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### **Subject III**

## **Rural Infrastructure and Growth**

**Rapporteur: Vasant P. Gandhi\***

The discussion of the topic at the conference revealed the paramount importance of rural infrastructure investment and improvement in boosting the rural economy to a path of higher income and growth. However, discussion in the Group also addressed the need to determine the best strategy for rural infrastructure development for the country.

The impact of infrastructure on agricultural output was clear and substantial, but it changed over the years. On the whole, irrigation was found to be the most important, followed by roads, and then literacy. The analysis did not show electricity as equally important perhaps due to empirical difficulties. In the earlier years (1970s), roads and literacy showed greater impact. There would be a lag in the impact of infrastructure on output and this needs to be considered in modelling and estimation. There were also difficulties in using cross-section estimation for this, and in not taking care of technology, which was changing. It would be very useful if such analysis showed what kind of infrastructure investment made the largest impact on the rural economy. Lack of district wise data on relevant variables was a serious constraint to demonstrating and estimating the impacts.

The study of the impact of infrastructure on the food bowl of the Indo-Gangetic plain was discussed. Large interstate differences were found across the states in the status and development of infrastructure with Punjab at one end and Bihar at the other. Road and irrigation infrastructure were found to be the most important determinants. It was indicated that on the current growth path the state agricultural product may show a decline in the states of Bihar and Punjab, but an increase in Uttar Pradesh and West Bengal. Estimation problems affected some results and certain fundamental differences across states needed to be included in the analysis. There was a need to bring more infrastructure variables into the models and separate models were required to assess the impact on the intensity of land use, agricultural income, and poverty reduction. There was also a need to use the variable of electricity judiciously since some areas had very few tube wells to show an impact whereas others had a large number.

Major problems exist in finding adequate financing for infrastructure development. There is a massive need for very long duration funds for this and this

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\* Professor, Indian Institute of Management, Ahmedabad – 380 015.

ideally needs to be matched with very long duration financial resources. Sufficient resources of the right type were not available. Long-term finance sources such as life insurance and pension funds needs to be explored and developed. Sourcing of funds from abroad had its own limitation and difficulties, and particularly, a steady flow needs to be maintained. Funding on the pattern of the national highways programme adopted by the National Highway Authority of India based on a fuel cess is one alternative and is also being considered under RIDF funding of Bharat Nirman. Many approaches and innovations, including public-private partnerships, are required to address this issue.

A detailed study on the impact of roads on the agricultural economy was discussed. The study revealed that the construction of a good road substantially reduced the cost of cultivation, the transportation cost for inputs and outputs, as well as increased the price realised for the output, and the profits. These were visible, particularly, in a large number of vegetable crops. However, gains in productivity were not seen perhaps because of the short time span. There was also a need to examine the other impacts such as on various quality of life indicators, as well as the effects on the environment. Another study discussed the impact of road strengthening and widening in the rural areas and found substantial impact on many aspects including transportation cost, speed, comfort, education attendance, and employment opportunities in nearby areas. It was suggested that there is a need to reduce time and cost overruns through better planning and a toll or alternative mechanism needs to be found to raise funds for maintenance. This could also be done by including maintenance for a period in the initial contract. There was a need to improve the participation of local institutions and people in the creation and maintenance of the projects through proper institutionalisation and technical capacity building.

The great importance and large impact of water resource infrastructure and watershed development on rural growth and development was clearly demonstrated by a large number of studies. In this context, certain risks and negative impacts were also indicated. A study showed the link between dams and earthquakes which had the potential for causing immense devastation. This was especially so when dams were constructed on or near major geological faults and where the structures were not designed to withstand significant earthquakes. Dangers in the Deccan volcanic area, Narmada basin and Tehri dam areas were indicated. It was discussed that such dangers were not large for all locations and for smaller dam sizes and need to be evaluated along with the potential benefits.

The impact of a comprehensive infrastructure and development project in the northeast (upper and lower Assam valley) were evaluated in a study and discussed. Road infrastructure as well as large number of shallow tube wells were created under this and various development services improved. There was a significant shift towards high water using crops such as rice and other commercial crops and activities. Rice, fish and dairy production increased substantially but faced crashing

prices in the absence of market development. A large increase in income and employment was reported and was linked to better farm management and training.

The impact of marketing, storage and processing infrastructure was also discussed. As a result of the development of marketing arrangements and processing infrastructure, huge gains were seen not only for traditional crops but also for special commercial crops such as henna in arid Rajasthan which now produces 90 per cent of these crops. The impact and influence of storage infrastructure varied by location, especially where the marketing operation is scattered and public agencies are not operating, the demand for storage infrastructure is limited. Commission agents require storage for short periods of time but private sector investment in storage has not taken off despite government offers.

The impact of communication and IT infrastructure was well demonstrated and accepted but required more research in the Indian context to find ways to reduce costs and achieve greater impact. With respect to drinking water infrastructure, it was found that its development produced immediate benefits, and this was included by NABARD under RIDF.

The impact of research, extension and development services infrastructure were also discussed. A scheme for the promotion of farm mechanisation showed large impacts on improvement of timeliness of operations, reduction in time and labour, speed of operations, and efficiency of input use. This was also seen in sprinkler irrigation. However, there was over-investment in tractors in some areas such as Punjab, and sprinkler irrigation was often expensive and not financially viable. There was significant need and scope to assist the adoption of some of these technologies in various crops, including through combining different operations in a single equipment to improve the viability and impact.