Project Management

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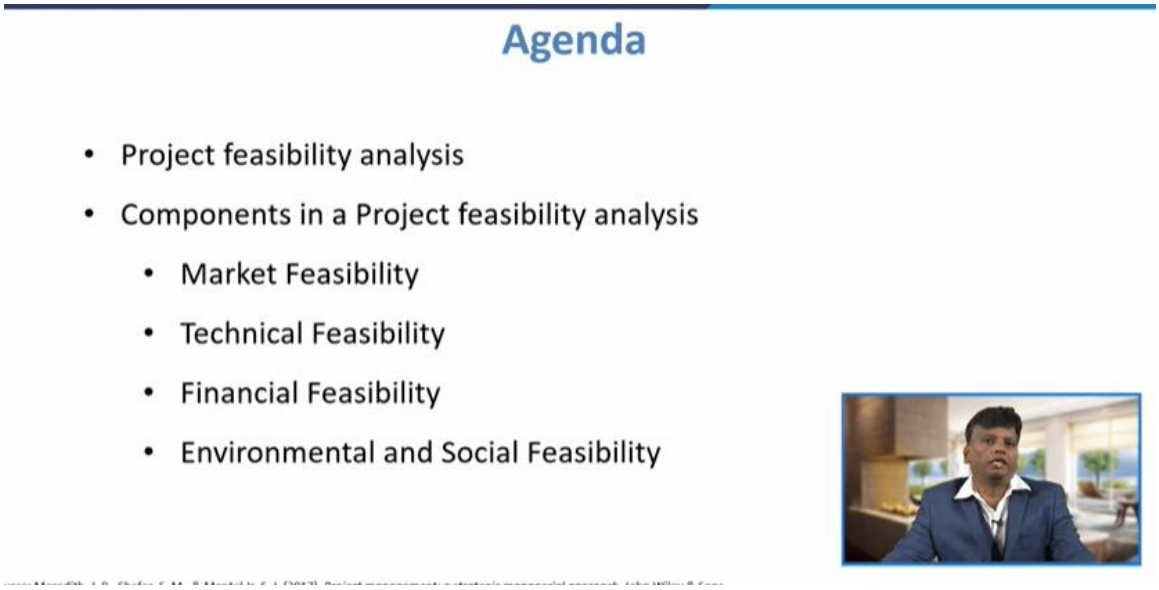
Lecture 16 : Project Feasibility Analysis

Dear students, today we are going to see another lecture. titled project feasibility analysis. Just for remainder students that we are in the phase 2 of this course that is a project planning. The previous class I have discussed about coordination through integration management. So in this lecture, I am going to discuss about various feasibility analysis for a project. So the agenda for this lecture is I will explain what is project feasibility analysis, then I will explain various components of a feasibility analysis report like market feasibility, technical feasibility, financial feasibility and environmental and social feasibility.



Actually these feasibility for example financial feasibility, market feasibility we have to cover in detail about various quantitative techniques. But I am going to avoid that quantitative techniques. I am going to give only the overview of various theoretical concept behind this various feasibility analysis. First we will see what is project feasibility analysis.

What is Project feasibility analysis?

- Project feasibility analysis is a critical process that organizations undertake to assess the viability, sustainability, and potential success of a proposed project before committing significant resources.
- It helps stakeholders make informed decisions by evaluating various aspects of the project.

Project feasibility analysis is a critical process that organizations undertake to assess the viability, sustainability and potential success of a proposed project before committing significant resources. So it is a report that sees the overall viability of the project before committing the resources and it helps the stakeholders and make informed decisions by evaluating various aspect of the project. First we will discuss about market feasibility that is one of the component of a project feasibility analysis. So market feasibility analysis assesses the demand for the product or service in a target market. Suppose your project is starting a new product or new service, the first requirement is there is really any demand for that product.

Components in a project feasibility analysis

- **Market Feasibility**
  - Assess the demand for the product or service in the target market
  - Analyze market trends, size, and potential growth
  - Identify target customers and their needs.

So unless there is no demand there is no point in working on that project. So that talk about this market feasibility analysis. Second the market feasibility analysis analyze the market trends, size and potential growth and it identify target customers and their needs.

So this is the introduction to the market feasibility. We will cover that various aspect of market feasibility in detail.

So what are the steps in market feasibility? Given the importance of market and demand analysis it should be carried out systematically. So market feasibility has to be done very systematically. The key steps in such analysis is the first step is situational analysis and specification of objectives. After that we will go for collection of secondary information. Then we will conduct a market survey.

Then we will go for characterization of the market that is profiling the market. Then we will go for demand forecasting. Then we will go for market planning. So these are the steps for market and demand analysis. Now for making that market feasibility we have to have the information.

Sources of Secondary Information

- Information may be obtained from secondary and primary sources
- Secondary information is information that has been gathered in some other context and is already available
- While secondary information is available economically, its reliability, accuracy, and relevance for the purpose under consideration must be carefully examined.

So one of the source of information is secondary sources. Here the information may be obtained from the secondary and the primary sources. Secondary information is information that has been gathered in some other context and is already available. So we can use secondary information which may be collected for some other context. We can use that information for doing the market and demand analysis.

Sources of Primary Information

- Secondary information, though useful, often does not provide a comprehensive basis for market and demand analysis.
- It needs to be supplemented with primary information gathered through a market survey specific to the project being appraised.
- It is likely to be a sample survey.

While secondary information is available economically its reliability, accuracy and relevance for the purpose under consideration must be carefully examined. So even though we use secondary informations we have to see at what context that information was collected. In what way that secondary information is relevant to our project that has to be examined. So secondary information though it is useful often does not provide a comprehensive basis for market and demand analysis. This may be a primary input for making your market demand analysis.

It needs to be supplemented with the primary information gathering through market survey specific to the project being apprised. So the secondary information even though it is useful but it has to be supported by the primary source of information like doing market survey, doing the questionnaire survey, doing the interview with the experts. So it

is likely to be the sample survey. So when we say the sample survey so what are the different steps for doing the sample survey for collecting the primary information. The first step is we have to define the target population for whom this project is intended.

Then select the sampling schemes and sample size. There are different sampling size, sampling schemes is available like probability sampling, non-probability sampling and so on. And you have to see what should be the appropriate sample size. If you are planning to do some statistical analysis for forecasting the demand every statistical analysis requires certain kind of certain number of sample size. You should be aware about that whether the sample size is adequate or not.

Then we have to develop the questionnaire. The questionnaire should contain various aspect of the project in the perspective of the customers or stakeholders. Then scrutinize the information gathered. Then analyze and interpret the information. So here scrutinize information is whether the information which we collected is relevant or not.

So once we know it is relevant then we should go for the next step that is analyze and interpret the information. Sometimes we have to look for market for the product service. Suppose your intended project is to develop a new product service you have to see whether there is really market for that. So based on the information gathered from secondary sources and through market survey the market for the product or service may be described in terms of the following. The first is effective demand in the past and present.

Market for the Product/Service

- Based on the information gathered from secondary sources and through market survey, the market for the product/service may be described in terms of the following:
  - Effective demand in the past and present
  - Breakup of demand
  - Price
  - Methods of distribution and sales promotion
  - Consumers
  - Supply and competition
  - Government policy

Then we can see the breakup of demand based on the customer profile. Then what will be the price for that product. Then method of distribution and sales promotion. Then consumers information about the consumers. Then supply and competition and government policy.

So these are the information gathered from secondary sources for doing the market survey. So after gathering the information about various aspect of the market and demand from primary and secondary sources next step is we have to estimate the future demand. So for estimating the demand a wide range of forecasting method is available to the market analyst. We are not going to study the quantitative aspect of this demand analysis but we are going to see overview of various method for forecasting demand. So there are three broad categories for forecasting the demand.

Estimating the future demand

- After gathering information about various aspects of the market and demand from primary and secondary sources, an attempt may be made to estimate future demand.
- A wide range of forecasting methods is available to the market analyst.
- These may be divided into three broad categories:
  - Qualitative methods
  - Time series projection methods
  - Causal methods

One is a qualitative method. Then there is a time series projection method. Then the causal method. First we will discuss about some qualitative methods for forecasting the

demand. So qualitative methods rely on experts judgment to translate qualitative information into quantitative estimates.

Qualitative methods

- Qualitative methods rely on experts' judgment to translate qualitative information into quantitative estimates.
- The important qualitative methods are:
  - Jury of executive method
  - Delphi method

So most of the time the qualitative information are obtained from the experts in that area. So the important qualitative methods are jury of executive method and Delphi method. So these are the qualitative method of collecting the information. The next forecasting method is a time series forecasting method. So time series projection method generate forecast based on the analysis of historical time series.

Time series

- Time series projection methods generate forecasts based on an analysis of the historical time series.
- The important time series projection methods are:
  - Trend projection methods
  - Exponential smoothing method
  - Moving average method

For example, last 10 years what is the demand? So what will be the demand for the 11th years? So we use historical informations of the data with respect to time for forecasting the or to predict the demand. So the important time series projection methods are we can use trend projection method. Here we can use your regression analysis. Then we can go for exponential smoothing method. Here in the exponential smoothing method so the latest information is given the higher weightage.

The old information is given lower weightage. So the weightage for the past data is exponentially decreasing. So that is why it is called exponential smoothing method. Then if there is a stable demand we can if there is no trend we can go for moving average method. Actually these are very detailed quantitative methods.

We can use lot of numerical problems but that I am not covering here but you have to go through this various forecasting methods. Another method is a Bass diffusion model and the causal model. So the Bass diffusion model seeks to estimate the pattern of sales growth for a new product in terms of two factors. One is P we call it is a coefficient of innovation. Then another term we will use in the Bass forecasting model is coefficient of imitation.

Bass diffusion model and causal method

- The Bass diffusion model seeks to estimate the pattern of sales growth for new products in terms of two factors: p, the coefficient of innovation and q, the coefficient of imitation.
- Causal methods seek to develop forecasts based on cause-effect relationships specified in an explicit, quantitative manner

So if there is no past data if you are doing for example any new technology if you are want to forecast it at that time this Bass diffusion model is most suitable model. This also a qualitative method we have to use a nonlinear programming here but we are not covering but you should understand this is the one forecasting method for predicting the new product demand because you may not have the past data. The another popular method is the causal method. It seeks to develop forecast based on the cause effect relationship specified in explicit and quantitative manner. The most suitable techniques for the causal method is regression method.

Components in a project feasibility analysis

- **Technical Feasibility**
  - Evaluate the technical requirements and challenges of the project.
  - Assess the availability of technology and expertise needed.
  - Consider any potential obstacles in implementing the technology.

We can use multiple regression method. So far we discussed about market feasibility. Now we will go to the next element in the feasibility analysis called technical feasibility. So here we evaluate the technical requirement and challenges of the project and assess the availability of technology and expertise needed. Can we consider any potential obstacles in implementing the technology? So these points are more important when we discuss about technical feasibility.

Purpose of Technical Analysis

- The broad purpose of technical analysis is

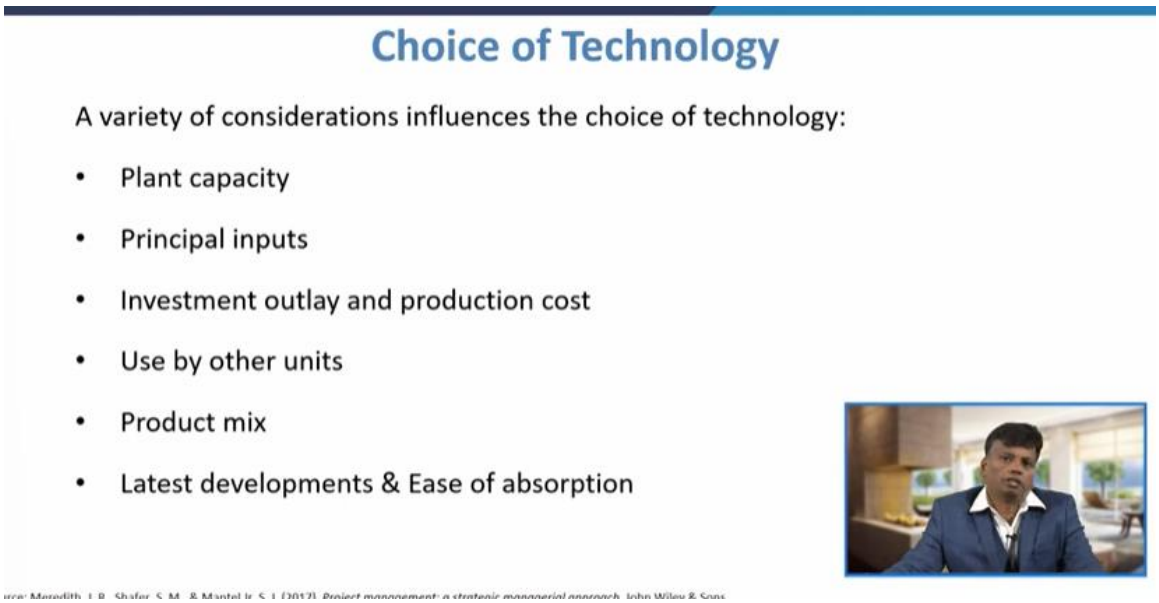
  (a) to ensure that the project is technically feasible in the sense that all the inputs required to set up the project are available and

  (b) to facilitate the most optimal formulation of the project in terms of technology, size, location, and so on.

What is the purpose of this technical analysis? So the broad purpose of technical analysis is to ensure that the project is technically feasible in the sense that all the inputs required to set up the projects are available This technical feasibility is more important. For example in certain places, certain locations when you are implementing the project you may not get enough technology for that. So sometime that technology may not work in that environment. Sometime you may not get enough manpower to run the technology.

So dealing with these kind of problems issues is called technical feasibility.

Another purpose is to facilitate the most optimal formulation of the project in terms of technology, size, location and so on. It is a very important element to choose the right kind of technology. Choice of technology for our project. A variety of consideration influences the choice of technology. What kind of technology should be used for in our project? First of all plant capacity.



For example if the plant capacity is small we can go for lower level of technology. Suppose the plant capacity is very high you should go for mass production, for example mass production technology. Then what are the principal inputs? Then investment outlay and production cost because some technology may be very costly but with the project may not give that much return on investment. So we should be very careful when you choose in the technology what will be the investment outlay and what is the return for that investment. Then whether the technology used by other units, whether the technology can be used by other units.

Then what kind of product mix, combination of products, mix of products that we are going to produce and also when you go for choosing technology you should look at the latest developments and ease of absorptions. So you have to see in market trend what development is taking place in the technology. So you have to upgrade yourself with the latest development otherwise you will become obsolete, will become outdated. So these are the factors that has to be considered while choosing the appropriate technology. So appropriate technology refers to the production methods suitable to local, economic, social and cultural conditions.

So that technology should be suitable for a local that technology should be accepted by the society and cultural conditions. The advocates of appropriate technology urge the technology should be evaluated in terms of the following questions. When you go for choosing the right technology it has to be evaluated and following questions has to be asked before choosing that technology. The first question is does the technology utilize local raw materials and manpower. For example say the project is in hilly area there the technology should absorb or utilize locally available inputs.

Appropriateness of Technology

The advocates of appropriate technology urge that the technology should be evaluated in terms of the following questions:

- Does the technology utilise local raw materials and manpower?
- Do the goods and services produced cater to basic needs?
- Whether the technology protects ecological balance?
- Whether the technology is harmonious with social and cultural conditions?

You have to go for only that technology you cannot every time transport the input from one place to another place. The second question should ask do the goods and services produced cater to basic needs then whether the technology protect the ecological balance some technology may provide lot of waste that may affect the ecology. Whether the technology in harmonious with social and cultural conditions some technology should be accepted by society otherwise you cannot use the technology. The next aspect when you go for technical feasibility is technical arrangements. So satisfactory arrangement must be made to obtain the technical know how for the proposed manufacturing process.

Technical Arrangements

- Satisfactory arrangements must be made to obtain the technical know-how for the proposed manufacturing process.
- When collaboration is sought, among other things, the following aspects of the agreement must be worked out in detail.

Because your project is implementing a new technology in the manufacturing context. You should see that whether the technical know how is there or not. You may borrow the technology but after that you have to reuse the technology so in your plant in your unit in your organization whether you have enough manpower to run the new technology that has to be identified. When collaboration is sought among other things the following aspect of the agreement must be worked out in detail. So when we go for collaboration as soon as we get the new technology generally it is advisable the person who supplied the technology he has to train our in-house employees.

Material Inputs and Utilities

- An important aspect of technical analysis is defining the required materials and utilities, specifying their properties in detail, and setting up their supply programme.

An important aspect of technical analysis defining the required materials and utilities and specifying their properties in detail and setting up their supply program. So when you go for technology you should remember that material inputs and utilities. So material inputs and utilities may be classified into four broad categories. So raw materials, processed industrial materials and components, auxiliary materials, unfactored supplies and utilities. So the point here is that if you go for a new technology so what kind of input is required for the technology to be successful whether that inputs are available locally so that point has to be keep in mind.

Material Inputs and Utilities

Material inputs and utilities may be classified into four broad categories:

(i) raw materials,

(ii) processed industrial materials and components

(iii) auxiliary materials and factory supplies

(iv) utilities

Product Mix

- Market requirements guide the choice of product mix.
- In the production of most items, size and quality variations aim to satisfy a broad range of customers.
- For example, a garment manufacturer may have a wide range in size and quality to cater to different customers.

urce: Meredith, J. R., Shafer, S. M., & Mantel Jr, S. J. (2017). *Project management: a strategic managerial approach*. John Wiley & Sons.

The another aspect is product mix. So market requirements guide the choice of product mix. Suppose we have to have variety of products that need to be supplied to the market. In the production of most items size and quality variations aim to satisfy the broad range of customers. So there may be different sizes required sometime there may be different quality some customers expect very high quality. So we have to have that you have enough technology to make different size and high quality products.

Plant Capacity

- Plant capacity (or production capacity) refers to the volume or number of units manufactured during a given period.
- Several factors have a bearing on the capacity decision.
  - Technological requirement
  - Input constraints
  - Investment cost
  - Market conditions
  - Resources of the firm
  - Governmental policy

For example a garment manufacturer may have a wide range in size and quality to cater different customers. Then you have to remember that you should consider the plant capacity before going for technology. So here plant capacity or production capacity refer to the volume or number of units manufactured during a given period. So several factors have a bearing on capacity decision. One is technological requirement, input constraint, investment cost, market conditions, resource of the firm, governmental policy.

So this will decide the plant capacity. So for that plant capacity you should look for right type of technology. Then location and site, the choice of location and site follows an assessment of demand, size and input requirements. So when we go for new technology you have to see what is the location, what is the most suitable technology for that location that need to be studied. And the site also in which locations. So here location refers to reasonably broad area like a city in industrial zone or coastal area.

Location and Site

- The choice of location and site follows an assessment of demand, size, and input requirements.
- Location refers to a reasonably broad area like a city, an industrial zone, or a coastal area; site refers to a specific piece of land where the project would be set up.

Here site refers to specific piece of land where the project would be set up. There is a difference between location and sites. Location is a broad area, site is on the specific location. Next we discuss about another important project feasibility is called financial feasibility. So here what we do, we estimate initial and ongoing cost of the project.

Not only estimate the cost, we estimate the revenue streams and potential profitability. And we do cost and benefit analysis. If it is suitable to you then only we will go for investing on the project. So that is called financial feasibility. Here in the financial feasibility the first element is cost of project.

Components in a project feasibility analysis

- **Financial Feasibility:**
  - Estimate the initial and ongoing costs of the project.
  - Project revenue streams and potential profitability.
  - Perform a cost-benefit analysis.

Cost Of Project

- Conceptually, the cost of the project represents the total of all items of outlay associated with a project supported by long-term funds.
- It is the sum of the outlays on the following:
  - Land and site development
  - Buildings and civil works
  - Plant and machinery
  - Technical know-how and engineering fees

The cost of project represents the total of all items of outlay associated with a project supported by long term funds. It is the sum of outlay on the following like land and site development, building and civil works, plant and machinery, technical know how and engineering fees. So these contributes the cost of the project. So we have to see cost of the project and the same time you have to see the benefit of the project. If there are more

benefit then it is worthy for doing the project, otherwise you need not do.

Cost of Project

- Expenses on foreign technicians and training of Indian technicians abroad
- Miscellaneous fixed assets
- Preliminary and capital issue expenses
- Pre-operative expenses
- Margin money for working capital
- Initial cash losses

In the cost of project the other elements are expenses on foreign technicians and training of Indian technicians abroad, then miscellaneous fixed assets, then preliminary and capital expenses, preoperative expenses, margin money for your working capital, initial cash losses, these and all comes under cost of the project that have to be analyzed in the financial feasibility analysis. Another aspect is where will you get the money. So means of finance for the project. So to meet the cost of the project the following means of finance are available. You can go for share capital, you can go for term loan or you can go for debenture capital, then we can go for deferred credit, then we can go for incentives sources.

Means of Finance

- To meet the cost of the project the following means of finance are available:
  - Share capital
  - Term loans
  - Debenture capital
  - Deferred credit
  - Incentive sources

The experts from finance he can explain each and every point in detail but here we are covering only the overview. The another thing is the cost of production. Given the estimated production the cost of production may be worked out that is more important.

The significant components of cost of productions are material cost, utilities cost, labor cost and factory overhead cost. Typically the starting point for profitability projection is the forecast of sale revenue.

Estimates of Sales and Production

- Typically, the starting point for profitability projections is the forecast of sale: revenues.
- In estimating sales revenues, the following considerations should be borne in mind:
  - It is not advisable to assume a high-capacity utilization level in the first year of operation.
  - Even if the technology is simple and the company may not face technical problems in achieving a high rate of capacity utilization in the first year itself, there are likely to be other constraints like raw material shortage, limited power, marketing problems, etc.

In estimating sales revenue the following consideration should be borne in mind. First one is it is not advisable to assume a high capacity utilization level in the first year of the operation. So the utilization of our plant should start increase gradually. Initially you should not go for high capacity utilization because there is no there are lot of uncertain about on the costing issues whether the product will be sold or not and so on. Even if the technology is simple the company may not face technical problem in achieving high rate of capacity utilization in the first year itself.

There are likely to be other constraints like raw material shortage may come, limited power may be there then maybe a marketing problems. So always what is advisable is at the first year you should not run your plant with the full capacity you should increase the capacity gradually. The other element in the financial feasibility is working capital requirement and its financing. Here working capital is day to day cash requirement for running the project. In estimating the working capital requirement and planning for its financing the following points has to be borne in mind.

Working Capital Requirement and its Financing

- In estimating the working capital requirement and planning for its financing, the following points have to be borne in mind:
- The working capital requirement consists of the following:

(i) raw materials and components (indigenous & imported)

(ii) stocks of goods-in-process (also referred as work-in-process)

(iii) stocks of finished goods (iv) debtors

(v) operating expenses (vi) consumable

One is the working capital requirement consist of the following one is the raw material and components stocks of goods in process, stocks of finished goods, debtors, operating expenses, consumables. So these point has to be kept in mind while preparing for working capital requirement. The another important document is projected cash flow statement out of the project. So here the cash flow statement shows the movement of cash into and out of the firm and its net impact on cash balance within the firm.

Components in a project feasibility analysis

- **Environmental and Social Feasibility**
  - Assess the environmental impact of the project.
  - Consider social and community aspects.
  - Evaluate the project's sustainability and corporate social responsibility.

Another feasibility of a project is environmental and social feasibility. Here what we do we assess the environmental impact of the project it is more important now we are talking about sustainability we talk about circular economy. So whenever we make a project that should not affect the environment and we have to consider the social and community aspect because we say sustainability have the three component people, planet and profit.

So yes profit is more important the planet the environment also important and the people those who live in the earth also important. Then we have to evaluate the projects sustainability and corporate social responsibility. So these components will be covered in the environmental and social feasibility.

I will study in detail about what is environmental feasibility and social feasibility. So first we will see what are the things has to be considered in environmental feasibility consideration. First is impact assessment. So what we have to do we have to evaluate the projects potential environmental impact such as air and water pollution, deforestation, habitat disruption and other ecological consequences.

Environmental Feasibility Considerations

- **Impact Assessment:**
  - Evaluate the project's potential environmental impacts, such as air and water pollution, deforestation, habitat disruption, and other ecological consequences.

So this point nowadays is very much important. Then whether the project is complaining, compliance with the regulations, meeting the regulations. So we have to make sure that the project complies with the local, national and international environmental regulations and standards. The next consideration is sustainability. Assess the projects sustainability by examining the resource use, waste generation and the overall ecological footprint.

Environmental Feasibility Considerations

- **Compliance with Regulations:**
  - Ensure the project complies with local, national, and international environmental regulations and standards.
- **Sustainability:**
  - Assess the project's sustainability by examining resource use, waste generation, and the overall ecological footprint.

Social Feasibility

- **Definition:**
  - Social feasibility involves analysing the potential impact of a project on the community, society, and stakeholders.

Now we will discuss about social feasibility. What is the social feasibility? Social feasibility involves analyzing the potential impact of a project on the community, society and stakeholders. What are the considerations we have to do while we doing the social feasibility analysis? First you have to do the stakeholder analysis. So we have to identify and assess the concerns and interest of various stakeholders including local communities, employees, customers and other relevant parties. If it is negatively impact these stakeholders then it is not advisable to go for that project.

Social Feasibility Considerations

- **Stakeholder Analysis:**
  - Identify and assess the concerns and interests of various stakeholders, including local communities, employees, customers, and other relevant parties.
- **Community Impact:**
  - Examine how the project may affect the social fabric of the community, including changes in demographics, employment, and overall well-being.

Then second consideration is community impact. Examine how the project may affect the social fabric of the community including changes in demographics, employment and overall well-being. Then cultural considerations, impact of this project on cultural considerations. You have to take into account the cultural aspect of the community and ensure that the project respect and integrates with the local customs and values. The next one is a social responsibility.

Social Feasibility Considerations

- **Cultural Considerations:**
  - Take into account the cultural aspects of the community and ensure that the project respects and integrates with local customs and values.
- **Social Responsibility:**
  - Evaluate the project's commitment to social responsibility, including issues like fair labor practices, human rights, and community development labour

Summary

- Project feasibility analysis
- Components in a Project feasibility analysis
  - Market Feasibility
  - Technical Feasibility
  - Financial Feasibility
  - Environmental and Social Feasibility

It is very important when we go for implementing a project. So we have to evaluate the project's commitment to social responsibility including issues like labour practices, human rights and community development labour. So dear students in this lecture I have discussed about various feasibility analysis. Just I want to remind you I have covered only the theoretical aspect of various feasibility analysis like market feasibility, technical feasibility, financial feasibility and environmental and social feasibility. But there are lot of quantitative aspect is involved here but I am not covering here then it will become

purely quantitative kind of subjects but since I am teaching at strategic level you should aware about different types of forecasting techniques, the different analysis, financial analysis. Thank you.