

Impact of Infrastructure Development on the Economy of Uttarakhand

Dr. SUNIL DUTT

Abstract: The present paper is devoted to the analysis of impact of infrastructure development on the economy of Uttarakhand. The study is based on the with regard to various indicators of infrastructure and economic development. District wise level of socio-economic infrastructure and economic development has analyzed at two different levels. Firstly, it studied the level of development achieved with respect to each indicator separately. Secondly, an effort is being made to present a macro picture pertaining to the levels of development in each district. The districts have been ranked in descending order in terms of the levels of development achieved. This has been done by deploying the standard technique of principal component analysis, and indices of levels of infrastructure and economic development.

I. INTRODUCTION

Infrastructure includes those basic services and utilities which are essential for various kinds of economic activities in primary, secondary and tertiary sectors. The two basic channels of investment as identified in the sphere of development planning are (i) social and economic overhead capital and (ii) directly productive activities. The former is sometimes called infrastructure by common consent, includes all things provided by the state which promote directly productive activities. It promotes economic efficiency of the region by enhancing accessibility to productive resources and physical mobility of raw material, finished product and factor of production (Chaudhari and Dasguta, 1985).¹ Economic development depends on the availability and utilization of various natural, human and derived resources. Apart from the problems confronting the growth process every developing economy, particularly of the size and shape of the Indian economy, has to address itself to the pressing problem of regional imbalances, unemployment, capital formation, surplus generation and export compatibility etc. Such a scenario calls for strengthening of its infrastructural base. Healthy and adequately dispersed infrastructural facilities act as a catalytic agent in promoting growth and minimizing other ills of the economy. Infrastructure is necessary for all kinds of production viz. agriculture, manufacturing or service industries, consumer goods, capital goods or export goods (Tiwari, 2000).² The study attempt to examine the impact of infrastructural development on the economy of Uttarakhand and its constituent districts on the basic composite indices.

Keeping in view the impact of infrastructural development on the economy of Uttarakhand the present study was under taken with the following objectives:-

- To examine the status of infrastructure development in Uttarakhand.
- To examine the impact of infrastructural development on the economy of Uttarakhand.

II. METHODOLOGY

For the present purpose, districts have been chosen as the units of study. The study is based on secondary data for all the 13 districts related to 19 indicators of infrastructure development and 20 indicators economic development have been taken from State & District level Statistical Diary of Uttarakhand and Economic Survey of Uttarakhand. The study has been carried out over two-time 2000-01 and 2010-11. To examine the inter-district disparities in the levels of infrastructure development and economic development, some simple statistical tools such as coefficient of range, coefficient of variation etc., has been used. To determine the equal and suitable weights of selected indicators and to identify basic factors, methods for construction of composite index of development Principal Component Analysis (including Factor Analysis) has been used.

III. RESULTS AND DISCUSSION

STATUS OF INFRASTRUCTURE DEVELOPMENT IN UTTARAKHAND

The hill economy of Uttarakhand infrastructure development, both in terms of scale of infrastructure stock and the institutional context has been discussed in this paper. The economic and social development of any state depends mostly on efficient system of transport, road, communication, banking and health services. The physical as well as institutional infrastructure is also necessary for sustainable development of the economy.

Brief analysis of socio-economic infrastructure during 2000-01 to 2010-11 in Uttarakhand is presented in the Table 1.

The results show that electricity sector recorded highest percentage increase followed by banking, road and education. Whereas post offices, co-operative and health sector shows declining trends during the same period. Electricity is one of the most important infrastructure components for development of economy. The state has large number of rivers and water sources and it is sound in hydro-electricity generation. Availability of power is in abundance, the state does not have any restrictions on usage of power by industries during peak load as well.

Table 1. Status of Socio-Economic Infrastructure in Uttarakhand

Sr. no	Sector	Indicators	Uttarakhand		% age change
			2000-01	2010-11	
1.	Road	Road length per 100sq. km. of area	39.2	63.41	61.77
		Road length per lakh of population	274.26	335.22	22.23
2.	Communication	Post offices per 100 sq. km. of area	4.95	5.26	0.62
		Post offices per lakh of population.	31.21	26.83	-14.03
3.	Irrigation	Percentage of net irrigated area to gross cropped area	32.49	28.73	-11.58
4.	Electricity	Installed capacity(MW)	993.6	1305.9	31.44
		Electricity Generation (M Kwh)	2660.9	4906.3	84.38
		Consumption of power(M Kwh)	2229.1	7250.8	225.2
		Electrified Villages	85.6	98.99	15.64
5.	Banking	No. of banks per 100 sq. km. of area	1.19	1.77	48.74
		No. of banks per lakh of population	7.53	9.39	4.71
		Credit-deposit	23.9	40.0	67.50
6.	Co-operation	No. of PACS per 100 sq. km. of area	1.6	1.49	-10.7
		No. of PACS per lakh of population	8.98	7.73	-13.92
7.	Education	Educational institutions per 100 sq. km. of area	35.27	43.57	29.20
		Educational institutions per lakh of population	222.1	230.4	3.72
8.	Health	Allopathic medical institutions per 100 sq. km. of area	1.57	1.53	-2.55
		Allopathic medical institutions per lakh of population	9.89	8.10	-18.09
		Hospital beds in allopathic medical institutions per lakh of population	83.0	107.8	29.88
		Ayurvedic medical institutions per 100 sq. km. of area	0.86	1.11	29.08
		Ayurvedic medical institutions per lakh of population	5.47	5.92	8.22
		Veterinary hospitals per 100 sq. km. of area	2.3	2.99	27.28
		Veterinary hospitals per lakh of livestock population	27.07	29.55	9.17

Sources: State & District level Statistical Diary of Uttarakhand (various issues), Economic Survey of Uttarakhand.

Roads are the major mode of transportation service available in the state. During the last decade not only the lengths of road improved and qualities of roads have also improved. Banks have become the bristle for the development of the economy on all parameters in any state. Likewise bank plays a vital role in development of the economy. Banks are not only important for the industrial development but they are equally helpful in social development activities. Regional rural banks and co-operative have very strong network to accelerate developmental activities of the state.

Education contributes directly to the human skill and qualities of life. The state government is progressing towards provision of education to all. Consequently state capital Dehradun is required an important centre of education in North India. Uttarakhand has some of the best boarding school in the country especially in area around Mysoree, Dehradun and Nainital. Fortunately Dehradun is having national level institution particularly in foresting sector.

Uttarakhand is predominately hilly state open wells and tanks are present in only in the plain regions of Dehradun, Haridwar, Poudigarhwal and Udam Singh Nagar. Rest of the districts has not adequate sources of irrigation. Primary agriculture co-operative societies are facing competition with nationalized commercial and rural banks. Hence they are showing negative growth change during the above mention period.

It is a recognized fact that good health promotes skill development in human, social stability, reducing poverty and inequality. Due to scattered topography of state accessibility in the hilly region is a serious concern for the rapid execution of health services.

IMPACT OF INFRASTRUCTURAL DEVELOPMENT ON THE STATE ECONOMY

Infrastructural development results in improvement in productivity and in overall quality of life. The impact of infrastructure are seen to occur at three levels- first through facilitating economic growth, second through improving quality of life and finally through enhancing broader social and economic capabilities. It increases the productive capacity of an economy either directly by enhancing the factor endowment of the economy, or indirectly by increasing the productivity of the existing factor of production. It provides active tool to promote economic development generate addition demand for various goods and services, redistribution of wealth and reduce poverty. Impact of infrastructure development on the economy of Uttarakhand is being presented in Table 2.

Table 2 Decadal Economic Development in Uttarakhand

Sr. no.	Sector	Indicators	Uttarakhand		%age change
			2000-01	2010-11	
1.	Gross State Domestic product	GSDP at constant prices in Rs in lakh	1414100	5562599	293.37
		GSDP at current prices in Rs in lakh	1450109	8291795	471.81
		Per capita Income at current price in Rs	15285	72717	375.5
2.	Sector wise %age of GSDP at current prices	Primary sector	30	13.87	-53.77
		Secondary sector	19	34.37	80.90
		Tertiary sector	51	51.76	1.49
3.	Agriculture and allied services	Agriculture & allied activity GSDP at current prices (Rs. in lakh)	416864	1150054	175.89
		Food grain production in million ton	1.72	1.78	3.48
		State contribution in national food grain	0.88	0.81	-7.96
		%age of agricultural worker to main workers	38.61	33.11	-14.25
		Net sown area as percentage of total geographical area	43.72	46.27	5.84
4.	Industry	No. of registered factories	14163	37928	116.32
		Total investment in registered factory (Rs. in crore)	149.0	6280.0	4141.7
		Employment created	59659	162453	172.31
5.	Education	Literacy percentage	71.60	79.63	11.22
		Percentage of female literacy to total literacy	59.60	70.70	18.63
		Literacy percentage among SC population	63.4	74.4	17.36
		Literacy percentage among ST population	63.2	73.9	16.94
6.	Other sector	Percentage of urban population to total population	25.66	30.14	17.46
		Percentage of main worker to total population	36.91	8.37	-23.14
		Percentage of household with latrine (toilets) facilities	45.2	65.8	45.58
		Drinking water in premises	44.2	58.3	31.91
		Infant mortality rates	48	41	-14.59
		HDI Score and rank	0.162(22)	0.426(11)	162.97

Sources: 1. State & District levels Statistical Diary of Uttarakhand (various issues), Economic Survey of Uttarakhand.

3. Human Development Report, 2002 and 2012.

Impact on Income

From the above discussion it is revealed that due to infrastructure development the state economy grown rapidly. The GSDP at constant prices has been increased 293 per cent and at current prices increased to 472 per cent and per capita income increased to 376 per cent during the reference period. The state after separation from Uttar Pradesh, recorded tremendous growth in GSDP and per capita income during the last decade. The present study reveals that the state of Uttarakhand has good potential of development in various sectors also.

The sector wise percentage of GSDP at constant prices reflected the divergence in sectoral growth trends. The contribution of primary sector to the gross state domestic product (GSDP) declined while that industry and service rose in the state. The contribution of primary, secondary and tertiary sector were 30.0 per cent, 19.0 per cent and 51.0 per cent respectively during 2000-01 and these are 13.87 per cent, 34.37 per cent and 51.76 per cent in 2010-11. The state has exhibited rapid growth in the tertiary sector especially in tourism sector which includes the travel, hotels, restaurants and other trades.

Impact on Agriculture

Agriculture is also important sector of the economy of and agro food processing is one of the most important industry of the state. It is the main source of livelihood to about 75 per cent of the population. Agriculture sector contribute about 14 per cent of the total state domestic product. Rice, wheat, maize and sugarcane are the main crops in the state. However sugarcane crop is mainly grown in plain area of the state. The key oilseed crops are ground nut, sunflower, soya bean, mustard and toriya and pluses crops includes Urdu, rajmah, bean, moong, gram and lentil. The state has about 30 per cent area under irrigation. Food grain production was 1.73 million tons during 2001, which has increased to 1.78 million tons in 2011. In 2011 the average share of Uttarakhand in India's food grain production was 0.8 only. Sugarcane is also one of the major cash crops of the state. Sugarcane production was 7.34 million tons in 2001 which has increased to 5.05 million tons in 2010 and average share of Uttarakhand in India's sugarcane production was 1.8 per cent.

Impact on Industry

Uttarakhand has made significant achievement in the field of industrialisation especially in the last decade. The flow of investment in state has increased manifold. Due to modernization the number of industries, industrial investment and employment in industries have increased manifold during the last decade in the state. Consequently it generated lot of employment potential in both the states. Being newly carved state the new industrial policy of 2003 is based on the special package of incentives to promote industrial development. The stock holders were consulted and experiences from their states were factored into drafting the new policy. The industrial policy contains the vision for Uttarakhand, a set of fiscal and non-fiscal incentives and a number of institutional mechanisms for the development of industrial sector were introduced. Development of infrastructure enhanced private participation, human resource potential, expansion of marketing facilities and protection of environment was identified as focus area.

Impact on Social Sector

The state has a relatively good social sector with high literacy rate. Education contributes directly to the human resource potential and quality of life. In 2011, the literacy rate of Uttarakhand was 79.60 per cent, Literacy rate, female literacy to total literacy, literacy among SC and ST population were respectively 59.60 per cent, 63.64 per cent, 63.2 per cent in 2001 and have gone up by 79.63 per cent, 70.70 per cent, 74.4 per cent and 73.9 per cent respectively in 2011.

The standard of life indicator for the state compare favorably with the national average. Out of total households 58.3 per cent households have safe drinking water facilities. Human Development Index (HDI) is a composite index, comprising of three indicators- consumption expenditure (as a proxy for income) education and health. According to Human Development Index Report (2011), Uttarakhand gets 11th rank in all India's states.

DISTRICT-WISE IMPACT OF INFRASTRUCTRE DEVELOPMENT ON THE OVERALL ECONOMY OF UTTARAKHAND

With the help of composite index of infrastructure development and economic development generated in the present study an attempt has been made to assess the district-wise impact of infrastructure development. The composite index of infrastructure development includes roads, post offices, irrigation, banking, primary agricultural co-operative societies, education and health and economic development index is prepared with the help of per capita income, urban population, main worker, agricultural worker, net sown area, area under commercial crops, cropping intensity, irrigation intensity, fertilizer consumption, registered factories, factory workers, small scale industrial units, literacy rate and household with latrine (toilets) facilities.

With the help of standard mathematical procedure the district-wise composite index of infrastructure development (ID) and economic development (ED) Composite indices values are presented in Table 3, and the comparative assessment is also presented graphically in figure I. and II.

Table 3: District-wise Indices of Infrastructure Development and Economic Development of Uttarakhand

Sr. No.	Districts	2000-01				2010-11			
		Composite Index of ID	Rank	Composite index of ED	Rank	Composite Index of ID	Rank	Composite Index of ED	Rank
1.	Almora	9.58	5	1.66	10	8.67	7	0.95	11
2.	Bageshwar	4.89	9	1.33	12	11.67	5	0.79	12
3.	Chamoli	0.00	13	3.57	9	0.74	12	3.59	8
4.	Champawat	7.39	7	7.08	5	8.46	8	4.2	6
5.	Dehradun	21.46	2	22.28	3	22.59	3	22.34	3
6.	Haridwar	19.89	3	29.03	1	24.18	1	22.35	2
7.	Nainital	15.94	4	16.63	4	15.46	4	12.1	4
8.	Pithoragarh	0.21	12	4.83	8	0	13	3.39	10
9.	PauriGarhwal	5.24	8	5.81	6	3.71	10	9.58	5
10.	Rudraprayag	3.44	10	0	13	3.89	9	0	13
11.	TehriGarwal	8.18	6	4.99	7	8.68	6	4.09	7
12.	UdamSingh Nagar	2.57	1	27.8	2	23.2	2	22.5	1
13.	Uttarkashi	0.83	11	1.59	11	1.01	11	3.27	9
	Mean	9.21		9.74		10.17		8.24	
	S.D.	8.15		9.76		8.40		9.79	
	C.V.	88.54		100.21		82.54		118.41	

Rank correlation coefficient of ID is = 0.91
 Rank correlation coefficient of ED is = 0.86

Figure 1: Comparative Assessment between Infrastructure Development and Economic Development in Uttarakhand (2000-01).

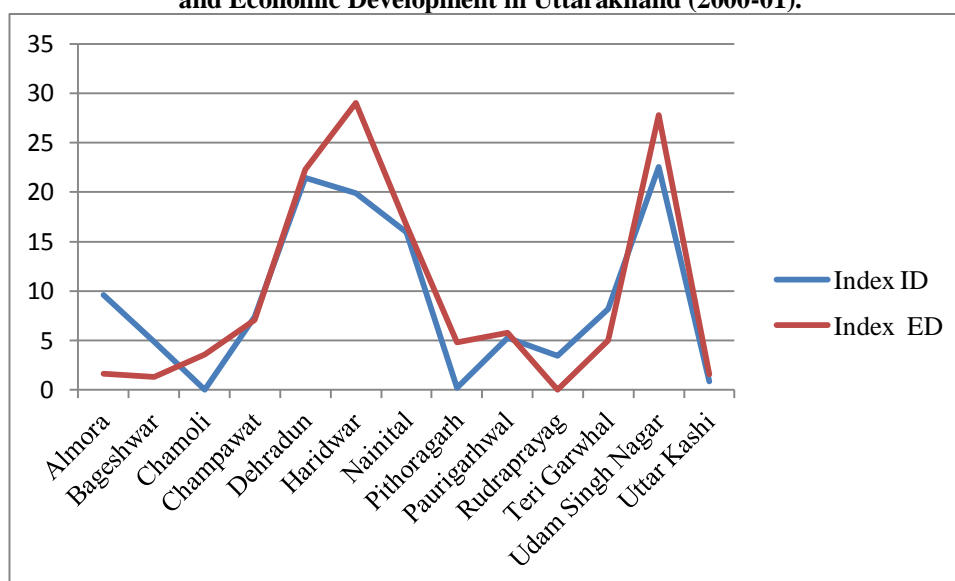
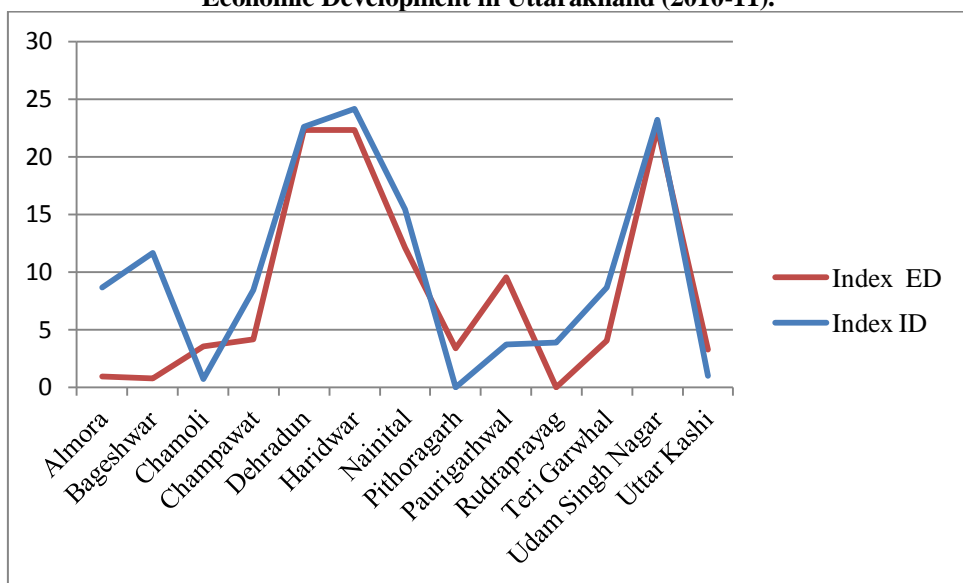


Figure 1: Comparative Assessment between Infrastructure Development and Economic Development in Uttarakhand (2010-11).



The result presented in Table 3 clearly reveals very interesting results i.e. plain areas of the state are leading higher level of infrastructure development. For that reason district Udam Singh Nagar score 1st rank (22.57) followed by Dehradun (21.46) and Haridwar (19.89). These districts are covered by almost all area in plain lands. Moreover the present state of Uttarakhand was the part of Uttar Pradesh therefore, the infrastructure development have taken place with the similar situated regions.

For the topographical condition Chamoli district is having lowest value of composite indices of infrastructural development and followed by Pithoragarh and Uttarkashi. Regarding composite index of economic development during initial period of study Haridwar district achieved highest value (29.03) of the index of economic development followed by infrastructurally developed districts. The main region of achievement of higher economic development in Haridwar district is religiously famous for religious purposes. Consequently the people of the region were getting good income sources and hence achieving better economic life. Other plain areas of the state were also getting good return from their resources and programmes. Ruderaprayag district has the lowest value of economic development in spite of 3.44 of infrastructure development index during the same period and reason may be thinly populated. Again in 2010-11 Pithoragarh is recorded lowest indices value while the districts of plain area of state have more than 22 point. These districts are Udam Singh Nagar, Haridwar and Dehradun. In the higher ranking the reason is same as was in 2000-01. Regarding composite index the only district Ruderaprayag has not achieved a single point during the decade.

IV. CONCLUSION AND SUGGESTIONS

Due to infrastructure development the state economy has grown rapidly. The GSDP at constant prices and current prices and per capita income has been increased manifold during the reference period. However the economy has shown more than double growth during period. After separation from Uttar Pradesh, has recorded tremendous growth in GSDP and per capita income during the last decade. The sector wise percentage of GSDP at constant prices reflected the divergence in sectoral growth trends. The contribution of primary sector to the gross state domestic product (GSDP) declined while that industry and service rose. The state has exhibited rapid growth in the tertiary sector especially in tourism sector which includes travel, hotels, restaurants and other trades.

Agriculture is one of the most significant sectors of the economy and it is the main source of livelihood to about 75 per cent of the population. Agriculture sector contribute only 14 per cent to the total state domestic product. Although the contribution of agriculture in total state domestic product is very low but more than half of the population in the state depends on agriculture for their livelihood. The state has about 30 per cent area under irrigation. The average share of Uttarakhand in India's food grain production was 0.8 only which contributes less than one per cent share in the food grain production of India. Sugarcane is one of the major cash crops of Uttarakhand and average share of Uttarakhand in India's sugarcane production was 1.8 per cent (2011).

Being newly carved state the new industrial policy of 2003 is based on the special package of incentives to promote industrial development in Uttarakhand. Development of infrastructure enhanced private

participation, human resource potential, expansion of marketing facilities and protection of environment was identified as focus area.

The state has a relatively good social sector with high literacy rate. Education contributes directly to the human resource potential and quality of life. In 2011, the literacy rate of Uttarakhand was 79.60 per cent which is more than all India figures of 74.04 per cent. The standard of life indicator for the states compare favorably with the national average. Out of total households 58.3 per cent households have safe drinking water facilities. According to Human Development Index Report (2011), Uttarakhand gets 11thrank in all India's states

The results of the study also indicate that infrastructure is significant determinant and plays a positive role in affecting the productivity of agriculture and industrial sector and directly related to many socio-economic factors. Thus it also contributes towards economic growth. Thus, it may be stated that infrastructure contribute a great role of economic development and therefore a suitable policy for infrastructure is needed for development of lagging behind region of Uttarakhand consisting of six districts Ruderprayag, Chamoli, Uttarkashi, Pithoragarh, Terigarhwal and Champawat.

REFERENCES:

- [1]. Chaudhary, D.P. and Ajit K. Dasgupta (1985); *Agriculture and the process: A study of Punjab*, Croom Helm Landon, pp. 8-49.
- [2]. Tiwari, A.K. (2000); "Infrastructure and Economic Development in Himachal Pradesh" Indus Publishing Company New Delhi 2000, p.13.
- [3]. Government of Uttarakhand, *Economic Survey of Uttarakhand (various issues)*, Economic and Statistical Department of Uttarakhand.
- [4]. Dutt, Sunil (2015); "Infrastructural development in Himachal Pradesh and Uttarakhand: Comparative Study" Ph.D. Thesis, unpublished, Department of Economics, Himachal Pradesh University, Summer Hill shimla-5, pp.1-174.