

Infrastructure Economics
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Module – 01
Lecture - 03
Infrastructure: Importance and Application

Production on infrastructure economics and also the discussion on the features of infrastructure. Now, we are going to discuss the third topic and that is the Importance and Application of Infrastructure.

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Brief Outline

- ❑ Importance of Infrastructure
- ❑ Applications of Infrastructure Economics
- ❑ Infrastructure and Public Policy



So, the brief outline of this lecture will be the importance of infrastructure, will discuss in detail that how infrastructure is an important step in economic planning, growth and development. Application of infrastructure economics in different field and at the same time will conclude with how infrastructure and public policy is important today.

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Importance of Infrastructure

- According to World Bank (2015), infrastructure helps determine the success of manufacturing and agricultural activities
- Investments in water, sanitation, energy, housing, and transport improve lives and help reduce poverty.
- New information and communication technologies promote growth, improve delivery of health and other services, expand the reach of education, and support social and cultural advances.
- Thus, infrastructure is not the end result of economic activities; rather it is the framework that makes economic activity possible.

And to begin with, what is basically, why infrastructure is so important with a brief introduction on infrastructure, we have already seen and we have discussed that how infrastructure is going to help in determining the process of a speedy economic growth. But, the recent literature available with the World Bank shows that infrastructure helps in determining the success of manufacture and agriculture activities, including services.

For example, investment in water, sanitation, energy, housing and transport improves lives and help in reduction of the poverty. This is statistically proved, that how availability of safe drinking water, sanitation, improvement in the energy condition, housing, transportation facility is improving the employment, improving the living standard and improving the conditions of the poor and at the same time, how it bridges the gap which continued in past and taking the society, economy as a whole in a completely new direction.

So, new information and communication technologies promote growth, improve delivery of health and other services, expand the reach of education and support social and cultural advances. So, in brief we can say that infrastructure is not the end result of economic activity; rather it is the framework that makes economic activity possible.

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Benefits of the Study of Infrastructure Economics

- ❑ Link between economic growth and development
 - ❑ Understanding the role of Infrastructure in Production of goods and services
 - ❑ Getting the idea of how cost-efficient services is being produced with the help of Infrastructure
 - ❑ Helps in evaluating the benefits of growth through infra projects
 - ❑ Exploring the promotional role of Infrastructure in trade and commerce
 - ❑ Attracting foreign capital (FDI and FII)
 - ❑ Regional economic integration
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So, what are basically the benefits of the study of infrastructure economics? Because, this particular study helps us in linking the economic growth with development, it gives us to an idea to understand the role of infrastructure in production of goods and services. We also get the idea of how cost efficient services is being produced, not only services, but also goods are being produced with the help of infrastructure, this study also helps in evaluating the benefits of growth through infra projects.

Exploring the promotional role of infrastructure in trade and commerce and how the development of infrastructure attracts foreign capital such as FDI and FII and a better infrastructure helps us in regional economic integration.

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Growth and Development through Infrastructure

- ❑ Infrastructure economics attempts to study the infrastructure is supporting certain principles of economics
- ❑ Rodan Model: Big Push-large minimum investments are needed in industrial and infrastructure sector to overcome the obstacles to development and attains the high growth path
- ❑ **Social Overhead Capital** - examples of social overhead capital include railways, roads, sanitation, schools, hospitals, and public parks
- ❑ Underdeveloped transportation infrastructure results in slow and uncertain delivery of goods and services, hinders economic growth and distribution
- ❑ The economic growth and success of US, Singapore, South Korea, Taiwan can be attributed to investments in social infrastructure such as education and health

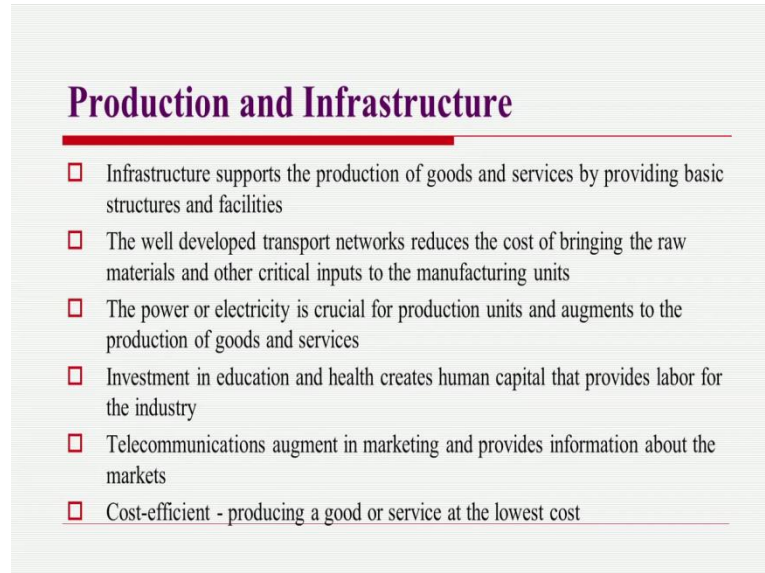
So, briefly I will discuss one by one. For example, when we say growth and development through infrastructure, infrastructure economics attempts to study the supporting concern of infrastructure, which basically supports the principles of micro economics and macro economics. The principles of development, principles of growth, because if we can just go back to the Rosenstein-Rodan model which is one of the old model of economic growth, which discuss about the big push and that big push is nothing except investment in large minimum investments, which is needed in industrial and infrastructure sector to overcome, though obstacles to development and which attains the high growth path.

Infrastructure helps in social overhead capital, examples of social overhead capital includes the railways, roads, sanitation, schools, hospitals and public parks. Underdeveloped transportation results in slow and uncertain delivery of goods and services, it hinders the economic growth and distribution, like that unavailability of electricity or safe drinking water or roads, bridges that basically hampers the future prospect of growth and development.

The economic growth story of the many successful countries, such as United States, Singapore, South Korea, Taiwan can be well cited here to understand that how investment in social, as well as physical infrastructure helps to design a very better living standard in the country. Having a well-being at a very large level and not only that, but

also to contribute in the economic growth of manufacturing, growth in agriculture and overall economic development process of these economies.

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Production and Infrastructure

- ❑ Infrastructure supports the production of goods and services by providing basic structures and facilities
- ❑ The well developed transport networks reduces the cost of bringing the raw materials and other critical inputs to the manufacturing units
- ❑ The power or electricity is crucial for production units and augments to the production of goods and services
- ❑ Investment in education and health creates human capital that provides labor for the industry
- ❑ Telecommunications augment in marketing and provides information about the markets
- ❑ Cost-efficient - producing a good or service at the lowest cost

After discussing this growth and development, we should not forget that how productions in all the sectors are well equipped, well supported with the help of infrastructure. Because, infrastructure supports the production of goods and services by providing basic structure and facilities. And once infrastructure is ready, there are so many positive aspects of the production. Once infrastructure is not ready, there are so many back track in the production system.

So, the well developed transport networks reduces the cost of bringing the raw material and other critical inputs to the manufacturing units. The power or electricity is crucial for production units and augments to the production of goods and services. Let me also cite here the recent advertisement, which I have seen few days before in news paper by the newly established state Telangana and the advertisement by the state, is showing that 24 into 7 electricity, at the same time ready infrastructure.

So, these two things are more than enough to attract the investment, because investors wants, if any producer wants to start production they need electricity 24 into 7. At the same time, they need other ready infrastructure to bring the raw material; even after the production, they need ready infrastructure to send the product material or the production to the consumer.

So, without such support, without such infrastructure support it is very difficult to continue with in the production. Because, production today is not only having the final product, but the production today includes the final consumption, the producer is no more a producer if the producer's product is not finally consumed. Because, we live, we are in a very globally interdependent world and interconnected world, where everything matters when all the production matters, the final victory of a producer is not only in terms of what they have produced, but the final victory of a producer is how a producer is smart enough to sell it in the international market.

So, the investment in social infrastructure such as education and health care creates human capital that provides labor for the industry. And as well as you are also having a very vibrant consumer, a very active consumer through the more educated and more healthy conditions of the social infrastructure development.

Telecommunication is again one of the major contributors in the modern economic development and that has really improved the marketing and it has provided a very wide range of information to the consumer, as well as to the producer. So, it was not the condition before 20 years, which we are having through the E-marketing and E-banking. And, so this is basically the economies do use this term as the information highway, we have developed the information highway in past few years.

And few countries are on the way of developing this information highway and that basically improves in delivering the information to the consumer, receiving the information from the consumer, throwing the products through the E-marketing. One of the survey which I was reading that these days, there are consumers attracted through the E-marketing, different web marketing is going on and the retail sector, especially the established shops are not really having increase in the number of consumers.

Because, they receive a threat, they receive a challenge from the E-marketing and E-business. So, this is a new turn in the market, where through the help of information technology, we are establishing a different type of network with the consumer and that network is going to reduce the cost of delivery of the product to the consumer and this type of experience and this type of marketing is the new way of marketing, new steps in the globalized marketing.





So, the cost efficient production of goods and services is the prime goal of the world today, prime goal of the market forces today. So, in that case infrastructure is one of the major contributor, it is one of the major, you can say facilitator to help the producers to reach to the market or to get the raw material on a very low price or to have the more and more input such as labor and which is known as the mobility of the factors. If you have more mobility of the factors, you will certainly have the availability of the factors of the production. If you do not have mobility of the factors of production, producers are not really gaining anything out of it, because they are losing the sense of production.

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Foreign capital and Infrastructure

- ❑ Infrastructure is critical in attracting foreign capital
- ❑ USD 8 trillion of infrastructure investments are required in Asia between 2010-2020
- ❑ The infrastructure investment –gap is huge in Asia, Sub-Saharan Africa and Latin America
- ❑ Countries having better infrastructure attracts more foreign investments

World's Largest Gap
Number of People without access to Infrastructure in the Asia and Pacific region

WATER & SANITATION	ELECTRICITY	ROADS	INTERNET
 900 million	 800 million	 1-2 billion	 80% of Asia

So, after discussing this, the interlinkage between the production and infrastructure, let me also discuss little bit about the foreign capital and infrastructure. Because, today as we have discussed in our introductory lecture that, we are not living in a command world or controlled world or only a state run system. But, we are in a free economy today, majority of the investors are joining here and there and they are looking for more opportunities and more growth.

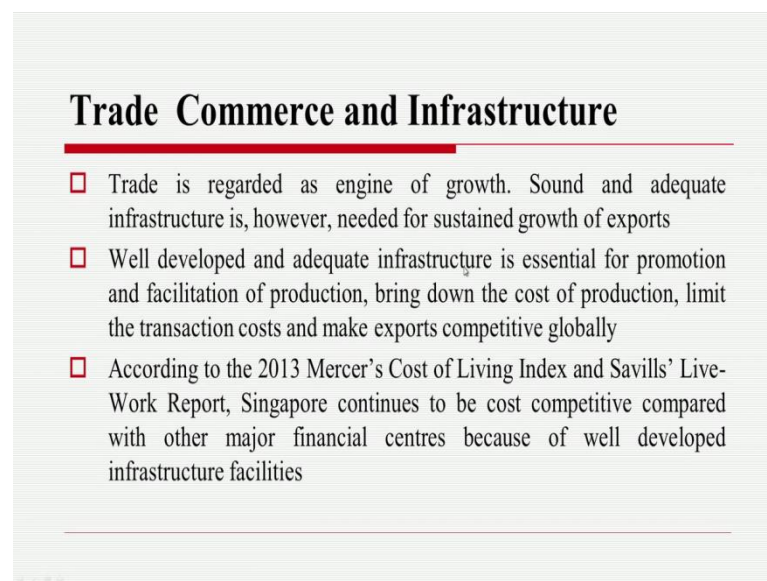
So, when they are looking for the country, they are looking for the country which has more better infrastructure and better equipped infrastructure for their benefit and in that way, we find here that some of the statistics is very clear that, between 2010 and 2020, Asia required around 8 trillion US dollar especially for infrastructure projects. And we

find an infrastructure investment gap especially in Asia, Sub Saharan Africa and Latin American countries.

Because, countries having better infrastructure attracts more foreign investments, there are certain statistics like 900 million people are still waiting for safe drinking water in Asia and pacific region. Similarly,one or two billion people are not having road facilities. So, these are the statistics which shows that we have to have foreign capital for the growth, for the development and we need this foreign capital also to develop our infrastructure.

So, we cannot really say that foreign capital will come without having a proper infrastructure base. But, it is also important to figure out that how this foreign capital will be attracted and foreign capital cannot be attracted, if we are not really having proper support base for the infrastructure.

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Trade Commerce and Infrastructure

- ❑ Trade is regarded as engine of growth. Sound and adequate infrastructure is, however, needed for sustained growth of exports
- ❑ Well developed and adequate infrastructure is essential for promotion and facilitation of production, bring down the cost of production, limit the transaction costs and make exports competitive globally
- ❑ According to the 2013 Mercer's Cost of Living Index and Savills' Live-Work Report, Singapore continues to be cost competitive compared with other major financial centres because of well developed infrastructure facilities


The next point which I would also like to highlight here, which is equally important when we are discussing infrastructure economics, that whatever trade and commerce is growing today, because world is increasingly having a fast growth in trade. The percentage which we are having in 1950 in terms of the percentage of trade in the global GDP, that percentage of trade in global GDP has improved manifold today.

And we find that majority of the countries are basically looking that outward development model, outward growth model where they are not only looking that what they have produced for the domestic consumer. But, they are looking for what they have to produce in what they have really contributed for the global consumer. So, trade is regarded as the engine of growth today and sound and adequate infrastructure is; however, needed for sustained growth of exports, well developed and adequate infrastructure is essential for promotion and facilitation of production.

Because, it brings down the cost of production, limits the transaction cost and makes export competitive at the global level. According to 2013 Mercer's Cost of Living Index and Savills' Live Work Report, Singapore continue to be the cost competitive compared with other major financial centers, because of the well developed infrastructure facilities.

So, this example tells us that how trade and commerce is one of the integral part of the infrastructure and without having the infrastructure it is impossible to really have growth in export and even a country wants to import it is hardly difficult, it is really difficult to have import also, because for that also you need infrastructure facilities developed in your country.

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Infrastructure and Regional Economic Integration

- ❑ There are forward and backward linkages of infrastructure development and regional economic integration
- ❑ Regional integration can take the form of either free trade area, customs union, common market, economic union or monetary union- the institutional framework is provided by the adequate and proper infrastructure
- ❑ By encouraging regional integration countries are better-off in trade, share resources and build mutually beneficial infrastructure
- ❑ Integrated markets with regional integration and efficient infrastructure helps in attracting investments, and provides quality goods and services at competitive prices
- ❑ For instance: Japan will provide USD 35 billions to India for Infrastructure development in next 5 years

Last, but not least I would also like to discuss that how infrastructure and regional economic integration working together. So, if neighboring countries are well connected with infrastructure like India is trying hard for a proper network with neighboring

countries, we have connectivity with Nepal, we have connectivity with Pakistan, we have connectivity with Bangladesh, we are having thinking for the connectivity with other neighboring countries.

And if that connectivity is there lots of mobility of the factors which we can see which will be helpful for each country in South Asia and outside the South Asian region. So, regional integration can take the form of either free trade area or custom union that is the part of the international trade and the institutional frame work is provided by the adequate and proper infrastructure, if the government is really ready for such regional integration government has to facilitate infrastructure projects and to help those neighboring states to have a proper understanding for the regional integration.

Integrated markets with regional integration and efficient infrastructure help in attracting investments and it provides quality of goods and services at competitive prices. For instance, Japan will provide 30 billion US dollar to India for infrastructure development in next 5 years. So, that is one example, but we have other news coming from China or we are also ready to help Bangladesh and we are also ready to help other smaller countries of South Asia and this shows that how the connectivity which is possible through the roads, which is possible through the open sky policy is important today for the regional economic integration.

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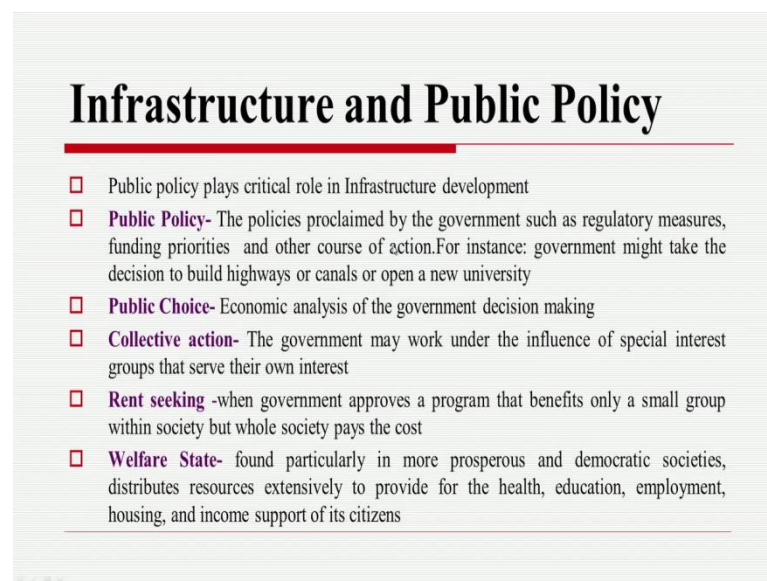
Applications of Infrastructure Economics

- Urban Finance
 - Business Economics
 - Civil Engineering
 - Local Bodies
 - Public Policy
 - Urban and Rural Management
 - Community Development etc.
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Let me again discuss briefly about the application of infrastructure economics. Infrastructure economics is not only the area, which is going to give certain benefits to the student of economics. But, for understanding the urban finance today or to understand the business economics or to have the idea of the cost and production for the civil engineers or to have the policy making for the local bodies or at the central level or the higher authorities as a part of the public policy, infrastructure economics is applicable for all these people and all these organizations including the rural and urban managers and the community development.

As an example we can say that infrastructure economics, the study of infrastructure economics is not having a very limited or narrow applications, but it has a very wide range of application today.

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Infrastructure and Public Policy

- ❑ Public policy plays critical role in Infrastructure development
- ❑ **Public Policy**- The policies proclaimed by the government such as regulatory measures, funding priorities and other course of action. For instance: government might take the decision to build highways or canals or open a new university
- ❑ **Public Choice**- Economic analysis of the government decision making
- ❑ **Collective action**- The government may work under the influence of special interest groups that serve their own interest
- ❑ **Rent seeking** -when government approves a program that benefits only a small group within society but whole society pays the cost
- ❑ **Welfare State**- found particularly in more prosperous and democratic societies, distributes resources extensively to provide for the health, education, employment, housing, and income support of its citizens

Again, when it comes for the public policy, public policy plays a very critical role in infrastructure development. Public policies proclaimed by the government such as regulatory measures, funding priorities etc. are the part of the decisions taken by the governments and what type of public choice government is having that is basically the economic analysis of the government decision making.

So, how good the government is in terms of taking the decision for the infrastructure development. How free the decisions are from the nepotism, corruption and how collective action the government may work under the influence of the special interest

groups that served the own interest sometime. We have seen in many infrastructure projects in India in many developing countries and outside India that there are certain rent seeking approach when government approves a program that benefits only a small group of people within the society, but whole society pays the cost for it.

So, it is high time for us to really interlink the infrastructure and public policy, there are certain states which is basically welfare a states. Majority of the states are basically coming out from the welfare approach. And, but at the same time we cannot the government cannot run away from the welfare responsibility of the society, because ultimately economics deals with the welfare of the society as a whole.

So, one cannot really decline from the responsibility of the welfare, but at the same time it was found that particularly in more prosperous and democratic societies which distributes resources extensively to provide for the health, education, employment, housing and income that basically supports for its own citizen. Especially many eastern European economies today they really have a better welfare system, better welfare income distribution compared to many Asian countries which are really having large population.

But,they are not good in terms of distributing the welfare in income, because of various reasons, because of not having a proper employment generation or not having proper understanding of economic growth, generally majority of the workers are still depending on the agriculture for the livelihood that is the feature of, major feature of the developing and least developed countries. And if there is no transition from no occupational change from agriculture to industry and industry to services, then the people are some of the people are either having disguised unemployment or their marginal productivity in agriculture is basically zero.

So, in that situation when we say to improve the human being conditions to improve the living standard, to improve the quality of the life, to have a major development, it is indeed important to have the infrastructure not only in the urban area, but also in the rural area. So, the urban and rural infrastructure should go together in many developing country and policy maker or the public policy bodies should not really avoid to have the infrastructure development in the rural part.

Because, more we are developing the rural part, more we are avoiding the migration from rural to urban part. And if we are avoiding, if we are somehow restricting this migration we really required less infrastructure in urban part. So, taking lessons from the different part of the world today, it is indeed important to important for the policy makers public policy makers to think on how infrastructure can be made on the low cost and how it can be maintained for longer period of time and how much we can really restrict the misuse of infrastructure and the rent seeking approach in the development of infrastructure.

So, with this note I would like to basically conclude this particular lecture saying that the importance of infrastructure, it is not the issue for us to ignore. But, it is very important for us to again have the further linkage of infrastructure with growth, development and with trade, commerce, regional integration and as long as we are not really connecting infrastructure with these aspects, the study of infrastructure economics will remain concentrated at a very restricted level.

So, it is indeed important to really look for the study of infrastructure beyond the country and to have the final view that how infrastructure is not only good for a country, but the infrastructure development is good for the regional integration, global integration.

Thank you.