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Week - 08
Lecture - 46
Environmental Impact Assessment (EIA)
Part 06

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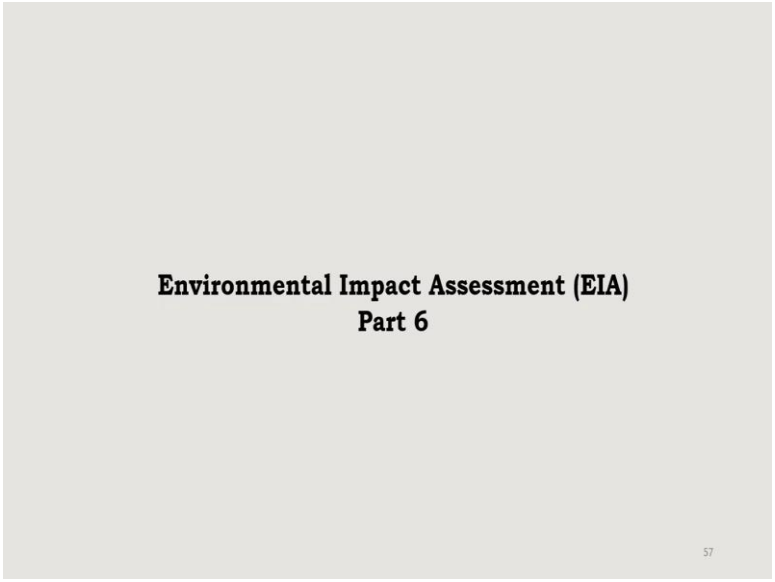

Environmental Impact Assessment, Part 6.

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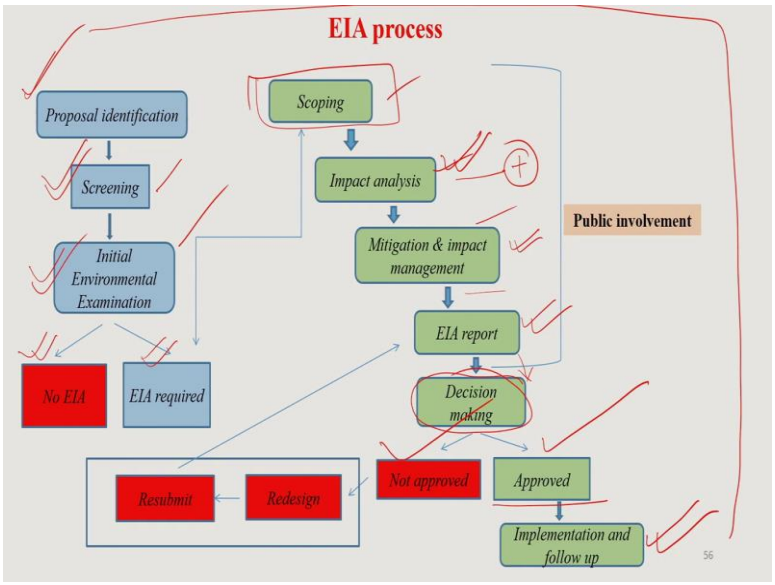

So, if you recall in previous lecture, we just discussed about the EIA process in great detail. So, continuing with that, we will now discuss each of these process that are mentioned here little bit in detail for your benefit, so that you understand the EIA procedure in a much better manner.

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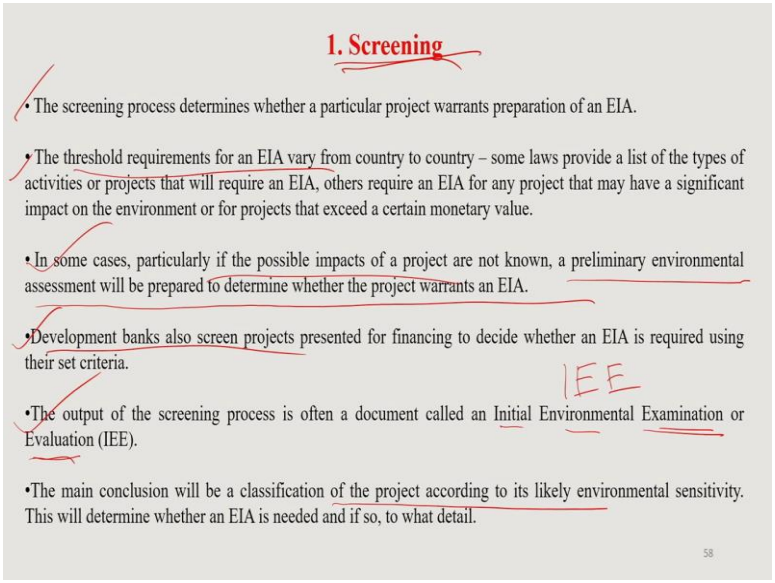

Now, screening. After the project proposals are submitted, we said that it will go for screening. The screening process actually determines whether a particular project requires a preparation of EIA or not, because we know category A, B, C, different type of category we will screen and accordingly we will see that whether we need to go for EIA or not. The threshold requirements for an EIA vary from country to country.

Now, we all know that, if you look at say suppose water pollution parameter, the maximum permissible limit for certain parameters in India and same those parameters the maximum permissible limit in some other countries; developed countries you will find that there is a significant difference. Now, country wise the threshold limit will be different, some laws and regulations also will be a little different.

So, EIA for any project that may have a significant impact on our environment or for projects that exceed a certain monetary value or say impact on a particular aspect that will require EIA. In some cases, particularly if the possible impacts of a project are not clearly known to us, we are not able to suppose, the Committee on the expense of EIA, not able to exactly identify that for this project, these will be the negative impacts.

What to do? At that point of time, if not EIA, but a preliminary assessment will be prepared to determine whether that project requests an EIA or not. So, that means what is the message, message is that blindly we are not telling that everything has to go for EIA. Before you say that one project needs EIA, there also is a process that we need to follow.

Now various development banks like I mentioned about ADB African Development Bank, lists of 8, 9, 10 banks that I have given.

They also screen projects according to their different established procedure, which are presented for financing to decide whether the EIA is required using their say career criteria or not. Now, bank to bank also it might different, world bank may have some criteria, African Development Bank, JBIC may have different criteria that we need to know. In most of the cases, these are all very clearly defined these days you can get it in their website itself.

Now, to put up the screening process is often a document which is known as initial environmental examination IEE, as we discussed in the previous lecture, or the initial environmental evaluation. So, the conclusion of this screening exercise will be a classification of the project according to its likely environmental sensitivity, and that will determine whether an EIA is needed or not. So, that categorization that we discussed in the previous lecture, category A, B, C, with World Bank example, remembers? So, that is what will be done.

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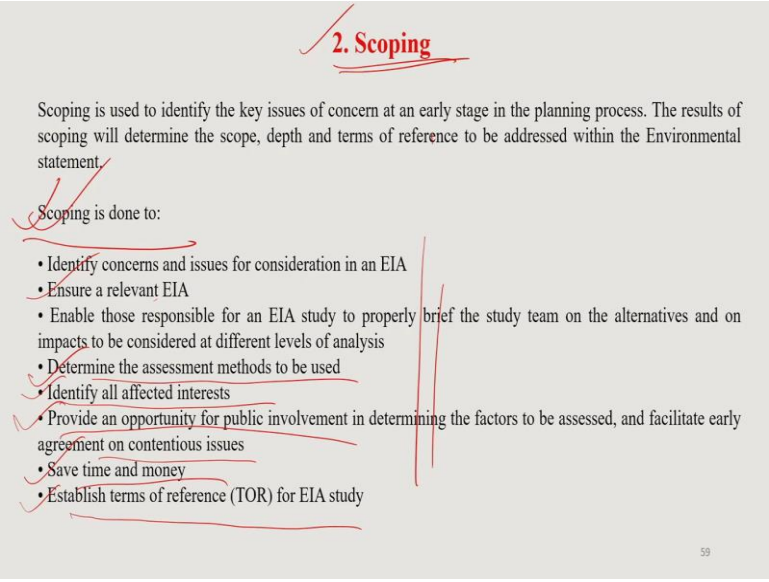

In scoping, scoping exercise, it is generally used to identify the key issues or the concern of a proposed project, its implementation planning processes. The results of this scoping study

will determine the scope, the depth and the ToR Terms of Reference to be addressed within the environmental domain or environmental statement. Now, how the scoping is done?

Scoping is done through identifying the concerns and the issues for consideration of an EIA. We ensure relevant EIA; it also enables those responsible for the EIA study to properly brief the study team on the alternatives, and also the impacts that to be considered a different level of analysis. Scoping also helps in determining the assessment methods that actually needs to be used under EIA.

Scoping also helps in identifying all affected interests, means for one project, which are the different kinds of effects on the environment, it will list of that. It also helps providing an opportunity for public involvement in determining the factors that to be assessed. And also, it will facilitate an early agreement on different contentious issues. And of course, if you do all those things, certainly it will save your time and money. And at the end of the day, through scoping study, you will be able to establish a ToR for EIA study.

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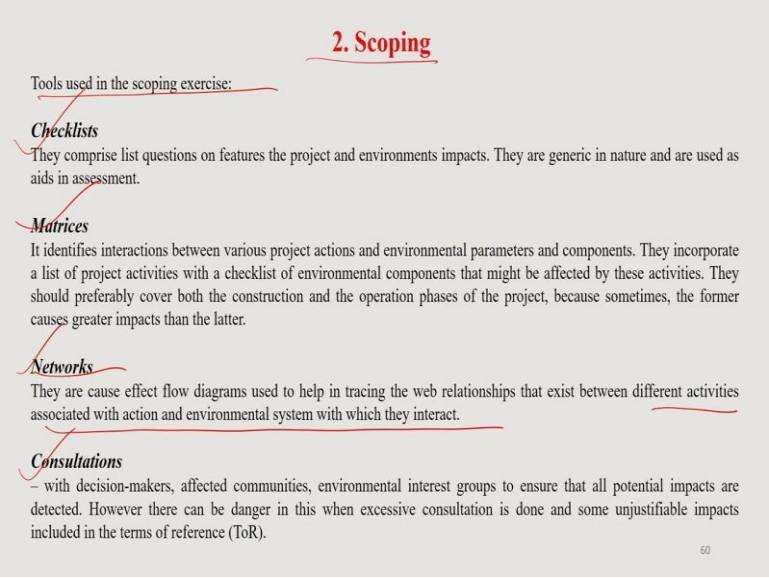

What are the tools we can use under scoping study? Checklists, which will have a list of queries questions feature on the different project and its different impact, and they could be very generic in nature and then some time also could be specific. Matrices; this helps in interactions or helps in identifying the interactions between various project and environment parameters or component.

Suppose, again and watershed development structure you are developing, for what, managing water, but that structure itself whether would have any impact on the local society, local environment, agriculture, etc, these things also need to be checked. Matrices help in that.

Networking or networks, networks actually the cause, they actually look at the effect flow mechanism which is used to help in tracing out the relationship that exists between different activities associated with the action and environmental system with which those parameters interact.

Consultations; with various stakeholders, decision makers, developers, communities, various environment groups. So, consultation can be carried out. But there is also one danger that in this process if you go for extensive consultations and try to make everyone happy. Because whenever there is a project say the example of Narmada Project, you remember how much have been written in media and everywhere, just search in Google you will find it out. So, the thing is that consultation is important, but sometimes too much of consultation also could be detrimental for various reasons. So, that also we need to keep in mind.

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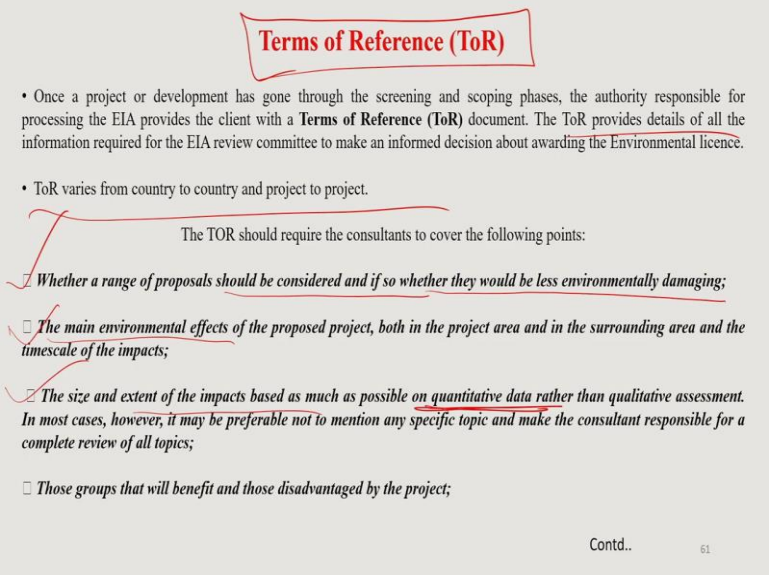

Many of you who are into professions and taking these particular MOOC course, you may be aware about the term ToR, often we use Terms of Reference for any kind of project that we start working with. So, ToR, once a project or development project has gone through a screening or scoping study process, the authorities which are responsible for processing the EIA would provide the client or the proposer with a terms of reference document.

Suppose if I am the owner of a company, and I am proposing to establish and factory or industry in an area, then after all these screening and scoping study, I will be given a ToR by the government. The ToR will provide the details of all the information required for the EIA review committee to take to make an informed decision about whether to award the environment approval or not. ToR varies again from country to country, project to project.

Now, in ToR, what are the aspects that must be there? That is important for us to know. It should actually be able to talk about whether a range of proposals should be considered and if so whether they would be less environmentally damaging. The ToR whether the main environmental impacts of the proposed project both in the project area and in the surrounding area. And the timescale of impacts also need to be looked at.

The size and the extent of the impact based as much as possible on quantitative data, not just assumption looking at the project proposal. Qualitative assessment in such kind of cases is not actually acceptable. In most of the cases, you will find that it may be preferable not to mention any specific topic or make the consultant responsible for a complete review on all topics. Those groups that will actually benefit and those which actually will be affected negatively by the project also need to be discussed with and considered.

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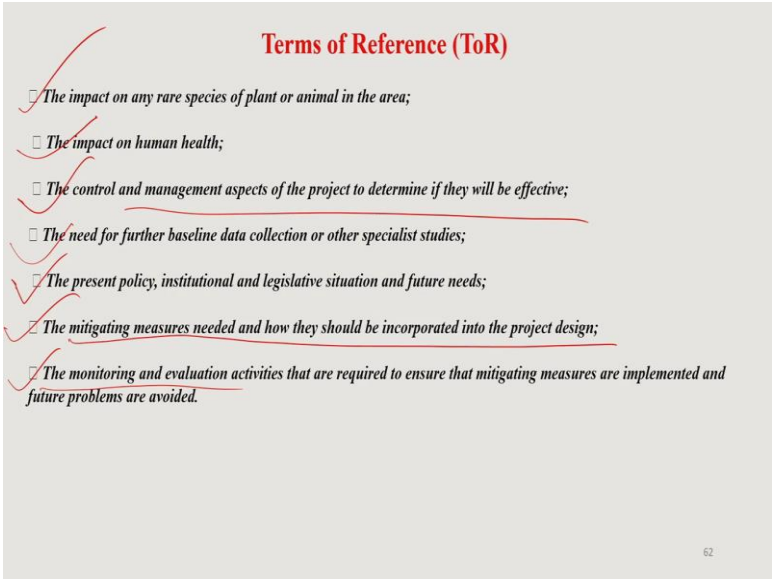

The impact of any kind of rare species of plant or animal in that particular area needS to be looked at. The impact on human health, the control and management aspect of the project to determine whether they will be effective or not. The need for further baseline data collection, suppose, you have collected but then you feel that whether there is a requirement of further

data collections or others specific studies is required that also in ToR, the people, the consultants who are being involved, they need to look at.

The present policy, institutional or legislative situation, future requirements, these also need to be thought while preparing the ToR. Mitigating measures needed for that particular development project and how they should be incorporated into the overall project design also need to be looked at and should be mentioned in the ToR.

The monitoring and evaluation activities of that project, which are required to ensure that mitigating measures which are being proposed or implemented; in future any kind of impact negative impact of problems are avoided. So, you see that how important a ToR, a ToR a project outcome will be as good as its ToR is. Many times, experts say like that.

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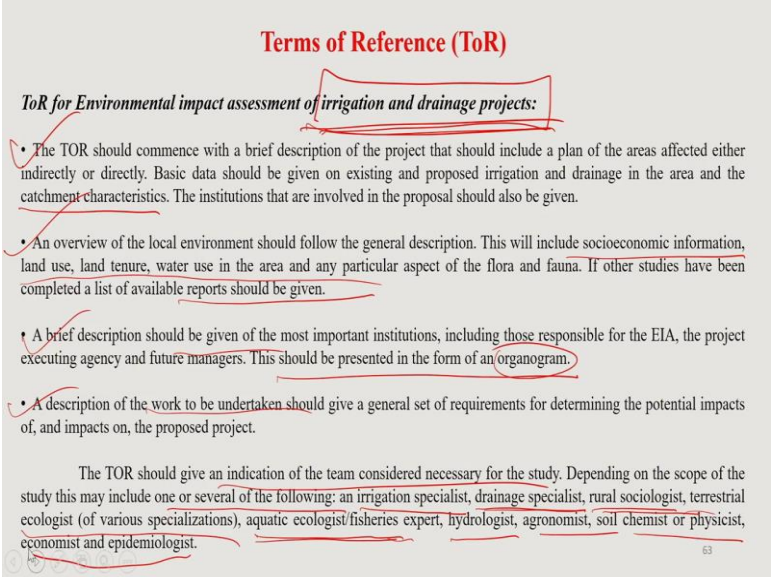

Now, if you look at the ToR for environmental impact assessment of an irrigation and drainage project as an example, which I think most of you will be able to understand. The ToR should actually start with a brief description of the project, that actually should have a plan of the areas where you are actually going to implement the project and then some basic data should be given on the existing and also on the proposed irrigation and drainage planning.

That ToR also should include the catchment characteristics because any irrigation or drainage project that you will develop largely depends on the catchment areas and the characteristics of a catchment area. The institutions which are involved in the proposal should also be given

some kind of importance and they should be also discussed while developing a ToR for irrigation and drainage project.

An overview of the local government where actually the project is taking place and that overview should include the socioeconomic information, land use, land tenure, water use of the area and any other particular aspects associated with Flora, Fauna, means plants and organisms. If other studies which have been completed a list of all those available reports also should be given or mentioned there.

A brief description should be given on the most important institutions which are there in that particular locations which you are proposing your project including those which are responsible for the EIA, the project executing agency, the future managers. So these all should be presented in the form of a organogram. So, that anyone look at this and can clearly understand who are the people and at what capacity they are involved with.

A description of the work to be undertaken should give a general set of requirements for determining the potential impact of certain activities and the potential impacts on what, means whether specific plant or organisms. So, overall the ToR should give an indication of that team which is considered necessary for the study depending on the scope of the study.

This may also include one or several of the following other aspects like irrigation specialist, a drainage specialist in the team, rural sociologist, terrestrial ecologist, aquatic ecologist or a fishery expert, all on the basis of your project. That is why these experts are coming. If you go for an industry, so a food processing industry or some other industry then you need the other kind of expertise.

So, this is a project of irrigation, that is why you are going for drainage specialist, rural sociologist, aquatic ecologist, fisheries expert, hydrologist, agronomist, all these kinds of experts. So, that is one kind of ToR for a project like irrigation, or drainage project. So, before you start actually works on a project by a group of consultants or by a group of experts, they need a ToR. And that is why I am telling that developing a very good ToR is the first most important step for a project to become successful.

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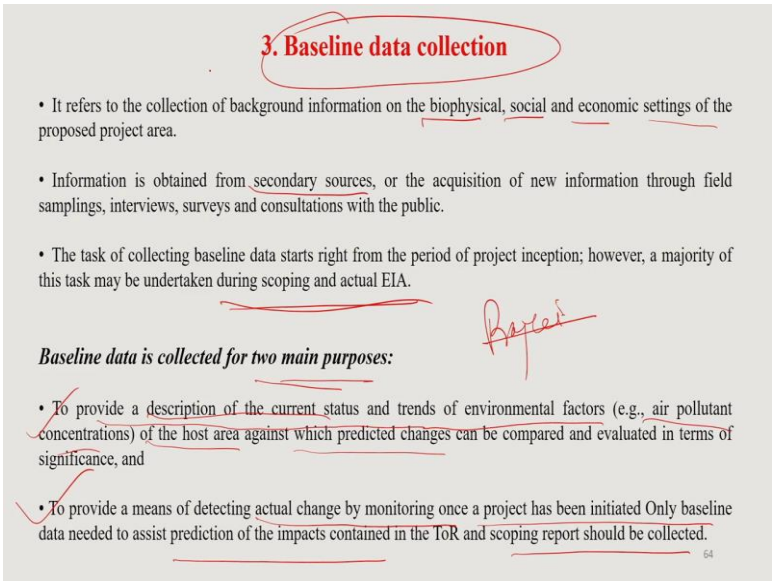

So, next is baseline data collection. Baseline data collection is another important aspect of this exercise. And in this case, when we say baseline data collection, it is mean that a collection of background information on the biophysical, social, economic settings of the proposed project area. Information need to be obtained from secondary sources or the acquisition of new information, either through field sampling, interviews, surveys, or even consultation with the public or stakeholders.

The task of collecting baseline data starts right from the period of project inception, and the majority of this particular task baseline data collection should be undertaken during scoping and also actual EIA.

Now, baseline data is collected for 2 main purposes, what are those, first, to provide a description of the current status and trends of environmental factors, as for example, air pollutant concentration of an area.So, the trends of environmental factors of the area where the project will come against which predicted changes can be compared and evaluated in terms of the significance. So, provide a description of the current status and trends of environmental factors of the host area, means where your project will take place, against the predicted change that can happen if the project takes place. That can be compared on the basis of the description that also come under baseline data collection.

Next, to provide a means of detecting actual change by monitoring once the project has been initiated. Baseline data needed to assess the prediction of the impact content in the terms of

reference and scoping report must be collected. So, these are the 2 main purposes that why we go for baseline data collection.

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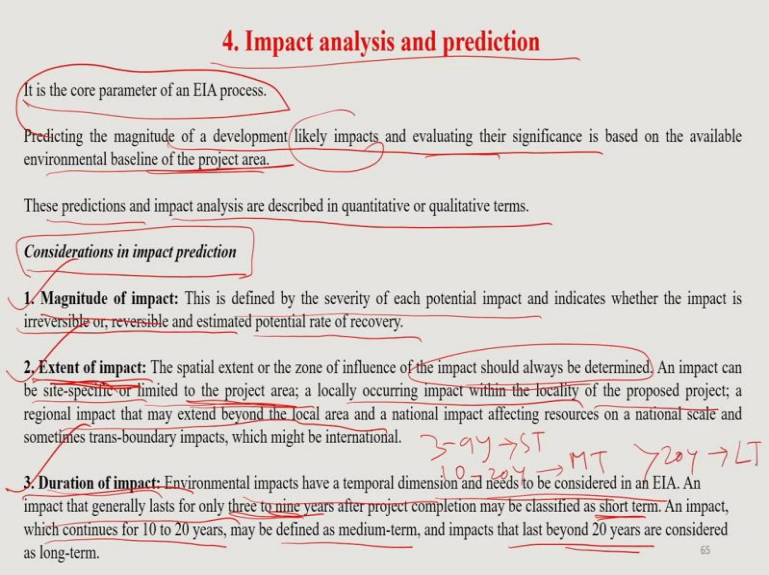

Next, impact analysis and prediction. By now we all know that EIA, the predictions on the early warning is how much critical for a project to be implemented or not. It is the core parameter of EIA process, the impact analysis and prediction. Predicting the intensity or magnitude of a development and the associated likely impacts and evaluating their significance is based on the available environmental baseline of the project area.

These predictions and impact analysis are described in quantitative or qualitative terms. Now, let us see the consideration for impact prediction, what are the points that you will consider for prediction of impact of a particular project. First, magnitude of impact; how much the project if takes place can actually impact local area and environment. This is defined by the severity of each potential impact and indicates whether the impact is irreversible or reversible and estimate potential rate of recovery.So, reversible or irreversible, if it is irreversible permanent damage that has to be understood, you cannot allow certain project to take place if you know through the EIA analysis that it is going to have an irreversible damage.

Second point is extent of impact, the special extent or the area how much the impact of a particular project will be there must be determined. An impact can be site specific or limited to a project area, it could be local impact, it could be transboundary impact, it could be even international impact. There are several examples that you can think of where one project

taking place in one country, but affecting the other country or countries, there are many examples.

Duration of impact, environmental impact have temporal dimension and it needs to be considered in an EIA. An impact that generally lasts for only 3 to 9 years after the project completion may be classified as a short term one. An impact which continues for 10 to 20 years may be defined as medium term and that lasts beyond 20 years are considered as long term, very clear, short term, medium term, long term.

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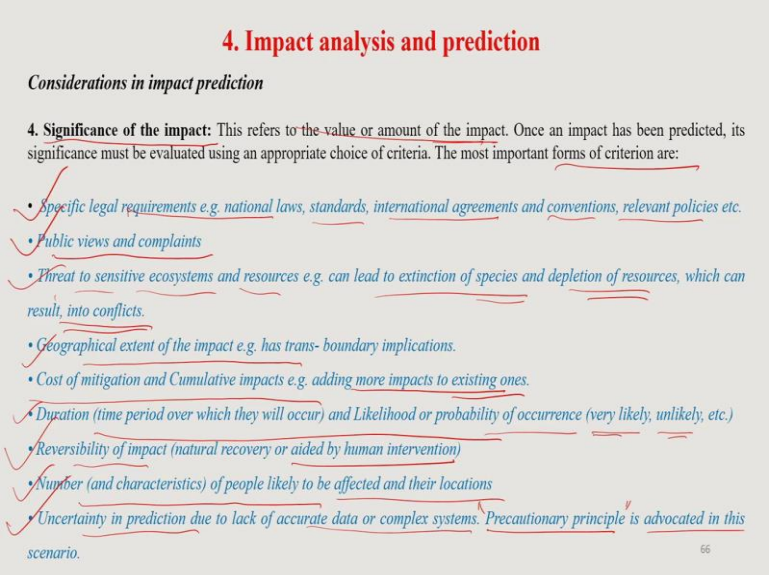

Now, next is the significance of the impact under impact analysis. And this refers to the value or amount of the impact. Once an impact has been predicted it significance must be evaluated using an appropriate choice of criterion. You remember in earlier lectures we have discussed about criteria. The most important forms of criterion are specific legal requirements, as for example, national laws, standard, international agreement, conventions, relevant policies, etc.

Then public views and complaints. Suppose one project has started somehow and EIA was not carried out properly. Once the project started, then people found that there is some issues some problem and they complain and then what happened is that they submitted the complaint and then exercise has been initiated.

Next is threat to sensitive ecosystem resources. As for example, which can lead to extinction of various species, depletion of various resources and sometimes this can also lead to conflict. There are many example between 2 countries regarding 1 resources suppose a fertile piece of land. Right now, I can recall one example of the food, there was a lot of conflict with piece of

fertile land 2 countries almost fought with each other, a lot of tension with a piece of land a resource.

Geographical extent of the impact, which has transboundary implications, cost of mitigation, cumulative impacts, as for example, suppose you add more impacts to the existing ones, and then you on top of that you add some more.

Duration, time period over which these impacts will actually occur. And also, the probability of occurrence, very likely, unlikely.

Reversibility of impact, very important, whether there is a chance of natural recovery of a damage caused by a particular project or with the help of human intervention, some restoration preservation work.

Number of people likely to be affected and their locations is another important considerations or criteria.

Uncertainty in prediction due to lack of accurate data or complex systems. In this case, precautionary principle is often advocated to use for this criterion selection technique for impact analysis and prediction.

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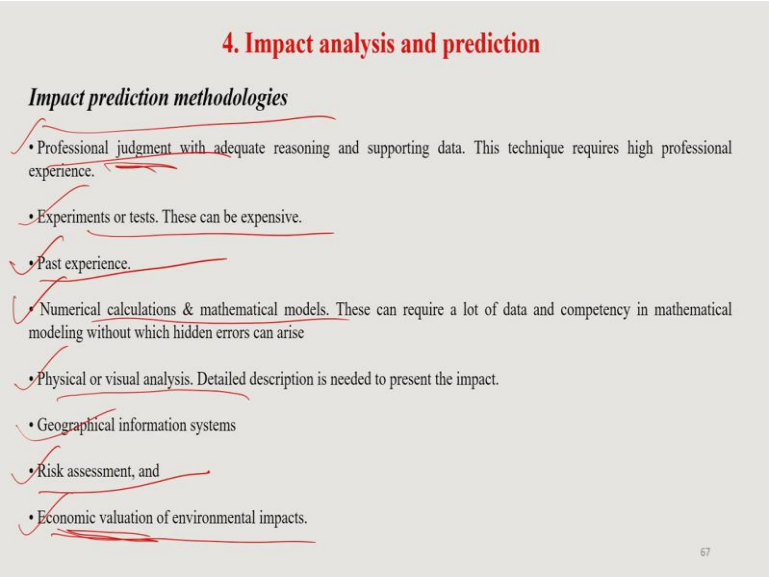

Next, impact prediction methodologies to study what kind of methodology that you will be doing. One, professional judgment with adequate reasoning and supporting data. This technique requires high professional expertise and experience because someone would be able to judge on the basis of certain available information, and that judgment definitely

cannot be made by someone who has not done much work in this field.So, an experienced professional must be consulted, if it is the case of professional judgment that you want to have it.

You can also go for experiments or tests, but this can be expensive, time taking. So, many times on the basis of baseline information and expert consultation, you can take a call-in certain case.

Past experience, numerical calculation, mathematical models, which we discussed in great detail in previous lecture.Using those models also you can generate lots of data, information, suitability analysis, physical and visual analysis, you can do it using geographical information system, we talked about that also. Geographical information system using of remote sensing technology, these are the tool that today we have and we must utilize it to the maximum possible.

Risk assessment, and then finally, economic valuation of the environmental impact. This is the one exercise economic valuation is very critical, the impact of any kind of activity on environment. Yes, we can understand that, looking at certain analysis, certain test. But how much actually value that we have lost because of that particular activity in monetary term is also equally important. That can give us some kind of understanding and the feeling that how much actually we are losing because of a certain activity.

And if we would have carried out a good EIA, we can actually generate early warning and then that particular activity could have been stopped and then this loss could have been avoided. So, see the total scenario. And that is why I am giving a lot of time and lot of lectures on EIA, because this is really very important for all of us.

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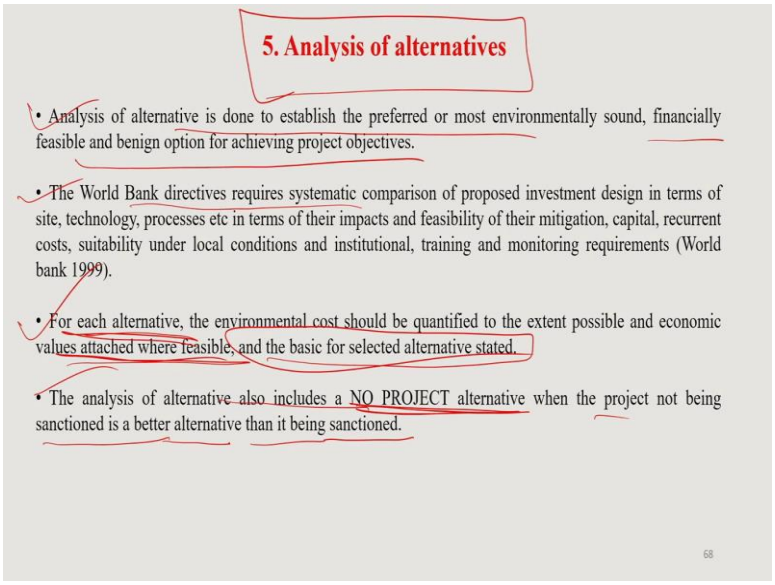

Analysis of alternative. Now, if you recall that in case of MCDA, we talked about choice of alternatives. Choice of alternatives is very, very important, but how do you do that. Analysis of alternatives is done to establish the preferred or most environmentally sound, financially feasible and benign option for achieving your project objective. Means, which impacts the environment less and achieve also the goal of the project.

And for that you need a very sound planning. World bank directives sometimes requires systematic comparison of proposed investment design in terms of site, technology, processes, etce. in terms of their impacts and feasibility of their mitigation, capital, recurrent cost, suitability under local condition and institutional, training and monitoring requirements. For each alternative the environmental cost should be quantified to the extent possible and economic values attached wherever feasible and the basic for selected alternatives must be stated; for what region which alternative you have chosen.

The analysis of alternative also encloses no project alternative; when the project not being sanctioned is a better alternative then being sanctioned. Means, if a project has some kind of negative impact, it is better to reject better not to sanction. So, the no project alternative is better than to have that.

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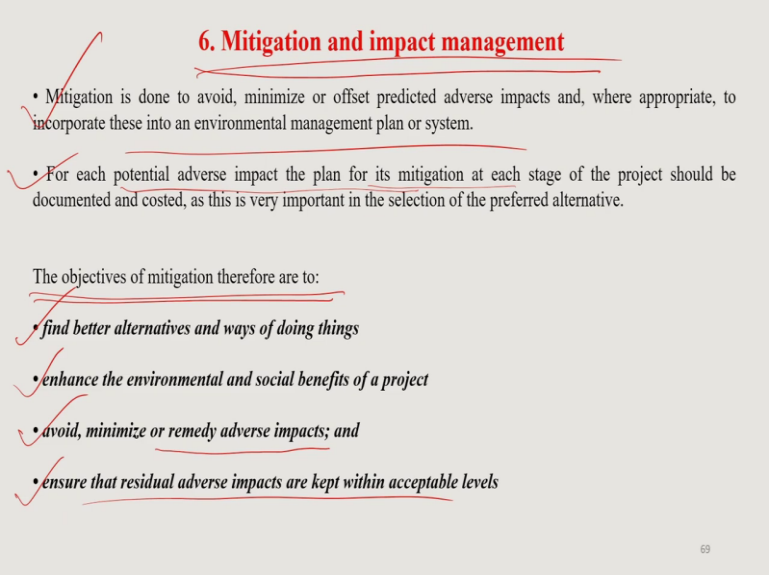

Now, let us come to the 6th step that is mitigation and impact management. Now, we know that mitigation is often done to avoid, minimize or offset a predicted negative impact. And whenever it is appropriate, it is to incorporate these into an environmental management plan or system. And that is what actually often you will see that people go for EIA, to understand that, to have a planning system in place.

For each potential adverse impact, the plan for its mitigation, at each stage of the project should be documented and budgeted. Costs should be mentioned how much actually is going to be required. So, the objectives of mitigation therefore are to find better alternatives and ways of doing things.

Second, enhance the environmental and social benefits of a project. Third, avoid, minimize or try to find out the remedy for the adverse impacts even if suppose, it occurs for some reason. Finally, ensure that whatever remaining residual adverse impacts they are kept within an acceptable limit or levels.

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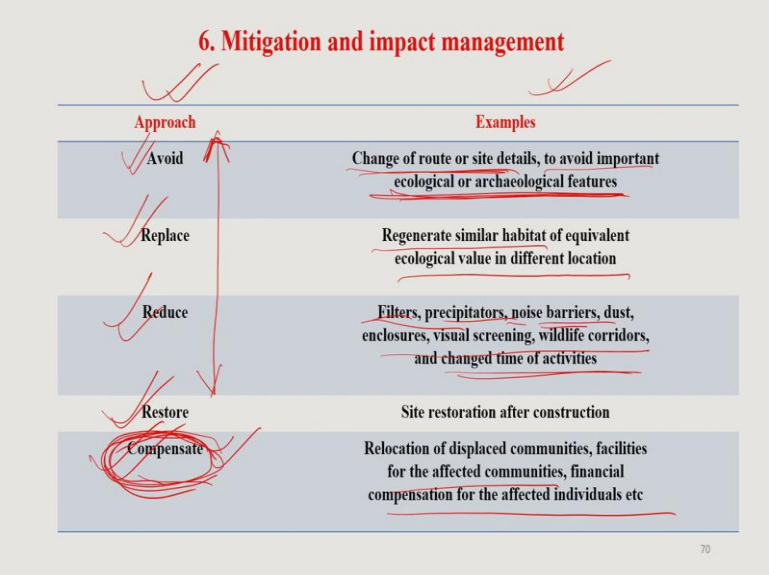

Now, under mitigation and impact management, I will mention about certain approaches with some examples. Now, avoidance approach means you want to avoid certain particular event or impact. Example, change of route or site details, to avoid important ecological or archaeological features. Means if you change the route or side details of the particular project proposed project, probably you can avoid some impact on important ecological or archaeological features. So, that is avoiding approach.

Replace, which is relatively harder. Replace, regenerate similar habitat of equivalent ecological value in different location. It is tough meaning in one location, you just cannot avoid, but you have to go for the project for the larger benefit of society. So, in that case, replace approach means you in another place try to regenerate a similar kind of habitat, similar kind of plantations, water bodies, etc. And that is not easy.

Reduce, that is relatively easier, using different kinds of filters precipitators in your industry or in your project, suppose your plan for processing industry, use those kinds of things, noise barriers, dust enclosures, and that is the way you can actually reduce the impact.

Restore, size restoration, after you construct suppose a project, you can go for size restoration, again, I think this is doable.

Compensate, easiest, I think option approach. Reallocation of displace communities, facilities for the effective communities, financial compensation. My point is that why to go at this place first, this should be our last thing. So, let us see that if we can somehow deal with these approaches and can address the situation so that we do not reach in compensate.

Compensate means already the impact has taken place, either you have pushed the people out of the place or suppose you have gone with the project and it has created an impact. So, the best would be that you try to find out a solution even before you go to the compensation. But if nothing can be done, then of course you reach in this state, this approach. And there are many examples that are lying in front of your eyes.

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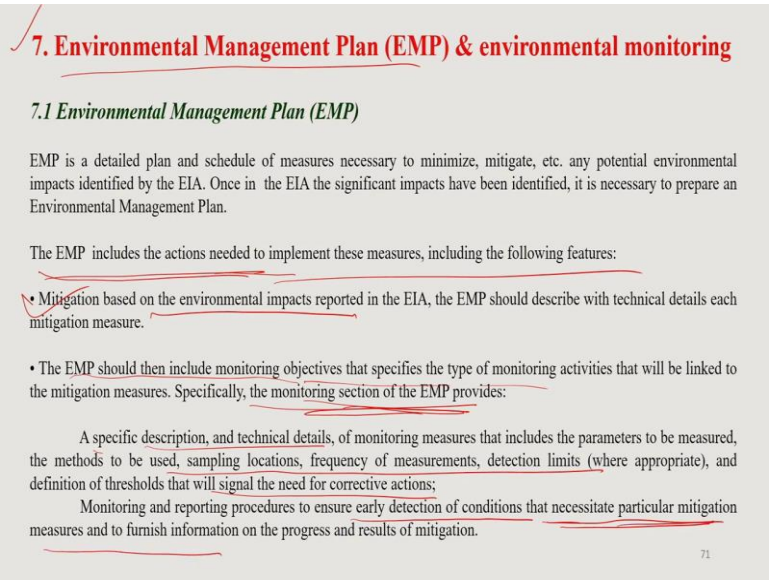

Then next, Environmental Management Plan EMP and environmental monitoring. EMP again in previous lectures, I have discussed about environment management plan in great detail. So, I will just touch upon here. Environment management plan, it includes different kinds of action that are needed to implement different kinds of measures, which can actually reduce the impact of any activity on the environment.

So, it could be mitigation based environmental impacts; it could be also environment management plan which can include monitoring objectives, so that continuously you can monitor a particular projects and impact. And if you see that the monitoring part of EMP, it provides a lot of information, monitoring part, it gives description, technical details of the project, what is happening actually over a period of time; this provides a lot of data on various aspects.

And believe me, if proper monitoring has taken place that not only gives an way out for the existing project, but also it will give you an enormous amount of knowledge base, which you can utilize for any upcoming or future project in that locality or elsewhere. So, monitoring and reporting procedures are very important and they ensure the early detection of conditions

any conditions that may necessitate particular mitigation measures. So, a good monitoring is also important.

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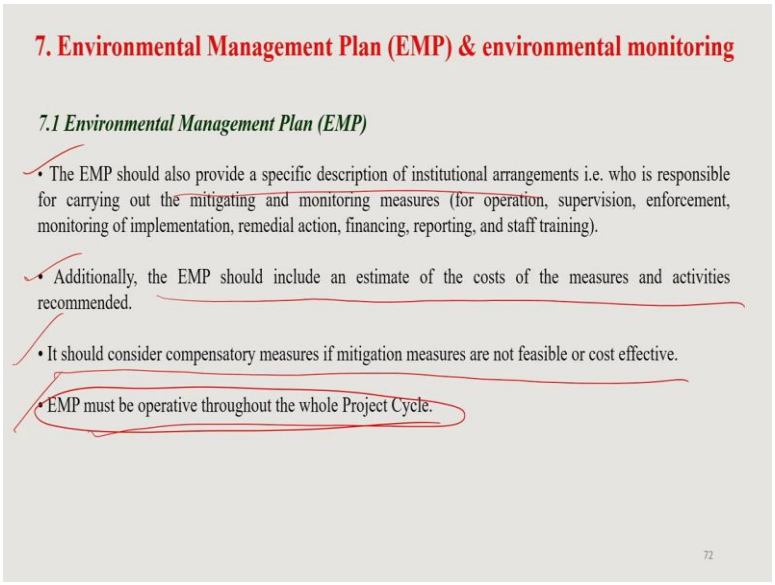

Environmental management plan should also provide specific description of institutional arrangements; we talked in earlier lecture about that. It should also include an estimate of the cost and measures and activities recommended how much money you need for that particular activity. It should also have compensatory measures, if in case mitigation measures are not feasible, or cost effective. EMP must be operative throughout the whole project. As I said, just few minutes back, is a continuous process monitoring, good monitoring is key under environmental project management plan.

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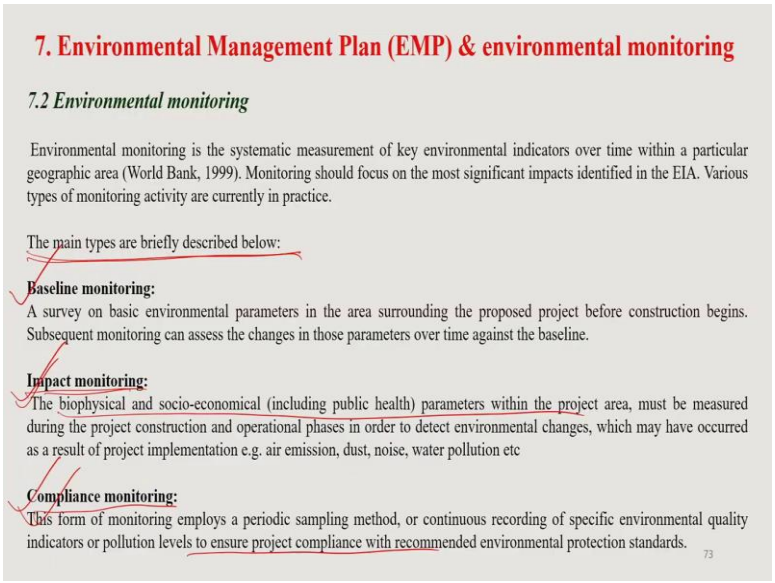

Environmental monitoring should actually have different types of monitoring system. One is baseline monitoring, impact monitoring, compliance monitoring. Now, if you see that baseline monitoring, it is a survey, we discussed about baseline data collection also, it gives you the basic information about an area, its environmental condition, and how the proposed site if it comes in, how that could actually impact the local area, society, these all are basic baseline information on monitoring.

Impact monitoring, if the project takes place, what kind of biophysical socioeconomical impact it will have. So, through impact monitoring, you can get to know those things. So, impact monitoring also involves a lot of field studies, where you can actually test your soil, water, air, you can monitor them on regular basis.

Compliance monitoring, this is actually a kind of a process where you time to time do sampling of a particular area, as I said soil sampling, water or air sampling. And try to see that whether that particular project is complying with the standards as set by a particular country or a standard that the country follows.

So, specific environmental quality indicators or pollution levels also need to be monitored and measure just to ensure that the project is maintaining that kind of standard which is required. The minimum standard on the basis of that particular country's environmental criteria, environmental standards or any international standard, whichever. So, compliance with the existing standards is another important part of EMP and environmental monitoring.

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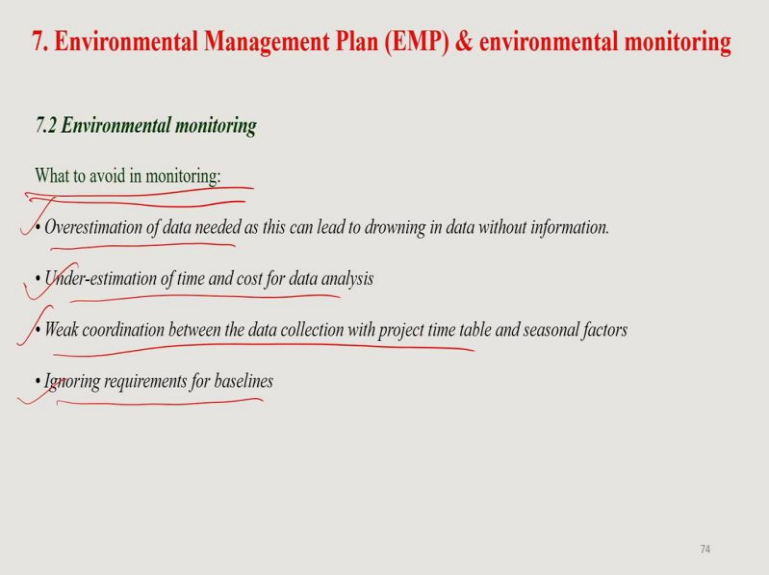

What to avoid in case of monitoring? We must be careful of over estimation, because sometime you will find that, sometimes a report overestimates and project in such a way that the project, if that particular project comes in, it will be a doom day, everything will be finished. So, we also should be careful about overestimation, equally underestimation, underestimation of time, cost, impact on environment must be avoided.

Weak coordination between data collection with project timetable and seasonal factors, because sometime in some cases suppose the rainy season, a project is there which is affected by flood every rainy season. Now, you cannot do, you cannot carry out any kind of monitoring exercise. But if in your timetable you mentioned that July, August you are going to do the field monitoring certainly that will not be feasible.So, you should have coordination between your data collection with the timetable and along with the keeping the seasonal factors in mind.

Ignoring the requirements for baselines. So, these are some of the things. We sometimes do the mistake that we ignore in the baseline survey, we think that okay, it is not required, but baseline survey, as I said just couple of minutes back that gives you an idea, clarity, that how the particular location was before the project and then you do monitor because that will be your starting point.And then if the project comes, what could be the impact? So, if your baseline information is not sound, and if you ignore that, certainly your monitoring or planning will be wrong.

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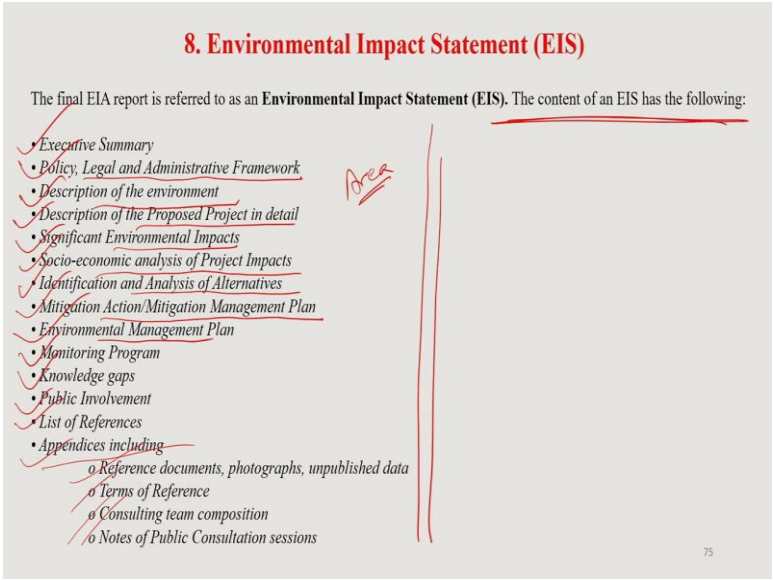

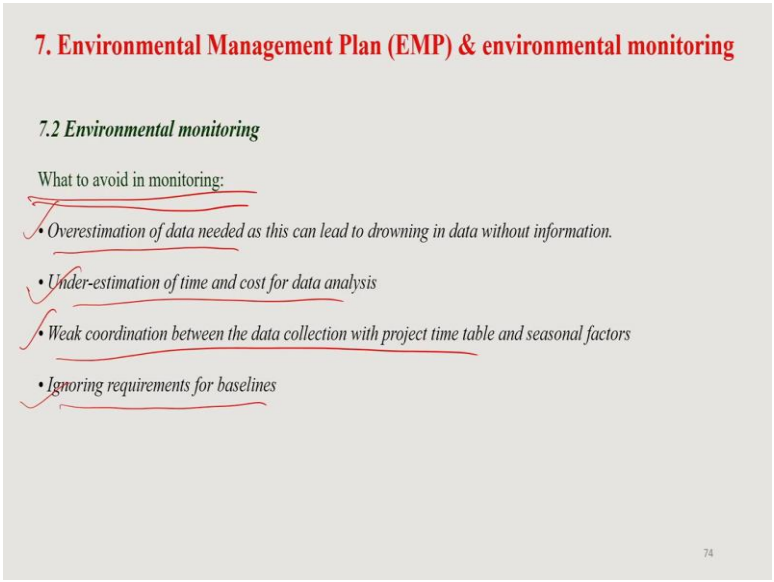

Environmental Impact Statement EIS, I mentioned it also earlier, very, very important when you go for EIA report EIS is important part of that. What are the contents of EIS? Executive summary you should have, EIS should have a policy legal and administrative framework, should have description of the environment of that area, local area, where actually the project will take place.

Description of the proposed project in detail. Significance of environment impacts. Socioeconomic analysis of project impact. Identification and analysis of alternatives, just now we discussed. Mitigation action, mitigation management plan, which we just discussed. Finally, environment management plan that we are discussing over last couple of minutes.

Then monitoring program, knowledge gaps, public environment, how public communities getting involved. Then you should have list of references. And finally, you can have appendix with the different secondary information, Terms of Reference and various other notes that you have referred while compiling the EIA report. So, this is important part.

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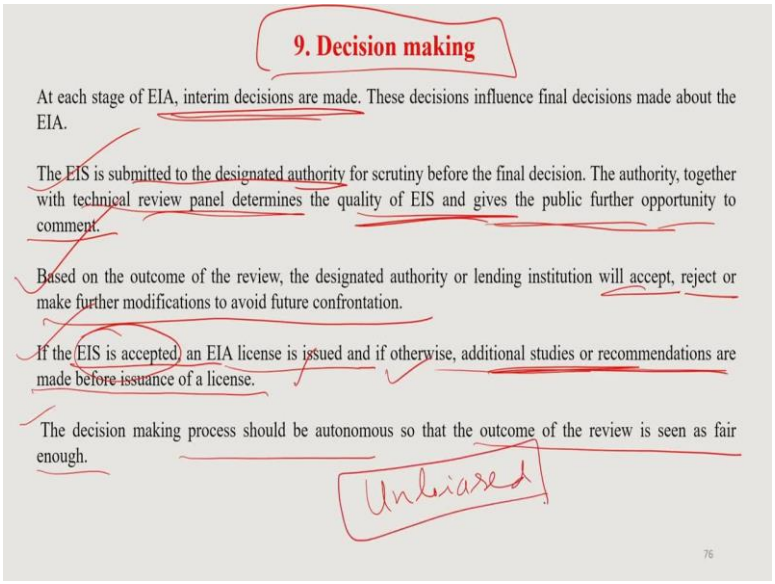

Decision making, step 9. As every stage of EIA, an interim decision is made. And this decision influence your final decision made about the EIA means whether the project will be sanctioned or not. These interim decisions which are being taken ultimately will affect your final decision. The EIS is submitted to the designated authority, and they will have a scrutiny before the final decision.

The authority together with the technical review committee will determine the quality of environmental impact statement that is there in the EIA report, and then they will give the public further opportunity to comment. So, the report will be kept shared in the public domain for a certain period of time, if anybody wishes to comment on that.

Based on the outcome of the review, the designated authority finally will accept, reject or make further modification to avoid any future confrontation. If the EIS is accepted, an EIA license will be issued, additional studies or recommendation are made before issuance of license if your EIS is not accepted. If accepted license issued, if not accepted, and then further studies should be carried out.

The decision-making process should be autonomous so that the outcome of the review is seen as fair enough and unbiased, that is important. Because in most of the cases, there is complaint of biasness.

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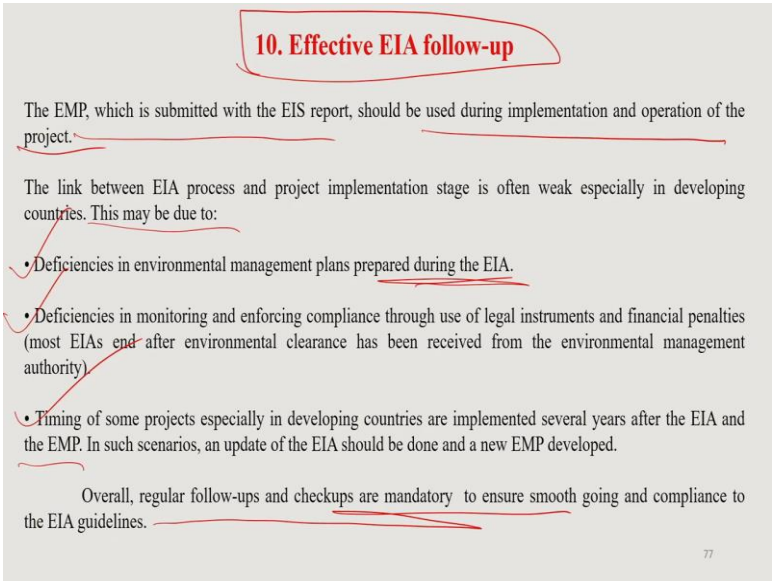

The final step, effective EIA follow up. The environment management plan which submitted with the EIS report that you will submit should be used during implementation and operation of the project. Now, what is the link between the EIA process and the project implementation stage? You will find that in most of the cases, the link between the EIA process which is being carried out and the project implementations stage is very weak and especially in developing countries, and there may be various reasons for that.

Some of them are deficiencies in environmental management plans prepared during the EIA. Deficiencies in monitoring and enforcing that compliance whichever has been established in particular country or location on the basis of legal instrument, financial instruments. So, monitoring is weak. Timing of some projects, especially in developing countries are implemented several years after the EIA has been carried out, EMP has been built.

And in this kind of scenario, if you have 10 years of gap between the EIA report submitted and the project initiative, then you can understand within that 10 years there must have been some change, natural process change in the environment. So, you need again another interim EIA, you have to update that old EIA. So, ideally between EIA and project implementation there should not be long gap.

If for some reason there is a long gap you must update that otherwise what is the meaning, EIA also you have carried out, you spend so much of money and then you start the project after 10, 15 years, showing that old EIA report that my project has compliance certificate, what is the meaning? So, that needs to be also taken care of.

Overall a regular follow ups, checks ups and mandatory kind of checking, compliance, whether the compliance are meeting or not as per the EIA guidelines. So, overall regular monitoring of the entire system is required for a successful EIA and so that a project also can be implemented without any kind of other issues or problems or confrontations. So, that is important.