

地域的国際研究環境作りの点で、我々は欧米にかなりの遅れを取っているように思われる。

3. これからの共生的な地域間国際関係の進展は、これまでの国家、大企業レベルの機構的な国際関係とは違った、住民レベルの人間関係的な国際関係を一層必要として行くように思われる。それは各地域に根ざした特色を持ち、多様であり、顔をつき合わせた人間的信頼をベースにしたものであろう。そして、

この学会形成の土台ともなっている地域の研究活動自体が、これら地域間国際関係の重要な担い手であると共に、その新たな地域間国際関係そのものの究明がこの学会で論議さるべき重要な課題と云えるように思われる。従って、この学会は、地域主導の性格を持った国際的問題の学会という特色を持つことになろう。

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CURES Report

INFRASTRUCTURE IN ECONOMIC DEVELOPMENT

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For a developing economy, infrastructure plays a very important role in facilitating the growth of various sectors of the economy. There has been, till recently, an insufficient appreciation of the crucial nature of the part played by infrastructural aspects in the economic system. So it was entirely befitting that the World Bank devoted its 1994 issue of the World Development Report to the theme: 'Infrastructure for Development'.

What do we refer to as infrastructure in the economic sense? Basically we think of a). transportation and b). communication facilities and c). energy supply as constituting the essential infrastructure for industry in any economy. Other factors like water supply, waste disposal etc, can also be included under infrastructural facilities.

Industries that provide the infrastructural facilities have certain properties that set them apart from other industries. One,

infrastructure industries provide services and output that are directly necessary for most other sectors of the economy. Few industries can flourish without proper transport facilities enabling raw materials to flow to their factories and their finished products reaching the market. Fewer still can operate without power. Two, infrastructure industries need vast sums of capital to be developed. It is easy to see that the development of roads, dams, ports etc, consume large amounts of capital. A corollary of this is that it is the state which has been the investor in most countries in infrastructure industries. Thus, till very recently the state has been having monopoly control over infrastructure industries in a number of countries. Hence, with very little competition and being a government run service, losses and inefficiencies have not been infrequent in infrastructure industries.

THE JAPANESE EXPERIENCE:

The early identification of infrastructure industries as being vital to the modernization efforts of Japan is well known. Early in the Meiji period itself, the government showed interest in developing railroads, communications etc. A key player in the modernization of Japan is the energy industry. It is held that the spread of cheap electricity in pre-war Japan triggered off an industrial transformation which can be likened to the industrial revolution in the West. The electrical power industry got a fillip to grow in the boom years of World War I. Once this industry grew, it had strong beneficial effects on other industries.

The quantum of electricity produced rose sharply from 1920 onwards, thus supply was not a problem. But much more significantly the relative price of electricity, namely the electric power price compared to the coal price, fell dramatically between 1914 and 1935. Electric power price was over 2.5 times the coal price in 1914 and rapidly declined to just 1.5 times the coal price in 1920. This figure was 1.8 in 1925, 1.4 in 1930 and in 1935 it was just 0.95.

The rapid fall in the relative price of electricity along with its rising supply resulted in many industries switching over to electricity. The incentive came from the fact that the cost of power produced using electricity was only half the cost of steam generated power. By 1929, electrical motors were used in 87 percent of the factories. Electricity consumed by industry rose threefold between 1926 and 1936. Modern methods of production replaced traditional methods of production as foreign machinery driven by electricity was introduced. This led to rapid industrial growth during this period.

CURRENT SITUATION IN DEVELOPING COUNTRIES:

In the present day world, developing countries find that the long neglect of infrastructure is hampering their industrial growth and hence slowing down their modernization. In what follows, we confine our attention to India and China only. These two may not be true representatives of the developing countries, but what holds for these two can by and large be held as indicative of the situation of a large number of developing countries.

At present the population of India is over 7 times that of Japan and the land area of India about 8.7 times that of Japan. But in terms of paved roads the figure for Japan is higher (782,041 kms compared to 759,764 kms). The difference becomes very obvious when we use the indicator of road density which gives the kilometers of paved roads per million population. For India the figure for road density was 893 while for Japan it was 6007. Also the roads in good condition — namely roads substantially free of defects and requiring only routine maintenance — as a percentage of paved roads was a dismal 20 percent for India and over 85 percent for Japan. The low figure for roads in good condition in India is at least partially explained by the fact that there is tremendous overloading of trucks that use the roads. It is believed that when a truck carries double its permitted load, the roads wear out ten times faster than usual.

Historically India's railways have been relatively well developed compared to roads. Hence the economy was dependent on the railways network to a high degree in the past. In recent years the expansion of railway facilities has not kept pace with the burgeoning population. Further the recent

liberalization policies of the Indian government have acted to encourage industrial activity. So the movement of raw materials and finished goods will increase and this calls for rapid expansion of the goods carrying capacity of railways. The railroad tracks in India were over three times that in Japan (75,333 kms compared to 23,962 kms). The rail traffic—namely the sum of passenger—kilometers and ton—kilometers—was 144 kms per million dollars for Japan and a much larger 593 for India. However since the dependence on railways for the movement of goods and passengers is much larger in the case of India, the carrying capacity of the railways has to be rapidly increased.

One implication from the above is that there is going to be enormous amount of capital need. The upgrading and expansion of railways is going to be costly. The paving and upgrading of roads might prove to be costlier still as just about one—fifth of currently paved roads are in good repair. The movement of men and material is bound to increase further as economic activity grows and real income levels rise. The total number of passengers using the Indian railways in one year period is more than the entire population of the country. Thus one can get an idea of the absolute strain the transport sector will face in the near future.

Despite having a population over seven times that of Japan, India has about one—tenth the number of telephone lines. China with about 9.5 times the population of Japan, has about one—eighth the number of telephone lines. While Japan has about 441 lines per 1000 persons, India has just 6. Turning to energy, the production of electricity in India was just one third of

that produced in Japan. China produced about three—fourths that of Japan. The percentage of population with access to safe drinking water was 96 for Japan, 73 for India and 72 for China. While the data for China on roads and railways is not available, it is easy to imagine the huge infrastructural expenses they represent in upgrading and maintaining as her land area is over 25 times that of Japan.

In the power sector also huge investments are needed not only to increase capacity, but to upgrade the sector. The system losses in the power sector were 4 percent of the total output for Japan. Comparable figure for India was 19 and for China 15.¹ The Center for Monitoring the Indian Economy in its Monthly Review for May 1995 indicated that the power shortage in India is about 16 percent of the peak power demand. The capital costs involved in power, oil, gas, coal, pipelines and refining for the whole of Asia for just the 1990s is placed in excess of \$1 trillion.² Another estimate places the capital requirements of China alone for the years 1995—2004 in the areas of power, telecom, transport, water and sanitation at around \$744 billion.³

Another factor to be considered is that as the developing countries raise their standard of living, there is going to be explosive rises in the demand for energy. This is because of two factors. First, the basic industrial development is highly energy—intensive. Secondly, as income levels rise in developing countries more people are able to afford consumer durables that use up energy. For instance since 1978, the number of electric fans in China has increased twentyfold, and washing machines have grown from zero to 97 million. And in 1993 China increased its oil consumption by 11

percent. This had the effect of turning China, the sixth largest producer of oil in the world into an oil importer.⁴

IMPLICATIONS:

Our coverage of infrastructure in developing countries is very brief and sketchy, but certain implications and pointers for the future are inescapable. First, the developing countries have to do some quick innovative thinking to raise resources to meet the current and future infrastructural needs. The amounts involved are astronomical and already the initial euphoria that the Western bankers would rush to lend for the Asian infrastructure projects has vanished. Conventional ways of capital raising just can not cope with the quantum and type of capital required. Developing nations need to explore possibilities of capital-raising from not only the international sources, but also domestic avenues. The private sector in most developing nations has so far been kept out of the infrastructural projects.

Secondly, it is not going to be easy sailing. So many different services have to be enlarged or created simultaneously that there is bound to be mismatches and inefficiencies. In its rush to create power plants, China finds it does not have adequate railways and highways to transport the coal required for them from one part of its country to another. The easy option could be to import coal directly to the power plants!

Thirdly, there is no time to go slowly and steadily in infrastructure buildup. Japan was relatively luckier in that it started its modernization efforts well over a century back. Not only did it have time to proceed smoothly, there were not many others in the race. Now it is a mad scramble betwe-

en various Asian nations to compete for international finance for infrastructure. So one finds the terms offered to multinational corporations becoming better and better. The "demonstration effect" also ensures that no country can live as a recluse cut off from the rush for growth. All the more reason that the developing nations have to come up with very innovative and flexible policies and ideas.

FOOTNOTES

1. Figures for infrastructure have been computed using World Development Report 1994 : Infrastructure for Development (New York : Oxford University Press, Inc, 1994)
2. The Economist (London) June 18 1994.
3. The Far Eastern Economic Review April 6 1995.
4. The Economist (London) October 1 1994.

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