

Infrastructure Planning and Management
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Introduction to Infrastructure and the Transportation Sector Part 1B

Ok so we want to continue on from where we left off yesterday. So the idea today is, we are going to talk about a few infrastructure sectors, build up a vocabulary.

We will talk little bit about what India is doing in infrastructure as a whole and we will talk a little bit about a couple of sectors ideally, you know on tap for today are transportation, power and telecom. We will see, if we can get through all three, great, otherwise, we will shift. You know, we will sort of just have whatever we have not discussed, in the next session. You will recall we talked about this yesterday, we said this is a measure of a country's infrastructure.

The x axis which in this case is paved roads per capita, so countries with better infrastructure, have more paved roads per capita or per million inhabitants. Countries with poorer infrastructure have less paved roads per capita. And this is a measure of a country's wealth. And what we said is, there is very nice correlation happening here, things are along the diagonal. And so infrastructure and economic growth are correlated. We do not know the direction of correlation. Perhaps richer countries have more money to spend on infrastructure, or perhaps countries that spend on infrastructure become richer, we are not quite sure but we know that they are linked.

In any case if the end goal is India should become a developed country, clearly at some point our infrastructure needs to step up. I mentioned briefly but I also want to touch about the fact that infrastructure essentially does two things. Infrastructure promotes economic growth, which is what we saw in the previous graph.

But side-by-side it also helps with more equitable, societal outcomes. So you can take any of these examples. You can take transportation. So if you have better transportation infrastructure, are you likely to have more economic growth?

And the answer is probably yes, you are likely to have more economic growth because, you know essentially you sell more. You might be essentially selling more produce faster. So now

I have transportation networks, I can manufacture something in Chennai. I can manufacture a car in Chennai and I can sell it anywhere in India. So I can cater to demand.

Earlier I might have had to geographically bind myself and say no, I can only supply to this area. But because I have wonderful transportation networks, I can actually achieve large scale economic growth. But at the same time, as we briefly mentioned yesterday, if you are a farmer, you are relying on transportation networks to get your produce to the market. If those transportation networks are bad and it takes a long time for your produce to get to the market. Then the chance of things spoiling and rotting in the process is higher.

And therefore the amount of money that you might earn is going to be lower. If I had really good transportation networks and all of my produce is able to get to market then it stands to reason that I would actually make money on everything I grow.

And therefore not only am I making more money from economic growth perspective, I am also achieving a poverty reduction kind of perspective.

In that sense I am able to generate wealth equitably not only to high ends of society. Some of those arguments are more, you know stark in water and sanitation. So we look at water and sanitation. We talked about this yesterday. A lot of diseases are water borne diseases. You and I fall ill by drinking poor quality water. Worst case, in your case you are going to miss a couple of classes, not the end of the world. In my case I am going to miss a couple of days of work, I have got enough leave; it is not the end of the world.

But if you are a daily laborer, if you are a daily wage earner, every day of work missed is income lost. And it is not as if you have a huge savings balance that you fall upon.

So by providing better quality water supply, where I give you a more potable water, less water borne disease infected water etc. If I can keep you healthy longer, that means you are going to go for work, go to work for a larger number of days in a year. Which means not only are you going to earn more, it is bit of a double whammy. Because you are actually spending less on medical fees, right which is where a lot of money goes. So you have again the providing good quality water and sanitation infrastructure, you have also the impact of poverty reduction.

Telecommunications is perhaps more on the economic growth side. We are able to do business much faster, energy, so I am not going to get into these now, because we will get into each of these sectors and we will unpack them a little bit. But what I want to point out is the thing that everyone talks about, infrastructure and GDP. And that was what we had on the previous slide.

You will always find these predictions. India needs to grow at 10 percent. India's GDP needs to grow at 10 percent because of its need to invest in infrastructure. That's, all of that is fine but we also have to understand that infrastructure is something that touches every one's lives.

And therefore it is also a way in which you reduce poverty, provide equitable access to services and generally make peoples' lives much better. So infrastructure fulfills these dual purposes which is why recall what we talked about yesterday in the last class. We want to talk about, we want to consider infrastructure not just as an asset but as a service, right, providing a service to people. Although few of you disagreed yesterday but by and large people sort of agree that world over and in India in particular we have some kind of an infrastructure crisis.

In developed countries and this includes countries like United States for instance. The United States built a lot of its infrastructure, roads for instance, you know right after World War II. That was the way in which they were trying to stimulate the economy after the war. They went in for a massive road-building program. Wonderful highways but those highways are now what? 70-80 years old, so lot of that infrastructure has starting to show signs of wear and tear. It is not functioning as well as it is even in developed countries. In developing countries some of that infrastructure is simply not there. We are still talking about needing to connect 100 percent of Indian citizens with basic sanitation facilities etc. which are not there.

And these are the kinds of problems that you find, even in urban settings right you have places where there is no water, where people are having to rely only on water tankers that are highly expensive, not very regular; no power yesterday when we started off class there was no power. So that is a relatively common occurrence.

And it does not have to be only in rural areas. Roads, lots of potholes, lots of wear and tear on several, several roads, too much traffic which again causes all kind of congestion-related issues and all of that. And so the point is, it is of course not all doom and gloom.

So these days there are wonderful roads available in all parts of the country. We have, and we will talk about it now. We have gone through a national highways development program and we have started laying roads. Clearly our energy infrastructure is far more robust today. We are generating far more energy now than we did earlier. And now, some of that energy is coming from alternative sources like solar. We have got much better in managing that energy and not losing a lot of it.

So it is not all doom and gloom. But the fact of the matter is when you step outside you are hit with congestion, you are hit with poor quality water, you are hit with power cuts all of that. And question is why can't we eliminate all of this? Because if we do according to what we have seen, the country will grow faster and people will be a lot happier, right.

So this is essentially what we want to talk about. So let us start getting into infrastructure sectors. So we will talk about transportation, power, telecom but just before that, this is what we will do. We will sort of look at, is there a need for infrastructure in these sectors in India or have we built what we need to build? What are the kinds of schemes, projects etc that we are doing now and what are the key learnings, what are the performances, what is happening today?

Just get a sense of what's out there. This cannot be comprehensive. You guys can spend hours browsing through various government websites and gathering more information. This is meant to be a little bit indicative. But first, in your perception what is India doing?

With regards to infrastructure what have you heard about? What are we doing? Infrastructure in general, to start with.

(Professor – student conversation starts)

Student: We are trying to expand.

Professor: Yeah, so we are trying to expand infrastructure. What ways, what are we doing? Give me some specific examples.

Student: Smart cities.

Professor: Ok, so some people saying smart cities, good, smart cities.

Student: Government schemes.

Professor: So government schemes, what kinds of government schemes?

(student voice not clear)

Professor: Ok so there are electrification schemes, PMGSY, for those of you who do not know what PMGSY is, it is the Pradhan Mantri Gram Sadak Yojana. As the name implies Gram Sadak, it is more of the rural road kind of scheme. Somebody said Swacch Bharat; I will put that in as well, because that relates to waste and waste management which is part of infrastructure.

Student: Building of national corridors

Professor: National corridors, alright.

Student: Setting up of SEZ

Professor: National, sorry corridors

Student: Bharat Mala project

Professor: Bharat Mala, we will talk about these in a second.

Student: Mass housing

Professor: Mass housing. You guys are saying a lot of things. I may not capture everything.

Mass housing, what is that called?

Student: Awas Yojana

Professor: Right so there is the Awas Yojana, it used to be called the Rajiv Awas Yojana, now I think it is called the Pradhan Mantri Awas Yojana, correct, the Pradhan Mantri Awas Yojana.

There is also a scheme; Ok I have a few of these.

(Professor – student conversation ends)

So we are essentially creating a number of schemes. What do these schemes do? Somebody makes an announcement, Pradhan Mantri Awas Yojana, Pradhan Mantri Gram Sadak Yojana, Smart Cities. What do these things do? So what is a Smart City program or Smart City Mission as we call it? What does it do?

(Professor – student conversation starts)

(Student: audio not captured clearly)

Professor: That is the idea. So the idea behind smart cities is I want better planned cities, I want cities of tomorrow.

(Professor – student conversation ends)

But what does it do? How do we get there? So these are all initiatives that the government has come up with. And each initiative has a vision. So Pradhan Mantri Awas Yojana, since everyone needs to have a house. Gram Sadak Yojana says every village needs to be connected. Smart cities said, says all cities need to be cities of the future. So we say all of this. But what is, but beyond saying this, what does this scheme or the mission do?

(Professor – student conversation starts)

Student: They quantify the goals and then...

Professor: They quantify goals but that is academic. So I can quantify goals but what else?

Student: They provide employment for the people.

Professor: Do these schemes provide employment to people?

(response not clear)

Professor: So very directly, why are these schemes so appealing? So there are a couple of things that you guys have said just now which I think are critical.

(Professor – student conversation ends)

One is that, these schemes provide funding. One of the key things that most of these schemes do is they provide funding.

So smart cities, a number of cities have been selected and these cities are given a certain amount of money. We will talk about it when we get into the urban infrastructure sector in detail. And also a framework is established in terms of what you can do and what you should do. So in Smart Cities you can see a list of critical things that the cities must do and then beyond that, there are things that they can do depending on their bandwidth financing available etc. So essentially we are trying to do two things. Essentially, one is we are trying to increase funding on infrastructure.

Pradhan Mantri Awas Yojana, you guys didn't mention something called AMRUT, which is the Atal Mission for Rejuvenation and Urban Transport, urban Transformation which in some ways, is the second, you know level implementation of something that we used to call the Jawaharlal Nehru National Urban Renewal Mission. So we had JNNURM for a series of years, which provided funding for cities to upgrade their urban infrastructure and AMRUT does something quite similar.

Smart Cities, National Highway Development Program, Bharat Mala is part of the National Highway Development Program and there are many others. I have not listed these comprehensively. Funding is provided. In addition to funding, certain kinds of frameworks are provided. Some directives are provided and some other sort of perks or incentives are provided.

So we are trying to sort of decentralize, to say look, can various agencies, so Smart Cities, the Ministry of Urban Development is actually doing relatively little. We are trying to strengthen the cities and say, look I will give you guys money, you decide, what, how to build your Smart City.

Trying to improve transparency, inclusivity, encouraging private sector participation so we are trying to provide some guidelines, so that different players at different parts of the country can take this money and actually build better infrastructure, right. So what the Government of India is trying to do is actually set the rules of the game.

Set the rules of the game, give some funding and let various organizations, could be national highways, could be Corporation of Chennai, could be, you know the Public Works Department, who can then leverage and build infrastructure.

One of the things that we will come to repeatedly in this class is this, the private sector participation, PSP, some people call it PPP, public private partnerships etc and it is worth, I think spending a minute although we will discuss this in detail in the class. Just historically looking at the infrastructure story in India and why this is relevant, right. So clearly pre-Independence, a lot of the infrastructure was built by the British. There is a big debate. Some people say, oh the British built really good quality infrastructure, look at some of the drainage systems they built etc. If you are interested I will refer you to Shashi Tharoor's latest book Era of Darkness which if you have read it, he writes really well. But he makes the claim that yes, the British did build good infrastructure but the cost to India of that infrastructure was extraordinarily high.

So, yes they did build a railway system that we leverage now. They did build, urban sanitation networks that function, some of which function even today but the cost at which they built it, and the amount of money that went out of India for that was far, far higher than had we built it ourselves.

So, but it was still funded by the British and then after Independence we went through a period where we decided to nationalize a lot of what we were doing. So the Government essentially took control of a lot of the infrastructure development functions post-Independence. This was again on account of a number of reasons, again some really good books to read on these are Ramchandra Guha's India after Gandhi. Wonderful sort of book that traces what happened to India from 1947 till the early 2000s and he makes the argument that in 1947, when if you were in India at that time, and you looked around you've just come out of Independence. The world is in shambles, because World War II has just sort of finished. One of the reasons why the British moved away when they did, was also because they were impoverished, couldn't really run India in the aftermath of World War II.

So most of these developed countries are in terrible shape. In India of course we are also in very poor shape. We are a poor country. We have just received Independence. And there is a need to strategically think about how we go ahead and build the country going forward. And essentially there are roughly two options. One is to say let us get strong government support and let government build. And the other option is to say, let us start getting the private industry involved and let them build. When you look at the private industry option in 1947, it looks like a pretty poor option for two reasons. One is when you look across the world, everyone is in trouble. No one is jumping to come to your aid.

But secondly, the last time you let a private enterprise in, was in whatever, 1650 when the East India Company came in and we know what happened for the next 350, 80 odd years. And so again mentally you want to think twice about really giving control to the private sectors. So because of these reasons, essentially there was a decision that was taken to centralize a lot of the infrastructure production functions. And if you read Ramchandra Guha's book he talks about how the leading industrialists of the day made a representation to Nehru, Prime Minister at the time saying you should take over the infrastructure and a lot of the set of regulatory functions in India at the time.

And so while later on people come and say, we had this Sarkari Raj, License Raj this that, and all of that, it is important to note that at the time even the top industrialists went ahead with that view and said we want you guys to take the responsibility as government. So Government took responsibility, had a series of Five Year Plans which you probably familiar with through the Planning Commission which was alive until, relatively recently and started building. Now for a variety of reasons we entered into, again what is been termed this License Raj kind of mentality where in order to do something you would essentially have to procure a license from Government.

And so as somebody, you know once put it and I will try to get this right. You sold what you made. You did not necessarily make what you could sell. So the point is, if you have a license to manufacture car tires, then you can manufacture car tires the way you want, in whatever shape and people would have to buy them because there are no alternative car manufacturers, car tire manufacturers, right, because that's whole point of licensing. There aren't, there isn't that much competition in the economy. So essentially you sold what you made rather than the

other way around when you would say, these guys are making these kinds of tires with these kinds of materials. I need to sort of compete with them otherwise people will not buy my tires. So you had that kind of a system. So our economy grew at a rate of about 2 percent which is relatively low and in some circles it was also called the Hindu rate of growth, so the people used to refer to that as the Hindu rate of growth. And essentially said, look country like India that is all you can grow at, at 2 percent. So this continued essentially until 1991, at a time when Manmohan Singh was the Finance Minister and then we had a pretty bad economic crisis.

We actually had to default on some loans and that sort of brought things to a head, when we said look the economy can't really move on. So at that point we did something. I do not know if you guys know what this something is called?

(Professor – student conversation starts)

Student: Liberalization

Professor: Right we did something called liberalization, right exactly. Ok what is liberalization?

Student: Opening the market for foreign....

Professor: So, in very simple terms that is what it is.

(Professor – student conversation ends)

Liberalization essentially says, (it is not just foreign) it just says open up these kinds of markets. Let other people come in and provide. Let there be competition for all kinds of services, cars for instance, so you can have a number of car manufacturers come in and let them compete and citizens will then choose, which car they like best and that will incentivize people to innovate, incentivize people to drop cost.

Let's start getting more into the market economy; you know kind of mode of thinking. So liberalization was the first step towards that but what that did in relevance to this is when you extend that argument, the argument was Ok, fine car manufacturing can be opened up, etc. But what about infrastructure, right? And at some point, people at some fundamental level said, look infrastructure is basic. It needs to be provided by government.

But if you carry the liberalization logic forward people started asking the question, why can't infrastructure be opened to private players as well?

Because at the end of the day, it is a service. So why can't we have a number of people delivering that service and we as citizens pick the best person, right and vote with our feet. So private sector participation is something that arose as result of liberalization which I think is a key watershed moment in India's history in general but of course the history in infrastructure as well, and we will see ramifications of that today, in days passed and in days of the future as we go through this class.

So essentially that is what India is doing. We have liberalized. Part of liberalizing is we have allowed competition in, which hopefully helps more people come in and start making our infrastructure better competing with each other but we have also done a few things. We have started creating these kinds of schemes and we have started creating policies around these schemes that we hope will help improve infrastructure development, you know encouraging private participation is one such policy that we have sort of created.

So this is what the Government of India is doing, this is across sectors. It is not as if that we are only funding one sector allowing PPPs; we are doing it across sectors, so far so good.