

# Exploration of Factors of Information Communication Technology (ICT) in the Socio-Economic Development of Nagaland, India- A Citizen Perspective

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## Abstract

Information Communication Technology (ICT) in recent years is acting as a vital force in the socio-economic development of a Country. The potentiality of ICT impacting many activities like-economic, social, education, healthcare, productivity, poverty alleviation can be observed in extant literature. However, the direction and magnitude of the impact of ICT on socio-economic development have not been examined elaborately and statistically in particular to the North-Eastern part of India. Thus, this study attempts to fill the gap by emphasizing on ICT driven socio-economic development from the perspective of a developing country. The theoretical model adapted from the works of Palvia et al. (2018), which was influenced by Madon (2000) conceptual design was used to achieve the objectives of this study. A principal component analysis (PCA) was performed at first to extract the factors, and later through confirmatory factor analysis (CFA), the construct reliability was calculated on a separate sample. This study also examines the extent of the impact of ICT on socio-economic development by fitting a structural model. The findings suggest that the empowerment factor of ICT has the highest predictive capability of socio-economic development in the State of Nagaland, followed by the social contact factor. However, the complementary potential of ICT in the economic transformation can be adequately exploited, provided the State government brings out the cutting-edge policy on entrepreneurship through setting up of micro and small-scale units preferably agro-based and service-based. Thus, the policymakers need to give more emphasis on ICT to significantly speed up the overall socio-economic development and inclusive growth in the State of Nagaland.

**Keywords**— ICT, Socioeconomic Development, Empowerment, Economic Transformation

## I. INTRODUCTION

Information and Communication Technology (ICT) in the present-day scenario has become an indispensable part of human life. Similarly, for a Country or State, its significance in economic as well as social and cultural development cannot be overlooked. Michiels and Van Crowder (2001) have defined “ICTs as a range of electronic technologies which, when converged in new configurations, are flexible, adaptable, enabling and capable of transforming

organizations and redefining social relations.” Thus, ICTs can be regarded as a technology through which information technology devices can be interlinked with communication technologies, and it can be used for the transformation of organization and society. It is instrumental in rapidly changing our way of life, the way we do business, access, and communicate information with each other. In this information, age ICT is considered as an essential factor in the socio-economic development of a Country. Today ICT is used

by the Government agencies of different Countries as a tool to reach all the citizens and provide improved service quality, which in turn enhances citizen satisfaction and socio-economic development. Kozma (2005) stated that “Information and communication technology (ICT) is a principal driver of economic development and social change worldwide.” It is expected that ICT will bring transparency and fast response within the government departments, generate opportunities in education and health care sectors, cultural creativity, and integration of different cultures. It is a well-documented fact that, majority of population in India live in rural areas having limited access to information. In this context, ICT will enable in the better delivery of government services and assist in their socio-economic development. Apart from this, ICT can be used significantly as a means in creating information-rich societies and play a prominent role in strengthening sustainable livelihoods for the citizens.

Information Technology (IT) today is becoming as important as water, bread and air. In the early part of 20th Century, people used to believe in the secrecy of information but in this 21st Century, the concept is totally reversed. Now people like to share information and thus, Information Technology is emerging as a powerful tool to improve socio-economic development. Experts in this field confidently predict that in the future, the poverty line will no longer be measured in terms of money, but in terms of information.

Nagaland is a land locked hilly State bounded in the east by Myanmar, west by Assam and Arunachal Pradesh and it is one of the 8(eight) States in Northern Eastern part of India comprising mostly of villages. The geographical location and perpetual geopolitical crises in this region have slowed down its development although this state has 79.55% literacy rate as per census 2011. The State has a unique character both in terms of its social composition as well as economic development activities and the citizens depends predominantly on agricultural sector as their

main source of income for their livelihood. The State of Nagaland consists of 11 (eleven) districts with 16 major tribes and the state has often been confronted with various constraints and challenges in areas like economic activities, development of infrastructure, development of the social capital, marketing and promotion of agricultural products etc. The resilience of the rural communities is not only giving hope but also making a beginning to help in overcoming the other challenges. In rural areas of Nagaland people often face difficulties in transportation, communication, marketing of rural based products, training facilities and large variation of pricing of commodities which goes a long way in impacting directly or indirectly the overall sustainable development. In today's world, access, usage, and ownership of ICT are fundamental in linking communities, facilitating businesses and empowering communities economically and therefore use of ICT in the state of Nagaland is crucial in accelerating socio-economic development in rural and remote areas. Besides basic infrastructures like road, power, water, health, education etc. even the IT infrastructure is equally important since it is considered as an enabling factor in promoting socio-economic growth. In recent years both the central and state government are proactively emphasizing on the IT infrastructure development.

India is currently the world's second-largest telecommunications market with a subscriber base of around 1.18 billion. The mobile industry has witnessed an exponential growth over the last few years driven by affordable tariffs, wider availability, roll out of Mobile Number Portability (MNP), expanding 3G and 4G coverage, evolving consumption patterns and supportive policy and regulatory environment. The Government of India has placed considerable emphasis on growth of internet and broadband in the country as part its Digital India campaign. Mobile has now emerged as the main platform for internet access in India, bringing connectivity to many previously unconnected populations. Efforts are being made to address the digital divide by

extending inclusive internet access to every Indian, as mobile technology looks to empower the masses and become the critical means of accessing a broad range of public services (Department of Telecommunications Annual Report 2018-19). By and large IT infrastructures are gradually improving in the State of Nagaland and therefore, in the context of emerging Information technologies and its possible use in enhancing productivity and improving quality and efficiency for all-round socio-economic development, an empirical study in the state of Nagaland is immensely necessary.

## II. LITERATURE REVIEW

In a developing country like India majority of the people live in rural areas. As per the census 2011 the rural-urban distribution of population is 68.84% and 31.16% and it indicates that the percentage of rural population is very high. Since population growth affects per capita GDP (Gross Domestic Product) growth, higher population growth rates would contribute to either higher or lower overall economic growth depending on the nature of its effects on per capita GDP. Hence, placing special focus on the socio-economic development of rural area especially in State like Nagaland will contribute to the overall socio-economic development of India. The resources and enormous opportunities available in rural India are the key factor that is needed to be exploited at its full potential by the policy makers and government at various levels. According to Bage (2004); Carney (2000) three quarters of the world's poor, approximately 900 million people around the world live in rural areas are dependent on agriculture for their livelihood and according to Mwabu and Thorbecke (2001), due to low agricultural productivity, poor infrastructure, lack of access to market and information, low levels of investment in people, ethnic and tribal conflicts, inappropriate economic policies, unsustainable population growth etc. there is high level of poverty in rural areas. Although, the aim of rural development is to eradicate poverty through equitable distribution of

income, yet majority of governments in developing countries hardly achieve this goal.

The exponential growth of ICT in the last decade is instrumental in developing a new economic world order through intensive knowledge transfer and the true sense of globalization is felt after development and deployment of ICT the world over. It is through ICT the very goal of globalization like- new market access, quality improvement in products, provision of better and quick service delivery and flexibility has been achieved. Thus, the impact of technology on economic development has been a focus area among the research community, particularly at a time when there is rapid change in ICT technology. In many recent literatures, the researchers are highlighting the impact of IT on knowledge, growth, production, employability, competition and human resource development. Although, it is difficult to measure and study the impact of ICT, still several indicators had been proposed in various empirical studies to investigate the opportunities and challenges of ICT on world economy. Jorgenson and Stiroh, (1995) as well as Phojola, (2000 & 2001) had used an index on ICT investment and expenditures on IT, computers and equipment to study its impact on economic growth and development. Similarly, Bresnahan, Hitt and Brynjolfsson (1999) made a study on the impact of ICT on employment and work organisation. The major finding in the literature suggests that the combination of computerization, workplace organization and increased demand for skilled workers appears as a cluster of changes and ICT complements the economic growth through human capital skill upgradation.

Also, Goldin and Katz, (1998); Bresnahan et al., (1999); Autor, Katz and Krueger, (1998); Acemoglu, (1998) had investigated the complementary relationship between “technological progress, as measured by ICT and human capital, as measured by the increasing utilisation of higher educated workers”. Areepattamannil & Khine (2017) explored that use of ICT at different places like school, home, classroom and even during

entertainment can have positive impact on the social behaviour among early adolescence students. This study conducted across 20 countries. This will help policy makers and education institutes to think to develop academic curriculums. While, study made by Stolaki & Economides (2018), suggests ICT can improve the creativity of the students and help in creating diversified thinking ability. Educators can use extensive ICT tools to help students in understanding the subject better and consider this as part of curriculum. Fernández et al. (2020) suggests application of ICT in schools may have positive impact based on the subject and the technology applied for teaching. The study found that ICT has positive impact on science scores than other subjects. This study conducted at Spanish reason on secondary schools. Apart from direct and indirect contribution to economic growth and development, ICT also impacts the social, cultural and individual empowerment.

Among the literature related to impact of ICT on socio-economic development Orlikowski and Iacono (2001) said that in the day-to-day socio-economic life ICT plays a central role. While Puri (2007) emphasized on the role of ICT in socio-economic development is a means to advance the less developed nations by creating a better world. Similarly, Hardy (1980) studied on the impact of telephone on socio-economic development. Njoh (2018) witnessed implementation of ICT in Africa resulted in substantial development. Human development index and utility service data were analysed to support the outcome. A unique study by Pandey & Ilavarasan (2019) on migrated Afghan Sikhs to India expressed how ICT helped them in keeping their sole identity. The study further suggested ICT is having same rank as physical infrastructure for refugees. The collectively owned capital, experience, social status and symbolic capitals are managed by ICT, which are very unique to society. On the other hand, the study conducted by Choudhary et al. (2020) conducted survey in 28 countries to find the impact of ICT from the period of 1998 to 2016. The study suggests that ICT can impact war

against terrorism, improving communication technologies, improving tourism, increased per capita income, trade openness and FDI inflows. Study carried out by Chatterjee et al. (2020) in India suggests that adaptation of ICT among rural women brings out access to mental, material, innovation, skill and increase entrepreneur ability. This also helps in technology adoption easily. In country like India and focus on women empowerment, this function of ICT can be considered as game changer. While, Falck et al. (2020) found there is significant drive with ICT skills to any country's economic affairs. This research is carried out at Germany. Neubauer, T et al. (2012) examined the role of ICT as a facilitator in postmodern and empowered citizenship. They opined that, the inherent democratic characteristics of ICT automatically empower citizens technologically and majority of socio-political issues will be addressed effectively. Kuyoro Shade, et al. (2012), suggested that, the development of ICT infrastructure offered possibilities in improved health care, new ways of empowering citizen, and active participation in social and political systems. De Rosa, E. (2017), studied on "social innovation and ICT in social services" from the European context. He argued that disruptive technologies especially ICT buttress the social service innovations and concluded that new technologies in fact provide opportunity for better life and promote rights of citizens.

Min et al. (2020) conducted research in China to establish impact of ICT on rural development through farmers. The study clearly established that implementation of ICT resulted in off-farm employment of farmers and their family members, cultivation of nongrain items and crop specialization. Madon (2005) examined the impact of e-government on development by using Amartya Sen's (2004) capability approach model. Liew et al. (2014) "indicated that religion, ethnicity, language, gender, and education are significant factors moderating the adoption, perception, and use behaviour of Facebook in a developing country". Despite economic opportunity and advantages of ICT

several studies had debated on the dangers of ICT particularly to developing countries and lacks a systematic analysis on impact of ICT on overall socio-economic development parameters.

The theoretical model adapted from the works of Palvia et.al (2018) which was influenced by Madon (2000) conceptual design was used to conduct this study on the idea of socio-economic development of developing countries from ICT framework, and was validated empirically. The model of Palvia et.al (2018) is presented in Figure-1.

In the above context, the goal of this research work was to investigate impact of ICT on socio-economic development in the state of Nagaland. Therefore, this study has adopted the Palvia et.al (2018) model and tried to validate this model from the Nagaland, India perspective. Therefore, the following were the hypothesis for this study:

- i) There is a significant positive relationship between personal security and socio-economic development.
- ii) There is a significant positive relationship between Cultural evolution and socio-economic development.
- iii) There is a significant positive relationship between Economic transformation and socio-economic development.
- iv) There is a significant positive relationship between empowerment and socio-economic development.
- v) There is a significant positive relationship between social contact and socio-economic development

### III.METHODOLOGY

This study is based on survey of rural inhabitants in all districts of Nagaland conducted during 2018-19. The respondents were selected randomly from the population size 10,26,413 on the basis of clustered, stratified and multistage sampling method. The sample size determined was 843. At first the samples were stratified on the basis of district of residence as well as rural and urban areas. Here only residents of rural area were interviewed and the final sample consists of 789

respondents, out of which 422 responses collected initially for exploratory factor analysis purposes and later on 367 responses for confirmatory factor analysis. The data were collected during 2018-19.

Personal interviews were conducted by administering a questionnaire developed for this purpose. At first a pilot study was undertaken on 50 respondents selected randomly to check the consistency and reliability of the questionnaire. The instruments of survey were developed through in-depth review of literature and identified five factors on which ICT has direct impact viz. Social contact, Economic transformation, Cultural Evolution, Empowerment and Personal Security under Socio-economic development premises. All the factors considered for this study were measured in 5-point Likert scale. In order to validate the research instrument Principal Component Analysis (PCA) method has been used. It is a statistical technique of data reduction and used to explore the linear relationships amongst a group of variables.

PCA is one of the techniques in the factor analysis family that shows the level and importance of variables. The data collected from 422 respondents were analysed in SPSS version 21 by using Varimax rotation. According to Tabachnick and Fidell (2014) the aim of PCA is to obtain a parsimonious solution by explaining the variation in the original data set using the underlying components. Reliability tests of Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and communality values justified the use of PCA. With more than 300 cases and to improve the distinction between components, items with loadings less than 0.40 were suppressed. Initial examination of the correlations was to ensure that there were correlations  $>0.3$ . This influenced whether to proceed or not with PCA (Field 2009). To reject the null hypothesis, Bartlett's test of sphericity needed to be  $< 0.05$ . The PCA technique is generally used as tool for dimension reduction, however the results could not confirm the reliability of constructs considered in this study. Therefore,

confirmatory factor analysis (CFA) has been adopted to verify the construct reliability. The estimation method used is MLE (Maximum Likelihood Estimation) in CFA and as per Jackson (2003) a 20:1 ratio i.e. 20 participants per measured item is specifically suggested for MLE. The PCA results has confirmed 19 items distributed under 05 dimensions and based on 20:1 ratio the required sample size should be 380. Thus, data were collected to verify the construct reliability and hypothesis testing from 400 samples out of which 367 responses found suitable for confirmatory factor analysis. According to Hair et.al. (2015) the rule of thumb for reliability estimates of 0.7 or higher suggests good reliability and reliability between 0.6 to 0.7 may be acceptable, provided that other indicators of the model construct validity are good. A high construct reliability is the indication of internal consistency and represent the latent variables. The construct reliability (CR) is calculated as per the below formula:

$$CR = \frac{(\sum_{i=1}^n L_i)^2}{(\sum_{i=1}^n L_i)^2 + (\sum_{i=1}^n e_i)}$$

Where,  $L_i$  is the factor loadings for each construct and  $e_i$  is the error variance term of each construct. The results are presented in Table-3.

To analyze further the impact of ICT on socio-economic development, ANOVA test is performed taking into education, occupation, and age as factor variables vis-à-vis socio-economic development factors as dependent variables. Using various factor variables and each one of the interval dependent variables, through one-way ANOVA it will be checked whether there were any significant differences in the mean score. The descriptive statistics of factors measuring socio-economic development presented in Table-4 provides the information on distribution of data. It is held that Personal security has highest mean score, while Empowerment has lowest score. Thereafter, the results of ANOVA performed on these variables with respect to different demographic factors was presented in Table-5.

Finally, to test the hypothesis Structural Equation Modelling (SEM) tool is adopted,

since structural models provide information on the nature and magnitude of relationship between latent constructs and measured variables.

#### IV. RESULTS AND DISCUSSION

This section provides analysis of results obtained from collected data. First, we explore the determinants of ICT on socio-economic development. Second, the impact of ICT on various socio-economic variables was analysed through Structural Equation Model.

##### A. Users' Profile of ICT Usage

The demographic profile of respondents was provided in Table-1. It was observed from the table that among 789 usable responses female (51.8%) outweigh the male (48.2%) respondents. The awareness and usage of ICT was measured in this study on the basis of their "Level of e-literacy". It was observed that, the majority of respondents (96%) were e-literate in a scale of novice to expert, within which 71% have average knowledge in ICT. Regarding age distribution, citizens aged in between 18 to 28 years (58%) dominate in adoption of ICT. Moreover, with regards to educational level, graduate and higher degree (66.5%) dominate the ICT adopters. Finally, with respect to occupation students (61%) and farmer/self-employed (22%) outnumber the other categories.

Particulars	N	%
<b>Gender</b>		
Male	380	48.2
Female	409	51.8
<b>Age</b>		
Less than 18 Years	69	8.70
18-28	458	58.00
29-45	87	11.00
46-60	122	15.50
More than 60 Years	53	6.70
<b>Education</b>		
Illiterate	42	5.30
Primary/Secondary	200	25.30
Undergraduate	22	2.80
Graduate	424	53.70
Postgraduate	101	12.80
<b>Occupation</b>		
Farmer/Labour/Self employed	174	22.10
Government Employee	65	8.20
Industrial Worker	3	0.40
Student	478	60.60
Housewife	69	8.70
<b>Level of e-literacy</b>		
No Knowledge	34	4.30
Novice	77	9.80
Average	561	71.10
Moderate	96	12.20
Expert	21	2.70

Table-I: Demographic Data

### B. Exploratory Factor Analysis

The KMO measure of sampling adequacy value 0.855 having a sample size of N = 422 proves that selected sample size is highly satisfactory, since KMO value greater than 0.70 is considered to be satisfactory for PCA. The Bartlett's test of sphericity having Chi-square value 2290.64 and P-value less than 0.05 indicates that correlation between items are well defined for PCA. As reported in Table-2, all the items are perfectly clubbed under 05 components as per the conceptual model adopted in this study. The construct reliability was determined after running CFA and presented in Table-3. It is observed from the table that all the constructs considered in this study were either good or acceptable. While, Table-4 exhibits the descriptive statistics i.e., mean and standard deviation about all the 05 constructs. The low standard deviation observed in the data indicates that data points are clustered around the mean.

Item Code	Particulars	Factor Loading	Eigen Value	% of Variance Explained
<b>I</b>	<b>Social Contact</b>		<b>1.422</b>	<b>7.482</b>
SC01	ICT helps me to keep in touch with family and friends when I stay away from them.	0.685		
SC02	ICT helps in developing new friendships	0.677		
SC03	ICT provides capabilities for connection and communication within and outside the communities	0.497		
<b>II</b>	<b>Economic Transformation</b>		<b>1.142</b>	<b>6.012</b>
EC01	ICT has enabled people to engage in new economic activities in a much more flexible way.	0.711		
EC02	ICT assists in effective management of current economic activities	0.675		
EC03	ICT promotes free market to entrepreneurs and acts as a transformative force for economic development.	0.649		
<b>III</b>	<b>Empowerment</b>		<b>1.046</b>	<b>5.508</b>
EM01	ICT provides opportunities for education and learning	0.600		
EM02	ICT provides opportunities for healthcare	0.730		
EM03	ICT assists in participation in the political process, self-empowerment, self-efficacy and self-fulfilment.	0.580		
EM04	ICT has provided an innovative way to entertainment, news and media.	0.472		
<b>IV</b>	<b>Cultural Evolution</b>		<b>1.301</b>	<b>6.846</b>
CU01	ICT is responsible for changes in social behaviour	0.499		
CU02	ICT is responsible in transition from indigenous culture to western culture.	0.700		
CU03	Addition of ICT has a downside impact on family ethos and values like respect to elders.	0.472		
CU04	ICT is responsible for large scale use of Pornography, Nuisance, Waste of time and lack of attention	0.583		
<b>V</b>	<b>Personal Security</b>		<b>4.245</b>	<b>22.344</b>
PS01	ICT in government services has reduced bribery and improved the speed and quality of service delivery	0.603		
PS02	ICT has instilled a sense of security and peace of mind among the citizens.	0.675		
PS03	ICT has enabled the citizens in proper use of time by removing the need for visiting offices, banks etc.	0.602		
PS04	A sense of fear and anxiety remains within the citizens for being robbed in online fraud	0.651		
PS05	ICT can be used for criminal activities, harassment, sexual misconduct etc.	0.616		
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.855		
	Bartlett's Test of Sphericity (Chi-Square value with df = 17)	2290.643		P-value < 0.05
	Cumulative Total variance Explained (%)	48.192		

Table-II Factor Loading as per PCA

	Personal Security	Social Contact	Economic Transformation	Cultural Evolution	Empowerment
PS01	0.512				
PS02	0.492				
PS03	0.614				
PS04	0.653				
PS05	0.629				
SC01		0.707			
SC02		0.494			
SC03		0.572			
EC02			0.509		
EC03			0.738		
CU01				0.442	
CU02				0.587	
CU03				0.831	
EM02					0.533
EM03					0.742
CR	0.67	0.62	0.81	0.61	0.72
Decision	Acceptable	Acceptable	Good	Acceptable	Good

\*CR= Construct Reliability

Table-III Standardized Factor Loading & Construct Reliability

	N	Minimum	Maximum	Mean	Std. Deviation
Personal Security	789	1.00	5.00	3.5265	0.49829
Social Contact	789	1.00	5.00	3.3595	0.62079
Cultural Evolution	789	1.00	4.75	3.4034	0.48918
Economic Transformation	789	1.67	5.00	3.5120	0.49193
Empowerment	789	1.00	4.67	3.2818	0.46737

Table-IV Descriptive Statistics

	Personal Security		Social Contact		Cultural Evolution		Economic Transformation		Empowerment	
Dependent Variable	F (Test Statistics)	P-Value	F (Test Statistics)	P-Value	F (Test Statistics)	P-Value	F (Test Statistics)	P-Value	F (Test Statistics)	P-Value
Occupation	2.836	0.024	4.173	0.002	3.797	0.005	2.072	0.083	2.703	0.03
Gender	0.275	0.60	0.005	0.943	0.157	0.692	2.657	0.104	1.113	0.292
Age	2.191	0.068	2.258	0.061	1.298	0.269	1.91	0.107	5.007	0.001
Education	5.451	0.00	4.709	0.001	1.397	0.233	0.982	0.416	9.929	0.0001

Table-V Summary of ANOVA

#### Component-1: Personal Security

This component has an eigen value of 4.245 and explains 22.34% of variance. This factor represents the ICT's technological prowess along with its dark side. Thus, personal security component can be treated as a double-edged sword, since from one aspect it provides safety and security to individuals while it increases the chances of cybercrime. The statements like "ICT in government services reduced...." exhibits the ability of ICT to deliver quick and quality service without any bribe, since people used to give bribe to speed up their work in government offices. Thus, with virtual interaction middle men and red tape will be avoided. ICT also provides peace of mind to the individuals in the time of emergency like lock down, strikes and natural calamities to stay in touch with near and dears. However, the downside of ICT is its usage in cybercrimes like online fraud and stealing of hard-earned money from bank account.

In the above context, personal security component of socio-economic development has



been analysed to detect any differences in means with respect to various demographical variables. The findings presented in Table-5 suggests existence of a significant difference in mean value of personal security between occupation and education of respondents. While difference in mean value between personal security and age as well as gender is insignificant since P-value is greater than 0.05. A post-hoc test using Tukey method is indicative of significant mean differences with respect to postgraduate education vis-à-vis illiterate and graduate, while highest mean difference found between postgraduate and illiterate respondents. Similarly, significant mean differences observed between government employee and student category within occupation variable.

From the ANOVA and post-hoc test results, it is held that higher the education of an individual more concerned she is about the personal security. Regarding occupation, in Nagaland majority of population prefer to have a government job and they are more concerned with personal security than any other category in this demographic variable.

#### Component-2: Social Contact

The social contact factor has eigen value 1.422 and it explains 7.48% of variance. Social contact may be defined as the capability of an individual to remain in touch with her family and friends. While in this study social contact has been measured apart from staying in touch with family, developing new friendships and communication within and outside communities, since people of Nagaland give more importance to their communities they belong. From the ANOVA table it is observed that education and occupation have significant mean difference with social contact. This might be because of occupation when an individual stay outside the family or an educated person who sends his children outside for studies give more importance to social contact factor. It is due to ICT they can talk live through video call. The post-hoc test result confirms that government employees and housewife have

higher significant mean difference than housewife and students. It proves that housewives acting as both mother and wife give importance to social contact factor of ICT from that of other categories in this demographic variable.

#### Component-3: Cultural Evolution

Cultural evolution although is not directly related to technology and capability, but impacts its adoption, where indigenous culture rules the roost. This component has eigen value 1.301 and explained 6.846% of variance. It was derived from the statements like change in social behaviour, transition from indigenous culture to western culture, change in family ethos etc. Despite customisation of technologies as per the local customs and traditions yet it is regarded as a threat to their culture and traditions by some authors. From the factor loadings presented in Table-2, it is observed that "ICT is responsible for transition from indigenous to western culture" has highest loading 0.7 followed by "Large scale use in pornography, nuisance, waste of time etc." 0.58, while its impact on social behaviour and downside impact on family ethos and values have 0.5 and 0.48 loading score. However, the ANOVA results confirms that occupation has significant mean difference with respect to cultural evolution factor. The from post-hoc test it is found that significant mean difference observed among industry workers vs other occupation category of respondents.

#### Component-4: Economic Transformation

Economic transformation means productivity, access to potential markets and exploiting new business opportunities. Although, ICT has no direct influence in this aspect yet it plays a supporting role in many life changing opportunities. According to Saidi et.al. (2015) and Olszak and Ziemba (2011), ICT was instrumental factor in the economic development of developing countries like Tunisia and Poland. In this study, this component has an eigen value of 1.142 and explains 6.01% of variance. This factor has



been measured with 03 items like engaging in new economic activities, assistance in existing business activities and promoting free market to entrepreneurs. Although the respondents have a positive perception yet the state of Nagaland is not that much progressive from that of other Indian states in terms of entrepreneurship. This is reflected in the ANOVA test having no significant mean difference with respect to demographic parameters. Thus, with the increase in entrepreneurship activities in future, the impact of ICT in the economic transformation will be felt and assist in the socio-economic development.

#### Component-5: Empowerment

The empowerment dimension reflects capability of a technology employed by the citizens in their daily life in different domains like healthcare, education, entertainment etc. The role of ICT in all these domains are immense. For example, free access to educational content and continuous learning provided by different universities through Coursera, Edx etc. empowers citizens by upgrading their knowledge base. Similarly, application of ICT in telemedicine, home delivery of medicine and collection of samples for diagnosis can be observed. This factor has been measured through sub-dimensions like education and learning, healthcare, participation in political process and entertainment. The eigen value of this factor is 1.046 and determines 5.51% of total variance. It is also found that the healthcare sub-item has higher loading at 0.730 while entertainment has lowest loading at 0.472 under this dimension, while significant mean difference observed among occupation, age and education as reported in Table-5. Thus, it is evident that ICT contribution in areas like education, healthcare, entertainment and participation in political process will improve the quality of life and contribute positively to socio-economic development.

### V. HYPOTHESIS TESTING

The fitted structural model has five exogenous variables (Personal security, Social contact, Economic transformation, cultural evolution

and empowerment) and a latent factor socio-economic development. The model fit statistics is presented in Table-6 and it is observed that this model is well fitted with the data.

Goodness of Fit Index	Model Values	Decision Criteria
<b>Absolute Measures</b>		
Chi-square Value	147.88	
Degrees of Freedom (df)	85	
CMIN/df	1.740	Less than 3
GFI	0.911	Greater than 0.9
RMSEA	0.061	Less than 0.08
SRMR	0.051	Less than 0.05
<b>Incremental Fit Measures</b>		
NFI	0.898	Greater than equal to 0.90
CFI	0.970	Greater than equal to 0.95
<b>Parsimony Measures</b>		
AGFI	0.902	Greater than 0.9

*Table-VI Overall Fit Statistics*

Furthermore, the value of R-square indicates the predictive capability of the model constructs. It is found that empowerment has R2 Value 0.68, culture scored 0.11, economic transformation 0.25, social contact 0.33 and personal security 0.16. Thus, it confirms the predictive ability of the model and 05 hypotheses related to socio-economic development antecedents. The final structural model is presented in Figure-2.

Hypothesis	Standardised Path Coefficients	Predicted Direction	Supported/Not Supported
Personal security positively affects socio-economic development	0.40	+	Supported
Cultural evolution positively impacts socio-economic development	0.34	+	Supported
Economic transformation positively affects socio-economic development	0.50	+	Supported
Empowerment positively affects socio-economic development	0.83	+	Supported
Social contact positively affects socio-economic development	0.57	+	Supported

*Table-VII Summary of SEM Results*

The results of SEM analysis are presented in Table-7 along with hypothesis testing results. The findings of this research work have proved that all the five exogeneous variables are related to socio-economic development in Nagaland, India. Out of this empowerment has highest impact on socio-economic development, followed by social contact, economic transformation, while cultural evolution has least impact. High impact of empowerment dimension which finally includes healthcare and self-empowerment through participation sub-dimension can be construed to be an important aspect of ICT on socio-economic development of citizens. Similarly, improvement in social contact which is

essentially a significant part of ICT impacts the socio-economic development next to empowerment. The cultural evolution has least impact on socio-economic development, the reason might be the prominent religion of Nagaland is Christianity, which is largely influenced by the western culture and supplants indigenous culture. On the other hand, rest two dimensions too supports socio-economic development positively in the state of Nagaland, India.

## VI. CONCLUSION

This research work is based on empirical exploration of factors of ICT in the socio-economic development from the perspectives of a developing country like India. The country India is a vast multi-ethnic, multi-religious and multi-cultural unique in the world. Although, India has progressed tremendously in the IT and telecom sector in the last two to three decades, yet it was mostly concentrated in few cities and states. The introduction of new telecom policy was aimed at providing highspeed connectivity to rural inhabitants has resulted in large scale ICT diffusion during the recent past. The state of Nagaland is one of the 8 (eight) States in North Eastern India comprising mostly of villages in hilly terrain with lack of basic infrastructure. The State has a unique character both in terms of its social composition as well as economic development activities and the citizens depend predominantly on agricultural sector as their main source of income for their livelihood. The state has invested a sizable fund in development of ICT infrastructure in consonance with the Act East policy of the Federal government of India. Therefore, this study has been undertaken to investigate statistically which of the factors are responsible for socioeconomic development of the state.

The findings of the study, suggest that all the five hypotheses were supported by the data and the major contribution of this research work was empowerment dimension of ICT has the highest predictive capability of socioeconomic development in this state followed by social contact. However, the complementary potential of ICT in the economic transformation can be

exploited provided the state government would have the cutting age policy on entrepreneurship through micro and small-scale Agri-based units. Finally, in the backdrop of ICT's importance in socio-economic development this study implies that in the present technological environment there must be synergy between inter government departments and the IT department. Although, in developing countries like India, the government frames various policy decisions, yet improper implementation and lack of feedback from bottom to top resulted in early death of such policies without credible impact. Thus, decision makers need to formulate policies in association with IT department for effective benefit transfer to the last person in the queue. The only limitation of this study is majority of respondents were young, since the elderly age groups have very less knowledge on ICT. The reason might be Nagaland's late entry in delivering citizen centric services through ICT and higher age people need time to adapt themselves in this technological league. Therefore, a further study is necessary to understand the adoption of ICT among all age groups, since at present majority of government services are available online that requires sufficient knowledge of ICT.

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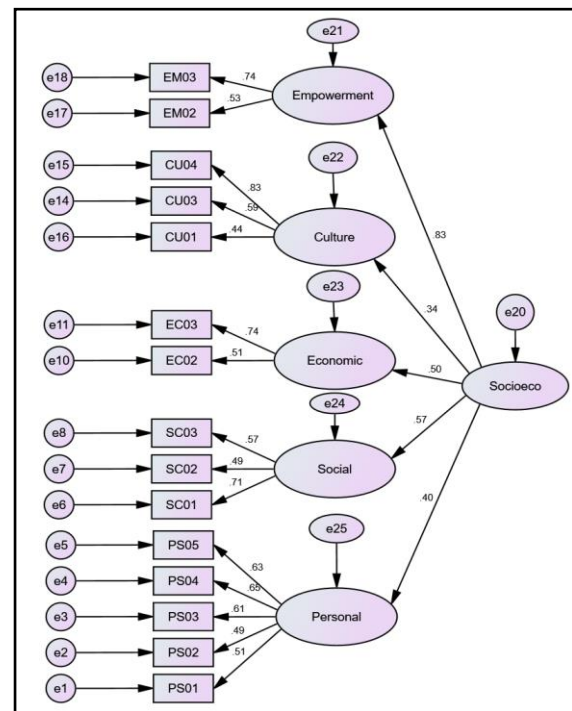


Fig.2 Structural Model

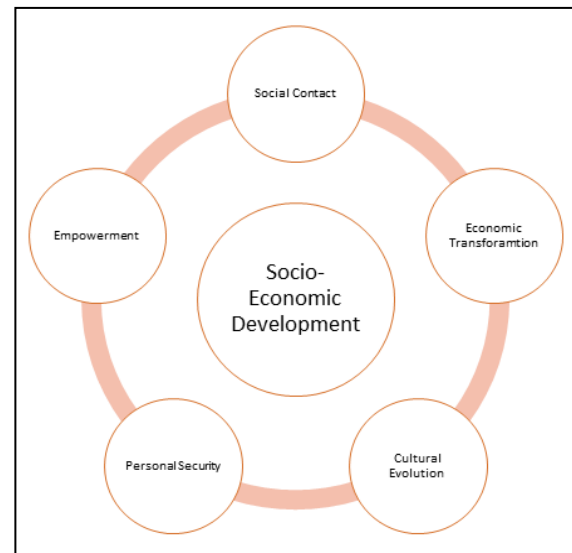


Fig.-1 ICT impact on socio-economic development