

Stride in Development of Information and Communication Technology: A Study on Potential Engine for Industrial Development of North East India

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1. Introduction:

In the Holocene epoch, the unique geopolitical location of North Eastern Region (NER) of India has been attracting a huge number of tourists from all over the world. With its resources and international trade opportunities, the region has various dimensions that contribute towards India's economic progress at present time. However, in spite of the favourable factors present in the region, its economic conditions still suffer compared to the mainland of India. Thus, one may argue that the key impediment of economic growth is due to lack of infrastructure: transportation, Information and Communication Technology (ICT), market accessibility, substructure etc. Owing to the important issues, the Government of India has reached out to the North Eastern Region; thereby enacting the 'Look East Policy' in the early 1990's which is presently renamed as the 'Act East Policy' (Nay, P. T. 2014). In order to develop in strategic sense, the government has also initiated 'North Eastern Region Vision 2020' in July 2008 with the aim of accelerating development in order to achieve sustainable progress and prosperity. Prior to this, India had witnessed a transition of growth in the sector of Information and Communication Technology (ICT). The trend of growth indicates speedy advancements in the technologies for communication like television, computer, internet etc, which enabled the country to receive prompt access to necessary information. Thus, ICT has become the most robust industries in India as well as in other countries by supporting trade and community through information exchange, and connecting people-to-people through delivery services, reducing the cost of business transactions, and increasing consumption and enhancing operational efficiency. The vision of North Eastern Region was concerned with holistic development. ICT and Information Technology Enabled Service (ITES) can emerge as the major sources for both growth and employment creations, which will further drive development and improve the GDP of the country.

2. Information and Communication Technology and its Role in the World:

Information and Communication Technology can be understood as a processing system that acquires, stores, processes and disseminates the voice, picture, textual and numerical information by a micro-electronics-base (very small electronics device designs and components that are used for communication purpose). The ICT sector can even be considered service Industry that spreads knowledge to the people with computer and telecommunication equipments: Radio, TV, Telephone, Newspapers, Fax and Internet. Therefore, ICT refers to the entire gamut of media and devices that is used in transmitting and processing of information to the various target groups of societies. In this competitive epoch, a life seems to be paralyzed without computers and more ironically, a day without computers hampers the work of people in their day-to-day lives. Instantly, the importance of computers has seen almost in a daily live though it might be in the office or at home and thereby become the backbone of every groups or organization reaching to individuals at the grassroots. The major roles of ICT and ITES in the society are, namely, railways, airways, sea networks, banking, tourism, businesses, education etc.

3. Objectives of the Study:

The objectives of this paper are to examine the present position of the progression of Information and Communication Technology (ICT) and its potential strength for the development of industry, as well as, the entire region of North East of India. More specifically the paper stresses on the following objectives:

1. To assess the present status of IT-Enabled Services induced for the development of ICT sectors in North Eastern Region.
2. To evaluate the potential of ITES and ICT in near future for industrial development in North East India.

4. Methodology of the Study:

As the paper is designed to study the footings in the status and potential of ITES and ICT in North Eastern Region of India, the sources of data is solely based on secondary data. The various schemes and initiations for the development of ITES and ICT are obtained from various departmental reports. Information collected is compiled and tabulated with the help of various statistical tool analyses and interpretation of the generated data.

Data Analysis:

The analysis of the study is divided into two parts, namely, the present status of ITES and ICT and the potential of ICT and ITES in NER.

5. Present Status of ITES and ICT in NER:

The discussion on the present status of ITES and ICT in NER can be break up under six different heads, namely, Status of Telecom Circles and BPO-ITES in NER, Status of Base Transmitting Stations (BTS) of Major Telecom Operator in NER, Status of Wire-line Broadband Scheme of USOF, Status of telecommunications in NER vis-à-vis North Eastern Region vision 2020, Status of Internet Service Providers (ISPs), Status of State Data Centers (SDCs) and Status of Community Service Centers (CSCs) through which the IGNOU courses run.

Status of Telecom Circles and BPO-ITES in NER

Today, the significant activity for the growth of economy in North Eastern Region is the software industry and IT-enabled services. In order to coordinate and accelerate this sector, the region has been covered by three Territorial Telecom Licensed Service Areas (LSAs), viz. Assam (covered the State of Assam), NE-I (comprises the States of Meghalaya, Mizoram and Tripura) and NE-II (includes the States of Arunachal Pradesh, Manipur and Nagaland) and the eighth State of NER, Sikkim is under the Territorial LSAs of West Bengal. Under the special component plan, BSNL makes provision for the development of telecom facilities in NER. However, till date the presence of IT industry including BPO-ITES operations in NER is very limited, consisting of only a small number of private companies in each state that support local requirements.

Table 1: Status of Base Transmitting Stations (BTS) of Major Telecom Operator in NER

Operator	Assam	North East (Except Assam & Sikkim)
BSNL	1733 (5 th)	1605 (2 nd)
Aircel	2518 (2 nd)	1721 (1 st)
Airtel	2598 (1 st)	1496 (3 rd)
Idea	673	709
Reliance	1950 (4 th)	753 (5 th)
Vodafone	2409 (3 rd)	1140 (4 th)
TATA	295	189

Sources: IndiaStat, 2011.

Graph: 1(A), Showing Major Telecom Operator in North East Region

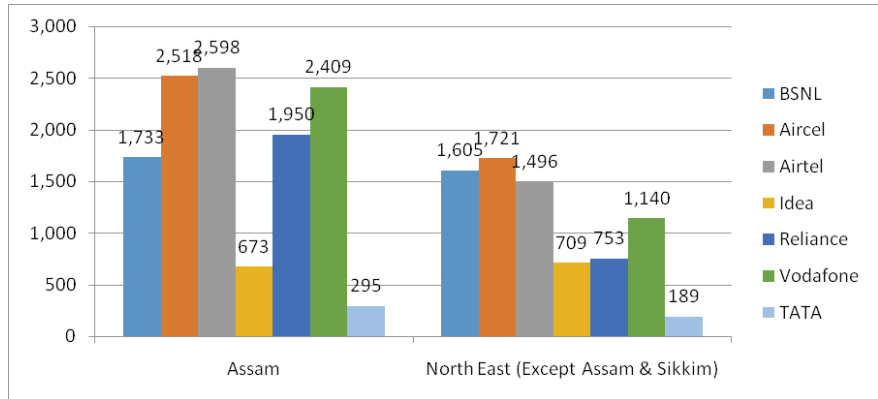


Table 2: Status of Wire-line Broadband Scheme of USOF

State	Number of Rural Exchanges	Number of Broadband connections planned	Broadband connections provided as per 2012
Assam	429 (50.71%)	13299	1318 (9.91%)
Meghalaya	56 (6.62%)	1736	90 (5.18%)
Mizoram	35 (4.14%)	1085	177 (16.31%)
Tripura	58 (6.85%)	1798	417 (23.19%)
Manipur	54 (6.38%)	1674	155 (9.26%)
Arunachal Pradesh	105 (12.41%)	3255	161 (4.95%)
Nagaland	62 (7.33%)	1922	40 (2.08%)
Sikkim	47 (5.56%)	1457	47 (3.22%)
Total	846	26226	2405

Source: Compiled and calculated based on India Stat, 2012

Graph: 2(A), Depicting Broadband Connections provided as per 2012

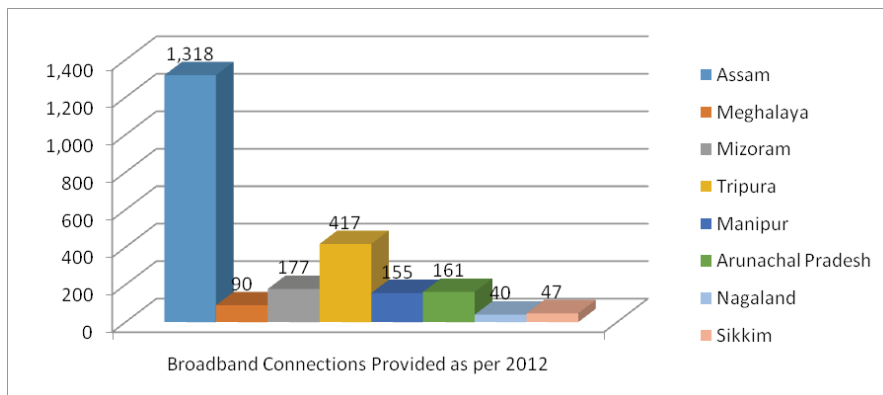


Table 3: Status of Telecommunications in NER vis-à-vis North Eastern Region Vision 2020

ASSAM					
Sl. No	Parameters	Unit	Target	Status as on 2009	Status as on 2012
1	Coverage of Area of State	Sq.km	78436	35288	70000
2	Coverage of Villages	Nos	25124*	17070	24000
3	Coverage of Population	Lakhs	266.55*	206.00	240.00
4	National Highways	Kms	2816	2545	2816
5	State Highways	Kms	2102	2102	2102
MIZORAM					
1	Coverage of Area of State	Sq.km	21087	3953	19000
2	Coverage of Villages	Nos	707*	120	707
3	Coverage of Population	Lakhs	8.91*	4.36	8.91
4	National Highways	Kms	927	224	927
5	State Highways	Kms	440	150	440

TRIPURA					
1	Coverage of Area of State	Sq.km	10492	6756	10492
2	Coverage of Villages	Nos	858*	176	858
3	Coverage of Population	Lakhs	31.92*	8.38	30.0
4	National Highways	Kms	400	200	400
5	State Highways	Kms	90	88	90
MEGHALAYA					
1	Coverage of Area of State	Sq.km	22429	7017	20000
2	Coverage of Villages	Nos	5782*	392	5400
3	Coverage of Population	Lakhs	23.19*	8.04	21.50
4	National Highways	Kms	810	236	810
5	State Highways	Kms	180	128	180
ARUNACHAL PRADESH					
1	Coverage of Area of State	Sq.km	83743	4920	50000
2	Coverage of Villages	Nos	3863*	577	3400
3	Coverage of Population	Lakhs	11.00*	4.23	10.00
4	National Highways	Kms	392	145	392
5	State Highways	Kms	1232	445	1232
MANIPUR					
1	Coverage of Area of State	Sq.km	22357	4655	20000
2	Coverage of Villages	Nos	2315*	1645	2199
3	Coverage of Population	Lakhs	22.87	8.18	20.00
4	National Highways	Kms	959	417	417
5	State Highways	Kms	668	208	208

NAGALAND					
1	Coverage of Area of State	Sq.km	16529	5570	15000
2	Coverage of Villages	Nos	1278*	788	1125
3	Coverage of Population	Lakhs	19.89*	9.44	19.00
4	National Highways	Kms	494	460	494
5	State Highways	Kms	1094	696	1094
SIKKIM					
1	Coverage of Area of State	Sq.km	7096	2055	6400
2	Coverage of Villages	Nos	450*	276	430
3	Coverage of Population	Lakhs	5.4*	2.3	5.00
4	National Highways	Kms	92	52	92
5	State Highways	Kms	165	157	165

Source: Compiled and calculated based on MCITDT

Table 4: Status of Internet Service Providers (ISPs)

States	Status of State Wide Area Network (SWAN) as per 2016 census
Tripura	There are 69 Point of presence (POPs) including SHQ under TSWAN
Mizoram	2-34Mbps connectivity are provided up to DHQ with 42 POPs completed under MSWAN
Meghalaya	Minimum 2Mbps connectivity are provided up to remote 39 BHQs. Future plan to extend it to 8Mbps.
Nagaland	The SWAN consists of 48 POPs covering 1 SHQ and 10 DHQs. Currently up to 8 Mbps bandwidth is provided. Future provision is of 32 Mbps.
Manipur	Under National e-Governance Plan (NeGP), Manipur is in the implementation phase
Assam	Under PPP model, there are almost 240 POPs at across SHQs, DHQs and BHQs.

Sikkim	SWAN has already been implemented at Sikkim. All government departments are in the process of being networked through optical fibre and radio frequency (RF)
Arunachal Pradesh	SWAN project includes 15 DHQs and 46 blocks in the state. Some of the flagship programmes which have been digitized are Public Distribution System (PDS), driving licenses and vehicle registration, and commercial taxes etc.

Source: KPMG.com/in

Table 5: Status of State Data Centers (SDCs)

States	Status of State Data Centers (SDCs)
Mizoram	Prithvi Info bagged the Mizoram SDC project in 2011 for 5 years
Tripura	SDC commissioned on 24.12.2010 and hosts 100 applications and website of 50 different State government departments/organisations
Manipur	SDC operational with eight government department utilizing MSDC infrastructure for hosting their respective applications
Nagaland	NSDC currently hosts applications like State Portal State Services Delivery Gateway, File Tracking System, Online Inner Line Permit, Vigilance Department, Economics & Statistics, Finance Department, Election Department, Crime & Criminal Tracking Network System (CCTNS), food & Civil Supplies, Department of Soil & Water Conservation, Department of Information & Public Relations
Meghalaya	MSDC hosts 27 applications/websites from various state departments. Disaster recovery Storage Replication has been set-up with National Data Center New Delhi. Cloud based hosting has also been implemented
Assam	ASDC located at Dispur is connected to SWAN and internet cloud. It's services are available throughout the state to various State Government departments and agencies including CSC operators
Sikkim	The Sikkim data center hosts Sikkim open Data Acquisition and Web Portal which applies to all data created by various Departments/Ministries/Departments/Organizations with OLAR (Online Analytical Processing) capabilities

Source: KPMG.com/in

Table 6: Status of Community Service Centers (CSCs) through which IGNOU courses run /No. of CSCs as on 31.01.2012

State	CSCs to be set up	Status as on 31.01.2012	IGNOU courses through Community Information Centres (CICs)
Tripura	145	145	IT Education and Training
Arunachal Pradesh	200	200	
Assam	4,375	3,881	E-mail and Internet Access
Manipur	399	399	
Meghalaya	225	214	Information Dissemination
Mizoram	136	118	
Nagaland	220	198	Citizen-Centric Applications
Sikkim	45	45	
Total (NER)	5,745	5,200 (90.51%)	Entertainment and News
India	1,26,949	97,159 (76.53%)	

Source: Common Service Centers (CSCs). <Indiastat.com>

In the light of the above tables and graphs, it is certain and confirmed that numbers of government initiations and schemes has been implemented for the development of ICT and ITES in North Eastern Region of India. It was found that the region has been covered and reached out by under special plan by BSNL with three Territorial Telecom Licensed Service Areas (LSAs), viz. Assam (Assam), NE-I (Meghalaya, Mizoram and Tripura) and NE-II (Arunachal Pradesh, Manipur and Nagaland) and the eighth State of NER, Sikkim is under the Territorial LSAs of West Bengal. However, till date the presence of ICT industry including BPO-ITES operations in NER is very limited, consisting of only a small number of private companies in each state that support local requirements. Despite BSNL being the mother of telecom operator in the region, a tremendous change has been seen in recent times. Subsequently, almost all the telecom companies are now present in the region however the major operator are Aircel, Airtel, Vodafone, Idea, Reliance and TATA.

In order to connect various parts of the areas in the region, Wire-line Broadband Scheme of USOF has been launched to have connection with State District Headquarter (SDHQ) to District Headquarter (DHQ) through Optical Fibre Cable (OFC). At present, there are 846 Rural Exchanges centre in the region, USOF Broadband Connections Planned was 26,226 and it has already connected with 2,405 Broadband Connections provided as per 2012.

The status of Telecommunication (North Eastern Region Vision 2020) reveals data on all the eight states National Highways and State Highways that have been completed within three years (2012) as per the data disclosed. The Planned monitoring targets for improvement of telecommunication infrastructure in North Eastern Region also indicates that for the states of Mizoram and Tripura, the target villages and population has been covered since 2012. As per the data disclosed by MCITDT, the target set for all the parameters in the eight states were almost completed in 2012 which means by now the set target should have been covered.

Internet Service Provider (ISPs) is to connect the end users with the internet backbone, which is the Points of Presence (POPs) and connected through State Wide Area Network (SWAN), which connects State HQ, District HQ, sub-divisional HQs and Block HQs in order to provide G2G, G2C services. North Eastern Region has been initiated with SWAN and hence the relationship between government and the stake has been improved.

State Data Centers (SDCs) is the key infrastructure to provide efficient delivery of services for Government to Customer (G2C), Government to Business (G2B) and Government-to-Government (G2G) services across the North Eastern states. These services are rendered through common delivery platform by connecting with SWAN (State Wide Area Network) and CSCs (Community Service Centers) with connectivity up to the block level. The ideal uptime of DCs is 99.74 per cent.

Department of ICT (DIT) has taken up a project along with NIC (National Informatics center) and the state governments of the NE to provide CICs per block in all the NE states and Sikkim. The project objective is to address the basic needs of citizens such as information, education, entertainment and health services through CSCs. The IGNOU has been assigned to develop awareness among people on courses to be provided through Community Information Centres (CICs). The courses

are IT education and Training, E-mail and Internet access, Information Dissemination, Citizen-centric Applications, Entertainment and News. Dissemination of ICT enabled education through open and distance learning will boost up gradation of technology owing to which enterprise in the region will become more competitive.

Hence, the Government of India has taken various initiations and schemes to reach the unreached and to connect the unconnected areas through ICT and ITES in the North Eastern Region of India. The footprints of these introductions have been seen in various places of the rural areas in the region. Nevertheless, the contribution has attracted many telecom companies and eventually the telecom companies are found with moderate amount of investment in the region. The amusement for the development of ICT and ITES is North Eastern Region Vision 2020, under which numbers of project are underway: road connectivity, rail connectivity, air connectivity, cyber and telecom connectivity, inland waterways and power. The vision will mark change for the North Eastern Region of India if efficiently implemented. With ICT and ITES acting as the mechanism of fuel and engine to development in this competitive epoch. The North Eastern Region should emphasise on the development of ICT and ITES, when only this sector advances there will be development in the field of socio-economic and industrial development.

6. Potentials of ICT and ITES in NER

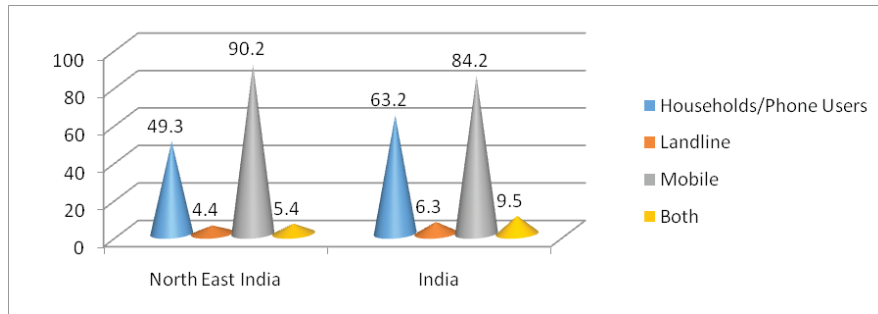
In the discussion on the potential of NER, there are seven heads, namely, the potential demands for connectivity in NER as per 2011 census, Status of Phone connectivity in NER as per 2011 census, Connectivity with neighboring countries of NER, NER of India as a trade and commercial hub, agriculture, horticulture and natural resources of NER, tourism, education and healthcare across the NER:

Source: Compiled and calculated (India 2011 census data; state-wise internet users)

Table 7: Demand for Connectivity in NER as per 2011 Census

States	Households	Computers	%	With Internet	%	Without internet	%
Sikkim	1,28,131	14,735	11.5	4,228	3.3	10,507	8.2
Arunachal Pradesh	2,61,614	21,452	8.2	5,232	2	16,220	6.2
Nagaland	3,99,965	35,597	8.9	6,799	1.7	28,797	7.2
Manipur	5,07,152	45,644	9	10,650	2.1	34,993	6.9
Mizoram	2,21,077	33,604	15.2	5,527	2.5	28,077	12.7
Tripura	8,42,781	60,680	7.2	8,428	1	53,095	6.3
Meghalaya	5,38,299	40,911	7.6	8,074	1.5	32,836	6.1
Assam	63,67,295	5,92,158	9.3	1,01,877	1.6	4,90,282	7.7
Total in NE	92,66,314	8,44,781	9.11	1,50,815	17.85	6,93,966	82.15
India	24,66,92,667	2,31,89,111	9.4	76,47,473	32.98	1,55,41,638	67.02

Graph: 7(A), Showing of Comparison between India and NER in term of Computers owners, Computers with Internet and Computers without Internet

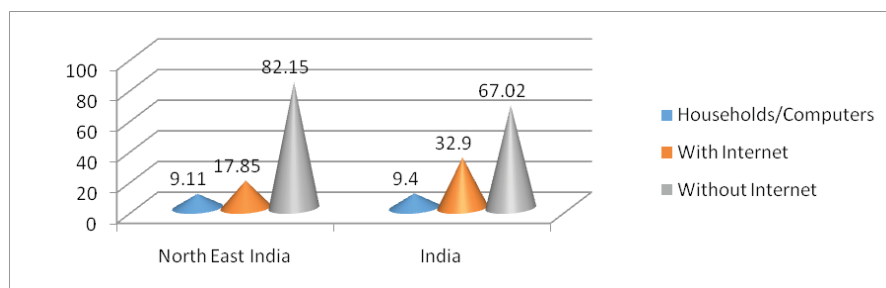


Source: Compiled and calculated (India 2011 census data; State-wise phone users)

Table 8: Phone Connectivity in NER as per 2011 Census

States	Households	Phone Users	%	Landline	%	Mobile	%	Both	%
Sikkim	1,28,131	93,536	73	2,306	1.8	86,745	67.7	4,485	3.5
Arunachal Pradesh	2,61,614	1,26,360	48.3	7,587	2.9	1,04,122	39.8	14,650	5.6
Nagaland	3,99,965	2,12,381	53.1	5,200	1.3	1,94,383	48.6	12,799	3.2
Manipur	5,07,152	2,91,612	57.5	15,215	3	2,65,240	52.3	11,157	2.2
Mizoram	2,21,077	1,60,944	72.8	3,758	1.7	1,41,268	63.9	15,918	7.2
Tripura	8,42,781	4,05,378	48.1	17,698	2.1	3,59,867	42.7	27,812	3.3
Meghalaya	5,38,299	2,31,469	43	8,074	1.5	2,10,475	39.1	12,919	2.4
Assam	63,67,295	30,49,934	47.9	1,40,080	2.2	27,63,406	43.4	1,46,448	2.3
Total in NE	92,66,314	45,71,614	49.3	1,99,918	4.4	41,25,506	90.2	2,46,188	5.4
India	24,66,92,667	15,59,09,766	63.2	98,67,707	6.3	13,12,40,499	84.2	1,48,01,560	9.5

Graph: 8(A), Showing Phone Users



The status of potential demand for connectivity in NER reveals that the North Eastern Region has more demand of computers than the other parts of India as compared to other households but with regard to internet connection other parts of India computers are mostly connected with internet whereas North Eastern Region computers shows less connectivity. Among the North East States, Mizoram has the highest demand of computers with 15.2 per cent followed by Assam with 11.5 per cent. However, the computers of Sikkim show highest in internet connecting with 3.3 per cent and Mizoram has the second highest connections with 2.5 per cent. The state of Tripura has the lowest demand in computers, as well as, connectivity. Hence, the episode indicates that though the demand of computers are increase in the region the connectivity facilities to internet are still very poor. According to 2011 census, the phone users as compared with households in North Eastern Region shows 49.3 per cent and in India show 63.2 per cent. When we compared the mobile phone users, it was found that North Eastern Region has higher connectivity with 90.2 per cent than that of India with 84.2 per cent.

7. Other Potential Areas in NER for the Development of ITES and ICT:

Smart Cities:

The government of India has a vision to developed 100 smart cities as satellite-based towns and by modernizing citizen-friendly and sustainable environment. The concept of Smart Cities is projected to improve the standard of living through smart solutions. A total of INR 980 billion (US\$ 15 billion) has been approved by the Indian Cabinet. Amongst the shortlisted 100 cities by the Centre includes a number of States from the North Eastern Region, namely: Pasighat in Arunachal Pradesh, Guwahati in Assam, Imphal in Manipur, Shillong in Meghalaya,

Aizawl in Mizoram, Kohima in Nagaland, Namchi in Sikkim and Agartala in Tripura. The smart cities will have facilities of highest impact ICT-enabled infrastructure and services projects, digital infrastructure and citywide Wi-Fi.

Connectivity with Neighboring Countries of NER:

The North Eastern Region of India acts as the gateway to South East Asia sharing land borders with China, Bhutan, Bangladesh, Myanmar and Nepal. Due to the strategic location of North Eastern Region, it has immense opportunities to growth through integration of South East Asia. In the recent time, the Asian countries have provided several benefits to India. In order to maximize the benefits and strengthen the relationship, India has taken the initiatives since 1990 to enhance both economic and strategic ties. These include the Asia-Pacific Trade Agreement (APTA), which comprises India, Sri Lanka, Bangladesh, Lao People's Democratic Republic and Republic of Korea. Moreover, in August 2014, India introduced the 'Act East' Policy (AEP), which renewed the previous 'Look East' Policy (LEP). Such policies and initiations will pave the ways for foreign investors and will enhance the ICT sectors by promoting growth in industries and driving overall development in the region.

NER of India as a Trade and Commercial Hub:

The NER being strategically close to emerging markets of South East Asia countries; it has vast potential to become a trade and commercial hub. The market opportunities and rich resources offer local and international investment opportunities and can become a strong base for emerging businesses. NER, having the potential facilities, has the scope of improving production networks between these countries in a big way. Bangladesh is a major trading partner for the NER, despite a long and troubling history of political disputes, stemming in part from the uneasy bilateral trade relationship between the two countries. Cross-border trade between Bangladesh and the North-East Region has been growing steadily. Exports from the North Eastern India to Bangladesh are twice the size of its imports; however, the NER has witnessed an increase in its imports from Bangladesh, particularly during 2008-09 and 2012-13. From 2008-2009 the NER exported INR 4.2 billion to Bangladesh, and INR 9.2 billion to Bangladesh from 2012-2013. Above all, IT and ITES has turned into a significant player which has played a great role and without which development would be impossible.

Agriculture, Horticulture and Natural Resources of NER:

The North-East Region is abundant in natural resources including limestone, coal, petroleum crude, natural gas, dolomite, and uranium. The states of Assam and Meghalaya are the main producers of coal while Assam also holds substantial reserves of oil and natural gas. Commercial horticulture, forest products, fruits and vegetables and hydro-energy potential also blesses the Region. Each of the states is abundant in natural products; however, the export potential is ample in size. The food-processing sector in particular has seen considerable growth and presents a number of development opportunities to the NER. This would involve the development of processing units, as well as, provide infrastructure for transportation of goods in order to facilitate trade. ICT development in particular can facilitate cross border trade for example technology innovations have made it easier for small firms to connect buyers with sellers and participate in international trade. This has in turn reduced trade costs and transaction costs. Traders within North Eastern states can similarly enter into a buyer-seller relationship thus giving a boost to exports of agricultural produce and entering into new value chains.

Tourism, Education and Healthcare across the NER:

The picturesque beauty has not been discovered by tourists owing to its shortcomings such as lack of infrastructure and connectivity. The entire region is subject to the notion of geographical isolation by the tourists because of the lack of connectivity, in spite of the region being a melting pot of culture and scenic spots. The region is equipped to entertain various kinds of tourism such as eco-tourism, golf and tea-tourism, heritage tourism, adventure sports-tourism and ethno-tourism.

The healthcare sector of NER as compared to mainland of India is an area, which requires considerable focus to improve. Due to poor infrastructure, limited machines and lack of trained manpower it has lagged behind. Rural and remote areas in particular have suffered lack of doctors, forcing patients to travel to far. Primary Healthcare Centers (PHC's) are understaffed and are unable to provide quality services to the population at large. Improvements in the ICT and ITES will greatly affect the healthcare sector. Skill development and education are integral areas for development, particularly across the NER. Although the number of educational institutions at both the secondary and higher-

secondary level has increased in recent years, the number of technical colleges is severely lacking. Of all regions in India, the North East Region in particular requires an increased focus on skill development as a way of generating rural employment. Education is a sector, which can effectively leverage through ICT through the modes of learning and teaching using ICT.

8. Discussions and Conclusions:

The North Eastern Region of India has witness a sluggish pace of movement with regard to ICT and ITES till 2009. Nevertheless, tremendous change has been brought in through various governmental schemes and initiations for the overall development in order to match with mainland India, particularly with regard to the development of ICT and ITES. Recently, the realizations of limited ICT and ITES infrastructure in the NER by the Government of India was the integral part for this tough terrain region and so the Government of India has taken initiatives at Agartala by inaugurated India's third international internet gateway link, after Mumbai and Chennai, through Bangladesh extending to the South East Asian countries which also will benefit the people of North Eastern States with accessibility to internet. In the meantime, the Ministry of Communications and Information Technology, Department of Telecommunications, Government of India has launched various schemes under USOF and OFC, and also taken initiatives under 'North Eastern Region Vision 2020' with the aim of developing road connectivity, rail connectivity, air connectivity, cyber and telecom connectivity, inland waterways and power. As per the records of 2012, NER is covered by three Territorial Telecom Licensed Service Areas, viz. Assam, NE-I and NE-II, and the eight states, Sikkim is under the Territorial LSAs of West Bengal. Despite LSAs coverage in the region, the IT industry including BPO-ITES is very limited. The status of Wire-line Broadband shows that potential progress has implemented so far with 846 rural exchanges and out of 26,226 broadband connections planned to be completed in 2020, 2,405 has already been connected in 2012. The status of telecommunications in NER vis-à-vis north eastern region vision 2020 reveals that telecommunications has already covered 100 per cent in National Highways and State Highways in all the states and for the parameters such as, coverage of area of state, coverage of villages and coverage of population has already achieved more than 50 per cent of the set target by 2012. The status of Internet Service Providers (ISPs) and State Data Centers (SDCs) depicts that in all the eight states the

facilities have reached various district headquarters and even extended to their own blocks. The status of Community Service Centers (CSCs) revealed that 90.51 per cent has been achieved from the set target, this credit has been taken initiations by IGNOU by providing various courses like: IT Education and Training, E-mail and Internet Access, Information Dissemination, Citizen-Centric Applications and Entertainment and News. Hence, the status of various scheme and initiations reveals that the induced programmes are accelerating in a good wave for the development of ICT and ITES in NER.

As far as the potential for growth of ICT and ITES is concerned in NER, the implementation of 'Act East Policy, Organic Cities and Smart Cities will have corking impact for the development. Moreover, in this trend of digitization in the economy for utilizing the abundant resources (Natural Resources, Cultural Resources and Human Resources) ICT and IT-enabled services has become utmost essential. On the other hand, the demand on connectivity as compared with households and computers, shows that the states of North East has more demand than the all India average; but in the case of internet connections to the computers North East has lesser connectivity than the all India average; however, the mobile users shows that North East have more demand than mainland people which reveals that the accessory of ICT and ITES are in great demand in the region. Eventually, ICT and ITES support trade and community through information exchange and connecting people-to-people in delivering services and reducing the cost of doing business, increasing consumption and enhancing operational efficiency. Hence, for the North East India, which was characterized by their unique geopolitical location and rich resources, ICT and ITES have come to the doorstep of industrial development in the near future.

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