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ICT USAGE OVERALL BENEFIT AND POVERTY REDUCTION FOR RURAL FARMERS

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ABSTRACT :

The focus of the article is the impact of ICT usage and overall benefit of the farmers. Additionally, the impact of ICT on poverty reduction was also looked into. The study concludes that ICT provides an overall benefit, but there is a need to have concrete steps in centralising the information needed by the farmers. Though there are indications of poverty reduction as an outcome of the overall benefit, further research/deeper analysis is needed to find a direct correlation between ICT usage and poverty reduction.

KEYWORDS : *ICT, Overall benefit and farmer.*

1. INTRODUCTION

Information and Communication Technology (ICT) over the period of time has evolved into a format that can affect almost every aspect of life. The same is true for the rural sector also. In the current context, the idea is to assess the overall benefit of the farmers on ICT usage. We also will like to understand any impact on poverty reduction for the farmers in context of ICT usage, but the primary focus will be on the overall benefit. The overall benefit, for farmers can be measured in case they get updated information on latest news on agriculture, get requisite funds, have market information and be able to negotiate prices. These critical information can increase farmer's productivity, his/her income and provide them food security. ICT usage (through ICT-enabled services) helps in spreading timely information on agricultural practices, information on fund source, inputs on marketing the produce. It also helps farmers in building up capacity to plan for or take action to mitigate risks.

Farmers' information priorities also include accurate local weather forecasts, crop specific advisory based on the stage in the crop cycle and price information. ICTs helps in capturing real time weather parameters through remote sensors, collect commodity prices through mobile technologies and acquire information on latest research data regarding crops through the web-based platforms of agricultural universities and research institutes. The information, thus, collected can be stored in database and triggered automatically to spread as localised and personalised information on weather, market price indication and crop cultivation to registered farmers through Short Messaging Service (SMS) and Interactive Voice response (IVR). This updated information can empower farmers as they are better informed and prepare themselves to utilise available resources to the maximum profitable outcome.

2. OBJECTIVE

The objectives of the study are the following:

1) To assess the overall benefit of ICT usage in the case of the farmers.

2) To assess how the ICT usage also helps in poverty reduction for the farmers.

3. METHODOLOGY

The methodology applied for the current topic is scanning through articles published in journals, periodicals, books, edited chapter in books, conference proceedings, published occasional papers and reports to assess the impact of ICT on overall benefit and poverty reduction among the farmers. The outcome has been discussed in the subsequent sections to get a clear understanding if ICT has indeed an impact on the areas which is under the purview of the current study. The available materials have been accessed over a period of time to see the impact and across the various regions of the world to provide a wider angle to the topic.

4. LITERATURE REVIEW

To better understand the overall benefit for the farmers (with the ICT usage), let us take a segregated approach. For **agriculture** the following can be the very useful information need:

- Findings the best market price for their crops.
- Tracking the latest weather information.
- Protecting crops better and increasing crop yields.

In the relation to **health of self or family**, following can be the typical information requirements:

- Receiving diagnoses and/or treatment reminders.
- Helping limit and contain disease outbreaks.
- Monitoring and analyzing vital signs.

In view of **emergencies and natural disasters**, the following are effective:

- Summoning assistance or critical support.
- Coordinating relief efforts.
- Contacting the nearest clinic.
- Tracing, finding or contacting relatives.

Volatility in commodity price and the threat of climate change have increased interest in risk transfer instruments such as insurance and price hedging more relevant and affordable for farmers. The ability of mobile platform to facilitate financial transactions, capturing real-time data about crop loss and automatically perform damage assessment can definitely help in scaling up risk transfer instruments for farmers. Similarly, accessing the futures and national spot markets for agro-commodities with real-time price dissemination help farmers or farmer groups to hedge their positions or opportunity to sell online at the spot markets.

The agriculture market size and its reach have increased manifold over the years due to linkages with distant and overseas markets. Farmers (globally), have started using various ICT platforms like mobiles, web-portals, information kiosks, e-markets, etc. for marketing their produce. These ICT platforms provide market knowledge and give farmers good insight to understand the demand and provide some ability to control the produce and effectively manage the supply chains. It also helps farmers to deal directly with large wholesalers/traders/ food processors rather than intermediaries (who might wrap-up their profits). Thus, ICT platforms assist in networking by providing various contacts, which in turn helps in making better decision regarding transportation and logistics, price and location, supply and demand and cheaper access to inputs.

Information needs and flow in the rural parts of Australia was studied (Wilde and Swatman, 1997). The study showcases that the farming community, in many parts of Australia, was widely spread and heavily dependent upon communication both within and outside the community. Farming communities had been

considered as the potential focus of a virtual community. A virtual community would in turn form a basis for the electronic commerce and social activities (via telecommunication).

Mobile has not only been adopted for social reasons, but is viewed by the farmers as a tool that would to create efficient handling of economic opportunities or threats. This finding supports the Information and Communication Technology for Development's (ICTD) perspective, that it is a tool that encourages efficient and informed action to lead to greater productivity (Martin and Abbott, 2011). Additionally, a significant number of responses have indicated that, the use of the mobile phones is happening to access agricultural inputs and market information. This provides a clear indication that rural farmers are using mobiles for development as a whole.

Bhavnani et al., (2008) had discussed of strong evidence to suggest economic and social benefits from mobile telephony in rural areas in case of high mobile network penetration. Studies had attributed multiple benefits by use of mobile phones. The view expressed in this juncture was that benefits seen in developed countries can also percolate to the developing countries, provided the mobile service is readily available with the right amount of pricing. It was also mentioned that mobile phones do have a multi-dimensional positive impact on sustainable poverty reduction. There has a been a gradual decline in the cost of devices and services, as developing countries markets saturate and mobile operators and service providers increasingly compete with each other for a better share. However, in order to achieve the maximum impact, it remains vital to continue evaluation of impact of mobile phones on poverty reduction on sustainable basis. Relevant applications and business models, would have to be identified to create a conducive environment.

Suggestions of Bhavnani et al., (2008) has already been taken care to quite an extent in developing countries. Devices and service costs has greatly reduced over the period of time. The advent of prepaid services for voice and data has greatly contributed to the mobile usage penetration in rural areas in the developing world and particularly in India. Furthermore, the recent price war launched by the private telecom service providers, have contributed to further cheaper options in using the mobile services. The urban and rural sector consumers are both going to benefit out of it. For real measureable impact of mobile phones in the rural sector, concrete data seems to be not yet available on the increase of household income.

Going into the area of mobile phone and household income, a study on the Haitian context can be cited. Barberousse et al., (2009) mentioned that there is a growing evidence of mobile telephony having a positive effect on overall economic growth and hence indirect impact on a large portion of the population. However, when it comes to assessing the direct effects on the well-being of households, it also shows that a significant share of the population remains excluded from cell phone services, essentially due to a lack of sufficient resources. For those who do have access, with a few exceptions, cell phones essentially involve social services to link subscribers with their families and friends. Some evidences had suggested cell phones may positively affect income through ease of transfers, and access to information at the time of emergencies. There are cases which suggests of positive impact on household income from ICT and mobile usage. But strong evidences on this subject is yet to be encountered.

In a study on Morocco, it was demonstrated how mobile phone had increased income, improve business operations, and strengthen social relations (Ilahiane and Sherry 2009). The mobile phone can overcome the boundaries of physical space, enabling workers to travel to far-off job sites. In some situations, it seems that neglect in one's local network may pose economic risk. But this research suggests that there is a need to explore the role of the mobile phone in the economic lives of individuals in future studies.

Aker and Mbiti (2010) has observed the mobile phone usage in Sub-Saharan Africa has grown significantly over the past decade and covered 60 percent of the population (at the time of the study). Empirical evidence showed that mobile phones have the potential to benefit consumer and producer welfare, and perhaps broader economic development.

Lwoga (2010) did a study on telecentres and rural radio in Tanzania. The study found that the telecentres and rural radio can bridge the knowledge gaps in the rural communities. But the pre-condition is that the rural communities should be facilitated with adequate resources, in terms of skills, facilities,

finances, and policies. The study findings showed that there was low use of internet for knowledge acquisition. However the cell phones were becoming popular among the farmers for communication with telecentre operators and rural radio in case of emergencies and advice regarding agricultural activities. Additionally, it was observed that only few farmers used telecentre services, such as email and internet services due to lack of assistance, awareness, and skills, high costs, and language barriers. Hence, in these kinds of situation local and regional authorities need to pitch in to create a conducive atmosphere.

Awour et al., (2013) discusses that ICT usage has the potential to increase the efficiency, productivity and sustainability agriculture by providing right information and doing the required knowledge sharing. They propose a solution architecture (e-agriculture framework) to expose farmers to the much needed agricultural information (like pre-harvest and post-harvest information, pricing, weather conditions etc.) which can in turn boost agricultural productivity. Such a framework should accommodate the dynamic trends in ICT tools, applications, adoption and usage.

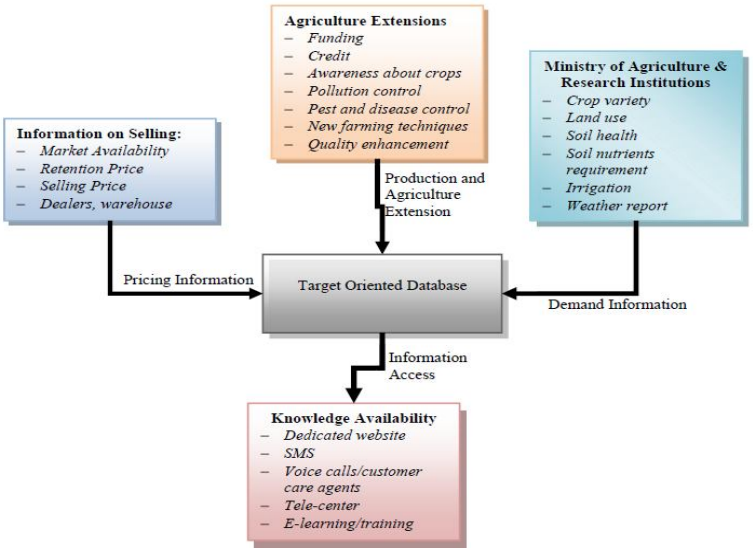

Fig 1: ICT Solution Architecture for Agriculture
Source: Awour et al., (2013)

The use of ICT offers an unprecedented opportunity for decentralizing information access and creation. Less focus on ICT tools and application enhancements and low usage will not help in the growth in whatever sector we might think off. In any situation problems related to poverty are multidimensional therefore requires political consciousness social organization. ICT becomes an essential tool in alleviating poverty through the enhancement of social capital and economic of livelihood of the poor. Additionally, it helps to remove information fudging which often makes it difficult to monitor the unethical practices of getting the eligible families excluded from poverty alleviation programmes (Obayelu and Ogunlade, 2006).

In a study of the Sub-Saharan region of Africa, a comparison between the costs of providing internet service to the benefit the very poor can receive from the same is showcased. It reveals a very low figure on the cost benefit-ratio as an outcome of that comparison. On the contrary the access to radio and telephone services show a higher benefit-cost ratio. It also highlights a lower overall cost for the alternative of radio and telephone service poverty alleviation programmes. ICT tools and application are shown in the same study as strong and important motivating force for poverty reduction. The notion is application and enrichment new technologies create excitement, a lot of positive energy and dynamism. In a broader definition of poverty, as per the UNDP (United Nations Development Programme), not only income poverty

is included, but also the capability and the participation poverty (which means the lack of participation). The study also highlights that even though direct poverty alleviation in monetary terms is difficult to prove, ICT can definitely empower the poor (with requisite knowledge), give them a voice and connect them to the global world requisite with capability development and better understanding of the day-to-day local and global scenarios. Hence universal access to all ICT tools and applications should be a top priority for governments and international bodies. The implementation however needs to be carefully planned and integrated with long-term development strategies to ensure sustainability and a definitive impact on poverty alleviation in developing countries (Giannini, 2009).

Farmers need information in the nick of time to take more the right decisions within their day to day agricultural activities (De Silva et al., 2012). Lack of adequate information at the main three phases namely choosing the correct crop, growing and selling compel the farmers to take wrong decisions which ultimately leads to short & long-term financial problems. They get sucked into the vortex of financial problems year-on-year leading to total disarray in their lives. Hence, it is fundamental to present the right information to the necessary communities so that they can make informed decisions precisely at the right time. The study mentions that at present, the agricultural data is scattered in different locations making it difficult for collation and sharing at the right time. Thus, there is a need for a farmer centric information flow model connecting all required stakeholders. This model will aid the decision making process of the farmer, providing them the best of all available information. The findings demonstrates that a "mobile-based" information system will be an effective way to make the information flow happen as most farmers have access to a mobile. The information flow model as proposed in the study is provided below (Fig. 2).

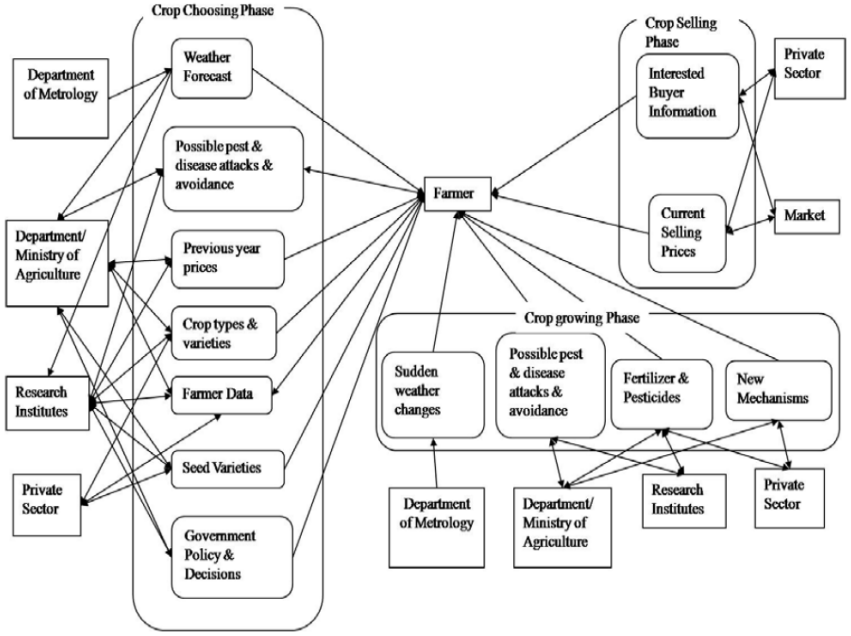

Fig 2: Proposed information flow model

Source: De Silva et al., (2012)

5. ANALYSIS

Gigler (2011) mentions in a study that ICT can significantly contribute in enhancing poor population's human and social capabilities, under some pre-defined conditions. The human and social capability enhancements in turn have a positive impact on the overall well-being on the concerned cross-

section of the people. The central thought process in introducing ICT into rural communities can be highlighted as the following:

(i) ICT enhances poor population's individual and collective agencies.
(ii) ICT strengthens their current individual and/or community assets.
(iii) ICT enhances their "informational capabilities".

Similar to literacy, the newly acquired "informational capabilities" can act as a strong agent for change both for the individuals and the communities. It enhances their abilities and hence provides them the courage to engage with the formal institutions in the sphere of economic, political, social and cultural aspects for betterment of their lives. The study also mentioned that the upliftment of "informational capabilities" of any cross-section of the population is the most critical factor for determining the extent to which ICT can enhance the well-being of the masses. So, having the right information at the right time is not only beneficial for anyone's well-being, but also, plays an essential role as a catalytic agent in strengthening his/her capabilities in multiple dimensions of life. The second part as mentioned above is the more important aspect and is in-line with the overall benefit idea of the study that we are undertaking in the current context.

Sinha (2005) highlights that the mobile phones, like other ICT devices are merely tools used to help connect individuals. But as a fallout of that process, the concerned people can get the required empowerment to strengthen their social networks. Once that is achieved, these social networks can help them in a various ways like new economic activities, being active in social and cultural matters and become up-to-date on what is happening in the political arena. Mobile phones can be considered as fantastic solution for the rural segments (individuals and communities), due to the availability with ease and flexible payment options ("pay-as-you-go" or "prepaid" services).

Ahuja (2011) highlights that the availability of information over internet helps the important process of agricultural extension, makes it faster and also more effective. The important constituents of the agricultural extension systems are the research happening in the field of agriculture, marketing information and the farmers. ICT bridges the communication gap between all and sundry. The enhanced and seamless communication among these constituents results in the overall development of the agriculture system of any given region and moreover the whole country.

The application of ICT in agriculture has emerged as an important pillar for agriculture extension focusing on the development of agricultural and rural sector as a whole through targeted information and relevant communication (Dhaka and Chayal, 2010). The study highlights that the effective usage of ICT has the potential to make the rural sector prosperous as it enables the spread of requisite information in desired form, easily accessible and in a cost-effective mode at the right time and place.

Syiem and Raj (2015) had conducted a study to find out the level of access and usage of ICT devices/applications among farmers of Meghalaya (India). Random selection was done for a total of 120 farmers for the study during the period of November 2013 to May 2014. The results highlighted that the level of availability and accessibility of ICT was the highest through mobile phones followed by television and radio respectively. Additionally, mobile phones were also regarded as the most frequently used ICT tool as compared to others. The areas which saw a wide use of ICT were information services on availability of inputs and its quality, contacting stakeholders for marketing of agricultural products, pest and disease management of requisite crops, and inputs on market price.

A study was done on the farmers from Punjab, Haryana, Uttar Pradesh, Bihar and West Bengal (Mittal and Mehar, 2012). An earlier survey was done through focussed group discussions in 2008 with around 187 farmers of whom 35 were big and rest were small farmers. In the second stint (Feb to April 2011) a survey was done on around 1200 farmers in the five states as mentioned above. This time the big farmers were 36% and the rest were having small or marginal land holdings. The outcome provided evidence that mobile phones help in reducing cost for information search and increases market efficiencies. The use of mobile phones has encouraged poor farmers to move towards greater market participation and doing diversified cultivation of high-value crops. This turn-around has increased farm earnings through gaining of

higher price and reduction of losses through earlier wastages. Eventually, it is expected that mobile-based information services will influence the behaviour pattern of farmers and this will facilitate adoption of improved techniques leading to better yields.

Robust and economical mobile infrastructure is imperative for exchange of vital information between farmers and service providers. Further, the use of smartphones and tabs for information dissemination is more efficient and tailored for the users as it facilitates to install software applications for getting advanced risk mitigating strategies such as early warnings and advisory information. It also helps in integrating supply chain with GPS which provides mapping functionality. Thus, ICT innovation empowers farmers by facilitating timely access to localised and personalised information for greater control of their production, risks and thus market their produce to identified market opportunities.

6. CONCLUSION

The study reveals, that there are evidences on overall benefit achieved by farmers on ICT tools usage. This is evident from the studies across various countries and also from India. However, some studies indicate that the information (as in agriculture related) still lies scattered and requires help from government and competent authorities in collating in a central location. The collated information then can be shared via various ICT tools to the required consumers (as in the farmers operating in the rural segment). The overall benefit is seen in latest news on agriculture, information/access of requisite funds, market information and the ability to negotiate prices. Additionally, though there are indications of poverty reduction in the rural farmers as a result of all the factors mentioned as above, further research/deeper analysis is needed to find a direct correlation between ICT usage and poverty reduction.

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