CHAPTER-I

INFRASTRUCTURE

Definition

Economists such as Paul Rosentein-Rodan, Ragnar Nurkse & Albert Hirschman define Infrastructure as a "Social Over Head Capital". By definition it includes all those which are not directly productive activities but are necessary for productive activities like industries & agriculture. However it would not be fully appropriate to label entire infrastructure as directly non productive as some of them may prove to have extremely viable commercial proposition.

Source : Operation evaluation Department. It may be seen that infrastructure projects thus also can be viable commercial proposition.

But there are certain characteristics which would with varying degree apply to all the infrastructure services. Traditionally, infrastructure has been generally provided by the public sector, requiring high investment & economy of scale, resulting in monopolies, intermediate input characteristics, network effect & difficulties in recovery of cost. These characteristics would be generally accurate but distinctions must be made between urban, rural, trunk & feeders, fixed facilities & moving ones, level public participation local, provincial or central govt. agencies.

In general, the term infrastructure includes broadly three categories of services :

a) Public utilities including power, telecommunications, drinking water supply, sanitation and sewage, soiled waste collection and

sewage, soiled waste collection and disposal, gas supply & storage and ware housing.

b) Public works : such as roads, dams, canal works & tanks for irrigation & drainage.

c) Transport sector ; including roadways, railways, waterways, ports & airports.

Under the section 81/A of IT Act following have been categorized as infrastructure for tax concessions, Roads, highways, Bridges, Airports, Ports & Railway system are regarded as infrastructure & undertakings engaged in providing & or maintaining such infrastructure are entitled for tax holiday for five years and deduction of 30 of profit in the next five years. This facility can be availed in any 10 consecutive years out of initial fifteen years in which these commence operation. Similar tax benefits are available for undertakings in power generation & distribution, telecom services & setting up of industrial park. However, in the case of latter, the deduction in profit is available at the rate of 25 (30 for the Companies). This year the facilities are extended to power distribution & transmission lines, on or after 01.04.1999 but not later than 31.03.2003.Five year tax holiday on profit is also extended generation & distribution of power provided the profits are used for generation, distribution, & transmission of power. This takes effect from 1.4.2000.

The Finance ministry extends some other concessions to the infrastructure projects,

a) income tax credit for investments unto RS.70,000

b) increased limits on external commercial borrowings

c) concession import duties & port charges for project related imports

e) exemption from minimum alternate tax.

IMPORTANCE

Infrastructure can in affect the influence output through demand & supply. It can affect the supply of output by being direct output on production, making private capital or labor more productive, or enhancing in area's ability to produce by attracting workers or private capital from other regions. Infrastructure can create demand of total output by creating income for workers and entrepreneurs through.

FINANCIAL & FISCAL DIMENSIONS

The real financial & fiscal linkages which infrastructure has with the rest of the economy has Important policy implications, e.g. The effects of borrowing by public infrastructure enterprises can have effect on the availability of credit for private infrastructure. The fiscal linkages include deficits of public enterprises, subsidies, user charges & cost recovery. In addition they can be substitutes as between transport and telecommunications. Unfortunately, most evidence involves individual investments. Many of the Bank financed infrastructure have higher internal return than the Bank average.

URBANISATION:

Infrastructure could be key in determining whether a developing country becomes an urban society. This is a consequence of land use, concentration of economic activities/growth of transport. As per India Infrastructure Report, the availability of infrastructure facilities is imperative for the overall economic development. Infrastructure adequacy helps determine success in diversifying production, expanding trade, coping with population growth, reducing poverty & improving environment.

Many studies examining the link between aggregate infrastructure spending & GDP growth show very high return on time series analysis. However, the casually does the infrastructure investment cause growth or does infrastructure cause investment is not fully established. A strong association nevertheless exists between the availability of services such a telecommunication, power, paved roads, access to safe water and per capital GNP.

INDUSTRIAL GROWTH

The survey made by Business Today on the competitiveness of various Indian states in attracting investment by using 19 most important parameters from investors perception such a low and order, labor policies/various aspects of infrastructure etc. ranked physical infrastructure as the most important parameter followed by power availability & cost (pg. 95 of Business Today edition Dec 22, Jan 1997 IS given in table 1 of the thesis.)

TABLE 1

THE FUNDAMENTALS

Physical infrastructure	81%
Power availability & cost	61%
Quality of power	51%

THE ENABLERS

Quality of Administration	49%
Law & order	46%
Policy implementation	43%

THE ENHANCERS

State govt. support	43%
Work culture of the state	41%
Labour relations	38%

THE SUPPORTS

Social infrastructure	38%
Proximity to ports	36%

Proximity to markets	35%

THE AUXILLALES

Availability of raw material	33%
Presence of industrial zones	28%
Labour availability	23%

THE SUPPLIMENTARIES

Cost of labour	23%

Each state's score opn every parameter was calculated. And parameter rankings were awarded on the basis of these scores.

THE COMPUTATION:

To create a state score for a particular parameter, the state with the best performance was awarded a scrore of 1. And the worst received a score of 0. The rest of the states received scores depending on the extent of their deviation from the best and the worst. For instance, in the case of the Plant Load Factor (PLF) parameter, the best in class - Andhra Pradesh, with a PLF of 77.4 - received a score of 1. The worst performer - Bihar, with a PLF of 17.4 - received a score of 0. The difference between its PLF of 67 per cent and the worst performer was computed; which worked out to 42.6 (67-17.4). Orissa's performance on this factor was then expressed as the ratio of these two differences, resulting in a score of 0.83 (49.6/60) and earning it the 5th rank.

Next, factor indices were constructed for each of the four factors by comining parameter scores. Typically, parameter scores were assigned equal weights. So, the Social Index Score of a state is the average of its urbanization, literacy and medical coverage scores. However, the infrastructure Factor Index was computed slightly differently since it required two levels of aggregation. First, scores for the various sub-factors-power, roads, railways, telecom, ports and airports - were calculated. Again, barring railways-where rail coverage was accorded twice the weightage assigned to the proportion of broad gauge track-all the other parameter scores received equal weights. Second, the sub-factors scores were amalgamated to create the infrastructure Factor Score. While Power, telecom, roads, railways and ports were all assigned a weightage of 19 per cent, airports were given a lower weightage of 5 per cent. 9) The infrastructure spending pattern is given below which reflects the significance of the two sectors both in terms of aggregate spending & also in terms of each country's position however there are characteristics which make the power sector little different from railways firstly railway being a central subject are under single management with 100 state participation/ whereas the power generation is both with central &provincial governments under management of various electricity board, central public sector corporations & also some private undertakings.

THE SYSTEM OF RECOVERY REVENUE IN RAILWAYS is superior to the electricity boards perhaps this is because of customer profile of both the sectors.

The objective score for the state-which formed the basis of the objective ranks-was a weight average of the four factor indices. Weights of 60,20,10 and 10 per cent were assigned to the infrastructure, government, labour and social indices, respectively. This weighting pattern reflects the survey ranking of parameters important to the location decision of a corporation.

THE PROBLEM

Flexibility of state policy 20%

Degree of urbanization 13%

Thus it can be seen that infrastructure especially power has become critical in attracting investments .it can be seen the infrastructure has been ranked higher than the monetary incentives/even higher than tax sops & subsidies given by the government. This was based on survey carried out by B.T. of the important CEOs. The index =[{number of best state mentions into (2)+number of best state mentions into (I)+[{number of worst mention into(-2)+{ number second worst state mention into(-I)]. The index scores of each state on all 19 parameters were added to arrive at a composite score. And the final perception ranks were awarded on the basis of these index scores. All the data was collated, analysed/and the calculations performed by a Gallup-MBA team, headed by CEO C.K. Sharma.

THE OBJECTIVE RANKS:

To supplement the survey-based data, BT constructed a series of objective indices for each state. Data was collected on parameters belonging to four broad factors: Physical infrastructure. Government, Labour, and Social infrastructure.

THE PARAMETERS:

The selection of parameters was guided by the need of reflect the availability, quality, and, in certain cases, the cost of the factor. For several variables, data transformations that adjusted for population and area were carried out so as to remove inherent biases in favour of the larger, more populous states. The list of 28 parameters that finally qualified for inclusion in the objective index.

PHYSICAL INFRASTRUCTURE:

Compounded annual growth rate in generation capacity (%) 1994-96.

Transmission and distribution losses as a percentage of availability: 1996-97.

Average tariff for industry (Paise per kilowatt hour): 1996-97.

Plant load factor for thermal plants (%): 1995-96.

Power surplus/deficit (%): Planning Commission projections for 1996-97.

Telephones per 100 persons: March 1996.

Compounded annual growth rate in exchange lines (%): 1992-96.

Roads per 1/000 sq km of area: March 1995.

National and state highways as a proportion of total road length (%) : March 1995.

Proportion of roads that are surfaced (%) : March, 1995.

Track length per 1,000 sq km of area : 1995-96.

Broad gauge track as a percentage of total rail length : 1995-96.

Number of ports, major and minor : 1996.

Share in cargo handled by the ports in the state (%) : 1995-96.

Growth in cargo handled by major ports in the state (%) : 1995-96.

Average turn around time at major ports (days) : 1995-96.

Proportion of cargo that is containerized (%) : 1995-96.

Number of airports : 1997.

The significant point to note her among the items selected for ranking infrastructure projects the power & railways almost account for 50% of the items & particularly power playing a dominant role.

As per world Bank developing countries invest more than 2 Billion $ a year on new infrastructure which is 20% of their national investment. Inspite of the fact, the per capital availability of power & telecommunications have doubled. Electric power is still to reach 2 billion people. The need for transport to modernize production and enhance international competitiveness for out strip the existing capacity. On top of all this, population growth & urbanization are increasing the demand for infrastructure.

Infrastructure challenge requires more than statistical counting of installed capacities as has been the case with most of the developing countries. It involves tackling inefficiency & waste both in investment & providing of services & responding to consumers need. On an average 40% of the power generating capacities in developing countries is unavailable for production. Large labour force is estimated to be redundant in Railways. Given below is the PLF of various power plants for the year 2002-2003.

STATE	PLF
APSEB	82
ASEB	21.3
BSEB	16.1
DVB	47.2
GEB	65.6
KPCL	72.4
MPEB	66
SEB	68.3
OPGC	65.3
PSEB	69.1
RSEB	80.5
TNEB	68.1
UBSEB	48.8
WBPDC	52.8
WBSEB	40

PRIVATE	PLF
AEC	71.3
BSES	82.4
CESC	76.9
TEC	63.5
CENTRAL	**PLF**
DVC	38.4
NTPC	74.4
NLC	72.5

(SOURCE : MINISTRY OF POWER)

Similarly operating ratio of the Indian Railways for the last three years shows declining trend in performance.

OBJECTIVES :

The objective is to study the bottlenecks and road blocks that have affected the flow of funds to infrastructure. The purpose would be to identify regulatory, monetary, fiscal, legal and tax frame work that will promote a fair, equitable, efficient and transparent domestic market for channelising funds into infrastructure.

Though traditional means of financing infrastructure have existed by way of equity, bonds, convertible debentures, bank loans, there has been growth of new means of financing through securitization, take-out financing, ECB, suppliers credit etc. The object of study would be to study the strength and weakness of each methods including experience of leading organizations with these products. To bring about in a well documented manner the options for financing infrastructure which can be used by existing, new and upcoming organizations involved in infrastructure development in Power Sector and Railways.

One of the aim of study would be to comment on the tariff mechanism. To establish tariff regulation and determination of guidelines on predictable and fair lines in order to stimulate competition to obtain investment including fair return on them. The tariff guidelines should provide for incentives for efficiency. The risk aspect of the return including security of receivables and revenue would also be covered. Security and tariff have been primary reason of private capital shying away from investment in Power Sector.

To study the broad reform measures these impact including management and organization systems to suggest structural change to bring down inefficiency and accountability with an idea to make sector viable and efficient.

Investment-gross domestic investment in infrastructure as a% of gross domestic product) this had increased during 1980s from 4.5% in 1980-81 to 6% in 1986-87 but by 1994-95 it was down to 5%.

The change is much if analysed in terms of shoft in structure if investment. The proportion of total investment going to infrastructure had increased from 19.7% in 1980-81 to 28.8% in 1986-87. There after it declined to 20.7% in 1994-95. These investments were well below infrastructure committees recommendation to have a G.D.P. growth of 7% the investment in infrastructure needs to be atleast 25% of the overall investment of 31.5%.

The sectors covered are power and railways. The reasons for selecting these sectors are as follows :

1. Both the sectors have inter-sectoral linkages – coal to power houses is the single largest market segment of the Railways. Moreover, Railways are also major consumers to power produced in the country. Performance of the two sectors have been inter-alia linked. IN RECENT TIMES THE SLOW CLEARANCE OF POWER PLANTS has also effected the growth potential of INDIAN RAILWAYS. There is certain commonality in the management of both these sectors as consequence of which, the latter has also provided considerable managerial talent to the former as the Railways have well organized managerial cadre & some of the CEOS & Finance top professionals in public sector power companies have come from the Railways. The researcher

him self has worked in both the organizations in the managerial capacity.

2. Coal/Fuel transport linkage is important area of concern for present & new power projects.

3. These sectors have traditionally occupied commanding heights of Indian economy, the growth, development & proper management of both these sectors is necessary for proper growth of the economy

4. Both these sectors have traditionally been the state sector managed by Govt. and have common problems of heavy bureaucracy, over staffing, delays in decision process on account of long hierarchical levels, lack of incentive to promote excellence in the organization, multiple & conflicting organizational goals. The sectors have till recently not paid due emphasis on the financial performance. The emphasis has been managing shortages. These sectors have beginning to face the problems of demand management. It can be seen that railway divisions have so far been working on loading & punctuality parameters only recently earning has started finding position in the scheme of performance critera.

5. Both the sectors are important infrastructure bottlenecks of vica versa. They both effect the industrial growth & also have impact on the performance of agriculture sector.

6. The tariff structure have also been so designed that they favor some sector of the economy by taxing another sector through cross subsidation there has been consequent effect on the demands of profitable segments having some degree of elasticity.

7. Resource crunch & capacity utilisation has been an area of concern for both the sectors leading to strategy for alternative financing to meet the burgeoning demands in both sectors of economy. This has led to opening of both sectors more so in case of power. THE BUDGETARY support.

8. Both the sector have heavy linkage with the macro economic policy of the government, since the power sector has opened up more its dependence on the macro economic policy is even stronger :

SECTOR	SHARE %
POWER	35
TRANSPORT	35
TELECOM	15
UTILITIES	10
OTHERS	5
COUNTRY	

CHINA	34
INDIA	23
INDONASIA	9
KOREA	9
THAILAND	6
MALAYSIA	5
TAIWAN	4
OTHERS	10

The above table also hows the importance of two sectors - transport & power in the overall scheme of infrastruture management.

WHAT DOES INFRASTRUCTURE FUNDING INVOLVE - Infrastructure funding has traditionally been doe with considerable state financing & commercial finance playing very little role. When the resource crunch faced by the govt. tightening of fiscal discipline change in the states philosophy/ growing requirement of infrastructure has necessitated need for alternate financing for infrastructure development. Infrastructure projects often involve huge outlays of fund. Secondly, the funds are required for a long tenor-say 10-20 years, infrastructure financing has its own peculiar characteristics.

In India the financial sector, i.e. the banks & financial institutions can generally raise funds for five to seven years only. Hence there was problem of raising funds with shorter tenor & deploy them for along period and face problem at the time of paying own liabilities. Further, since lot of these projects would be run on commercial basis for the first time there are uncertainties at every stage construction, operation, revenue collection etc.

METHODOLOGY

This is based on secondary data including reports of Government of India, study report of Expert Group, papers and articles presented in National and International Seminars, the documents of multilateral funding agencies including ADB and World Bank. The Market and credit rating analysis carried out by credit rating agencies like CRISIL, ICRA and CARE. The study would be supplemented with discussions and view points of senior representatives of Power Sector Organizations, Ministry of Power, Ministry of Finance, Department of Economic Affairs, Indian Railway Finance Corporation, Konkan Railways etc. The senior functionaries of financial institutions, credit rating agencies, ADB and World Bank.

HOW THE PROBLEMS HAVE BEEN ADDRESSED.

Over the last six to seven years financial institutions have taken the lead in understanding the dynamics of infrastructure financing. They have

managed to identify the risks at each stage of the projects and then have looked at evolving adequate safeguards to alleviate these risks.

While leaders have sharpened their loan structuring skills, they have also evolved several concepts that provide more security to tenders and are expected to attract more funds in this sector. The major concepts are:

a. Cash flow financing

b. Usage of government guarantees to induce private financing.

c. Escrow mechanism to ensure that lenders get first charge on project's cash flows.

d. Take-out financing.

e. Subordinate debt financing.

f. B.OLT./B.OT., B.T., B.L.T., R.O.T.D.O.T, R.O.O. they would be called built own lease transfer, build operate transfer/build lease transfer, rehabilitate operate transfer, rehabilitate own operate/develop operate transfer.

CASH FLOW FINANCING.

In cash flow financing, the lenders estimate the cash flows of a project over its estimated life-time to see what kind of debit burdens it can support and at what rates. Then the amount of debt financing rate and the way of repayments can be tailored to fit the cash flows of the project. This helps both the lender and the promoter.

ESCROW MECHANISM.

The escrow mechanism have been developed in case of the IPP's which are built by private parties out of private funds and supply electricity to SEB's. Essentially, this ensures that out of the revenues of SEB the debt obligations of the financing institutions will be paid out first.

This is done by having some identified revenues being passed through a separate account called the escrow account to which the lenders also have the right to appropriate the funds in case the SEB defaults in making the payments. By having the power to be assigned those funds in the case of default gives the added comfort to the lenders and also allows the IPP's to raise financial assistance. However, escrowable amounts are limited in each SEB and once these funds are appropriated the SEB may not have much assured revenue flows for its other expenses.

TAKE-OUT FINANCING

One of the major problems of financing infrastructure projects is that while the requirement is for long periods Indian banks and financial institutions can traditionally lend funds only for say five to seven years.

Take out financing allows banks to finance 15 years projects through 5 to 7 years money. In India Infrastructure development Finance Company (IDFC) offers this facility to the Banks and institutions. It offers

to take out the loan from the Bank's books after an initial period, say five years.

IDFC can then keep the loan in it own book or lend it to another bank for say five years. While the project promoter has got the loan for 15 years through this mechanism, banks can participate in loans on a part time basis which they were not able to do so earlier.

In another variant, the take out financier could offer a refinance facility to the original lender at the end of five years instead of taking out the loan from its books this means that the take out financier will infuse funds in the bank in case the bank faces any liquidity problems at the end of 5 years. With this assurance, the banks could keep the loan on its own books for a period longer than 5 years and earn interest.

SUBORDINATE DEBT FINANCING

Institutions have also talked about funding infrastructure projects through a quasi equity instrument called "subordinate debt" which may have flexible maturity and payment terms. In this case the borrower can he get the money which have a longer terror, and has the comfort of paying it after he has met the secured debt obligations. The payment terms can be made flexible. Such loans can even be converted into Equity at a later date, if desired. Though these loans may be more expensive than debts, they will a at least ensure a project starts up. On such lending has already been done in India. The subordinate debt financing is also sometimes died MEZZAINE CAPITAL. It is a kind of hybrid of debt & equity that can be structured in accordance with requirement of owners or senior creditors.