

Employment Generation in Gujarat: Role of Information and Communication Technology

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ABSTRACT

The past decade has experienced rapid spread of information and communication and technology (ICT) all over the world. The expansion of ICT networks has enabled almost all the sectors of the economy to increase their productivity. It facilitates sharing of information, communication and exploring the ideas to support their respective development activities. Among the various information and communication tools, the internet connections and mobile phones have attracted the population to communicate and share through various social network sites and develop new ideas and explore the opportunities at various levels, knowing the best remunerative prices, smooth dealing with banks and so on, which further enhances their productivity, employment opportunities, as well as contributes to economic growth. A higher level of economic growth further increases the employment opportunities. Thus ICT is now a days, playing an important role in generating employment opportunities. The study deals with Gujarat state which is leading in terms of spread of ICT network as well as infrastructure facilities.

The present study investigates the role of ICT in generating employment opportunities in Gujarat state. The study is based upon the secondary sources of data collected from various official websites. The variables like number of households having accessibility to ICT services like radio, television, telephone/mobile phone, computer/laptop with internet and without internet and other variables like drinking water, electricity and banking facilities etc. The ICT services and WPR (work participation rate) in the district of Gujarat is compared. The correlates of WPR are developed by using Spearman's rank correlation method and the ICT index is prepared by using ranking method.

The study finds that though ICT networks are spread all over India, but its access to households is greater in urban area than in rural area of Gujarat. Accordingly, the relationship of WPR with ICT index is stronger in urban area. Accessibility to drinking water, electricity and banking facilities is also, found to be important for WPR in urban area. However, their negative relationship in rural area implies that the lower development of these facilities forces the population to work, indicating that their participation in economic activities is of the distressed type. It appears that development of basic facilities releases the population from work and enables them to opt for education or other technical skill. The study confirms that ICT has an important role in work participation and it needs to be developed in rural area also along with other basic facilities.

1. Introduction

During the past more than a decade, India has experienced a higher level of growth rate averaging around 7-8 per cent per annum. Also there has been rapid spread of information and communication technology (ICT) services in the country. In the present scenario, almost all the sectors of the economy are benefited from the spread of ICT networks. The Indian government is also making efforts to spread ICT networks in the rural area. Though ICT services are accessible through computer, television, telephone, radio, etc., but the availability of mobile instrument in the hands of each and every individual has enabled them to access internet through Wi-Fi or data services. It has enabled the person to explore various employment opportunities in their hands. Also, a higher level of economic growth enables the country to spare resources for generation of employment opportunities.

Among the Indian states, Gujarat has achieved a higher level of economic growth and has also made various strides to spread the ICT networks even in the rural areas. Gujarat is also leading in terms of attracting foreign direct investment (FDI) from foreign countries.

This paper focuses on determining the contribution of ICT in generating employment opportunities in Gujarat state. The objectives of the study are as follows:

- To determine the status of Gujarat in terms of economic growth, ICT and work participation rate (WPR).
- To examine the changes in development of ICT services and WPR on district of Gujarat.
- To develop the correlates of WPR.
- To determine the role of ICT in work participation.

2. Review of Literature

The available studies like Koellinger (2006), Matteucci et al. (2003) and Greenan et al. (1999) have showed the positive effect of ICT on employment. Vivarelli (2007) explained the effectiveness of ICT in terms of increase in number of skilled workers, decrease in cost of production, development of competitive market, creation of business atmosphere and finally motivation for self-entrepreneurship, innovation and creativity. Heydari et al. (2015) regressed employment on information presentation index, information acquisition index, number of internet and computer users, value added, capital price and wages. The results show a positive effect of technology indicators on employment of skilled workers and negative effect on employment of unskilled workers.

Koellinger (2006) also highlighted the positive and negative effect of technology on skilled and unskilled workers with respect to replacement of human labor by machinery. O’ Mahony et al. (2008), taking the case of USA, England and France and using panel data approaches found the positive impact of technology on production, employment as well as wages, though the situation in the selected countries varied. Venkatesh et al. (2010) conducted the study in India and tested the Job Characteristics Model (JCM) that related job satisfaction and job performance via various mediators and moderators. The study focused on ICT implementation in India for job creation and job quality. Sepehrdoust et al (2013) also found the positively significant impact of ICT on employment rate, however, the effects are diversified among non-oil based economies.

Though ICT and employment has gained much importance in international level studies, but it has not yet been effectively focused in India. Since India is now on the path of higher economic growth and development of ICT services associated with skilling people, this study has its own importance.

3. Methodology

The study is based upon the secondary sources of data collected from various official websites. Economic growth is determined in terms of per capita net state domestic product (PCNSDP). In order to know the status of ICT, number of household having accessibility to ICT services like radio, television, telephone/ mobile phone, computer/ laptop with internet and without internet, etc. is taken into account. Index is prepared by using ranking method. The growth rate of ICT services and WPR (Work Participation Rate) in the district of Gujarat is compared. Further the correlates of WPR are developed by using Spearman’s rank correlation method. Apart from ICT index, the other variables used are percentage of population having accessibility to drinking water, electricity and banking facilities.

4. State wise Scenario of Economic Growth, ICT Status and WPR the Indian States

Table 1 reveals that among the Indian states, Goa has topped in terms of its economic growth followed by Sikkim, Haryana, and Uttarakhand. Among them, Goa is leading in its ICT index; however it is lagging in terms of its work participation rate.

**Table 1
Economic growth, ICT status and WPR in Indian states**

States	Economic Growth Per capita NSDP (2014-15)	ICT index (2011)	WPR (2011)
Andhra Pradesh	79441 (13)	17.2(18)	46.6 (5)
Arunachal Pradesh	79958 (12)	17(17)	42.5 (13)
Assam	45692 (23)	18.3(20)	38.4 (20.5)
Bihar	25400 (27)	19.2(22.5)	33.4 (27)
Chhattisgarh	63638 (16)	26.6(28)	47.7 (4)
Goa	262124 (1)	2.2(1)	39.6 (19)
Gujarat	109981 (7)	15(14)	41 (15)
Haryana	124092 (3)	8.2(5.5)	35.2 (24)
Himachal Pradesh	105269 (10)	9.8(9)	51.9 (1)
Jammu & Kashmir	54289 (20)	12.4(13)	34.5 (26)
Jharkhand	48550 (22)	22.8(25)	39.7 (18)
Karnataka	106896 (8)	8.4(7)	45.6 (6.5)
Kerala	116006 (5)	3(2)	34.8 (25)
Madhya Pradesh	44518 (24)	24.4(26)	43.5 (12)
Maharashtra	113379 (6)	10.2(10)	44 (10)
Manipur	43163 (25)	12(12)	45.1 (8)
Meghalaya	58363 (19)	19(21)	40 (16.5)
Mizoram	70552 (14)	7.8(3.5)	44.4 (9)
Nagaland	58998 (17)	15.4(15)	49.2 (3)
Odisha	52516 (21)	26.2(27)	41.8 (14)
Punjab	96638 (11)	8.2(5.5)	35.7 (23)
Rajasthan	64002 (15)	19.2(22.5)	43.6 (11)
Sikkim	177441 (2)	8.6(8)	50.5 (2)
Tamil Nadu	106034 (9)	7.8(3.5)	45.6 (6.5)
Tripura	58888 (18)	20.8(24)	40 (16.5)
Uttar Pradesh	35694 (26)	16(16)	32.9 (28)
Uttarakhand	116557 (4)	10.6(11)	38.4 (20.50)
West Bengal	NA	18.2(19)	38.1 (22)

Note: (1) Figures in parentheses () shows rank. (2) For the year 2007-08, the ICT index comprises households’ accessibility to radio, transistor, television and telephone. For the year 2015-16, the ICT index comprises households’ accessibility to radio, transistor, television, computer/laptop with internet and without internet and telephone/mobile phone.

Source: www.indiastat.com, census of India, Directorate of Economic and Statistics Government of Gujarat,

Some of the states like Arunachal Pradesh, Assam, Bihar, and Karnataka have achieved approximately similar ranks for all the three variables. The states like Meghalaya, Rajasthan, Tamil Nadu, Sikkim, Tripura, and Uttar Pradesh are nearly at the same status for economic growth and work participation rate. While regarding work participation rate and ICT index, Assam, Bihar, Gujarat, Karnataka and Maharashtra are almost at similar status.

The rank correlation coefficient (in table 2) shows that the economic growth is not significantly related to work participation rate, rather it is significantly related to

development of ICT services. However, there is no significant relationship between work participation rate and ICT services.

Table 2
Rank correlation coefficient

Variable	Correlation coefficient
WPR and Economic growth	.196
WPR and ICT	.009
Economic growth and ICT	.702**

Source: Computed

Gujarat is at 7th the position in terms of its economic growth, 14th position in terms of information and communication technology index and 15th position in terms work participation rate. This emphasizes the need to have a

deeper view for the relationship between information and communication technology and work participation rate.

5. District wise scenario of Information and Communication Technology and Work Participation Rate in Gujarat

The district wise scenario of ICT and WPR is presented in table 3. All the districts have experienced development of ICT services. It is highest in Banaskantha, followed by Panchmahals, Surat, Sabarkantha, and Patan. It is lower in Bharuch preceded by Dohad and Porbandar. However, for work participation rate, almost all the districts have experienced decline except Ahmedabad, Junagadh, Amreli, Bhavnagar, The Dangs, Navsari and Surat

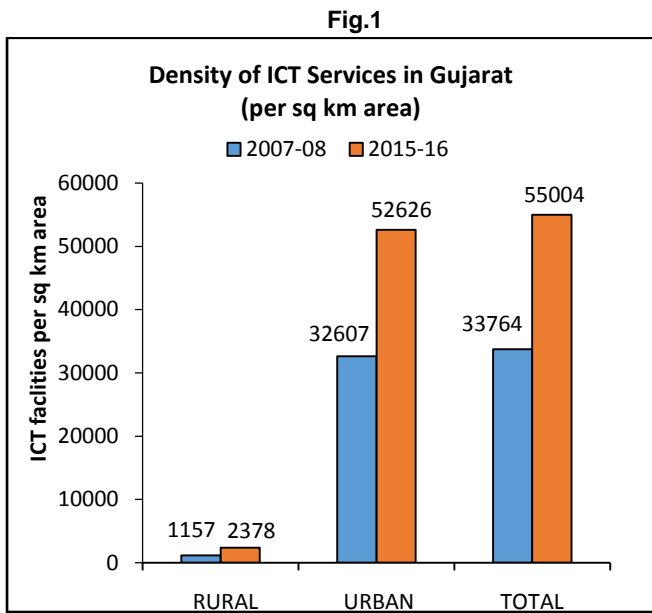
Table 3
Percentage change in households having access to ICT services and WPR in district of Gujarat

District	Households having access to ICT services (2007-08 and 2015-16)	WPR (2000 & 2011)
Kachchh	127.05	-3.13
Banaskantha	232.17	-7.34
Patan	160.61	-8.43
Mehsana	124.52	-11.53
Sabarkantha	161.02	-1.11
Gandhinagar	103.39	-7.47
Ahmedabad	113.27	4.35
Surendranagar	109.76	-3.51
Rajkot	120.10	-1.02
Jamnagar	120.13	1.55
Porbandar	97.07	-1.50
Junagadh	116.61	0.24
Amreli	132.93	0.70
Bhavnagar	126.93	4.45
Anand	130.09	-4.49
Kheda	145.41	-9.58
Panchmahals	221.84	-4.77
Dohad	15.33	5.62
Vadodara	119.05	-2.40
Narmada	125.19	-0.99
Bharuch	12.20	-2.88
The Dangs	119.76	4.02
Navsari	115.65	0.45
Valsad	142.78	-5.42
Surat	187.03	0.48
Correlation Coefficients	-0.094	

Source: Socio-Economic Review of Gujarat (2007-08 and 2015-16), Directorate of Economic and Statistics, GoG.

Fig 1 shows that the density of ICT services has increased in both rural and urban areas though the increase is smaller in

rural area. Since majority of population reside in rural area, this should reflect in work participation rate.



Source: Socio- Economic Review of Gujarat (2007-08 and 2015-16) Directorate of Economic and Statistics, GoG.

Since the correlation coefficient between the growth rate of ICT facilities and work participation rate is found to be negative (table 3), it has been further tried to find the extent of relationship between the two variables in relation to other variables.

6. Correlates of WPR

Table 4 shows the correlates of WPR for rural and urban area. In rural area, only percentage of households having accessibility to drinking water is found to be significant, but it is negatively correlated.

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Table 4
Correlation of WPR (Rural and Urban)
(Rank Correlation Coefficient)

	ICT	Education	Drinking Water	Electricity	Bank
Rural	-.009	.025	-.689**	-.287	-.133
Urban	.531**	.232	.405*	.425*	.399**

Source: Computed

Also the correlation of percentage households having access to electricity and banking facilities is negative though insignificant. This implies that with increase in facilities, the WPR decreases implying that work participation in rural area is of the distress driven type. While in urban area, WPR is positively and significantly related with percentage of households having access to ICT services, drinking water, and electricity and banking facilities. The 1 percent significance of ICT indicates that along with the other indicators, the districts having developed ICT network has a higher level of WPR.

7. Conclusion

The study finds that though ICT networks are spread all over India, but its access to households is greater in urban area than in rural area of Gujarat. Accordingly, the relationship of WPR with ICT index is stronger in urban area. Accessibility to drinking water, electricity and banking facilities is also, found to be important for WPR in urban area. However, their negative relationship in rural area implies that the lower development of these facilities forces the population to work, indicating that their participation in economic activities is of the distressed type. It appears that development of basic facilities releases the population from work and enables them to opt for education or other technical skill. The study confirms that ICT has an important role in work participation and it needs to be developed in rural area also along with other basic facilities.