

AVAILABILITY AND ACCESSIBILITY OF INFORMATION COMMUNICATION TECHNOLOGY (ICT) AMONG DAIRY FARMERS IN UTTARAKHAND, INDIA

MRADULA TIWARI¹, RITU CHAKRAVARTY² & JAYANT GOYAL³

¹Veterinary Officer, Department of Animal Husbandry, Uttarakhand, India

²Scientist (SG), Division of Dairy Extension, National Dairy Research Institute, Haryana, India

³Research Scholar, Department of Veterinary Animal Husbandry Extension Education, LUVAS, Haryana, India

ABSTRACT

Rapid growth of Information Communication Technology (ICT) and the introduction of ICT-enabled information services provide ways to improve information dissemination to the knowledge intensive agricultural sector and also help to bridge the information gap existing among the group of farmers. The study was conducted to assess the opportunity for using ICT, infrastructure availability, utilization and accessibility of ICT among the dairy farmers, of both plain and hilly regions, for agricultural purposes. This study is based on primary data collected from a sample of 160 respondents (80 respondents each from plain and hilly region), using random sampling, to assess the accessibility of ICT and secondary data collected from various sites to assess the availability of ICT. Digital Opportunity Index (DOI) was used to find out the availability of ICT in the state. Frequency, cumulative square root frequency and Percentage were used to analyze the accessibility of ICT among the dairy farmers. Findings reveal that availability of ICT in the state based on DOI was 0.12 and Uttarakhand lies in category of economies with low DOI scores. Majority of respondents in plains (61.25%) had medium accessibility to ICT whereas in hills, 50% had low accessibility to ICT.

KEYWORDS: Accessibility, Availability, Dairy Farmers, Digital Opportunity Index (DOI), Information and Communication Technology (ICT)

INTRODUCTION

The World Development Report 2008 [1] emphasized that agricultural extension plays an important role in agricultural development and in promoting sustainable, inclusive and pro-poor economic development. Also access to ICT can have a tremendous positive impact on sustainable development and poverty reduction [2]. Low availability and poor access to ICT can impede the transfer of technology at the farm level. The application of ICT in agricultural sector is not a new concept. But use of modern ICT and their applications, provide an opportunity to strengthen the linkages between researchers and farmers. ICT has emerged as a tool for socio-economic development and empowerment in a developing country like India. There has been a rapid growth in the ICT sector since the late 1980s and the use of ICT has dramatically expanded since 1990s. India has achieved a lot in telecom in terms of accessibility and connectivity throughout the country. But due to wide disparity in geographical conditions, availability and accessibility of resources and the knowledge of people, the effects of ICT on societies are both far-reaching and uneven which leads to Digital Divide.

The Digital Opportunity Index (DOI) is a composite index that measures ICT diffusion using diverse set of indicators that reflect a profile of a forward-looking Information Society. It is an all-inclusive measure that incorporates

both demand as well as supply-side factors that influence the uptake of ICT. Thus, the importance of DOI stems from the fact that it not only provides a objective reality check on the effectiveness of the previous policies and their impact on the various DOI indicators, but also identifies weaknesses and the direction which the future policy and regulatory design must take if the national governments are serious about developing an inclusive information society as well as provide policy-makers and regulators with an accurate picture of the state of the ICT sector.

Digital Opportunity Index (DOI), 2001 [3] shows a huge digital divide with Sweden, the highest ranked, having a score over four times greater than the lowest ranked, India. While Sweden scored 69 percent of the maximum, India only had a DOI of 14 percent of the maximum. Cecchini, 2003 [4] reported that Televisions and telephones were available to the majority of households. Very few families had access to a computer or Internet connection, and some households had never viewed television, or used a telephone. Malik, 2005 [5] stated that teledensity in Uttarakhand in 2004-05 is 5.74 and e-readiness was below average achiever. The prerequisite to bridge the digital divide is to know the exact picture of availability and accessibility of ICT among the farmers. This paper highlights the availability of ICT in Uttarakhand, India and difference in accessibility to ICT among dairy farmers in plain and hilly region.

METHODS

The study was purposively undertaken in Uttarakhand state. Availability of ICT was assessed using Digital Opportunity Index (DOI) for which state level secondary data were taken. According to Malik (2005) following indicators are used for measuring the DOI in India –

- Percentage of population covered by mobile cellular telephony- Opportunity
 - Proportion of households with a fixed line telephone
 - Mobile cellular subscriber per hundred inhabitants
 - Ratio of fixed broadband internet subscribers to total internet subscriber- Utilization
- } Infrastructure

To obtain DOI method adopted by Office of the Telecommunications Authority (OFTA), Census & Statistics Department, World Bank [6] was used. Average of all the weighted values of sub indices was taken. It was later classified as per classification given by World Information Society Report, 2007 [7] as –

Table 1

Category of Economies	Scores
High DOI Scores	0.49+
Medium DOI Scores	0.30 – 0.49
Low DOI Scores	0.30 or less

To assess the accessibility of ICT, two districts, one each from plain (Udham Singh Nagar) and hilly (Nainital) region, were selected randomly and from each district two blocks were randomly selected. From each selected block, two villages (i.e. total eight villages) were selected by applying simple random sampling technique. Twenty dairy farmers from each selected village were randomly selected. Thus, 160 dairy farmers were personally interviewed to get the first hand information on accessibility of ICT. Complete enumeration of dairy farmers rearing at least five dairy animals and possessing a mobile phone or landline, for increased possibility of usage of ICT, was done. Decision-maker in the family was selected as respondent. A pretested structured interview schedule was used for data collection which include

(i) internet connection at home either through mobile, laptop/desktop; (ii) internet café in village; (iii) Community Radio / Village Knowledge Centre in village; (iv) Computer/ laptop, mobile phone, landline, DVD player, Television and Radio in home; (v) use of DVDs/CDs for agriculture/ dairy related information. Weighted value of available ICT was pre-determined with the help of scientists and researchers. Response from the respondents was taken as yes (score 1) or no (score 0). Each response was multiplied with its respective relative weighted score (which was the average of the relative weights given to each item by researchers and expertise). Based on total score obtained by each respondent, they were classified into three categories viz. low, medium and high levels by using cumulative square root frequency method.

Table 2

Category	Score
Low	< 14
Medium	14 to 25
High	> 25

RESULTS AND DISCUSSIONS

Availability of ICT

Availability for present study was operationalised, as infrastructural persistence of ICT to the dairy farmers. It can be observed from table 3, that availability of ICT, calculated by Digital Opportunity Index (DOI) was 0.12. Uttarakhand lies in category of economies with low DOI scores (As per World Information Society Report, 2007). Opportunity index was comparatively higher (0.22) than infrastructure availability and utilization of ICTs, which were 0.009 and 0.12 respectively.

Accessibility of ICT

Accessibility of ICT was operationalised, as the timely availability of the ICTs to the dairy farmers at the time it is needed. Results depicted in table 4, indicate that, in plain region 61.25% dairy farmers were in category of medium accessibility to ICT, followed by high and low accessibility to ICT which accounts for 30% and 8.75%, respectively. While in hilly region 50% had low accessibility to ICTs, 42.50% medium and 7.50% had high accessibility to ICTs. Mobile was the most widely used ICT in both plain and hilly regions.

It was owned by almost 98 percent population in the study area. None of the villages in the study area had Community Radio/Village Knowledge Centre within the village or in nearby villages. Only two villages out of selected eight villages had internet cafe. Television was accessible to hundred percent populations but the use of Radio and landline was significantly low in both the regions. In hilly region lack of infrastructure availability, high cost of ICTs and lack of awareness about internet could be the region for low accessibility to ICTs. Another factor could be that the annual income of hilly region was comparatively low.

Table 3: Availability of ICTs in Uttarakhand (Calculated Using DOI)

S. No.	Indicator	Indicator Value	Sub Index	Weighted Value
Opportunity		0.22		
1.	Percentage of population covered by mobile cellular telephony.	65	0.65	0.22
Infrastructure		0.009		
2.	Proportion of households with a fixed line telephone	3.2	0.032	0.006

Table 3: Contd.,

3.	Mobile cellular subscriber per hundred inhabitants	1.3	0.013	0.003
Utilization		0.12		
4.	Ratio of fixed broadband internet subscribers to total internet subscriber	37.37	0.37	0.12
Digital Opportunity Index		0.12		

Table 4: Distribution of Respondents Based on Their Accessibility to ICTs

Variable	Respondents			
	Plains		Hills	
	Frequency	%	Frequency	%
Accessibility to ICTs (Score)				
Low (<14)	7	8.75	40	50.00
Medium (14 to 25)	49	61.25	34	42.50
High (>25)	24	30.00	6	7.50

CONCLUSIONS

As the study revealed that Uttarakhand lies in category of economies with low DOI scores (As per World Information Society Report, 2007). Opportunity for using ICT in the state is higher than infrastructure availability and utilization of ICT. Majority of respondents in plains (61.25%) had medium accessibility to ICTs whereas in hills, 50% had low accessibility to ICTs. Steps may be taken to enhance the infrastructure in the state and make people aware about the utilization of ICTs for increasing their production and productivity and thus improving their socio-economic status. As both in hilly and plain regions people were not much aware about use of Internet, awareness campaigns may be arranged to inform farmers of the potential benefits of ICT and use of internet so that internet can be used by the farmers for accessing information which will positively enhance agriculture and dairy production. Also steps may be taken to establish Village Knowledge Centre and Internet café in every village or cluster of villages. Suitable steps may be taken to strengthen the ICT infrastructure in hills, for overcoming power problem and mobile phone, computer/ laptops, internet facility may be made available to people in both regions at affordable prices so that people can make full use of new technologies for commercial and economic development. The findings of present investigation will be useful to researchers in field of ICT & policy makers to formulate effective strategies to reach the unreached through ICT-education. The output of the study would be useful for further investigation in field of Information Communication Technology in Agricultural sector.

REFERENCES

1. World bank (2007). Agriculture for Development. World Development Report 2008. The International Bank for Reconstruction and Development/World Bank, Washington, DC.
2. Torero, M. and Braun J. V. (2006). Information and Communication technologies for development and poverty reduction – The potential of telecommunication. The Johns Hopkins University Press and IFPRI, Washington, DC.
3. DOI Source. (2001). Adapted from office of telecommunication authority (OFTA), Census & Statistics Department, World Bank. (Available at <http://www.ofa.gov.hk/en/datastat/main.hxml>)
4. Cecchini, S. (2003). Tapping ICT to reduce Poverty in Rural India. *IEEE Technology and Society Magazine*, 22(2).

5. Malik. P. (2005). Policy Implications of the Digital Opportunity Index (DOI) Analysis for India: Capabilities of Measurement and Importance of Extending DOI to a Regional Level. <http://www.itu.int/osg/spu/digitalbridges/materials/malik-paper.pdf>
6. Office of the Telecommunications Authority (OFTA), Census & Statistics Department, World Bank report, 2005. (<http://www.ofta.gov.hk/en/datastat/main.html>)
7. World Information Society Report, 2007.

APPENDICES

Table 5: Accessibility of ICT by Dairy Farmers

ICT Facilities	Yes(1)	No(0)
• Internet connection in home through mobile phone		
• Internet connection in home through laptop/desktop		
• Internet cafe in the village		
• Internet connection in some people's houses in village		
• Community Radio / Village Knowledge Centre in village		
• Computer/ laptop in your home		
• Mobile phone (If yes, how many?)		
• DVDs/CDs for agriculture/ dairy related information		
• DVD player		
• Landline telephone in home		
• Television in home		
• Radio		

