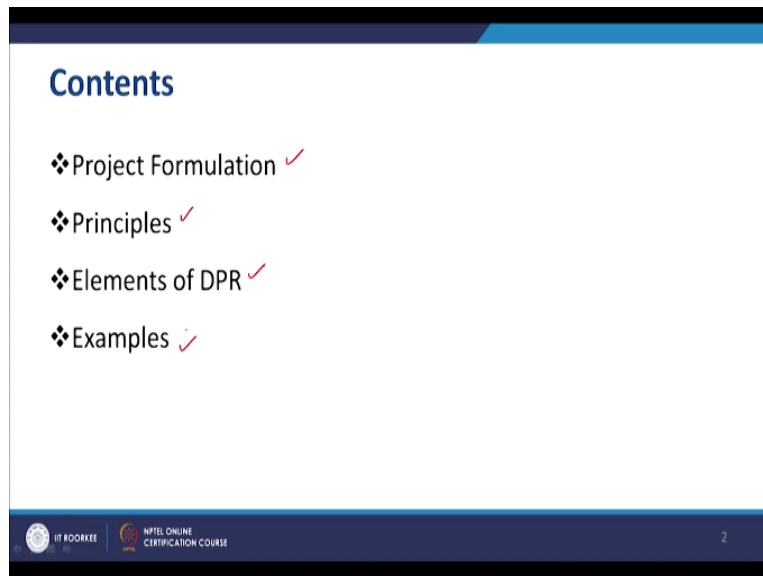


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Lecture - 47
Formulating Infrastructure Projects

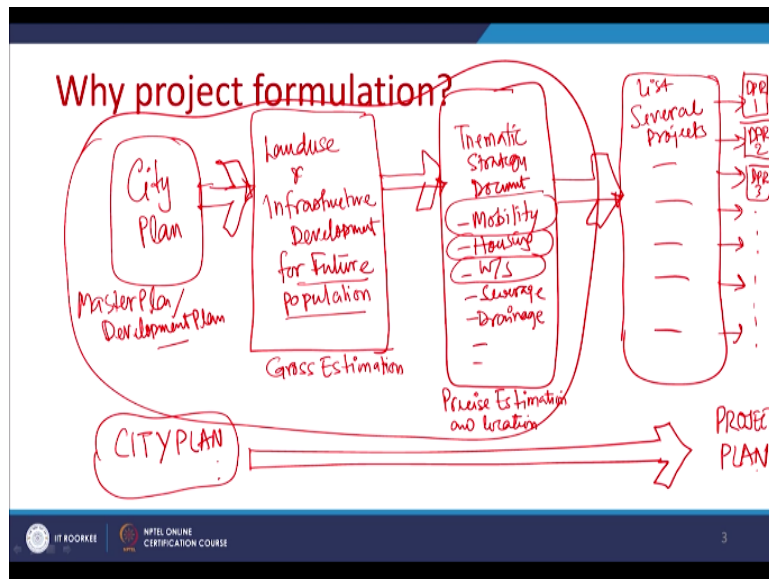
Welcome to lecture 47. In this lecture, will discuss various aspects of formulating a project. Last day, we started the discussion on the salient points on the project and its various aspect of the project, how projects are important in municipal works and what are the salient aspects of various stages of the project. So within that we have seen that making a plan for the project, making details of the project in terms of the planning document it is important. So today we are going to discuss that part of the project.

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So in this lecture, we are going to discuss the project formulation, its principles, then element of a project report, then what are the some examples. So in project formulation, I mean why the project formulation is required for a municipality.

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Now in municipality or in urban area, we have discussed the city plan. So city plan is a broad plan which gives a prescription of the city in terms of the land use and infrastructure development. That you already know because we have discussed land use and development for future population. Now this prescription in the city plan whatever if you call master plan or development plan whatever you call the plan, the land use and infrastructure development will be prescribed in their plan.

And this prescription is basically for the future population and it is a gross estimation. After the city plan basically, we make the thematic strategy document for mobility, housing, water supply, sewerage, drainage, etc. Now this strategy document gives the precise estimation and location of infrastructure and after that every subcomponent of that strategy document is reflected into several projects.

So these are basically list of projects which is the final outcome of any thematic strategy document. So starting from the city plan to the project level, it is a very important journey and academic journey and professional journey which we do in urban local bodies and after this list of project basically we do project report of various project DPR 1, DPR 2, DPR 3 like that. So many DPRs are made.

So in the list of projects, we basically list the project and then we make several DPRs. So DPR is basically the project plan. So from a city plan to project plan, it is to be understood properly. Now if a city is a small city or a small town then in the city plan also we sometimes

integrate the infrastructural prescription but definitely list of projects come after that and DPR is made after that.

So whatever is the size of the city after the city planning exercise, we make the project planning. So that is why the project plan is important and without the project plan we cannot perform the project like without the city planning the city cannot be developed, the city will be unorganized or unplanned or haphazard. Similarly, if a project is not planned properly, the project will be haphazard.

There will be wastage of money, wastage of the finance, wastage of the human resource and the objective will not be fulfilled that is why a project has to be planned meticulously, it has to be documented in a report form, it has to be approved and it has to be followed and monitored. That is the significance of a project formulation and it comes from the city development plan or master plan and so on.

Therefore, the DPR is not a standalone or isolated document what we make in the urban sector. DPR is a part and parcel of the overall city planning mechanism and it is very essential part to ensure the effectiveness of any projects.

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Project Development Principles

1. Sector Integration — OF DPR WITH

- integration of the facility with the **overall plan** of the city/region and sector is **critical** (Approving authority board, Master Plan / DP)
- approved by all stakeholders (Community and others)
- commercial viability must be optimal from a societal point of view

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So for formulating the project details, there are various principles. So I would like to explain those principles one by one. Now first is the sector integration. The sector integration is basically the integration of DPR with number one the overall plan that is the master plan as

we have told master plan or CDP. So it is not a standalone exercise and it is a very critical aspect.

If the DPR is not related with the prescription or master plan and CDP, it is not approved or is not considered as required or as a feasible plan. Then, it has to be approved by all stakeholders. All the stakeholders means the board primarily, then the community and others and it has to board and then some approving authority and it has commercial viability, it should perform the optimal from societal point of view.

A public sector or the urban sector projects is not aimed to have the maximum commercial viability or commercial profit. There is a social aspect, there are projects that are commercial, it is not viable but since there is a significant amount of social benefit that those kind of projects are also done. For example, in any municipality, there could be sewerage treatment plan, water treatment plan, every time all those projects may not be commercially viable.

But they are since the social viability or social benefit is concerned those kind of integration is also required, so first principle of the project formulation of the sector integration with the plan with the people and with the society benefit.

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The slide is titled "Project Development Principles" in red. Below the title, "2. Technical Viability" is written in bold black text and circled in red. To the right of this heading, there are handwritten red notes: "✓ NORMS", "✓ STANDARDS", "✓ THEORY", and "✓ PRINCIPLES". Below the heading, there are three bullet points in black text: "- To ensure that a rational basis", "- The establishment of optimal and least cost design", and "- This also becomes important when it is recognized that commercial costing principles". The words "rational basis", "optimal and least cost design", and "commercial costing principles" are underlined in red. At the bottom of the slide, there are logos for "IIT KOOBEE" and "NPTEL ONLINE CERTIFICATION COURSE".

Then, the plan should be viable technically. It should be done in a rational basis, optimal and least cost design. When you say rational basis, we should consider the norms, standards prevailing in the countries and then you should follow the theory and principles etc. So that your objective is to make least cost, minimum cost that is the ultimate objective.

Then, it should be done in such a way so that commercial costing principle should be taken care of so that it is not avoiding the commercial costing principle, so technical viability should be seen after the integration with the other sector.

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The slide is titled "Project Development Principles" in red. Below it is the section "3. Financial Sustainability & Economic Viability". There are three bullet points, each with some underlines and handwritten notes:

- identify and earmark funds sufficient to meet O&M and replacement costs — share / % as O/M ✓
- Economic benefits
- Thus, it is necessary to establish the basis for fixation of user charges, the level of user charges and the acceptance

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Next is the financial sustainability and economic viability, whether the project can sustain financially or economically even after the completion of the project. So here the important points are identify and earmark the funds, operation and maintenance and replacement cost if after the project is completed what will be the operation and maintenance. So always keep a share of the project cost or percentage of the project cost as operation and maintenance cost.

Then, what are the economic benefits in terms of the finance, in terms of the economic benefit whether the project is going to give some job or employment to the people or not, those kind of economic benefit is to be discussed. Next, so it is also need to be established on the basis for the fixation of user charges, level of user charges and the acceptance. So to calculate the financial sustainability and the economic viability, there could be amount of user charges by which you can get the money after the project is completed.

And you can recover the money from the lending or from the funding agency where from you have taken the money to initiate or to complete the project. So those kind of mechanism has to be seen and when you calculate the user charge or decide on the user charge you have to work on the acceptance and the level of the user charges and for example in your area there could be various categories of the people starting from the poor to rich.

So there could be variation of the user charges as well. So for any public infrastructure, the variety of the user charges needs to be considered very carefully.

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The slide is titled "Project Development Principles" in red text. Below the title is the section "4. Environmental & Social Safeguards" in bold black text. There are two bullet points: the first is "- The project must demonstrate environmental and social integrity" and the second is "- reducing these risks". The slide footer contains the logos for IIT Roorkee and NPTEL Online Certification Course.

Then, environmental and social safeguards, the project must demonstrate the environmental and social integrity. We have discussed in details that in earlier lecture that how environment is very critical in urban development project. So that has to be taken care of. You have to comply with all environment related acts, policies, rules, orders, notification and mandates so that your project is never challenged against the environment by any group, any party or any community association.

So that is the important part you need to take care when you formulate a project. Then, reducing the risk of the environment, so usually as we have discussed earlier, we do environmental impact assessment separately to justify or to check the justification or the feasibility of the project, so environmental and social subjects need to be taken care of.

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Project Development Principles

5. Institutional Arrangements

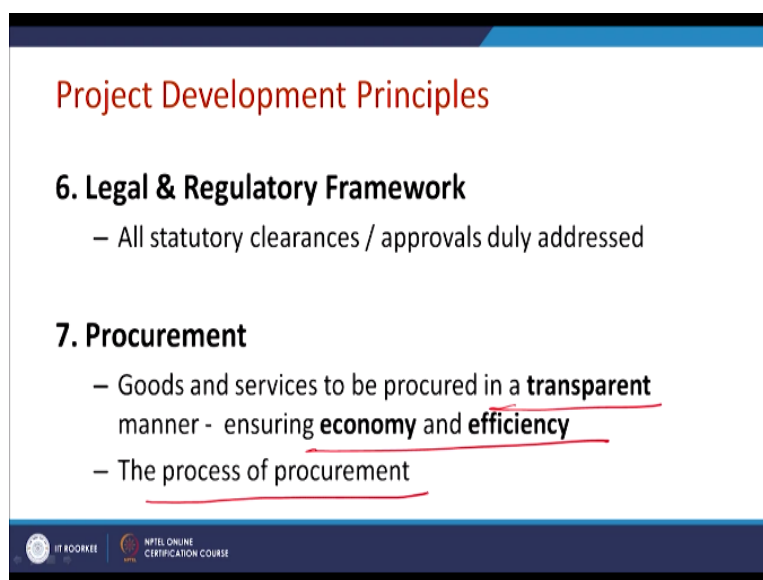
- Assessment of institutional capacity for **project implementation & maintenance**
- **PPP options**

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Institutional arrangements, how the project will be executed, so project implementation and maintenance and if the PPP options are applicable that all we have to consider whether the project will be implemented by the public agency or PPP or within the public agency, who are the person who will be in charge or which section will be liable for implementation of the project, so those kind of arrangements is important.

So that there is accountability in terms of getting money or the implementation and the quality control of the projects that is why institutional arrangement is important.

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Project Development Principles

6. Legal & Regulatory Framework

- All statutory clearances / approvals duly addressed

7. Procurement

- Goods and services to be procured in a **transparent** manner - ensuring **economy** and **efficiency**
- **The process of procurement**

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Legal and regulatory framework, in most of the cases the Government of India and the state government, they provide time-to-time all the regulations and the guidelines, formats, etc for making the DPR. I will show some of the example. At the same time, any municipal

corporation and municipality they can make some kind of local contextual regulations and rules for strengthening and for smoothening their performance and their work on the project formulation.

And then procurement, for procuring any contractor's job or contractor's service or any material, you have to be very much careful so that you can ensure the economy and efficiency of the project, the procurement process need to be transparent and the process has to be efficient. So procurement is very important. In most of the public organizations, we have seen that public organizations they sometimes fail to procure the service or the goods or the material in stipulated time.

Because of the procedural delay in terms of the inefficiency of the manpower, so we have to eliminate all those kind of thing to complete the project on time. So procurement has to be indicated in the project formulation itself that how you are going to procure the service of the third party agency or the materials from any other agency.

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Summary of Project Development Principles

- **Part of an overall plan** (City Development Plan, Sectoral Master Plan)
- Project **beneficiaries to be identified - Technology options** to be evaluated on **least life cycle cost** basis –
- **Engineering designs** to be economical
- **Environmental & Social assessment** **Financial and Institutional assessment**

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So in totality or in overall, we can conclude how we can project, you can formulate a project and how you can develop the project overall. So first is what we have discussed that it should be relevant and connected with the overall plan like City Development Plan, Sectoral Master Plans, etc. The project beneficiaries to be identified that is the societal benefit which we discussed.

The technology options to be evaluated and least life cycle cost basis. That means the design element has to be seen whether the project is environmentally sustainable or not. Engineering design has to be economical. We have told you that you have to follow all the norms, standards, guidelines and theory principle to make the design very much economical and functional.

Then, environmental and societal assessment, financial and institutional assessment has to be seen also and all these parameters need to be listed in the DPR one by one in several chapters so that the project is implemented on time and on desired objective. So let us see now what are the salient components of detailed project report? What makes a detailed project report? That is what we should see.

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Detailed Project Report (DPR)

- Clearly establish the intent of the Project Report
- Detailed Scope of Work for Project Preparation
- Appropriate Milestones
 - Start with Inception Report
 - Interim Reports for key decision points
- Adequate timelines
- Explicit deliverables

Road Map of any Project

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Now a detailed project report should show the intent, it will clearly mention the scope of work, it should give the milestone in terms of the inception report and the interim reports and the final reports. It should indicate the adequate timelines and the deliverables. So if you see these points, it is basically the road map of any projects. So based on the principle what we have just discussed the DPR should have all these elements clearly mentioned.

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Detailed Project Report - Contents

I. PRE-FEASIBILITY STUDY

- Project justification & scoping
 - Existing situation
 - Projected need, reach and coverage
- Optional project contours
 - Alternate means of addressing intended needs
 - Strengthening existing systems
 - Alternate solutions for new systems
 - Combination of above

Handwritten notes:
 City Plan / Sectoral
 Community / public demands

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So please see the little bit in details that what are the contents of a DPR. First is the pre-feasibility study, the project justification and scoping, existing situation, projected need and reach and coverage. This can come from the city plan or sectoral plan, sectoral or thematic plan like the strategy document, it can come from that or it can be justified by the community or the public demands along with the city plan and sectoral plan.

Then, optional project contours, it says that what kind of means of addressing intended needs could be done like what are the other option, why this particular project is required, what could be the other optional systems and why this particular project is essential to fulfill that particular need.

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Detailed Project Report

I. PRE-FEASIBILITY STUDY ... contd.

- Techno-commercial assessment
 - Least life-cycle-cost analysis
 - Technology compatibility and acceptance
 - Institutional capabilities
- Preliminary Environmental & Social Assessment
- Preliminary Financial Feasibility
- Implementation & Management Framework

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Then under that pre-feasibility study, there are techno-commercial assessment and preliminary environmental and social assessment, preliminary financial feasibility, implementation of management framework, all this we mentioned earlier. So this has to be written as a pre-feasibility study in the DPR.

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Detailed Project Report

II. DETAILED ENGINEERING DESIGNS & SPECIFICATIONS

- Economical designs ✓
- Detailed drawings ✓
- Specifications for Capital and O&M works ✓

III. ENVIRONMENTAL & SOCIAL ASSESSMENT

- Environmental & social impact mitigation plans

IV. COSTING

- Detailed Bill of Quantities (including items related to cost of Environmental & Social Management Plans)
- Rate analysis
- Capital costs
- O&M costs

Engineers

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After the pre-feasibility study, there has to be a detailed engineering design and specification in terms of economical design, detailed drawings, specification for capital and O and M, operation and management work. In some of the lecture, will discuss the engineering factors also so that you understand that what are the basic engineering design factors. Then, environmental and social assessment, we have to talk about the environmental impact assessment.

Those kind of things should be done and to be incorporated in the DPR. Then, costing, the BOQ, the rate analysis, capital cost, O and M cost, all this cost has to be listed and integrated.

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Detailed Project Report

V. PROJECT IMPLEMENTATION PLAN

- Investment phasing
- Institutional Framework for implementation and O&M

VI. FINANCIAL ASSESSMENT

- Analysis of Municipal Fund
- Project cash flow analysis based on landed project cost
- Identifying & earmarking funds for O&M and replacement costs

Stages of implementation

options of funds

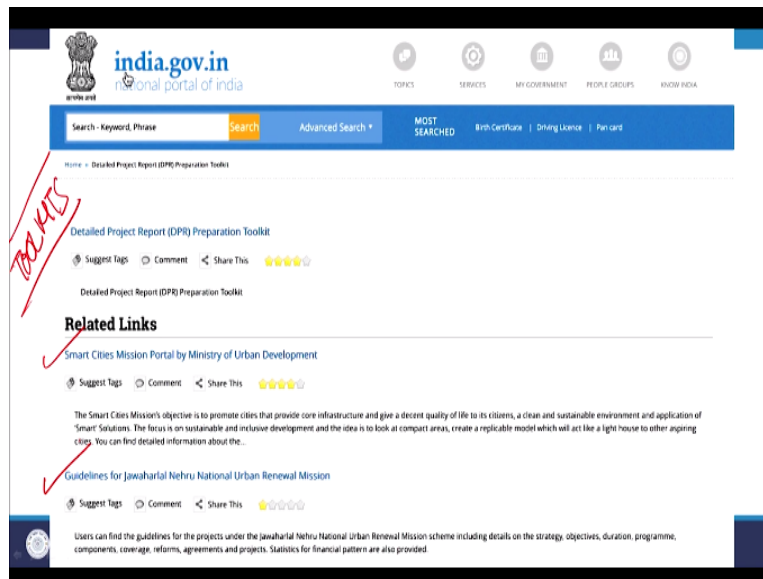
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Then, how the project will be implemented, in terms of investment, institutional framework. So project implementation should give a clear idea of step-by-step implementation of the project like this. So these are the stages of implementation. Usually, we show by various kind of diagrams, charts, etc how the project is implemented. Then, the financial assessment analysis, how the options of the fund are there.

So the analysis of the municipal fund, then projected cash flow analysis based on the project cost and identifying and earmarking the funds for the O and M and replacement cost, all these parameters will come under the financial assessment. So in short, you can see the components of a particular DPR. A DPR will have a pre-feasibility study, a detailed engineering design, environmental and social impact documents, the costing and the implementation plan and financial assessment of the overall project.

So based on that you can check the DPR available online and DPR available at your organization, for any example you can see the chapterization whether they have followed the stages or not. Now if a DPR follows the stages, definitely it becomes a valuable document for that project and whoever implements the project, it is not a difficult situation; it is not a very challenging situation to implement the project. Now I would like to show the resources available at the Government of India and other public domain.

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Please see this, screenshots I have taken from the india.gov.in portal. This portal gives various kinds of toolkits for preparing the DPRs. For example, the toolkits are there in Smart City Mission, The Jawaharlal Nehru National Urban Renewal Mission. I have not brought and shown everything. So toolkits are actually supposed to help you in various particular programme or particular centrally sponsored programme or the project.

So follow the government websites for the guidelines and then following that guidelines you can make your own DPR. If a project is very large and very huge capital investment is required, sometimes we outsource the DPR preparation mechanism to some private agency. In that case also, you need to know the various or the salient points or the salient chapters or the salient guidelines.

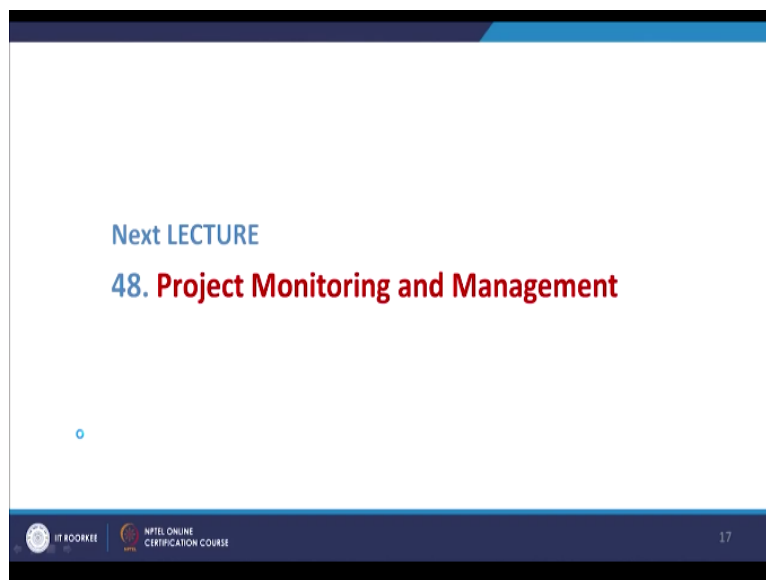
So that you can monitor or you can ensure that DPR is being made based on the prescribed guidelines and prescribed format. So that is what the role required from city managers that you not only know the process, you also ensure the process is maintained by others that is what is important in DPR preparation. So with this, I conclude this lecture. Today, we have discussed the salient factors of the project report.

We have seen that the project report is the project plan. It is the blueprint, it is the road map of a project and it is not a standalone exercise, it is coming from the city plan that is why and we have also told that a project plan, a good quality project plan can ensure timely delivery, timely completion of the project and effective completion of the project and fulfillment of the project objective.

On the other hand, if a project plan is inefficient, it is not having this important information, it is wrong in engineering design or the planning design, it may lead to a disaster situation like non-fulfillment of the objective or partial completion or bad quality of the infrastructural projects. So considering that you should know that what are the basic principles of the project formulation and development and what are the components of the DPR.

So I have mentioned those components. You just go through the lecture and then you can follow the resources which I have shown where from you will get the guidelines and the formats for preparing DPR and definitely you should not forget to see some of the DPRs from your organization so that you can see the details of the DPR and you can make in future.

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Next lecture, will discuss the project monitoring, how to monitor a project, how to manage a project, when a project starts and during the projects. So DPR we make before the project, during the project, how we can monitor and manage properly the project so that the objective of the DPR is fulfilled and the project is completed on time and on desired quality. So with that, I thank you very much for attending this lecture.