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## USING ICT BY THE RURAL COMMUNITY FOR KNOWLEDGE MANAGEMENT TO ACHIEVE SDG

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### ABSTRACT

The new Sustainable Development Goals call for several bold breakthroughs by the year 2030, including the end of extreme poverty (SDG 1) and hunger (SDG 2), universal health coverage (SDG 3), universal access to modern energy services (SDG 7), sustainable cities (SDG 11), combating climate change (SDG 13), and protecting marine (SDG 14) and terrestrial (SDG 15) ecosystems. Achieving SDG globally the major concern is minimizing the knowledge gap and information and communication technology (ICT) can play the lead role in minimizing the knowledge gap. The broad application of (ICT) is a profound reason for optimism, since the rapid development of ICT-based services and systems offer the possibility for the needed deep transformation of the world economy and societies more broadly. Communication is difficult in many parts of Bangladesh. Among different communication technology mobile phone has proven to be effective. ICT has the potential to increase the rate of diffusion of a very wide range of technologies, applications, and platforms across the economy. Oxfam in Bangladesh has been implementing the project Participatory Research and Ownership with Technology, Information and Change (PROTIC) since November 2015. The community in Shyamnagar and Dimla sub-district has identified agriculture as the main concern where knowledge management requires as new crops and cropping technology has been introduced and adopted to cope with climate change. The community is following Participatory Action Research to identify the scope of using ICT. This paper aims to describe the community perception of using ICT towards achieving the SDG. The scope of government intervention with the Vision 2021 and 7FYP will also analysed linking the community state of Capacity. The potential of ICT-related interventions is insufficiently explored. ICT can play its role in achieving SDGs, but technology can only deliver services and applications if that underlying infrastructure is available. It needs strengthening across the country in terms of infrastructure and capacity building.

**Key words:** Sustainable Development Goals, Communication technology, Climate change, Capacity building

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## INTRODUCTION

On 25 September 2015, the 193 countries of the United Nations General Assembly adopted the 2030 Development Agenda titled Transforming our world: the 2030 Agenda for Sustainable Development is known as Sustainable Development Goals (SDGs). But much remains to be done: the 17 goals comprise 169 targets, 91 of which need to be specified in more detail. Metrics need to be developed to measure progress towards the targets on local, national, regional and global levels and across sectors. Monitoring and evaluation procedures and standards need to be set up (Lu, 2015). The SDGs were in large measure informed by the oft quoted assertion by United Nations Secretary-General Ban Ki-moon that "There can be no Plan B, because there is no Planet B" (Espinoza, 2014). Knowledge has pronounced command to enlighten our obscurity. Reaching SDGs worldwide the major concern is minimizing the knowledge gap. ICT can play the lead role in minimizing the knowledge gap; from knowledge generation which is mainly the baseline information to capacity building and monitoring. ICT facilitate access to key information and provides means to access innovative services (Zhao, 2015). In recent years, rampant growth of network industry creates ample room for sourcing desired and authentic information instantly throughout the country, and Oxfam, who works in the hard to reach area of the country, has taken several initiatives to facilitate the connection between these technologies and beneficiaries. The widespread uptake of mobile phones increasingly has the capacity to fill this communication need. Mobile phone technology has proven to be effective in terms of time, cost, reach and response. Not only do mobile phones enhance the communication between individuals, they also have the potential to make 'a difference to the livelihood of the poor and to contribute towards reducing both financial and non-financial dimensions of poverty' (IDRC, 2013). The ICT intervention of Oxfam has been covered a wide range of use and user diversity. The current paper is based on the intervention PROTIC, which is being piloted jointly with Monash University. In the pilot 200 female farmers from the Satkhira coast and Dimla Charland along with stakeholders in information ecology will be equipped with smart-phone from which they will get both on-demand and promotional information via text or voice messages related to resilient agriculture. A Participatory Action Research (PAR) will assess the effectiveness of the communication, state and form of right communication and information sharing way, action in resilience, etc. Development participants Pollisree and Shushilan will implement the intervention as REE-CALL component. Oxfam's ICT partner WinMiaki; academic partners from Bangladesh, University of Dhaka, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Khulna University and Hajee Mohammad Danesh Science and Technology University are in the action research for community empowerment using ICT.

## LITERATURE REVIEW

### SDGs and ICTs

The sustainable development goals (SDGs) are a new, universal set of goals, targets and indicators that UN member states will be expected to use to frame their agendas and political policies over the next 15 years. SDGs, call for several bold breakthroughs by the year 2030, including the end of extreme poverty (SDG 1) and hunger (SDG 2), universal health coverage (SDG 3), universal secondary education (SDG 4), universal access to modern energy services (SDG 7), sustainable cities (SDG 11), combating climate change (SDG 13), and protecting marine (SDG 14) and terrestrial (SDG 15) ecosystems, promote peaceful and inclusive societies for sustainable development (SDG 16) and strengthen the means of implementation and revitalize the global partnership (SDG 17) (Wilenius *et al.*, 2014).

Information and communication technologies (ICTs) are a combination of devices and services that capture, transmit and display data and information electronically. This paper illustrates the importance of ICTs for achieving SDG 13, 14 and 15. The broad application of information and communication technology (ICT) is a profound reason for optimism, since the rapid development of ICT-based services and systems offer the possibility for the needed deep transformation of the world economy and societies more broadly (Bodrud-Doza *et al.*, 2015). The importance of ICTs is not the technology as such, but its enabling function in facilitating enhanced access to information and communication across large distances; improved access to governmental and quasi- governmental resources and services; opportunities to trade or bank online through kiosks; new opportunities to design, manufacture and market products through internet or intranet systems; increased and improved education through computers or about computers or both; superior medical advice and diagnostic information; information about local resources, opportunities to earn a better living by learning a new skill in the knowledge-based economy, improving agricultural productivity, etc., that are essential elements in today's economic and social interaction, conducting businesses, compete in markets and shape developmental priorities (Siriginidi, 2002).

### Concern of Bangladesh Achieving SDG

Bangladesh has significant success in achieving 4 goals out of 8 of the MDG. Bangladesh achieved the targets in improvement in mother health, reduction of child mortality, prevention of HIV/AIDS, malaria and other diseases and universal education. Besides, significant improvement has been made in the areas of gender equity, poverty reduction, sustainable climate change adaptation, developing universal cooperation. With these achievements, a confidence has been built up to tackle the challenges of SDGs and achieve most of the goals by 2030. But some goals are so difficult where lot of investments will be

required. The end of poverty in all forms and end of hunger will mean to eliminate the poverty in all areas of the country. Achievement of gender equality means to ensure reforms to give women equal rights in economic resources as well as ownership and control over land and forms of property. That concern on law, perceptions and acceptance on the changes. This will mean major changes in the law of inheritance, besides eliminating all harmful practices such as child, early and forced marriage etc. The SDG goals 6 and 11 require huge investment. The goal 16 is to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. For some goals we are yet to have sufficient baseline information.

### **ICT for SDG achievement**

Kamruzzaman *et al.*, (2013) was conducted a study “Use of communication sources in receiving agricultural.” According to their paper rural women play a key role in agriculture starting from soil preparation to the post-harvest. Although women are involved in agricultural activities strongly, little effort has been made to bring out their organized effort by providing agricultural information to them. Providing adequate information and training to women can pave way for socio-economic development of the country. Their study discussed various characteristics of rural women relating them to the communication sources used by them for receiving agricultural information. From their study it was learnt that a dominating majority of the rural women have low to medium level of agricultural knowledge which indicates a huge communication gap. Also majority of these women have low to medium use of communication sources in study area for agricultural information. From relating all the variables of the survey with the communication technology use it was seen that women having higher education, small family, higher agricultural knowledge use communication sources more while age and amount of agricultural work had no relation. It indicated inadequate use of communication in the community which may result in poor yield from agriculture works. So, development and introduction of appropriate communication technology for rural women to transfer agricultural information to women.

Information Communication Technology can potentially impact the lives of people living in the rural areas of a developing country. But the ways in which the development is influenced isn't well understood yet. This article is aimed at understanding these ways by analyzing two different initiatives to improve the lives of rural women. One of these two initiatives are Grameen Phone Community Information Center (GPICC), providing mobile broadband connectivity in rural community centers and the other one being Village Phone (VP), which facilitating small scale women enterprises by enabling women to sell mobile phone services in their communities. The VP initiative aims at contributing to the Million Development Goals, especially

Target 11, which calls for an increase in the ratio of women to men in non-agricultural sector. This has provided the rural women with opportunities to become entrepreneurs which allows them to overcome oppression or other humiliating factors residing in a male dominated society (Ashraf *et al.*, 2011)

Achieving SDG globally the major concern is minimizing the knowledge gap. ICT can play the lead role in minimizing the knowledge gap; from knowledge generation which is mainly the baseline information to capacity building and monitoring. ICT facilitate access to key information and provides means to access innovative services. Ending poverty (G1) can be accelerated through services such as mobile banking. It can help to end hunger (G2) providing key information to farmers, enabling them to make decisions. Health care in remote areas via mobile phone is proven (G3), connectivity can lower the barrier to education (G4); ICT skills can ensure inclusive and sustainable economic growth and decent work for all (G8). Ensuring that people have equal access and use to ICTs helps to reduce inequality (G10), helping to bring information and knowledge to disadvantaged populations around the world such as persons with disabilities and women and girls. ICTs support gender equality (Goal 5), increasing women's access to health, nutrition, education and other development opportunities. Smart water management, facilitating the measurement and monitoring of water supplies and enabling local practitioners to ensure the equitable and sustainable extension of water, sanitation and hygiene (WASH) services (G6) can be ensured using ICT. Energy efficiency (G7) is improved by ICT by making energy generation, distribution and consumption more environmentally-sound. Local infrastructure will be increasingly managed through technology, building resilient and sustainable power networks, intelligent transportation systems and smart water supplies (G9, G11). ICTs also foster sustainable consumption and production through product-specific improvements, increase dematerialization and virtualization (G12), meteorological, satellite services and providing better forecasting and timely information to early warning systems (G13) and can play a significant role in the conservation and sustainable use of the oceans through improved monitoring and reporting (G14). ICT data can also analyse trends in biodiversity and ecosystem evolution, helping to plan mitigation services for the protection and sustainable use of terrestrial ecosystems (Goal 15). The growing use of open data by government increases transparency, empower citizens and helps to drive economic growth (G16). Data and information sharing between government and other stakeholders strengthen the global partnership (G17) towards the achievement of the SDG (Zhao, 2015).

### **Knowledge Management in Sustainable Development**

Knowledge management systems (KMS) refer to a class of information systems that is applied to managing organizational knowledge (Alavi and Leidner, 2001). Organizational knowledge consists of information



about activities and best practices. Fernandez *et al.*, (2004) defined KMS as the integration of technologies and mechanisms that are developed to support KM processes. In rural areas, and elsewhere, knowledge is a crucial resource for preserving valuable heritage, learning new things, solving problems, creating core competences, and initiating new situations for individual and organizations, both now and in the future (Levy and Ellis, 2006). KM includes activities and processes that are intended to discover, capture, share, and apply knowledge (Fernandez *et al.*, 2004). A common distinction, highly relevant in KM, is made between tacit and explicit knowledge (Polanyi, 1966).

The concept of sustainability has been used in a variety of contexts arising from social, economic and environmental development (Ali and Avdic, 2015). Sustainability is a term that has been taken to describe biological resource use, sustainable agriculture and carrying capital. A social development definition of sustainability includes the continued provision of basic human needs, food, water, shelter, as well as high-level social and cultural necessities such as security freedom, education, empowerment and recreation (Brown *et al.*, 1987).

Appropriate partnerships for long-term sustainability, for example with agricultural bureaus and local universities, will be formed, as will community networks with teachers and farmers. ICT will help to identify and develop the most appropriate technologies including: novel technologies for collecting, analysing, archiving and visualizing information to support farmers to develop improved agricultural practices; innovative communication access facilities for sharing between isolated and dispersed rural communities; and radically different user interfaces for illiterate or semi-literate user groups (Marwick, 2001).

## **METHODOLOGY**

The paper is based on the findings of pilot intervention which includes community consultations, focus group discussion, Reconnaissance Survey of the PROTIC Project and review of the project activities.

The pilot intervention of Oxfam Bangladesh named PROTIC has been covered a wide range of use and user diversity in Satkhira coast and Nilphamari Charland. In the pilot 200 female farmers from both areas have equipped with smart-phone and accomplished them about these technologies. They have been conveyance messages (both text and voice) related to resilient agriculture through this device. Now their activities and life styles are under surveillance as FGD, case study, KII, HHS, personal interview by both indigenous development participants (Shushilan and Pollisree) and limited participant (Monash University).

A reconnaissance questionnaire survey was conducted for face to face interview/personal interview of the beneficiaries (animator) of PROTIC project of Dakshin Kharibari village under Tapa Kharibari Union, Dimla upazila under Nilphamari district were the population of the study. The list of all 100 female animator was collected from concerned development partner NGO named Pollisree. Out of them, a sample of 40 farmers (40 percent) was selected by simple random sampling method. Simultaneously, a reserve list of 10 farmers was made in order to use in case of unavailability of sampled female farmers.

Total No. of beneficiaries (animator)	Sample size	Sample (percent)	Reserve list
100	40	40%	10

Where  $N=100$ ,  $n=40$ , Sampling factor= $n/N*100$

Two (2) Focus Group Discussions were held with members of the PROTIC project in our study area. Each Group 15 female farmers were presenting as PROTIC is working with the female farmers who are the representative of marginalized group of people. The Focus Groups were 2 (two) hours in length and were digitally recorded and transcribed verbatim. Five leading questions were used as guides for focus group discussions. The questions are as follows:

1. How many of you know to build a resilience community in terms of agriculture and climate change what should be done by the community?
2. How many of you are enrolled for the Govt. safety net program? What are the reasons of not getting it?
3. Who takes the decision in terms of social capital and safety net issue?
4. Do you use any primary level technology for the betterment of agriculture or other purposes?
5. How many of you are linked with the market?

## RESULT AND DISCUSSION

### Steps towards SDG by and for the community: An analysis from Dakshin Kharibari

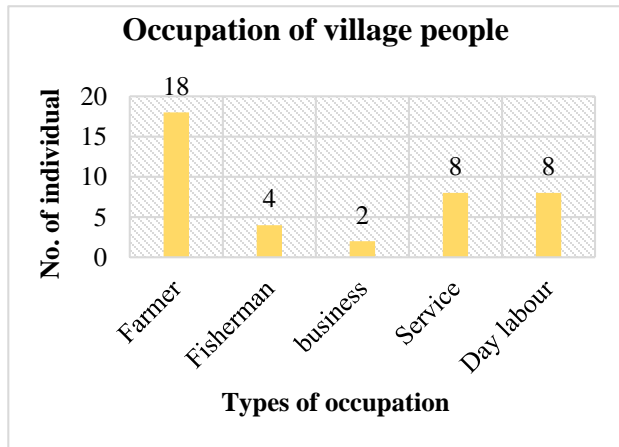
Dakshin Kharibari is a remote village under the sub-district Dimla of Nilphamari. It's an agrarian village on the bank of the river Teesta. What does it requires achieving the SDG in the village Dakshin Kharibari? Occupation is one of the single leading factors for farmer's self-development as well as development of community. In the table-1, most of the respondents were farmers (18) followed by 4 fishermen, 2 businesses, 8 service and 8 were day labor are demonstrated figure 1.

**Table-1:** Occupation of the Dakshin Kharibari village people.

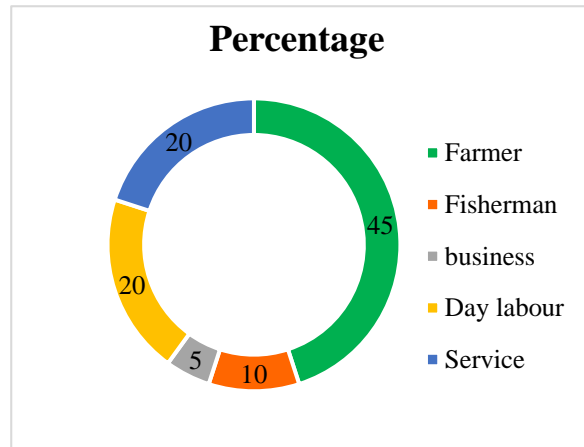
Occupation	No. of respondent*	Percent
Farmer	18	45
Fishermen	4	10
Business	2	5
Service	8	20
Day labor	8	20
Others	0	0
<b>Total</b>	<b>40</b>	<b>100</b>

\*Source: Reconnaissance Survey of the PROTIC Project in Dimla Upazila under Nilphamari District.

In the village 45% are farmer followed by 10% fishermen, 5% business, 20% in service and 20% are day labour (Figure 2).

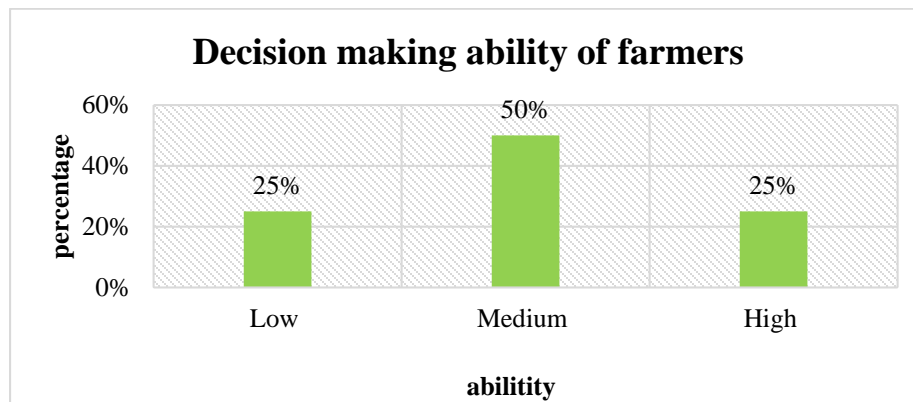


**Figure 1:** Occupation of village people



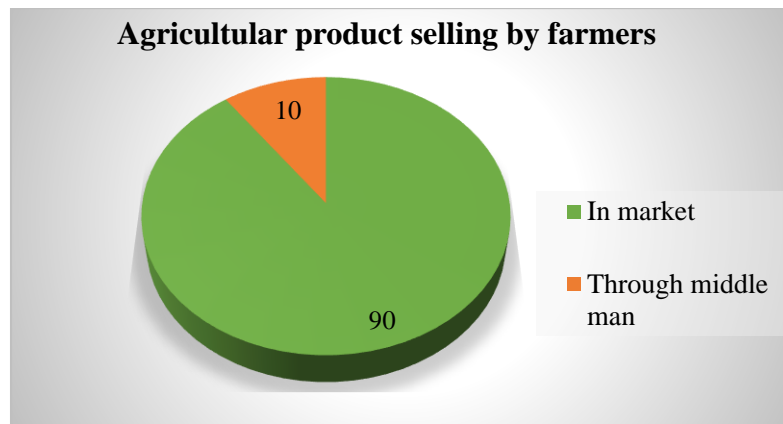
**Figure 2:** Percentage of occupation

Among the farmers 75% have fair knowledge while 10% have poor and 15 % have moderate knowledge on agriculture. From the poor of community 10% got VGF, 5% got old allowance, 5% got widow allowance, 5% got disable allowance, 5% got old allowance, 5% got relief and 5% supported by others. Half of the farmers have medium decision making ability, 25% have low decision making ability and 25% have high decision making ability (Figure 3).



**Figure 3:** Decision making ability of farmers in Dakshin Kharibari village

Seventy percent farmers use power tiller for tilling their land while 30% percent use plough. Tractor and trans-planter/drum seeder were not used. Among the irrigation machineries toddle pump used by 50% of the farmers, 40% use deep tube well and only 10% use shallow tube well for irrigation purpose. Farmers sales their product individually in market in most cases (90 percent) while only 10 percent sale it through middle man (Figure 4).



**Figure 4:** Product selling by farmers

More than half of the farmers stored their crop in gunny bag while 40 percent stored in inside house and 5 percent stored in cold storage. The data shows that to achieving the Goal 1 and 2, knowledge management is an essential requirement. We here considered those 2 goals only as lack of gender segregated data. On the above noted state the follow are the major requirement that need to address to achieve the SDGs though there are many other factors:

1. 25% have knowledge gap on the current practice of agriculture. To cope with climate change new crops and cropping practices are being introduced;

2. Safety net coverage till inadequate and community has questions of the beneficiaries specifically in term of priority;
3. Less than half of the community has indeciduate decision making capacity;
4. Around one-third is not equipped with primary level technology;
5. 10% are not linked with market;
6. Risk of production less due to lack of storage capacity.

How ICT can work to minimize the noted gaps. Oxfam has been implementing the project PROTIC as a participatory research to over the barrier to development using the ICT as one of the vehicles. The followings are done by PROTIC for knowledge management using ICTs:

1. Providing agriculture information both spontaneous and need based via SMS, IVR and Call centre. Because of the introduction of new crops and adaptive agriculture content of every query is not available. Small scale researches have been facilitated for the information;
2. To make the local community about all the safety net coverage and the updated information and also for the governance in the distribution an App has been developed which will be in field shortly;
3. Farmers calculator which has been introduced by another project of Oxfam has been under plan of us by all the farmers of the PROTIC working area;
4. Farmers are well informed about the technology but government intervention to make modern technology available for the farmers is required;
5. Farmers are informed with the market rate but access to market is still limited;

Farmers have belonged to PROTIC now can access information what's they need about agriculture, market of products, life style, entertainments etc. through ICT by themselves. They can make a call to other for communication and professional about crops, cattle and husbandry. They can also browse internet and maintain social media.

## CONCLUSION

Though the number of mobiles phone and other devices in Bangladesh is significant but access to ICT is yet to ensure for all the citizens. Now knowledge sharing, economy and life style of our study areas are progressing through accessing of the ICT that has introduced via PROTIC. In Dakshin Kharibari village Government and private sector intervention is required more to facilitate the storage and crop loss for all marginal people. ICT can orient the farmers on the importance of proper storage and market. When we say

ICT for achieving SDGs we need reliable, high quality communications infrastructure which will ensure the effective use of ICTs. ICTs can play a crucial role in supporting public outreach, building a data base, creating awareness of the impact of disaster, suggest possible interventions based on the data base for adaptive mechanism as well as ICT can offer opportunities to address those challenges. To achieve the goal of SDG the country needs to build the nation as knowledge scarcity; affordability of the devices, connectivity and the adequate contents for sharing need to be ensured. Political commitments, cooperation and participation of public and private interventions and use of the youth force can make it possible.

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