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**Module – 03**  
**Lecture - 10**  
**Challenges for Infrastructure Development**

Challenges for Infrastructure Development, in this module we will have the discussion on different challenges which is always seen in the field of infrastructure development.

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**Brief Outline**

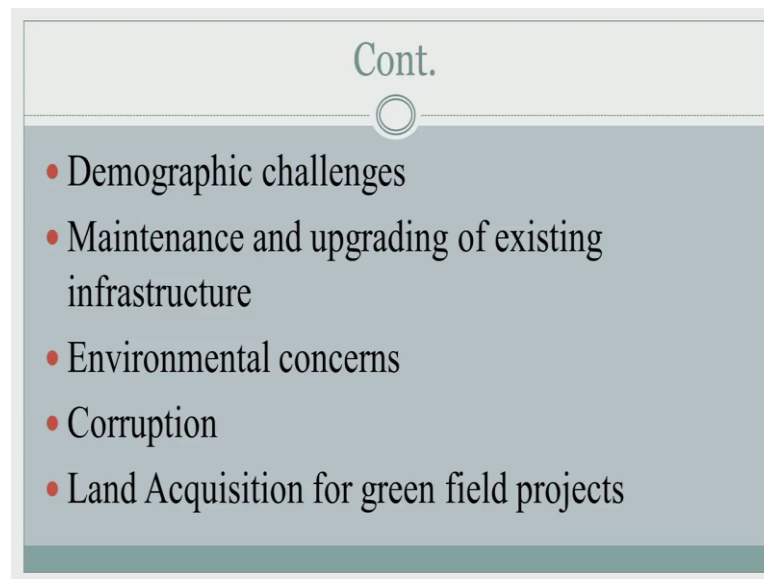
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- Infrastructure investment gap (financing gap)
- Inadequate and weak regulatory framework
- Sustainability of business-models of infrastructure development
- Limited public finances (social security burden and others)

Such as the one of the major challenge which we are going to discuss is the infrastructure investment gap, which is also named as the financial gap in infrastructure development. At the same time, inadequate and weak regulatory framework in many countries, sustainability of business models for infrastructure development, limited support from the government, because of various other social responsibility which various government is having today.

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- Demographic challenges
- Maintenance and upgrading of existing infrastructure
- Environmental concerns
- Corruption
- Land Acquisition for green field projects

At the same time, demographic challenge in the field of infrastructure, maintenance and upgrading of infrastructure, environmental issues related to the infrastructure development, corruption and land acquisition.

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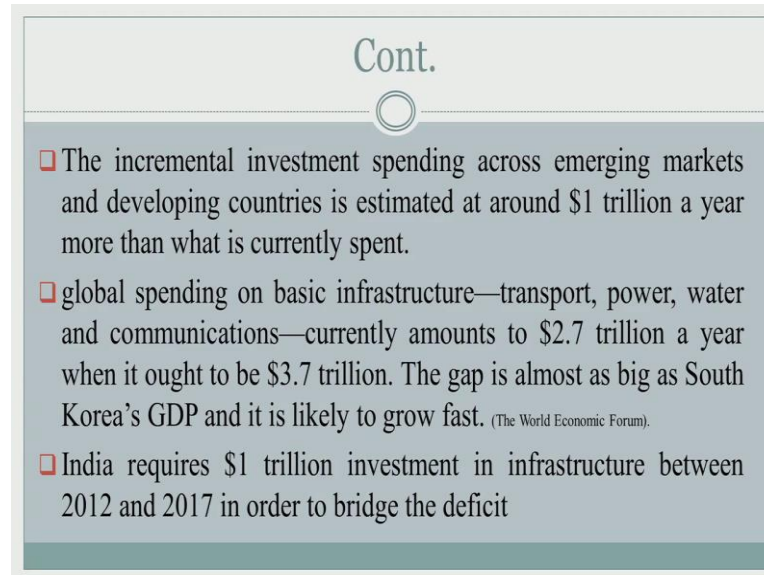
Infrastructure investment gap

- ❑ The global investment shortfall in infrastructure is estimated to be at least US\$ 1 trillion per annum
- ❑ Global demand for the funding of infrastructure investments is expected to reach as much as \$57 trillion by 2030
- ❑ Africa faces a finance gap of approx \$35bn/year. This includes taking into account the potential for efficiency improvements (as much as \$20bn). This gap could double in the coming decade due to growth, as well as limited public funding and lack of private capital.

So, let me start with the first discussion, which is the first part of the challenge, which is the infrastructure investment gap. If one can see here the different statistics related to the investment gap, the global investments shortfall in infrastructure is currently estimated to be at least 1 trillion US dollar per annum. Global demand for the funding of infrastructure investment is expected to reach as much as 57 trillion by 2013. Africa alone is facing a financial gap of infrastructure development which is approximately 35

billion dollar per year. This includes taking into account the potential for efficiency improvement. This gap could double in the coming decade due to the growth as well as limited public finance funding and the lack of private capital.

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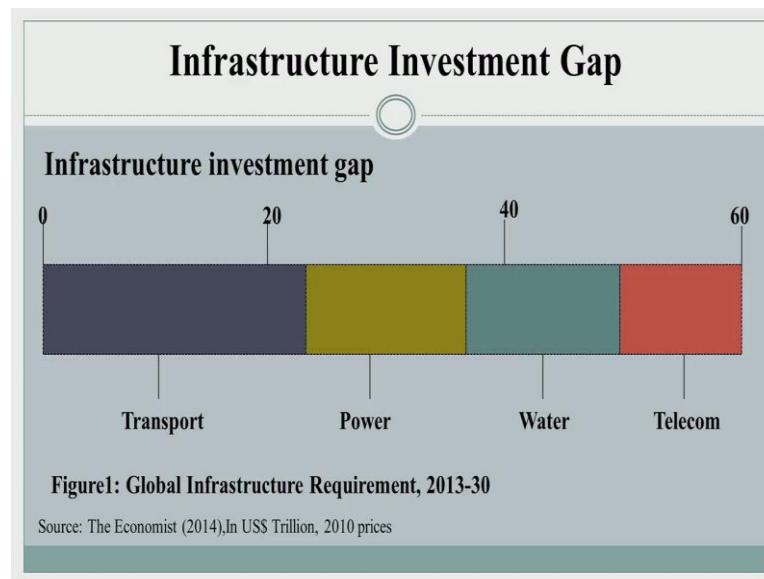


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- ❑ The incremental investment spending across emerging markets and developing countries is estimated at around \$1 trillion a year more than what is currently spent.
- ❑ global spending on basic infrastructure—transport, power, water and communications—currently amounts to \$2.7 trillion a year when it ought to be \$3.7 trillion. The gap is almost as big as South Korea’s GDP and it is likely to grow fast. (The World Economic Forum).
- ❑ India requires \$1 trillion investment in infrastructure between 2012 and 2017 in order to bridge the deficit

Similarly, the incremental investment spending across emerging markets and developing countries is estimated at around 1 trillion a year, more than what is currently spent. Global spending on basic infrastructures such as transport, power, water and communication which currently amounts to 2.7 trillion a year, when it ought to be 3.7 trillion. The gap is almost as big as South Korea’s GDP and it is likely to grow faster and faster. India alone requires 1 trillion dollar investment in infrastructure between 2012 to 2017, in order to bridge the deficit.

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So, here one can see that there is a gap of around 60 trillion US dollar only for four items transport, power, water and telecom in the, during 2013 to 30.

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### Inadequate Regulation

- The legal and regulatory framework that exists within a country is a critical
- Private participants needs fair and competitive process in their investments

The second challenge is the challenge related to the regulation, inadequate, legal and regulatory framework that exists within a country is a critical issue for the infrastructure development. There are many country in the world today, where the infrastructure development is taken care by without any proper regulation and legal framework. For example, the contracts are signed between the government agencies and the private parties, but there are very less agencies to follow those contracts and to really regulate the day to day development of infrastructure, development infrastructure projects going

on.

And at the same time, whenever investment is coming to the infrastructure sector in terms of FDI or in terms of public private partnership, the demand for the fair and competitive process is by those investors. Because when investor wants to join the hand in any country developing and least developed, they want to really get certain return on their investment and that return is not possible, if the market or if the economy is not providing a very fair conditions for them to compete. And that is really one of the major challenge for various infrastructure projects, ongoing projects in the world today.

Funding agencies are really concerned about the investment, they want to be completed the project on time, different agencies working for those projects or different project agencies firms in the infrastructure development, they try to have a maximum number of project completion on time. But, at the same time due to the local protest, due to the unfair practices in the economy, due to the highly non competitive atmosphere in the economy, some of the projects are really not in the position to complete on time.

And as we have understood that more we are prolonging the project of infrastructure development, more we are adding the cost of the project. Because, whatever contract is signed between the firm and the government agencies for the infrastructure development is basically on the calculation of the current cost, which firms are really calculating to the target year of completion.

But, when projects are delayed, the costs of productions are not going to continue on the previous price, costs of productions are going to increase. And with this increase the firms, infrastructure firms are having a really a very, very challenging time, very difficult time to control. And this is happening, because of a very weak regulatory framework in developing and least developed countries.

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### Inadequate Regulation

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**Table 1: Meta-Principles for Infrastructure Regulatory System**

Sr. No.	Principles	Explanation
1	Credibility	Investors must have the confidence that the regulatory system will honor its commitments
2	Legitimacy	Consumers must be convinced from the regulatory system that it will protect them from monopoly power, either through high prices or poor service, or both
3	Transparency	The regulatory system must operate in a transparent way, that investors as well as consumers 'know the terms of deal'

Source: The World Bank (2006)

So, the regulatory framework can be divided as the credibility, legitimacy and transparency. So, when the government in least developed countries and developing countries has to find out the transparency in the dealing, when they are going for the auction, when they are really going for the bidding, when they are really allowing the companies to join the hand in the infrastructure projects. There are certain examples in the world today, which shows that these government agencies are lacking in terms of transparency and they lose their credibility as a government, government has a major responsibility to provide a level playing field and to provide a very competitive atmosphere.

But, if government is involved in rent seeking behavior, if government is really involve in nepotism and corruption, then in that case the whole purpose of regulation of the infrastructure projects or the entire process of government being a supporter or being a promoter or being a guardian of that project is mistaken. And in such case, the firms who wish to join the country for the infrastructure development, they are really having a very bad time and they are on back foot in the infrastructure development. The second major challenge is basically the challenge in terms of what business model should be adopted for the infrastructure development.

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**Sustainability of Business-models of Infrastructure development**

- Effective planning
- Public Finance
- Models to finance the projects
- Feasibility of the Projects
- Risks Identification

*Australia has enforced a number of green-field toll road projects under a DBFO (Design-Build-Finance - Operate) model with the private sector taking demand and revenue risk. There have been a number of high profile project failures early on in the contract terms, primarily driven by actual traffic numbers being well below what was forecast at the time of the bids.*

Given the condition of least developed countries and developing countries today, it is indeed important and very difficult and challenging task for the infrastructure companies to have the effective planning. Whatever they have, whatever some of the firms are taking lessons from a country, it is not true that that lesson is going to give them a better result in some other country. Because, country to country social problems are different, county to country problems related to raw materials are different, country to country the issues and concern of the government is different.

The functioning of the government is different in different country and that way, it is really difficult for the firms to find out that what business model, what really the effective planning should be adopted for the infrastructure development. The second point of the business model which infrastructure companies are really finding as one of the challenge is, what type of public support, what type of public finance they will get from the government.

Because, we are finding that today government is not really 100 percent partner in majority of the projects, government is a very silent partner or one can say that government is a partial partner in the infrastructure development projects, not the whole partner. Because of the lack of the investment capacity of the government, because of the lack of revenues generated by the government and the many upcoming responsibilities of the government which they have to really take care for the welfare.

And one more point is the many social infrastructure development projects are basically

taken care with the government supports. So, government has to also finance those infrastructure projects. So, in that case when the firms has to decide about the business model, they are really confused and they are really having a challenging conditions to find out what public finance mechanism they will be adopting. At the same time, what models to finance the projects even they are looking for only the private partnership and majority of the private firms or maybe, they are having a consortium of firms, they are really not in the position to find out what mechanism they have to adopt.

Because, when varieties of private firms are coming together, there are again the matter of returns to interest, return on that investment and that way a proper finding of the suitability and sustainability of business model is again one of the real challenge. At the same time, feasibility study of the projects are being done, but the feasibility study of the projects are really how honest, how sincere that again makes the business model to be adopted without any risk.

One of the major challenges for the business model of infrastructure projects today is the risk identification, there are certain risk which is basically seen risk, which is basically non risk, but there are certain risk which is unseen and unknown. So, in case of such problem, when you have unknown risk available in the market. For example, what condition of the labour will be there in the society, whether the labour will be supportive or not, what type of political interference will be available in different part of the world, some of the companies, some of the firms, are not aware.

And even if they are taking lessons from the previous examples, previous infrastructure projects, that is not going to really help them in the new projects. Because, new projects is in a new place and local problems are not really, not some time really clear to them and in that case, whether it is social protest or may be the political interference or may be the financial gap or may be in terms of the risk related to the partners of the projects.

It is really difficult to identify those issues quickly by these infrastructure firms and sustainability of business models of infrastructure development is really one of the major challenge in that case. The second most important challenge not only in one country, but across the country which we are finding today is the public finance.



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Because, the government is really taking care of various other social responsibility as a part of the welfare concern and the promise to the public and at the same time, there are budget constraint of the government, government cannot really do all the activities which they were doing and they were involve in the past. But, they have to really target their expenditure and when they are targeting their expenditures, the major concern for many developers, infrastructure developers today is how to have a proper coordination with the government finance.

And that way, some of the governments are rich, some of the governments are poor, majority of the least developed countries, governments are not in the position to support such big infrastructure projects. And at the same time, in developing countries governments are also involve in varieties of other social infrastructure activities and providing public goods to the public.

So, in that case there is a really a big challenge for the infrastructure companies to find out what new ways of public finance and what new support from the government they can get it. At the same time, what will be the alternative sources of financing such as pension funds and endowment funds and the insurance companies? So, even if those alternative sources if a firm has to find out, they have to again see the government policy and the public finance mechanism.

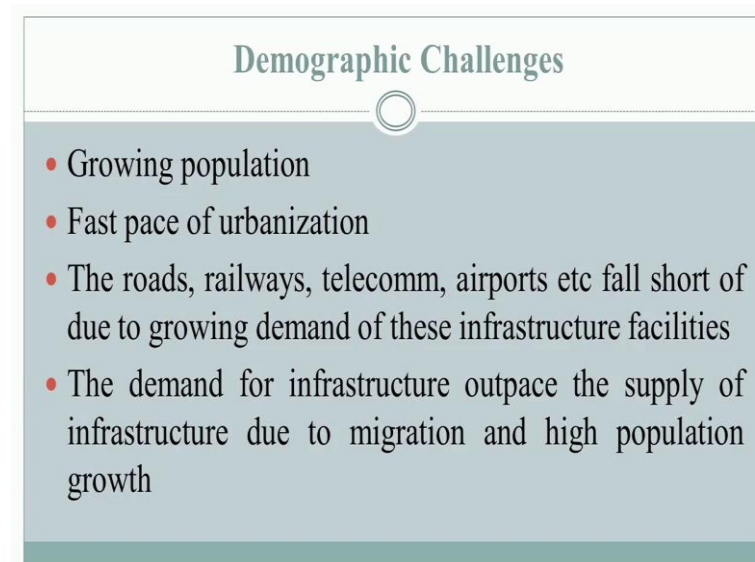
So, in such case also it is again the matter of public finance, it is again the matter of government decisions that how they are really supporting the development of

infrastructure projects in the country. At the same time, risk sharing model, infrastructure projects as we have discussed that it is a risky project. So, whether government is ready to share the risk only in terms of policy or whether they are also able to share the risk in terms of financial or maybe the social or may be in the field.

If government is really sincere, majority of the government, some of the examples are very good examples from Eastern European countries, where the government is sharing the risk not only at one level, but at various level and that really shows the government concerns in infrastructure development. It is the part of the public policy or one can say the public finance, when it comes for the risk sharing financial burden, risk sharing financial models.

But, when it is basically public finance it is not only the matter of finance, but also the government policy which makes finance ready and some time not ready. So, if public finance is really liberal, that can really support or that can really attract the multilateral development banks to join the country. If public finance is really inward looking, really controlled then they will not really look for the multilateral development agencies and banks to support the infrastructure projects.

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The slide features a title 'Demographic Challenges' in a teal font at the top center, with a small circular icon below it. The main content is a list of four bullet points on a light blue background. The first two points are 'Growing population' and 'Fast pace of urbanization'. The third point is 'The roads, railways, telecomm, airports etc fall short of due to growing demand of these infrastructure facilities'. The fourth point is 'The demand for infrastructure outpace the supply of infrastructure due to migration and high population growth'.

- Growing population
- Fast pace of urbanization
- The roads, railways, telecomm, airports etc fall short of due to growing demand of these infrastructure facilities
- The demand for infrastructure outpace the supply of infrastructure due to migration and high population growth

One of the another challenge is the demographic challenge with the growing population in least developed countries and developing countries, we are also finding there is a fast pace of urbanization in these economies. And in such a situation you need more roads, you need better railway facility, more expansion of the railways, telecommunication,

airports, etc. and that is always shortage of these items even if roads are being constructed, but it is not really maintained properly.

So, the roads which are constructed after 4 years of 5 years that is not in the position to really give you a matter of happiness. And even if the railway lines are expanded, but it is not true that, that railway lines or expanded and that is not really having the over crowd conditions. So, you are the government is really developing some of these facilities, but these facilities are really fall short of the growing demand of these infrastructure facilities, because ultimately you have huge pressure from the population growth.

Similarly, the telecom facility which the towers and the other internet facility, which is being provided in many developing countries is not up to the mark, is not really able to fulfill the requirement of the people. Because, everybody is not having the capacity to buy those products, infrastructure products such as telecommunication and internet are not the products which everybody can afford. For affording those products also people should have the income and ability to buy it.

So, again the question of who will pay for it that comes the question of payment and that is really important. Because, there are certain facilities which cannot be available free for to the public, it has to be paid by the public. So, when it comes for the payment everybody is not in the position to pay for it, at the same time in every society we are finding the problems of free riding, people wants to have these facilities free and majority of the infrastructure products, infrastructure development is finding the problem of public goods, as we have discussed in our previous lectures.

That if people do want to use it freely, if people do want to consume such products freely that is again the problem for the government or for the developer or the infrastructure companies to have their, to continue with the profit. Because, if the nonpayment problem will starts, if the people do not want to pay for the flyovers for other facilities, then who will pay for it that is the biggest question for the infrastructure companies.

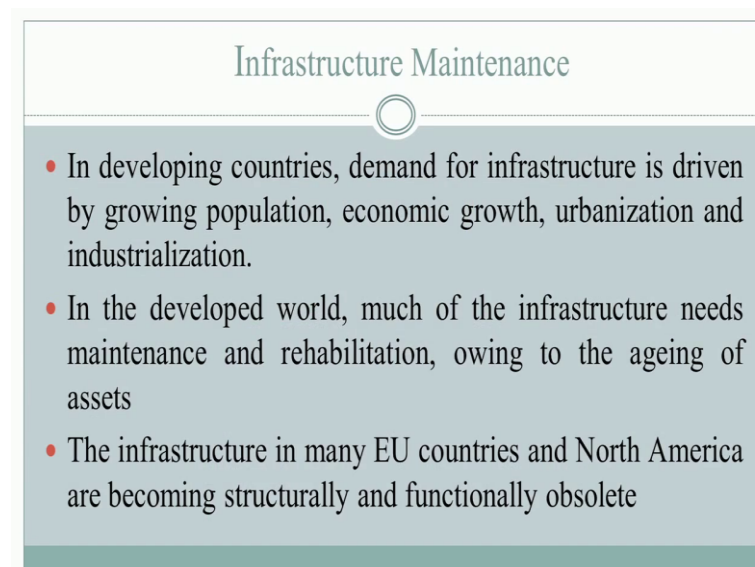
How it will be maintained? How it will be gaining firms? How the firms will gain from it? That is again one of the challenges and this is happening because of the demographic pressure, the country which is having more demographic pressure, they are really finding a difficulty to maintain the infrastructure facilities. At the same time not only maintaining, but again fulfilling the requirements of the infrastructure with growth of the

population.

And so one challenge is to provide the infrastructure, another challenge is to maintain the infrastructure and third challenge is to stop the free riding problem, especially in majority of the populated country is facing such problems. So, the demand for infrastructure outpace the supply of infrastructure, due to the migration and high population growth and that is the reality of the world today that majority of the activities by the infrastructure firms are basically outpace the supply of the infrastructure. Because, the constant growth in the population and the demand and the migration and urbanization.

As we have also discussed in case of maintenance in developing country, demand for infrastructure is driven by the growing population and that too by the young population and by the economic growth process and urbanization and industrialization. More we are industrializing, more we need infrastructure, more we are urbanizing we need more infrastructure, more we are migrating from rural to urban path we need more infrastructure. But, the fact is that, in many countries there is not any ready infrastructure, in many country there are certain ready infrastructure. But, at the same time it is not really easy to maintain those infrastructure. The condition is little different in developed countries.

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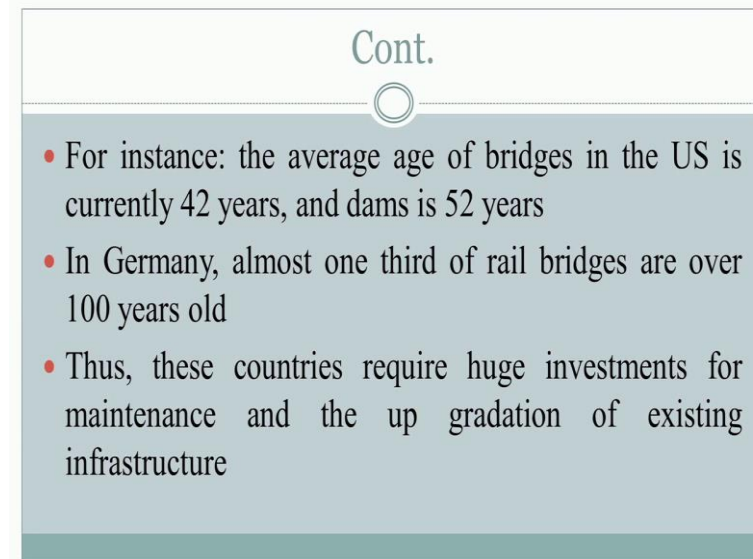
### Infrastructure Maintenance

- In developing countries, demand for infrastructure is driven by growing population, economic growth, urbanization and industrialization.
- In the developed world, much of the infrastructure needs maintenance and rehabilitation, owing to the ageing of assets
- The infrastructure in many EU countries and North America are becoming structurally and functionally obsolete

Because, in developed countries much of the infrastructure needs maintenance and rehabilitation, because of the ageing of the assets, the infrastructure in many European

countries and North America are becoming functionally not viable and it requires change.

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- For instance: the average age of bridges in the US is currently 42 years, and dams is 52 years
- In Germany, almost one third of rail bridges are over 100 years old
- Thus, these countries require huge investments for maintenance and the up gradation of existing infrastructure

For instance, the average of bridges in US is currently 42 years and dams is 52 years. So, these developed economies are also facing problem in terms of changing those infrastructure and having building the new infrastructures. In Germany almost one third of rail bridges are over 100 years old, because they were developed long time back. I have personally seen in Poland more recently in October last year that they are really having the new railway stations coming building up, because they were really old very old.

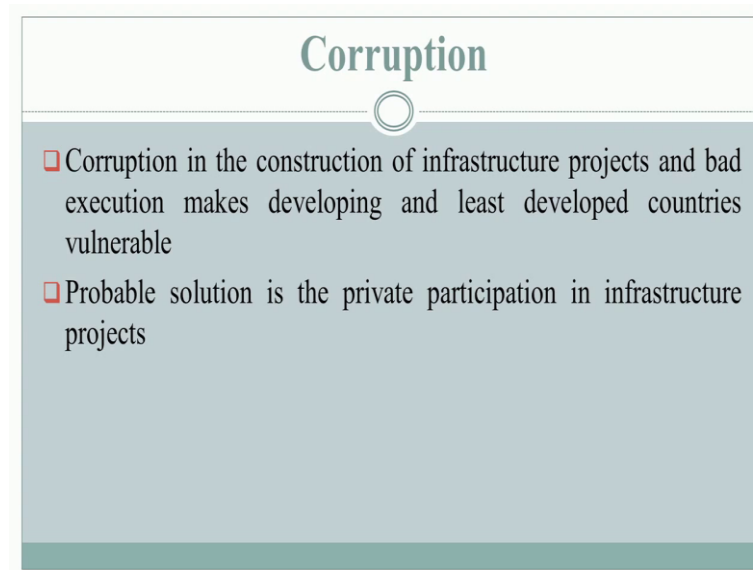
So, with the support of European Union they are doing it, road construction are also on peak, because Poland was not the part of European Union for many years, and when they became the part of European Union they have started really supporting the European Union has started supporting the Poland and that way there are new roads coming up, new flyovers coming up, new bridges coming up. Because the old bridge and roads were not in the position to really sustain the current population growth and fast economic growth process of that particular economy.

So, these economies, these countries required huge investment for maintenance, not the maintenance of infrastructure is the major problem of the developed country, while the establishment of the infrastructure is a major challenge for the developing country. So, in developed country they require huge investment for maintenance and upgradation of

existing infrastructure, while the developing and least developed country requires huge investment, not only for the existing infrastructure maintenance, but also to have the new infrastructure added in the economy.

Otherwise, with the huge population, urbanization, migration it will be really difficult to continue to take care of the infrastructure requirement of those population. One of the challenge which majority of the country is facing today in terms of infrastructure development is the corruption.

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As we have seen that because of the lack of regularity mechanism as it is observed by the different reports by the World Bank that whenever these developing countries are receiving the funds and when they are really practicing the establishment of infrastructure projects, there are so many illegal and one can say that unfair practice involved in the infrastructure development. And that has the support from the government. Because, majority of the government officials; a very famous book which was published by the World Bank is 'Bureaucrats in Business' which has find out that in more than 15 countries, how government mechanism is creating problem for the growth of the business.

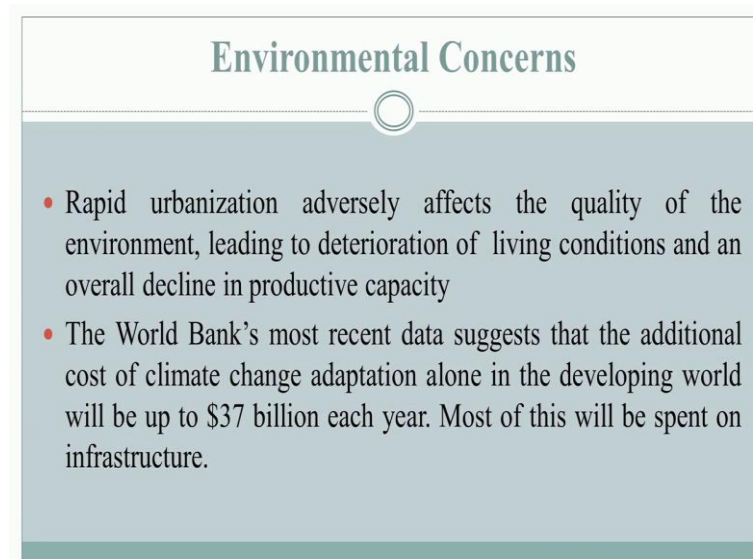
And if we have a very fair government mechanism, we have much better possibilities and much better opportunity to get the better infrastructure. But, if we have corruption involved in the decision making at the government level, because in majority of the projects government is a partner, in some of the projects government is a final regulator.

So, in that case we cannot really ignore the government, infrastructure development cannot be fulfilled without the support from the government.

And when infrastructure projects are going on firm has to depend on the government support and when they are asking for the government's support or even if without support also at the initial level of bidding or initial level of contract signing if things are not fair then in that case possibilities of building up a new infrastructure or better infrastructure is really dark. So, probable solution is to come up with such problem is to have better private participation in infrastructure projects with a fair and very competitive practice.

But, it is not happening, because infrastructure projects are having the merits one of the merit is it is having the long period of time to complete at the same time it involves the government directly and the third is it cannot ignore the interference of the regulatory, so call regulatory mechanism which too play a very dual role in terms of supporting the infrastructure. But, at the same time supporting their own interest which is consider as the rent seeking approach in the infrastructure development. One major concern for or one major challenge for the infrastructure development is the environmental concern today.

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### Environmental Concerns

- Rapid urbanization adversely affects the quality of the environment, leading to deterioration of living conditions and an overall decline in productive capacity
- The World Bank's most recent data suggests that the additional cost of climate change adaptation alone in the developing world will be up to \$37 billion each year. Most of this will be spent on infrastructure.

Rapid urbanization is really affecting the quality of the environment, leading to the distortion of the living conditions and overall decline in the productive capacity in many country in the world today. So, the World Bank most recent data suggests that the

additional cost of climate change adaptation alone in the developing world will be up to 37 billion dollar each year most of this will be spent on infrastructure.

So, that shows that how if a country has to really take care of the environmental aspect of the infrastructure development it is not so easy to again have the financial assistant for such climate change adoption, such climate change conditions which is on the way. And when we say infrastructure, it is not only for a year, but it is for the years which will continue and if we are not really taking care of such environmental concern at the initial level, then that is going to really lead us in a very uncomfortable environmental conditions in the future also.

So, there are certain recent improvement which we can see in the Nordic nations also in many other European countries, which has really taken care for the rivers which has really taken care for the city life. And even on the cost of better infrastructure and better investment in infrastructure they have not forgotten the responsibility of environmental concern.

And that way developing country and least developed country has many lessons to take from other countries, which has developed in infrastructure in their past. And even if they have developed their infrastructure in the past when it comes for the remodeling and restructure of those infrastructure. Today we are really concerned about the environmental impact of such concern, as such structural change and modernization. One of the major challenges which infrastructure development is facing today is the land acquisition.



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### Land Acquisition for Infrastructure

- One of the significant challenges in achieving the infrastructure development goal is the way land acquisition is done for infrastructure projects.
- Substantial difference between the compensation offered and the actual value of the land.
- The lack of an effective mechanism for land acquisition
- need for simplification and transparency in the land acquisition

Because, the significant challenge in achieving the infrastructure development goal is the way land acquisition is done for infrastructure projects. One can see today that how this Land Acquisition Act in India is being controversial and this is controversial, because of many reason and not only in India, but in many part of the world substantial difference between the compensation of award and the actual value of land is having a great difference and that difference makes the infrastructure project some time delayed, because people do not want to really lose their land.

But, at the same time when they are being offered some compensation that is due to the again further growth in that particular area in that economy, it is not as good as to lose the land, because losing land is basically losing the opportunity of agriculture production and livelihood. But, how fast they are getting a certain return on their loss that is also one of the issue in developing country to calculate and the lack of in effective mechanism of land acquisition is still continuing in these economies.

So, the simplification and transparency in the land acquisition is required today in main developing country and least developed country. And again we find out lots of unfair means and illegal practice involved in such activities. And we can simply say that these challenges, whatever challenges we have discussed today, these challenges are the challenges which is seen all over the world today, developed countries are having the challenge of maintenance. Developing countries are having the challenge of establishment of the infrastructure and the nonpayment many developed and least developed countries equally has seen the problem of rent seeking in the infrastructure

development.

And developing countries which are more concerned for the infrastructure development today with the support from those investment coming from international agencies and other partners. They have another challenge such as the environment concern and we find out that it is not so easy in terms of business modeling also or in terms of land acquisition also. It is not so easy that infrastructure projects which is being developed today in any part of the world is without any challenge.

The fact is that manufacturing a product is more easier job than the infrastructure products. So, we should not really forget that infrastructure development requires the support, not only from the government and not only from the investor, but also from the society and to make society ready for such support, it is indeed important to have the investment in the social infrastructure first. Again I would like to cite here the examples of newly industrialized nations, which has equally developed their social infrastructure as well as the physical infrastructure. Because, they cannot go alone and alone, but they have to go together- social infrastructure as well as the physical infrastructure.

Thank you.