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Catalytic Role Of Information And Communication Technology (ICT) In Rural-Urban Linkage: A Case Study Of Dibrugarh District Of Assam

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Abstract
Information and communication technologies (ICTs) have been playing a vital role as catalyst for all round development of both the developed and developing countries of the world. However, the role of ICTs in development and addressing the needs of the poor, especially in developing countries, has become the subject of a heated debate. In this study an effort has been made to examine the role of information and communication technology in rural-urban linkage to boost rural development on the basis of field based study consisting of four development blocks of Dibrugarh district of Assam. The triangulation method has been employed in this study. The findings of the study indicate that majority of respondents have access to ICTs most popularly Mobile phone and henceforth the rural dwellers able to make link with their urban counterparts. Most prominently those who are engaged in primary sector gather information through ICTs about pre-harvesting and post harvesting process. Hence willingness towards their occupation has improved and increases agricultural produce as well as sales in the both local and urban markets.

Keywords: *ICTs, rural, urban, development*

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I. Introduction

Information and communication technologies (ICTs) have been playing a vital role as catalyst for all round development of both the developed and developing countries of the world. However, the role of ICTs in development and addressing the needs of the poor, especially in developing countries, has become the subject of a heated debate.

Information and communication technology usually called ICT is often used as a comprehensive synonym for information technology stresses the role of unified communications and integration of telecommunications, intelligent building management systems and audio-visual systems in modern information technology. ICT comprises of all technical means that are used to handle information and aid communication. It includes computer and network hardware, middleware and necessary software.

According to UNDP (2001), Information and communication technologies (ICTs) involve innovations in microelectronics, hardware and software, telecommunications and opto-electronics. These allow the processing and storage of large amounts of information along with rapid distribution of information through communication networks. ICTs lead to multiplication of time, shorten distances and reduce hierarchy and geographical boundaries. This leads to reduced costs of operations. ICTs have been the driving force behind the global information society, in which information work predominates and information is regarded as a valuable resource (Chilimo, 2008:5).

ICTs can be divided in to two categories: (a) Old ICTs: These include radio, television, landline telephone and telegraph. (b) New ICTs: These include computers, satellites, wireless one to one communication including mobile phones, electronic mail (e-mail) and internet.

Despite the huge potential to harness ICTs for agricultural and rural development, only a few isolated projects have been initiated in India. Many of these projects were started by NGOs, private organizations, cooperative bodies and governmental organizations. Indian experiences with IT projects are Gyandoot project (Madhya Pradesh); Warana Wired Village project (Maharashtra); Information Village project of the M S Swaminathan Research Foundation (MSSRF) (Pondicherry); iKisan project of the Nagarjuna group of companies (Andhra Pradesh); Automated Milk Collection Centres of Amul dairy cooperatives (Gujarat); Land Record Computerisation (Bhoomi) (Karnataka); Computer-Aided Online Registration Department (Andhra Pradesh); Online Marketing and CAD in Northern Karnataka (Karnataka); Knowledge Network for Grass Root Innovations - Society for Research and Initiatives (SRISTI) (Gujarat); Application of Satellite Communication for Training Field Extension Workers in Rural Areas (Indian Space

Research Organization); In addition to the above, a few non-governmental organisations (NGOs) have initiated ICT projects such as Tarahaat.com by Development Alternatives (Uttar Pradesh and Punjab); Mahitiz-samuha (Karnataka); VOICES -Madhyam Communications (Karnataka); Centre for Alternative Agriculture Media (CAAM); etc. All these initiatives are about creating a IT enabled rural market from graze by first developing it, solving its basic problems, figuring out what it needs and then designing a product or service built around that one need in rural areas (Kapoor et al, 2011).

The Assam Agricultural Competitiveness Project developed a system of sending bulk SMSs to groups of project staff and farmers through mobile phones. A database of the cell phone numbers of all concerned officials and farmers was drawn up, and different SMS recipient groups were created. The SMSs have now become an additional device for the provision of agricultural extension services. They help accustom with both village-level officials as well as farmers with the varieties of availability of seed, techniques of crop cultivation, plant diseases, methods of applying fertilizers and pesticides, market prices of crops etc. (World Bank, 2011).

A part of extension programmes a farmer friendly website named BRIDDHI has been launched at Assam Agricultural University with funding from the World Bank under Assam agriculture competitive project. ADB in its report on e-governance in Assam states that as large proportion of the population of Assam is concentrated in rural areas which are remote, sparsely populated, it is difficult to access such services in economical manner without compromising on quality of services is a key challenge (ADB, 2007).

In this study an effort has been made to examine the role of information and communication technology in rural-urban linkage to boost rural development on the basis of field based study consisting of four development blocks of Dibrugarh district of Assam.

Objectives of the Study

The prime objective of the study is to examine the role of ICTs as cartelist in rural-urban linkage.

II. Research Methodology And Study Design

In this study triangulation method has been employed and information collected from rural dwellers from four development block of the Dibrugarh district of Assam. Out of seven development blocks viz. Barbaruah, Joypur, Khowang, Lahowal, Panitola, Tengakhat and Tingkhong four development blocks viz. Barbaruah, Khowang, Tenghakhat and Tingkhong selected randomly.

Table 1

Drawing of Sample Villages and Sample Households from Inhabited Villages

Name of the block	No. of inhabitated villages as per 2011 census	Sample villages (5%) of inhabitated villages	No. of sample households (5%) of sample villages
Barbaruah block	181	9	80
Khowang block	295	15	126
Tengakhat	224	11	100
Tingkhong	221	11	94
Total	921	46	400

III. Discussion And Interpretation Of Data

Socio-economic characteristics of respondents

Recognizing the socio-economic characteristics of the respondents is not part of the specific objective of this study. However, it is necessary to present this data to comprehend the background of the respondents. Characteristics of the respondents provide a snapshot on the appropriateness of the respondents for the study. They also provide information on how well the respondents represent the characteristics of the users and non-users of the ICTs. The characteristics of the respondents are described as follows:

Age of the Respondents

The respondents of our study area has been broadly divided in to seven age groups like 16-20 years, 21-30 years, 31-40 years, 41-50 years, 51-60 years, 61-70 years, 71-80 years. In this categorisation the age 16 is considered as the starting age of the respondents assuming beyond HSLC, the ICTs are commonly used among the respondents in the study area. The age categorisation of respondents helps us to estimate the number of respondents in the working age group as well as the respective old age. The block wise distribution of respondents according to age is shown in the following Table 2

Table 2
Block-Wise Distribution of Respondents According to Age

Age(In years)	Name of the Block				Block combined
	Barbaruah	Khowang	Tengakhat	Tingkhong	
16-20	01(1.25)	01(.79)	02(2)	02(2.13)	06(1.5)
21-30	10(12.5)	24(19.05)	20(20)	14(14.89)	68(17)
31-40	33(41.25)	44(34.92)	30(30)	30(31.91)	137(34.25)
41-50	23(28.75)	34(26.98)	24(24)	22(23.40)	103(25.75)
51-60	11(13.75)	16(12.70)	15(15)	20(21.28)	62(15.5)
61-70	2(2.5)	06(4.76)	08(08)	06(6.38)	22(5.5)
71and above	0	01(.79)	01(01)	0	02(.5)
Total	80(100)	126(100)	100(100)	94(100)	400(100)
	Mean age=40 (approx)	Mean age=40 (approx)	Mean age=41 (approx)	Mean age=42 (approx)	Mean age=40 (approx)

Source: Field data (Figures within bracket indicate percentages)

The result shown in the table specify that about (34.25%) of respondents are in the age group of 31-40 and few (0.5%) are in the age group of 71-80. The mean age of respondents of the block combined is 40 years approximately. The mean age of respondents of Barbaruah block and Khowang block are 40 years while mean age of Tengakhat and Tingkhong are 41 and 42 years respectively.

Educational Qualification of the Respondents

Literacy level is a basic parameter of determining human development index. It is assumed that higher the literacy level, higher is the quality of life. In our study area educational qualifications of the respondents are found out. The block wise distribution of respondents according to educational qualification is displayed in the following Table No. 3.

Table 3
Block-Wise Distribution of Respondents According to Educational Qualification

Educational qualification	Name of the block				Block combined
	Barbaruah	Khowang	Tengakhat	Tingkhong	
Illiterate	2(2.5)	3(2.38)	1(1)	3(3.19)	9(2.25)
Primary(class I to V)	9(11.25)	7(5.6)	7(7)	18(19.15)	41(10.25)
ME level(VI to VIII)	15(18.75)	21(16.6)	13(13)	20(21.28)	69(17.25)
High school level(IX to X)	21(26.25)	50(39.7)	31(31)	27(28.72)	129(32.25)
Higher secondary level(XI to XII)	17(21.25)	29(23.01)	31(31)	19(20.12)	96 (24)
Graduation	14(17.5)	13(10.3)	14(14)	6(6.38)	47(11.75)
Post-graduation and above0	2(2.5)	3(2.38)	3(3)	1(1.06)	09(2.25)
Total	80(100)	126 (100)	100 (100)	94(100)	400 (100)

Source: Field data (Figures within bracket indicate percentages)

As displayed in the above table 3 about 32.25 percent respondents have high school level qualification and negligible percent (2.25%) of respondents have post-graduation and above. It is also found that negligible percent (2.25%) of respondents are illiterate. Among the blocks about 39.68 percent respondents of Khowang block have high school level qualification and more than 26 percent of respondents of other surveyed blocks have high school level qualification.

Employment level of the respondents

In our study, employment level of the respondents is divided in to 10 groups viz. service, business, professional, farmer, skilled labour, unskilled labour, unemployed, self-employed, students and others. Others include housewife and pension holder. The results obtained about employment level are shown in the following table 4.

Table 4
Block-Wise Distribution of Respondents According to Employment Level

Employment level	Name of the block				Block combined
	Barbaruah	Khowang	Tengakhat	Tingkhong	
Service	15(18.75)	19(15.08)	21(21)	16(17.02)	71(17.75)
Business	26(32.5)	30(23.81)	30(30)	11(11.7)	97(24.25)
Professional	1(1.25)	3(2.38)	2(2)	0(0)	06(1.5)
Farmer	19(23.75)	50(39.68)	21(21)	41(43.62)	131(32.75)
Skilled labour	0	2(1.59)	1(1)	3(3.19)	6(1.5)
Unskilled labour	6(7.5)	7(5.5)	6(6)	4(4.26)	23(5.75)
Unemployed	3(3.75)	4(3.17)	4(4)	1(1.06)	12(3)

Self-employed	3(3.75)	3(2.38)	2(2)	6(6.38)	14(3.5)
Student	2(2.5)	1(.8)	1(1)	2(2.12)	06(1.5)
Others	5(6.25)	7(5.56)	12(12)	10(10.64)	34(8.5)
Total	80(100)	126(100)	100 (100)	94(100)	400(100)

Source: Field data (Figures within bracket indicate percentages)

As shown in the above table 4, about 32.75 percent respondents of our study area adopt farming as their occupation and negligible percent (1.5%) of respondents are students. The deviation is observed among the blocks regarding the farming occupation followed by the respondents. Among the blocks about 43.62 percent respondents of Tingkhong block adopt farming as occupation followed by the 39.68 percent respondents of Khowang block, 23.75 percent respondents of Barbaruah block and 21 percent respondents of Tengakhat block.

So far as the business as occupation is concerned more than 24 percent respondent in the study area follow the business as their occupation. Among the blocks about 33 percent respondent of Barbaruah block are in business occupation and more than 11 percent respondents reported having business as occupation in other three surveyed blocks of the study area.

So far as the service is concerned more than 17 percent respondents of the study area are in service. Among the blocks about 21 percent respondents of Tengakhat block follow service as occupation and more than 15 percent respondent reported having service as occupation of other three respective blocks of the study area.

Access to different ICTs in the Study Area

Respondents are asked about their access to different ICTs. The reply of the respondents is displayed in the following table and figure no.5.

Table 5

Block Wise Distribution of Respondents According to the Access to Different ICTs

Access to ICTs	Name of the block				Block combined
	Barbaruah	Khowang	Tengakhat	Tingkhong	
Radio	52(68.4)	34(28.1)	33(33.7)	19(21.3)	138(35.9)
TV	72(94.7)	108(89.3)	85(86.7)	72(80.9)	337(87.8)
Computer	21 (27.6)	28(23.1)	26(26.5)	15(16.9)	90(23.4)
Internet	25(32.9)	48(39.7)	45(45.9)	31(34.8)	149(38.8)
e-mail	7(9.2)	13(10.7)	12(12.2)	6(6.7)	38(9.9)
Landline Telephone	01(1.3)	2(1.7)	2(2)	0	05(1.3)
Mobile telephone	76(100)	117(96.7)	94(95.9)	85((95.5)	372(96.9)
fax	02(2.6)	03 (2.5)	02(2)	02(2.2)	9(2.3)
CD-ROM	06(7.9)	04(3.3)	06(6.1)	04(4.5)	20(5.2)

Source: Field data (Figures within bracket indicate percentages)

As shown in the table 5, among the ICT users as high as (96.9%) of respondents use mobile phone whereas a very few (1.3%) respondents use landline as single most ICT. It is noted that hundred percent (100%) respondents of Barbaruah block use mobile phone in addition to other ICTs. Other three surveyed blocks mobile phone user have reported more than ninety five (95%) percent.

So far as the access to TV is concerned more than 87 percent respondents of our study area use TV. Among the block more than 94 percent respondents of Barbaruah block use TV whereas more than 80 percent respondents reported using TVs in other three surveyed blocks.

In regard to the use of internet it is seen that more than 38 percent respondents in our study area have access to internet. More than 45 percent respondents of Tengakhat block have access to internet whereas more than 32 percent respondents having access to internet in three other respective blocks in our study area.

So far as the use of radio is concerned more than 35 percent respondents in our study area use radio to obtain information. Among the block highest (68.4%) radio users are found in Barbaruah block whereas only 21.3 percent respondents of Tingkhong block use radio. It is also found that there is deviation in use of radio in two other blocks i.e., Khowang and Tengakhat in our study area.

More than 23 percent of respondents use computer in our study area. More than 27 percent respondents of Barbaruah block use computer whereas more than 16 percent respondents reported having use of computer in other three surveyed blocks.

IV. Findings Of The Study

The result obtained from the field study revealed that the majority of the respondent used ICTs most specifically the mobile phone. It is found that through mobile phone respondents especially the agricultural farmers could able to operate their pre-harvesting and post-harvesting process and those who are in business.

The farmers and businessmen could be able to find the market of their products both in rural and urban areas. The success stories of four respondents from sample blocks are illustrated below:

One respondent of Tingkhong block stated that emergence of mobile phone helped him in his hotel business. He said that his sale of his hotel products was meagre prior to the use of mobile phone by him. By using mobile phone he could be able to provide his products to the consumers at their doorsteps. Consumers could also communicate with him about availability of products in his hotel. He got order from the customers in their different festivals and social rituals. He said that his volume of sales of hotel products increased as a result of increase the number of consumers. He could also place order to the suppliers of inputs necessary for his hotel business from urban suppliers by communicating them with mobile phones without having unnecessary travelling cost. He said that his use of mobile in his hotel business increased individual as well his household income.

One respondent of Tengakhat block stated that use of mobile phone by him affected his occupation. The respondent is well known for his plant medicine that could cure paralysis disease. He said that due to use of mobile phone, he could be able to communicate with his workers and suppliers of plants without travelling cost. When there was no mobile phone, he had to travel to his workers home place for any kind of information and also had to send messenger. But after the use of mobile phone, communication of him with his workers became easy. He could be able to communicate with his workers at any time. He also said that the both rural and urban patients could be able to communicate with him and took the appointment in phone. He could also be able to send the medicine by making contact with the patients through mobile phone within and outside the district. He got a good number of patients after the use of mobile phone that enhances his individual and as well as his household income.

One respondent of Khowang block stated that the use of ICTs especially the mobile phone helped him to search markets where he could be able to get the best price of his products. He said that due to poor communication facilities, he had no idea of price for his products. He often relied on intermediaries who in some instances have been accused of taking advantage of ignorance. By using mobile phone he could be able to reduce the transaction costs and associated costs due to having accurate and timely market information. Poor transport infrastructure and other vital facilities missing in the market chain led to huge loss of income. But after use of mobile phone he could be able to search the rural and urban market earlier where could get the best price for his products. He could be able to get best price of his product in his rural and urban market that led to increase in his individual as well as his household income.

Respondent of Barbaruah block viewed that the use of mobile phone has changed the marketing of poultry farming. When there was no mobile phone, then he had to travel a long distance to sale his products in both the rural and urban markets. Sometime he had to go for distress sale of his products. After the use of mobile phone he could be able to communicate with his fellow farmers about the price of his products and could also be able to search different sub-markets in both rural and urban where he could be able to sell the products at the highest price. He could be able to communicate with his customers and supply the product to them in celebration of different festivals at the households of customers. His volume of sales has increased after the use of mobile as compared to the time when he had no mobile phone. Increase in sale of his products led to increase the individual as well as his household income.

From the success story of ICTs, especially the mobile phone could be able to make rural-urban linkage that leads to rural economic development.

V. Conclusion

The findings of the study indicate that majority of respondents have access to ICTs most popularly mobile phone and henceforth the rural dwellers able to make link with their urban counterparts. Most prominently those who are engaged in primary sector gather information through ICTs about pre-harvesting and post harvesting process. The respondents who are in farming sector could able to widen their market both in rural-urban areas. And the businessmen could also be able to accelerate their market. Hence willingness towards their occupation has improved and increases agricultural produce as well as sales in the both local and urban markets through use of ICTs.

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