how our approach towards handling it and the details of it changed in the Human Health Risk Assessment. Then we looked at certain definitions and concepts and how they overlap with other domains. And then we looked at what would be your study domain inside the fence or outside the fence.

Then, we looked at various stages of screening scoping, and then we also looked at the assessment for Health Impact Assessment. Then we looked at some of the mitigation monitoring for Health Impact Assessment. And then in the last we looked at the human health risk assessment process and tried to conceptually understand it. So that was the coverage for today.

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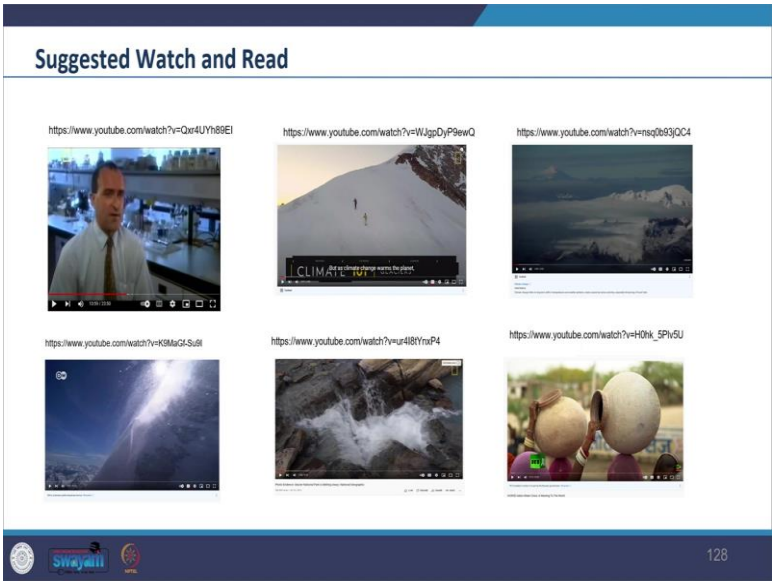

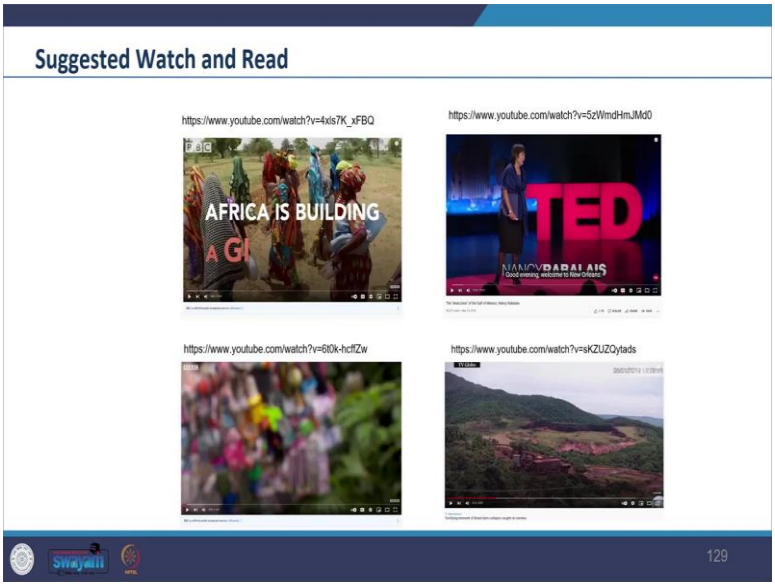

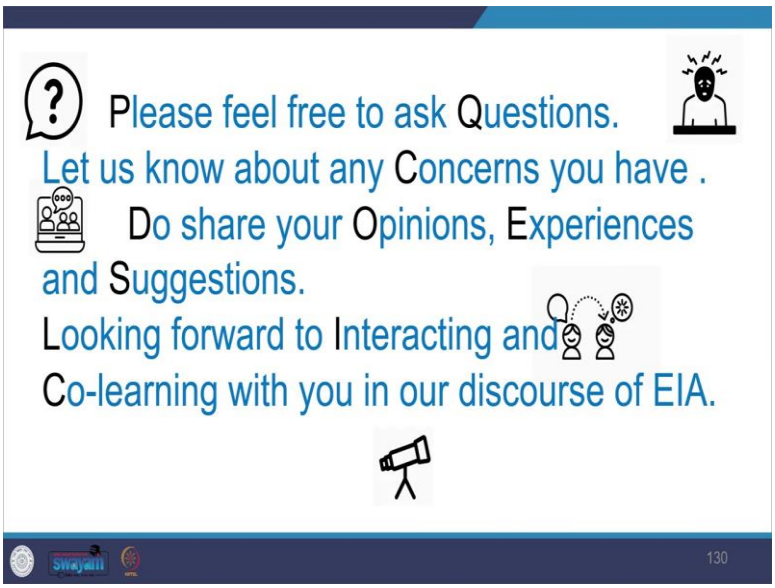

So this was our key reference further our coverage has been limited as to the scope of the subject and additional resources to read and watch are provided to you. So you can look at a range of videos and cases which I mentioned about so you can see those here. And you can get the link to the YouTube video from here and see all those cases. I am winding up please feel free to ask questions. Let us know about any

concerns you have, and do share your opinions, experiences, and suggestions. Looking forward to interacting and co-learning with you in this course of EIA. Thank you.