

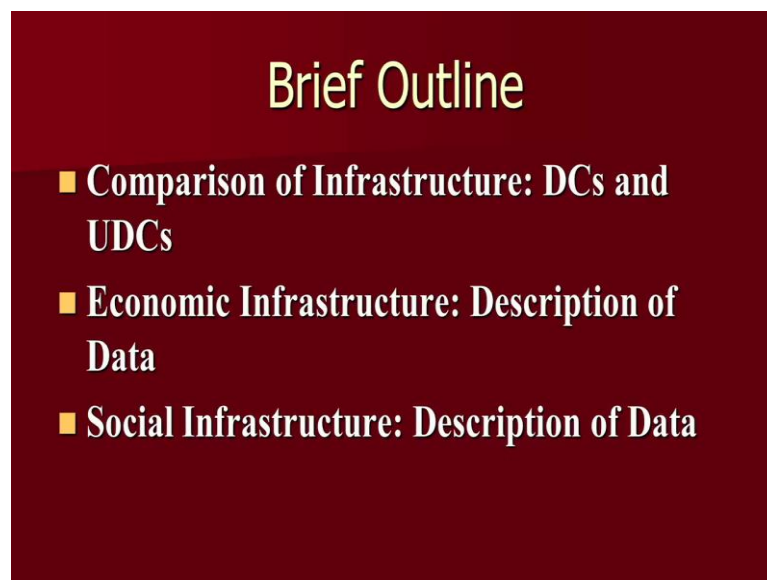
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**Module – 03**  
**Lecture - 09**  
**Infrastructure in Developing and Underdeveloped Economy**

In our previous discussion, we have seen that how newly industrialized countries have improved its infrastructure and how they are getting basically the return on their infrastructure investment today. Whatever they did during 1970s, now they are getting the return for those infrastructure development. Today, we will discuss that how infrastructure in developing and underdeveloped economy is not having the equal level of conditions.

We will find out through the description of data especially in the economic infrastructure sector and also in the social infrastructure sector, that how there is a huge gap between the developing and underdeveloped economy today. And based on that we will also see that how the new task and the unfinished task for the infrastructure development is on the way for developing and underdeveloped economy.

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**Brief Outline**

- **Comparison of Infrastructure: DCs and UDCs**
- **Economic Infrastructure: Description of Data**
- **Social Infrastructure: Description of Data**

Let me begin with the brief outline of this presentation as I have said, we will compare the infrastructure in developing country and underdeveloped economy or least developed economy. Also we will have the description of data in the economic infrastructure sector

and we will also try to find out some of the indicators of social sector, which will be further described.

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### Condition of Infrastructure: DCs and UDCs

Country	Global Rank
Hong Kong	1
Singapore	2
UAE	3
Netherlands	4
Switzerland	5
Japan	6
Germany	7
France	8
Spain	9
United Kingdom	10

Source: WEF (2014)

Country	Global Rank
India	87
China	46
Sri Lanka	75
Bangladesh	127
Pakistan	119

LDCs	Global Rank
Bhutan	92
Nepal	132
Yemen	142
Guinea	143
Chad	144

Source: WEF (2014)

Let me begin with what basically the condition of infrastructure between the developed country and underdeveloped economies there. In the left side of the table, one can see that how Hong Kong is again having the best rank in the world in terms of global infrastructure rank. Again the Singapore, United Arab of Emirates and Netherland and many other countries which has better understanding such as Japan, France, Spain United Kingdom.

So, these are the countries which has achieved its position out of 1 to 10 rank, but what about India, a country which is having the second largest population in the world today and what about China, which is having the largest population of the world today, what about Sri Lanka, Bangladesh, Pakistan. So, if you can see here in terms of global rank in infrastructure, India is on the position of 87, while the China is on the position of 46, Sri Lanka is on the position of 75, Bangladesh on 127 rank, while the Pakistan is on 119 rank.

Let me also see some other least developed countries, because these examples are from the developing one. If one can see here the Bhutan which has 92 rank, Nepal 132 rank, Yemen and other countries, which is for below from the rank of some of the developing country, which we have discussed today. So, what this shows? This shows that some of the newly industrialized economy and some of the developed countries are far ahead in

terms of infrastructure development compared to the developing country and at the same time, some of the developing countries are ahead from many least developed countries.

And so, we find out that world is not having the equal level of field in case of infrastructure and this basically gives us a different opportunity for economic growth and development in coming years also. In our previous example, yesterday we have seen that four different newly industrialized countries such as Hong Kong, Taiwan, Korea and Singapore has proved through its infrastructure development, that infrastructure is the key for the economic growth and success in the world.

And these four economies has achieved these benefits through the infrastructure growth and how they did it, they did it through the reform in the economic policy, they did it with the huge investment in infrastructure, they did it with the private participation in infrastructure, they did it with the help of a new model of industrialization and that is basically the outward looking industrialization model or the development model, which economist is pointing out.

But, why many developing countries are still not having a better rank in infrastructure development? Because, if we see or compare these developing country with some of the newly industrialized economy and some of the developed economy, we find out that many economy in south Asia including India, Pakistan, Bangladesh, Sri Lanka even China, they were having little late reform or even today they are not really having a full-fledged private partnership in all the sectors.

So, there are state run telecom services in these economies, we are finding that there are state run airways in these economies, we are finding that state run bus services are still there, railways are still managed by the government in these economies. And we do not find that the responsibility of infrastructure growth or infrastructure maintenance or infrastructure in telecommunication and transportation is not in complete hand of the private sector.

Because, these economies were having a previous background of government control, public sector was one of the huge area or public sector were taking the responsibility of industrialization and infrastructure development in these economies. In fact, for till 1991, it was nothing except to the government of India, which has taken care of largest part of infrastructure development. Similarly, in Bangladesh, till now Bangladesh Viman and

Bangladesh railway is run by the government.

Even in Pakistan, public sector was one of the prominent partner in infrastructure development and slowly after 1995-96 or by 2000, we are finding that there are certain areas, where government is coming out from the responsibility of development of infrastructure by their own means, but they are also finding the partners from the market. What about the least developed countries?

We can find out that least developed countries are not having enough resources in development and they have to depend on the resources from different international agencies, lending agencies and at the same time, bilateral agencies and the partners in their infrastructure projects. We are finding here that compared to developing country, least developed countries conditions are really bad, because they have still not a very good governance or they are not really having a good sense of maintaining those infrastructure or developing those infrastructure.

Because, it is not really difficult to produce the infrastructure, but it is also difficult to think about production of those infrastructures, especially least developed countries, because resources are not really in favor of developing those. So, major responsibility in least developed countries are in the hand of the International agencies such as World Bank in physical infrastructure sector or different agencies, which we have discussed in our previous presentations, that there are certain bilateral agencies, which helps in infrastructure development in these economies.

Similarly, in developing country also we need the partners from different part of the world and it is not really possible to help the, to bridge the gap of the infrastructure without, such support, because you need a new technology to develop the infrastructure, you need new investment to develop the infrastructure. And you need constant support in terms of advisory nature and in terms of maintaining those infrastructures also in future.

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So, let me just compare some of the statistics between few economies and through that we can really have a discussion that how some of the economies are far ahead from many developing and least developed countries. One can see here the number of airports; United States is again one of the top positions in terms of having the airports after that Russia and Mexico and Canada. But, one can see here the position of India, which is or the China, which is or South Africa, which is not as good as at the position of United States.

So, this is one of the indicator which shows that the difference between the developed and developing country. Why this difference is important to understand? Because, some of the developing country, especially India and China is having the huge population of the world, but what this huge population has achievement in terms of airports compared to the population, which US having or the France is having or the Russia is having or other countries are having. In terms of population, we are much bigger population in the world, but in terms of the facility we are not as good as many developed country.

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Railways			
Total Route Length (in km)			
Rank	Country	(km)	Year
1	United States	224,792	2007
2	Russia	87,157	2006
3	China	86,000	2008
4	<b>India</b>	<b>64,600</b>	<b>2012</b>
5	Canada	46,552	2008
6	Germany	41,981	2008
7	Australia	38,445	2008
8	Argentina	36,966	2008
9	France	29,640	2008
10	Brazil	28,538	2008
11	Japan	27,182	2009
12	Ukraine	21,619	2012
13	Italy	20,255	2008

Source: The World Fact Book CIA (2015)

Here in case of railways if you can see here, China and India is not as good as the United States. At the same time, if we can see the size of the population of Italy or France they are very less in term or Germany, their population is really less, but the difference between the railway length route compared to India and China is in terms of population we are not really as good as those smaller countries, where they have developed railway routes in much better way.

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Roadways			
Total Length of Road network (in km)			
Rank	Country	(km)	Year
1	United States	6,586,610	2012
2	<b>India</b>	<b>4,689,842</b>	<b>2013</b>
3	China	4,106,387	2011
4	Brazil	1,580,964	2010
5	Russia	1,283,387	2012
6	Japan	1,210,251	2010
7	Canada	1,042,300	2008
8	France	1,028,446	2010
9	Australia	823,217	2011
10	South Africa	747,014	2014
11	Spain	683,175	2011
12	Germany	645,000	2011
13	Sweden	579,564	2010

Source: The World Fact Book CIA (2015)

Apart from this, if we can see here the road networks in kilometers, again United States is in the top, is in a better position and India, China is still better. But, when it comes for the population, when it comes for the road network for the current population, it is not

good to say that we are better or we are equal to the developed one, because the developed countries are not really having a large population and urbanization going on, because they already reached the level of development in past.

So, they are just maintaining **their** development, but at the same time we have to achieve the new targets in development and these indicators are really showing us that we have to move ahead with the growing population and urbanization in our economy.

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Waterways			
Total Length of navigable rivers, canals and other inland bodies of water (in km)			
Rank	Country	(km)	Year
1	China	110,000	2011
2	Russia	102,000	2009
3	Brazil	50,000	2012
4	Vietnam	47,130	2011
5	United States	41,009	2012
6	Colombia	21,579	2012
7	Indonesia	21,579	2011
8	Congo	15,000	2011
<b>9</b>	<b>India</b>	<b>14,500</b>	<b>2012</b>
10	Burma	12,800	2011
11	Papua	11,000	2011
12	Argentina	11,000	2012

Source: The World Fact Book CIA (2015)

In terms of waterways also we are not really especially India, Argentina, Indonesia they have to have much better waterways facilities developed. Because, waterways is one of the way of transportation not only from today, but from the long history of civilization and the trade begins with waterways. And, so many countries are really good enough to catch this opportunity, Singapore is one of the economy in the world, which has huge transactions through the waterways and they earn a lot, a major part of the GDP comes from such activity.

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Communication		
Main lines in use compares the total number of main Telephone lines in use.		
Rank	Country	Telephones- main line in use.
1	China	278,860,000
2	United States	139,000,000
3	Japan	64,273,000
4	Germany	50,700,000
5	Brazil	44,300,000
6	Russia	42,900,000
7	France	39,290,000
8	Indonesia	37,983,000
9	United Kingdom	33,010,000
10	<b>India</b>	<b>31,080,000</b>
11	Korea, South	30,100,000
12	Iran	28,760,000

Source: The World Fact Book CIA (2015)

In terms of communication number of main telephone lines in use, that also indicates the way we have developed our communication system, currently country like South Korea, or if one can compare South Korea, United Kingdom and India. The telephone lines which is basically the main telephone lines in use, we have the equal statistics, but if we can compare this statistics with the current population of India, United kingdom and Indonesia, we are not really having the equal population.

So, that again shows that there are large number of population which is far away from main telephone lines or land line telephone connections. So, this is one of the indicator, where we can again find out that infrastructure developed in different part of the world is not equal and even in the communication sector we find out that there are difference in the case of infrastructure development.

Let me also discuss about with the cellular mobile telephone subscribers conditions in many country today. And we find out here in terms of number of total number of mobile cellular service provider service subscribers, China and India is again the second largest country in the world while the China is having much better performance in terms of cellular telephone and mobile services. United States, which is much less population populated country, than India is much better or one can say it is much better in terms of cellular subscribers conditions having the condition of the current population.

But, at the same time we have countries like Pakistan, Nigeria, Vietnam, which has to really work hard for the work hard to get more number of subscribers in the telephone



especially mobile cellular segment.

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Communication			
An internet host is a computer connected directly to the internet.			
Rank	Country	Internet Hosts	Year
1	United States	505,000,000	-
2	Japan	64453,000	2012
3	Brazil	26,557,000	2012
4	Italy	25,662,000	2012
5	China	20,602,000	2012
6	Germany	20,043,000	2012
7	France	17,266,000	2011
8	Australia	17,081,000	2012
9	Mexico	16,233,000	2013
10	Russia	14,865,000	2012
11	Netherlands	13,699,000	2012
12	Poland	13,265,000	2012

Source: The World Fact Book CIA (2015)

In terms of internet host, which is internet host is a computer connected directly to the internet. We again find the difference in terms of computer host in the developed country and developing country, one can see here the Poland, which is much lesser compared to the China and again United States is in a very better condition today.

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Communication			
Internet users compares the number of users within a country that access the internet.			
Rank	Country	Internet users	Year
1	China	389,000,000	2009
2	United States	245,000,000	2009
3	Japan	99,182,000	2009
4	Brazil	75,982,000	2009
5	Germany	65,125,000	2009
6	India	61,338,000	2009
7	United Kingdom	51,444,000	2009
8	France	45,262,000	2009
9	Russia	40,853,000	2009
10	Korea, South	39,400,000	2009
11	Mexico	31,020,000	2009

Source: The World Fact Book CIA (2015)

Again in terms of internet users, which is with a country that access the internet users compares the number of users within a country, and we are finding that a better statistics is not available in the populated country. But, better statistics China is the exception here,

but we find out the better statistics are available with Japan with United States with Germany, but not with India not with Mexico.

So, in case of number of internet users also some of many of the developing country and especially country like India, which is largest, second largest in the world is lagging behind in terms of internet users.

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## Social Infrastructure : Description of Data

Let me also discuss some of the social infrastructure, which some of the indicators of social infrastructure.

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### Education Expenditure

Education expenditures compares the public expenditure on education as percent of GDP

Rank	Country	% of GDP	Date of Information
1	Lesotho	13.00	2008
2	Cuba	12.80	2010
3	Marshall Islands	12.20	2003
4	Kiribati	12.00	2001
5	Botswana	9.50	2009
6	So Tome and Principe	9.50	2010
7	Timor- Leste	9.40	2011
8	Denmark	8.70	2009
9	Namibia	8.40	2010
10	Moldova	8.40	2012
11	Djidova	8.40	2007
<b>134</b>	<b>India</b>	<b>3.20</b>	<b>2011</b>

And we can also find out, that how our economy India are some other developing

economy and least developed economies are having the expenditure on education. Expenditure on education is compared to the public expenditure on education as a percentage of GDP and this is also one of the indicators to find out or to show that how sensitive a country is in terms of educating the people. Because, educating the people is not only an expenditure, but educating the people is basically an investment which will pay you a better return after some years.

And that has been proved by many is East Asian countries, that the investment on education and health is going to lead them in a much better human development index in the world today. So, if we can see here in this particular example, percentage of GDP education as a percentage of GDP in this rank, India in the 134 rank in the world in 2011 with the expenditure of 3.20 percent. So, that shows that as a part of the society infrastructure program education is one of the major pillars in the social infrastructure development.

And we are not as good as many smaller countries of the world, which are really having a better expenditure in education such as Cuba, 12 percent of the GDP is having 12 percent of the GDP is expended for having the expenditure on education. But, in comparison to if we will compare the population of Cuba and India, this percentage of the GDP on education shows that Cuba is more concerned for education than the Indian government, which is 3.2 percent of the GDP.

One can see here the Denmark, some of the Nordic Nations, Denmark is one of the most educated in terms of recent achievement in education. And we are finding, that how it happened, it happened because of the constant investment, this is little older data of 2009 and we find out that 8.70 percent of the GDP is on education. Similarly, some more countries like Botswana 9.5 percent and we have developed many developing countries can really take lessons from these economies, that how sensitive and how fast and how aggressive education, basically they are in their mind they are having in mind and that is why a huge percentage of GDP is being allotted for education.

So, this is one of the indicators which shows that many countries, many developed countries, many developing countries and least developing countries percentage are having the difference in terms of having the expenditure on education. And India is one of the countries, which is lagging behind in terms of percentage of GDP paid for the education.

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Birth Rate			
Birth rate compares the average annual number of births during a year per 1,000 persons in the population at mid year; also known as crude birth rate			
Rank	Country	Births/1000 population	Date of Information
1	Niger	46.12	2014
2	Mali	45.53	2014
3	Uganda	44.17	2014
4	Zambia	42.46	2014
71	Pakistan	23.19	2014
<b>86</b>	<b>India</b>	<b>19.89</b>	<b>2014</b>
129	United Arab Emirates	15.54	2014
150	United States	13.42	2014
219	Germany	8.42	2014
220	South Korea	8.26	2014
221	Singapore	8.10	2014
222	Japan	8.07	2014

One of the another indicator is the birth rate. Birth rate compares the average annual number of birth during a year. This also shows that, how good, how better position we are having in terms of, because birth rate is one of the rate, which also contributes in terms of growing the population. And our rank in terms of birth rate is 86, while the some of the African economics is having first rank Niger, Mali, Agenda, Zambia they are first second third fourth in the world in 2014.

So, these indicators are basically the indicators which shows that out of 1000 persons how much out of 1000, how much is the rate of birth of a child. And in developed country we find out that this percentage is little less compared to percentage of many African countries in fact, in Singapore it is five times lower in Japan it is again five time lower, then the some of the African countries, which is cited as the first ranker second and third and fourth in the world.

Even the Germany is having less birth rate, United States is having less birth rate, and this happened due to the contribution of educating the people and making them healthy and more if the life expectancy is very high, then there is a certain impact on the birth rate. Because, if population is educated, healthy, they can understand the living standard and they really work on reducing the birth rate if the population is not un healthy not educated, if the population is really uncertain about the survival of the child, in those economies we are finding the very high birth rate.

But, if the economy is certain about the child's health, their survival these economies are

really having lower birth rate and that way Singapore, Denmark, Germany, South Korea, Japan has proved that they are more serious about the child care, they are more serious about the education they are more serious about the sanitation, they are more serious about the well being of the new generation. So, in those economies we are finding the birth rate is really less compared to African economies.

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Death Rate			
Death rate compares the average annual number of deaths during a year per 1,000 population at midyear; also known as crude death rate.			
Rank	Country	Death Rate	Date of information
1	South Africa	17.49	2014
2	Ukraine	15.72	2014
3	Lesotho	14.91	2014
4	Chad	14.56	2014
10	Russia	13.83	2014
65	France	9.06	2014
90	Canada	8.31	2014
115	China	7.44	2014
<b>118</b>	<b>India</b>	<b>7.35</b>	<b>2014</b>
174	Bangladesh	5.64	2014
187	Malaysia	5.00	2014
209	Macau	4.10	2014
217	Singapore	3.42	2014
219	Saudi Arabia	3.33	2014

Now coming back to death rate, we can also see here again South Africa is having the highest death rate in the world, Ukraine is again very high. India has reduced its death rate, which is around 7.35 in 2014 compared to these African economies if you can see here the Singapore or the Malaysia that has really less than or around less than three times less than death rate in these economies.

And as we are constantly making the point that how education and health is really influencing these indicators, because if the economy is really having educated population, healthy population, and then they will certainly understand the meaning of health they will certainly understanding they will certainly knowing the fact that how small-small things is very important to maintain the health.

And for taking care of the child these educated population are much advanced and they really concern the really shows their concern for the kids and ultimately their expectations, their expectations for the birth of the child is also declining when the death rate is declining. Across the country we have also see that wherever there is high death rate we are also finding that there are high birth rate. Because, more child will not be

able to survive the parents are more certain about, more uncertain about the the child and then they are having more expectation for the more child.

Even in India there are certain states where the death rate is still very high and we are also finding that wherever there is high death rate, there is there are chances for the high, there are indications for the high birth rate. So, reducing death rate is again one of the major indicator, which also says which also shows that how death rate and birth rate influence each other and how the population growth is really influenced with these indicators and these rates.

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Children under age of 5 years underweight			
Children under the age of 5 years underweight gives the percent of children under five considered to be underweight. Underweight means weight-for-age is approximately 2 kg below for standard at age one, 3 kg below standard for ages two and three, and 4 kg below standard for ages four and five.			
Rank	Country	%	Date of Information
1	Timor-Leste	45.30	2010
<b>2</b>	<b>India</b>	<b>43.50</b>	<b>2006</b>
3	Yemen	43.10	2003
4	Niger	37.90	2012
5	Bangladesh	36.80	2011
6	Madagascar	36.80	2004
7	Eritrea	34.50	2002
8	Afghanistan	32.90	2004
9	Somalia	32.80	2006
10	South Sudan	32.50	2006
11	Pakistan	31.60	2013

Let me also see here the children under the age of 5, which is under weight that way India is the second in the world in 2000 it was in the 2006, but the still India's condition in terms of underweight kids is not very, not very improved. Because, this is again connected with connected with disease, connected with the child care if a child is weak a child is ill, they will not able to eat probably, they will not able to digest properly. And ultimately the poverty and the income level of the poor people who produces more child are not in the position to provide the kids more better food and better calorie.

So, ultimately there is a vicious circle of underweight children and once a child is under weight they will remain underweight for many years, because they will they will be badly affected by the diseases once they are badly affected by the diseases they will continue with that diseases for some time. Because, the parents are not having a proper income to really take care of them and due to this tendency this type of conditions in

society especially in developing country and also in economy of African economies and many Asian economies.

We find out that five years under weight kids are in a very large number and children's under the age of 5 years under weight gives the percentage of children considered to be underweight. It means that weight for age is approximately 2 kg below from the standard at age 1, 3 kg below standard for age 2 and 4 kg below standard as 4 at the age of 4 and 5.

So, that way India is and even the Pakistan in 2013 data if you can see here or the Niger, Bangladesh, these data's Yemen this shows that their conditions are not really not really good and these out of 1 to 10 countries, which is shown in the diagram shows that these economies are not really having better child care system. Recently, some of the some of the programs are initiated in a country like India, but still there are miles to cover for the underweight children in India in Pakistan and Bangladesh and in many economy.

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<b>Maternal Mortality Rate</b>			
<b>The Maternal mortality rate (MMR) is the annual number of female deaths per 100,000 live births from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes).</b>			
<b>Rank</b>	<b>Country</b>	<b>Deaths/1000,000 live births</b>	<b>Date of information</b>
1	South Sudan	2,054	2006
15	Zimbabwe	570	2010
22	Afghanistan	460	2010
44	Pakistan	260	2010
49	Bangladesh	240	2010
55	India	200	2010
147	Canada	12	2010
148	UK	12	2010
158	France	8	2010
164	Australia	7	2010
165	Germany	7	2010
171	Netherlands	6	2010

At the same time, maternal mortality rate- annual number of female deaths per lakhs births from any cause related to or aggravated by pregnancy or its management excluding accidental or incidental causes. We are finding here that again some of the African economy and Asian economy such as Afghanistan, Pakistan, Bangladesh, and India is one of the major country in the world.

And this also shows that not only not the level of health conditions are not only not only not only bad for the kids. But, equally bad for the mother, because low income group

people and the poor people are not in the position to provide a better calorie during the pregnancy even if certain supports from the government due to the low level of literacy and awareness they are not in the position to really concentrate on taking the iron and calcium pills on time.

And, because of this reason there is a iron deficiency and hemoglobin deficiency in the majority of the women during the pregnancy and this is one of the major cause of the maternal mortality rate in India, and also in many developing country and least developed country and when when the danger with the when the danger is for the mother the danger is also for the kids. And there are cases where mother is not able to survive and because of that the child is also not able to survive, infant is also not able to survive- this is very tragic fact.

In terms of our social infrastructure development number of hospitals are very less, number of nursing facilities, number of nurses are very less, the society is not really having proper social infrastructure in terms of health in many places of the world. And that is the big challenge for the current development of the world economy we have we have large number of manufacturing products to transported from one part to other part. But, at the same time we are not having large number of doctors available to every part of the world today.

And even the basic facilities are not available in many country for the pregnant lady and for the kids and that is one of the major task, which developing country, and least developed country has to take care with the support from various international agencies such as World Health Organization and UNICEF and other supporters like World Bank. So, with this discussion we can find out that there are indicators of physical as well as social infrastructure.



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## To sum up

Description of Indicators of Physical as well as social infrastructure show that Developing and least developed countries had improved the condition of Infrastructure development in certain areas but it will take years to fulfill the requirements of infrastructure for the current population.

Which show that developing and least developed countries had improved little bit in the condition of infrastructure development in certain areas such India has improved certain better conditions in the telecommunication sector in internet subscribers or mobile subscribers. But, when we see the data of the death rate when we see the date of birth rate when we see the statistics on underweight children, majority of the developing country including India and many least developed countries from Africa to Asia.

We find out that they have to really take care of different targets to fulfill the current requirement of infrastructure. Because, with the current growth of population and urbanization and also the facility not available in the rural part of majority of the developing and least developed country this is one of the big challenge for us to find out the ways how to come up from the such infrastructure gap.

And if these social infrastructure gaps and the physical infrastructure gaps are not really not really taken care, then the majority of the social problems will continue and that social problem the lack of social infrastructure and the physical infrastructure will remain keep us in developing and least developed stage of the society.

Thank you.