

Empowering Rural Women through ICT in Agro-meteorological Practice in Bangladesh

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Abstract: Objective of this paper is to find out the empowerment scenario of rural women in Bangladesh through participatory action research in agricultural practice. The female farmers of Dimla upazila under Nilphamari district of Bangladesh got agricultural and agro-meteorological information through Smartphone. By using the Smartphone the rural female farmers gather knowledge about agriculture and agro meteorology. On the other hand, they can ask the solutions from the call center of a project operated by an NGO, if they face any problem regarding agriculture and agro meteorology. There is a two way communication which makes possible the interactivity between experts and users and fulfills the condition of an action research. The researchers used quantitative and qualitative method to assess the output of this interactive knowledge management. The study conducted a questionnaire survey from 80 respondents selected by simple random sampling from the total 100 populations. Primary and secondary data has been used in this research. The location of the study area is Dakshin kharibari village under Dimla upazila of Nilphamari district. In recent past, the female farmers of this locality engaged with agricultural activities but they had limited accessibility toward agricultural knowledge. By providing information on agriculture and agro meteorology through previously given Smartphone the project wants to have a decisive participation of women in agriculture. The project gives training to the female farmers so that they can use those phones and meet up their necessities. Based on the demand of the female farmers the call center prescribes and supplies the relevant information continuously for having the highest empowerment of the rural women. The goal is to make the female farmers empowered socio-economically and establish an interactive knowledge management system by providing and receiving information. Although the educational qualification of the rural female farmers of Bangladesh is comparatively lower than their male counterpart the findings showed that women become highly empowered if they get proper information. On the other hand, as there is an instant two way communication, women can fulfill their information lack within very short time. The adaptation level of the respondents with information and communication and technology is very high which make the rural women more empowered. But there are some problems in rural Bangladesh, such as imposing limited importance upon women to make decision and infrastructural inefficiencies, which sometimes make this action research ineffective.

Keywords: Women Empowerment; Participatory Action research; Interactive Knowledge Management; NGO.

Date of Submission: 10-04-2022

Date of Acceptance: 27-04-2022

I. INTRODUCTION

The decisive role of rural female farmers is not accepted in Bangladesh although they participated in agriculture from long ago. Even, women have also earned their laurels as pioneers in agriculture. The women pioneers in agriculture were more likely to be 'silent heroes' (Inhetveen, 1998). However, the female farmers are not the user of formal mass media like newspaper, television or internet. Their agricultural knowledge and technological orientation is very low because of the lower capacity of using mass media. However, the small farming family is fully depended on the women supervision especially regarding yard side daily agricultural essentials production. In this case if we can give them the proper information the women can play a vital role to empower themselves. To empower the rural female farmers of Dimla upazila under Nilphamari district of Bangladesh, the agricultural and agro-meteorological information is given by an NGO named Pollisree, Dinajpur through Smartphone. Unlike other NGOs working in Bangladesh, Pollisree provides agro-meteorological information instead of loan and other financial facilities to the poor. It only provides information

to the farmers on agriculture, weather etc. Its aim is to empower the female farmers with information and communication technologies. Under this project 100 female farmers are given smartphones each with internet access, apps and call center support. The farmers are being provided with pertinent information on agriculture, weather etc. through these mobile phones. It works on the basis of an interactive communication between experts of call center and the rural female farmers.

To empower women by making any program effective it is necessary to execute it properly. Besides, it is necessary to find the difficulties out which the participants are facing during implementation. In this case action research can do a lot. Through action research it becomes easy to find the problems out and provide proper solutions to the problems. Participatory action research is implementing here among the female farmers to know the communication gap and to assess whether the information they provide is working rightly? Then they take proper initiative to establish an interactive knowledge management system.

Action research is a process in which participants examine their own educational practice systematically and carefully, using the techniques of research (Ferrance, 2000). Action research is a type of research that is to be done to solve an immediate problem and to improve the methods of study. It is implementing action research in order to provide their beneficiaries proper information that helps them to build a strong interactive knowledge management system. Pollisree, at first provides them smartphones and gives various information on agriculture and then they implement action researches to justify that whether the information they provide them are working rightly. These action researches help Pollisree to provide the most effective information that the beneficiaries needed based on their queries.

The aim of the project is to establish interactive knowledge management with their beneficiaries. One of its objectives is to develop and implement an interactive mobile apps information system through which the women get necessary information on agriculture. Pollisree wants to develop a two way communication between experts and the beneficiaries and for this purpose they implement action research. It provides the necessary information according to the queries of the people. Through this interactive research process, the project is being able to know what kind of information people needed and then they try to fulfill their demand. By this way they activate the interactive knowledge management system which is a two way communication or interaction between the different parties.

Statement of the problem

Information and Communication Technology can make a change everywhere. Participatory Research and Ownership with Technology, Information and Change (PROTIC) is implementing the technology to change the situation of the rural female farmers. In this purpose they are using smartphone and ICT for providing information. It was the query of the researcher how successful the PROTIC is to implement the interactive knowledge management system by action research.

PROTIC project conducts various activities along with its animators. PROTIC has been initiated to begin specifically addressing women's economic empowerment in agriculture for resilience. Through the Participatory Action Research (PAR) approach, PROTIC aims to enhance the economic situation of poor and marginalized climate change vulnerable community through providing relevant, comprehensive and accurate information which is trustworthy and well-timed. Within the overall project period, this project aims to increase women's participation, helps to strengthen their leadership role, and to enhance their economic situation by developing customized information systems for agriculture including crop farming, homestead gardening, fisheries, livestock, horticulture and poultry. PROTIC is implementing in Borokupot village under Atuliya union at Shyamnagar upazilla in Satkhira Coast, in Dakshin Kharibari village under Tapa Kharibari union at Dimla upazilla in Nilphamari Charland, and in Bhawanipur village under Dakshin Sreepur Union at Tahirpur Upazilla in Sunamganj Haor.

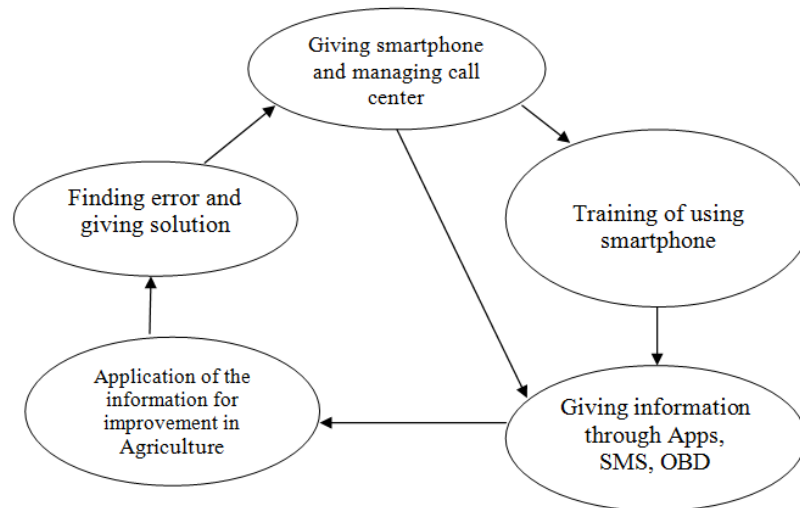


Fig.01 Activity cycle of PROTIC

In this project 300 female farmers from the three echo systems (100 from each area) have been equipped with smart mobile phone along with internet scheme. Through these mobile phones they are getting SMS, Outbound Dial (OBD), Interactive Voice Response (IVR), Apps and Call Centre services on agriculture, agro meteorology, and early warning system. This is a project funded and technically aided by Oxfam, Bangladesh and Monash University, Australia. Through this project, the female farmers are getting information on various sectors. The activities of PROTIC project are mainly providing information. PROTIC provides information regarding:

Agriculture: PROTIC provides information on different agricultural crops like rice, corn, wheat, nut etc. They give necessary information through text messages and apps regarding these crops. But, when the animators feel any problem regarding agriculture they can call to the call center. From the call center, they are provided with specialist's information how to get rid of the problems immediately.

Livestock: Besides different agricultural crops, PROTIC project also provide information on different domestic animals like cow, goat, hen, duck etc. The animators get information through the same procedures for the betterment of these domestic animals in order to grow them more and earn more. When the animators face any problem like diseases of these animals they get the information of treatment from PROTIC, especially through the call center. The call center suggested them the name of the medicine after getting the details. Then the animators can easily buy the medicine from local market and feed the animals properly.

Weather: Weather has a huge impact on agriculture. Rainfall and drought plays a vital role in agricultural crops. Based on the geographical characteristics of Dimla, Nilphamari, PROTIC project aims to give necessary information on weather. This includes proper seasonal schedule, time of rainfall, time of drought, when the temperature will rise, when it will fall and many other information through text messages and apps. The animators of this project get weather updates on their smartphones by text messages.

If the PROTIC project is more successful in this information giving process then the farmers of this project will be empowered more. Through the action research if they find any problem between their interactions, it will become easy to provide the solution and that will make the interaction more effective.

The PROTIC project has some aims and objectives. Some of these are as bellows:

1. Connecting the rural female farmers to the mainstream community.
2. Building and enhancing their capabilities through technology.
3. Bringing positive changes in them.
4. Establishing an interactive knowledge management system.

The female farmers who have been provided with the smartphones are not educated enough. When they face any kind of problem regarding agriculture, agro meteorology and others, they contact to the call center which is toll free. The call center representatives give them solution for their problems. The farmers take steps according to the information provided by the call center. They have a huge lacking in ICT knowledge before introducing this project. Though they have been trained to use the smartphones but it is not so easy to execute the directions from the call center only by listening over mobile phone.

In this case, some questions arise in the mind of the researcher. These are as bellows:

1. What are the knowledge, attitude and practice levels of the respondents?
2. What are the problems or barriers in making the rural female farmers more empowered through ICT?

PROTIC is implementing action research to find the problems and provide them most effective information. But without educated participants it is highly difficult to reach the goals of development and implementing an interactive knowledge management system. Without proper education and guideline it is not possible to engage them to the mainstream community. In this research, the researchers will look for the barriers of the female farmers to make an effective interactive knowledge management system with PROTIC. It's the target of the researchers to find the answers of the questions out and show that how effective the activities of PROTIC to empower rural female farmers.

II. LITERATURE REVIEW

Marking the international day of rural women in a statement the then UN Secretary-General Ban Ki-moon has pointed out, "Rural women are the backbone of sustainable livelihoods and provide food security for their families and communities" (Ki-moon, 2016). In international development, the NGOs play a very important and progressive role. Some developed countries and individual allocates fund through these NGOs to do some development in the third world countries. In addition, NGOs are effective in these developmental activities by providing loans and other economic facilities to the poorest one (Werker and Ahmed, 2008). Guterres (2019) also reiterated that rural women represent the backbone of many communities, but they continue to face obstacles that prevent them from realizing their potential. Because, a large part of women in rural areas are illiterate. They have no knowledge on self-dependence, creativity, initiatives. These women are totally isolated, deprived from facilities and are marginalized because of non-interactive policies of the government. The development policy has clearly failed to make any improvement of the rural women in the country. As a result, there is a huge problem of unemployment. When a large part of the population, the rural women are unemployed, it is normal to raise these problems. The government has failed to apply the strategy of equal opportunities in rural areas. (Kongolo and Bamgose, 2002). Huairou Commission found in their research that in developing countries rural women represent up to 43% of the agricultural labor task. They also told that one quarter of the world's populations are living in rural areas who earn their livelihood by natural resources and agriculture (Bohrer, 2017). However, Parveen and Leonhäuser (2004) shows that, women's contribution is very low in economic development because of having a very narrow access to resources, decision making and ownership of asset. The study conducted in three villages of Mymensingh district in Bangladesh, shows that women cannot contribute to national development due to inequality in terms of facilities in all sectors. As a result, they are remaining backward in empowerment. Bohrer (2017) also stated the facts about the development of rural women which should give proper concentration. Such as, the farmers of rural area are not recognized properly as owner of the crops or producers, so they should get their rights. Besides, rural women should empower them in such a manner so that they can make decisions and can participate in the policy dialogues in order to implement SDGs. In this situation, Alkire *et al.* (2013) assess empowerment of women in five domains, including (1) decisions about agricultural production, (2) access to and decision making power about productive resources, (3) control of use of income, (4) leadership in the community, and (5) time allocation. Participation of the rural women in different domains is possible where interaction take place. When interaction is possible an environment of interactive knowledge management may create for the women stakeholders.

In studying with the purpose of interactive knowledge management system researchers found that information technology is successful and has a positive impact on knowledge management practices only if it is backed up by changes in people, organizational climate and organizational processes (Rašula *et al.* 2012). However, there is no single approach to develop knowledge management system. The organizations need to develop a variety of knowledge management systems and approaches in order to deal effectively with the diverse knowledge types and characteristics (Alavi and Leidner, 2001). The knowledge management system needs to implement within any organization which can conduct this process with a group of people. Knowledge management system is a vital operator in running an organization successfully and also very effective for existence, competitiveness and profitability of an organization. In another way, knowledge management system can effectively create, manage, share and utilize the value of knowledge for an organization. The researchers also state that, to operate knowledge management system effectively one must pay attention to three vital components which are people, process and technology (Omotayo and Olubunmi, 2015). On the other hand, Gonzalez and Martins (2017) indicate that knowledge management process consists of four stages: acquisition, storage, distribution and use of knowledge. NGO does not mean just performing a single job. There are some participatory functions of the NGOs like interaction with the communities, organizational structure of ownership which make them different from government and private sectors. The NGOs are operating their activities where there are other actors with whom their performances can be compared. In some situations the NGOs help the society to gain stability by building partnership with different agents (Zohir, 2004).

To solve any social problem through knowledge management system action is quite effective. Hine (2013) explained in a study that, action research is a very effective exercise for the teachers to use on the students. The study showed clear evidences behind it. Finally, he stated that, action research has some qualities

like empowering practically, solution based focusing system and so on which made this research system very effective and worthy to the teachers. Basically, action research is such kind of a research methodology which is very effective. Action research based training program contains a huge possibility to enhance or improve language skills and techniques of teachers. Research suggests that this action research based programs develop teachers' attitude and perspectives in conducting research successfully. The researcher used multiple case study and mix method to conduct this study (Sharar, 2016). It shows that, action research has the capability of having a positive impact in terms of getting result immediately. When NGOs do not use participatory action research in their activities the effectiveness may not be achieved as per the expectation. For that reason, in reality, Werker and Ahmed (2008) stated that while considering the effectiveness of the NGOs, a little critical image has arisen in developing the lives of their desired beneficiaries. Every non-governmental organization has an aim to fulfill it. Mendelson and Glenn (2002) argued that some foreign NGOs may have created domestic development sectors which were funded well but not so effective in supporting grassroots level. Stiles and Kendall (2002) have argued that the growth and advanced development of Bangladesh's NGO sector may cause some of these organizations to seek a greater presence in the public sphere. These NGOs often explore profit activities that carry out unintended and negative impact for the lives of poor. Generally, NGO's performance is evaluated by the results of their work, mainly including the targets for debt collection. However, Brown (2009) evaluated the NGOs like as inter-governmental organizations (IGOs) such United Nations (UN), World Bank (WB) defined NGOs as a nonprofit organization which will work for the development of the nations. NGOs are currently considered effective within the context of civil society. Of course NGOs need to operate their functions with responsibility and accountability to get the confidence of the donor organizations and countries.

Bangladeshi NGOs are adopting micro-finance more and more which is encouraging the authority of these NGOs to establish their offices targeting the rural areas. Though this process may be effective in an economic sense but these NGOs might not make the poorest economically strong (Gauri and Galef, 2005). This micro-finance couldn't lessen the sufferings of the poor people. Rather this process exploited them gradually.

Finally, the researchers found that the NGOs are playing a vital role was to provide loan and other economic facilities to the poor people who try to change their lives by these facilities. However, there was no such NGO available in the development arena which provides information for having economic development.

III. RESEARCH GAP

After reviewing these literatures, the researcher has found that there is a gap between this current and the previous researches. There have been a lot of researches on the effectiveness of NGO to empower rural women. Those NGO's were providing loan or economic facilities to the poor people or farmers. But, the NGO on which the research is being done, provide information to the farmers instead of financial help. They never give financial or any economic assistance to the female farmers. The PROTIC project is performing its functions on the basis of information giving approach. The researcher didn't find any previous research on such kind of NGO activities which only provide information. So, this is the area where the researcher is paying his attention that, when an NGO just provide information in order to change the situation of the rural women then how much effective it is.

Aims and Objectives of the Study

Every research conducts on the basis of a broad objective or some specific goals. An aim is the broad statements of outcome of research which gives importance to solve any problem. The broad objective of the research is to find out the empowerment scenario of rural female farmers while they get information. To fulfill the broad objective researcher set several specific objectives. They are as bellows:

1. To find out the knowledge, attitude and practice level of rural female farmers while they live with abundance of information.
2. To explore the challenges of the women to make them empowered through information.

Theoretical Framework

Women empowerment is the prerequisite of the overall development of a transformational society like Bangladesh. Each society has its own mechanism to empower the women. However, it is necessary to measure it. In the essence of measuring empowerment scenario of women in Bangladesh the research wants to measure the power of information which was supplied by this said project. Bokoyeibo (2018) discussed five ways to empower rural women. In the discussion he included adult education and training; vocational skills and business; access to financial facilities; health and social groups and mentorships are the basic five ways to empower women. We can assess empowerment capability of women by these five angles. When access to agricultural information is the way of empowering the women, assessment may follow the diffusion of innovation model of Rogers (1962). The four step theory articulated knowledge, persuasion, decision and confirmation are the adoption process in case of agricultural innovations. On the other hand, Schwartz (1976)

stated the correlations among the demographic and environmental factors with knowledge, attitude and practice of public health nurses to assess the success the nurses in integrating nutrition education into comprehensive health care. The study followed the three element model of Schwartz (1976) which shortly named KAP.

IV. RESEARCH METHODOLOGY

Research methodology is a body of methods, rules, and postulates employed by a discipline like a particular procedure or set of procedures, demonstrating library research. Methodology is an integral part of any research. It mainly indicates the strategy, model or the way how the research work will be completed. Generally it is the theoretical and systematic analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles related to a branch of knowledge. In this research, the researcher used a methodology which might bring a strong output to indentify the empowerment scenario of the rural female farmers. In this study, the researcher tried to search the given questions systematically through the quantitative methods used. The researcher used KAP model to measure the effectiveness of action research in rural woman.

The study follows a descriptive research design which is concerned with the description of data. Quantitative methods have been used in this study. The aim of the researcher is to find out the effectiveness of PROTIC project's action research in interactive knowledge management to empower the rural female farmers.

Selection of the study area

The study area of this research is Dakkhin Khoribari, a village of Tepakhoribari union of Dimla upazila of Nilphamari district. The village is situated at the river basin of Teesta. Dakkhin Khoribari is a village on the banks of Teesta river of Tepakhoribari union in Dimla upazila of Nilphamari district on the north of Bangladesh. Khalisha Chapani union is on the east side of that village, Khagakhoribari union on the west, Teesta River in the north and Shathibari market in the south. It is a densely populated village with an area of 12 sq km and total population are 10 thousand and 189 (female 5,270 and male 4919). Most of the people are agricultural workers or peasants and some people are stone workers.

PROTIC project is being implemented in three areas in Bangladesh. These are- Dimla of Nilphamari, Barokupot of Satkheera and Tahirpur Upazilla in Sunamganj Haor. Among the three areas researcher selected the Dakkhin Khoribari village of Dimla, Nilphamari as the study area by using purposive sampling.

Research Population

The population of the study is 100 female farmers of Dakkhin Khoribari village who had been given 100 smartphones. PROTIC first provided them one smart phone to each of 100 female farmers in the village of Dakkhin Khoribari when they have very limited knowledge about using smartphone. Then they gave training on using these phones. Today there is a new adoption of 100 smart survivors in the village. With this help, they now complete most of their daily life. From local news to national or international news and weather news, all this information they can be obtained from a call center.

Sampling

These are the individuals who the researcher ends up interviewing in a qualitative study or who actually complete the survey in a quantitative study. While conducting a research, it is quite impossible to study the entire population. So, the researcher needs to select a representative part of the population. In this research, the researcher has selected 80 female farmers from the 100 of Dakkhin Kharibari of Nilphamari. In the village there are five "Para" or parts of the villages. These are- Camppara, Guidebadhpara, Masjidpara, Chairmanpara and Dheeghipara. The researcher took sixteen respondents from each para as sample through simple random sampling. When sixteen respondent's interviews were completed, the researcher took another sixteen from the next para. In this procedure the 80 respondents were selected as the sample of the study.

Data Collection

In any research, it is necessary to collect data from various sources like primary and secondary source of information. The researcher has used both the sources for collecting data. The primary data were collected through direct interview of the respondents based on questionnaire survey. The sources are-

➤ **Primary sources:**

The primary data were collected by the researcher. The researcher collected the primary data directly interviewing the respondents through questionnaire survey.

➤ **Secondary sources:**

Secondary data are those which were collected previously by others like individuals or organizations or institutions. Secondary data were used to build a clear definition of the problem and understanding it. In this

research, the researcher has also used some data from secondary sources. Specially different documents used for the project, relevant research paper, books and journals are reviewed as the secondary source of information. The researcher collected the data through a pre-tested questionnaire. The questionnaire was set up by studying the contents of the information given to the animators through call center, apps etc. The questionnaire was based on the activities of the PROTIC project. What information is provided by PROTIC project were being analyzed and studied to arrange the questionnaire. The questionnaire was closed ended.

Measuring the empowerment of female farmers

The researcher made the questionnaire according to the contents of the information given by PROTIC in order to measure the empowerment scenario of female farmers under PROTIC’s action research. For this purpose the researcher used KAP (Knowledge, Attitude, Practice) model to measure the knowledge level, attitude level and practice level of the respondents. KAP surveys reveal misconceptions or misunderstandings that may represent obstacles to the activities that we would like to implement and potential barriers to behavior change (Monde, 2011). The questionnaire includes 60 statements based on KAP model. Each of the level naming knowledge, attitude and practice contains 20 statements. The researcher has tried to measure the empowerment of female farmers putting the answers of the respondents on a 5 point likert scale. Besides these, there were 15 more statements to identify the challenges faced by the respondents that create barriers of empowerment of female farmers.

Findings

To find the effectiveness of PROTIC’s action research in interactive knowledge management to empower rural female farmers, the researcher has collected some primary and secondary data which has been analyzed and are being presented here. The analysis of the data and the results given below according to various section.

Knowledge level of the respondents

Knowledge level of the respondents means whether the respondents know the information which are being provided by PROTIC project. In this research 20 different statements were used based on the basic information which was provided by the smartphone regarding agriculture or agro-meteorology. Here the answer were collected using a closed ended 5 point scale named strongly informed, informed, partly informed, disinformed and strongly disinformed. As the statements were made in a 5 point likert scale, the answers contain 4 points, 3 points, 2 points, 1 points and 0 points in terms of positiveness in answers.

When the animators need to know something they try to find it through the apps or making a call to the call center. From the call center they get known of their desired answer. So, their knowledge level about these questions is pretty high.

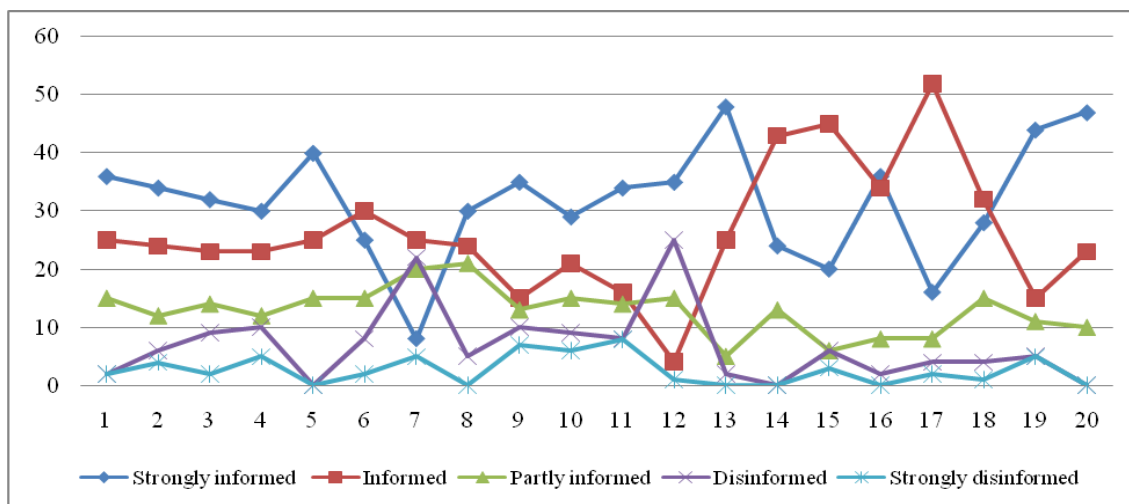


Fig.02 Number of respondents according to the knowledge level

In fig. 2 the study depicts that about 15 statements among the 20, 60 respondents of total 80 give their answer that they are strongly informed or informed. Number of respondents answer for partly informed, disinformed and strongly disinformed is very low, which is less than 15. Regarding this finding the research found out that the information level of the female farmers is quite high because of the uses of mobile technology for agricultural information.

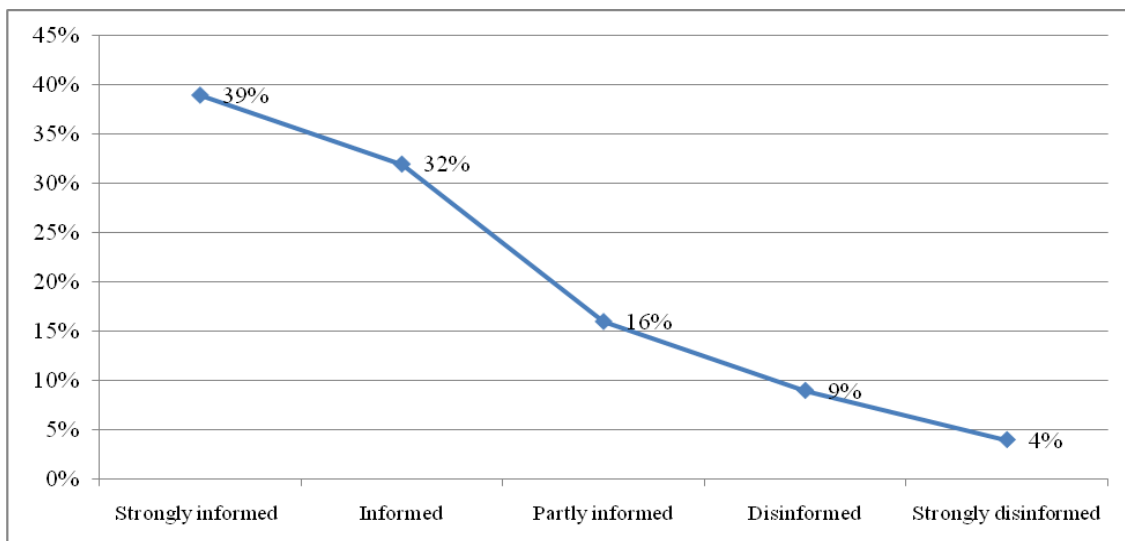


Fig. 03 Percentage of the respondents according to the knowledge level

The fig. 03 shows that the respondents are fully aware of the information provided by PROTIC. The knowledge level of 71% respondents is strongly high or quite high where 16% respondents are partly informed and 9% are disinformed and 4% are strongly disinformed respectively. The statements were indicating their knowledge that whether they are aware or not when to give water to plants, when to give fertilizers, which medicines that are needed for different diseases of the animals etc. As they get this information from apps, call center within a short time and when they needed, they know what to do in the particular situations. So, that means the respondents are completely aware of the knowledge that they get from PROTIC project. And it is quite easy to say that, the knowledge level of the animators are highly effective in the way PROTIC provides information.

Attitude level of the respondents

The respondents of the research get information on agriculture and agro-meteorology. After getting the information whether they take it positively or not. The researcher wants to find out the attitude of the respondents of what they think about the information provided by PROTIC project. In this section, the researcher will dig out the result of changes that occur in respondent's attitude. After getting various instructions from PROTIC project, whether the animators are willing to do this or not. It was the main focus of the attitude statements. The same procedure of calculating knowledge level has been applied here.

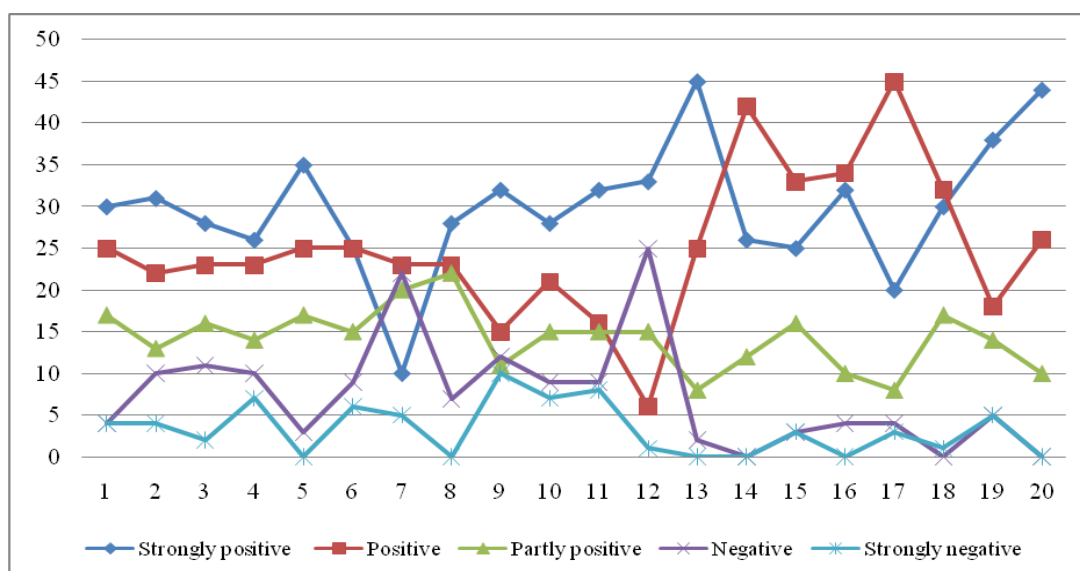


Fig.04 Number of respondents according to the attitude level

Fig. 04 discloses that 25 or above respondents choose 15 statements out of 20 statements as strongly positive or positive while for all of the statements less than 15 respondents choose partly positive, negative or strongly negative. Incase of attitude changing the information are moderately effective to make the respondents positive towards the agricultural participation. Because almost 15 respondents out of 80 are not strongly positive or merely positive.

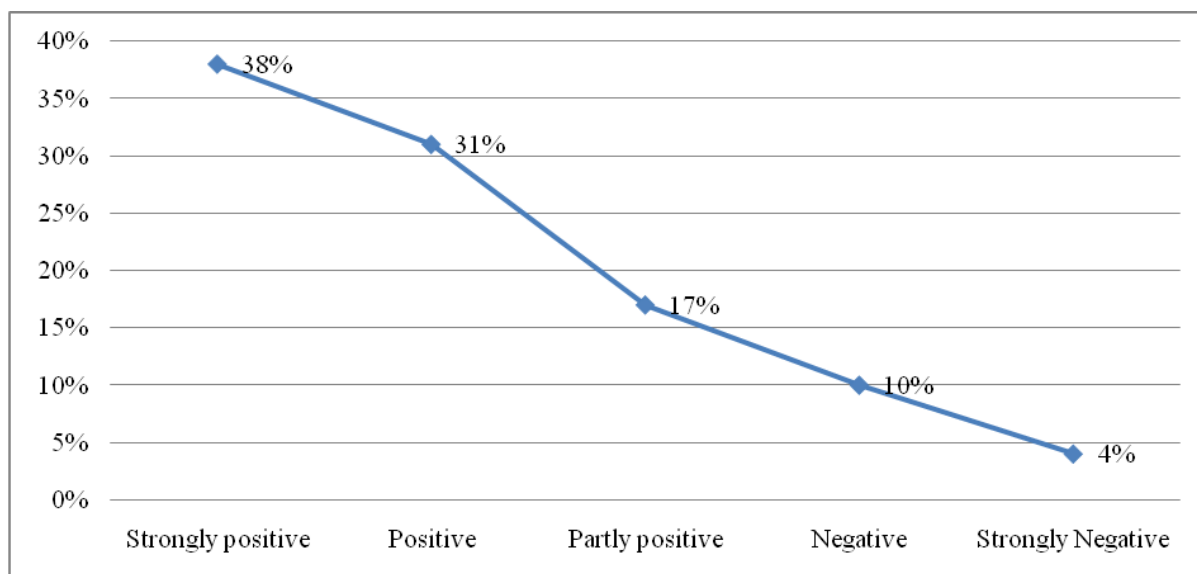


Fig.5 Percentage of the respondents according the attitude level

Fig. 5 focuses that 38% respondents are strongly positive and 31% are positive. It poses that 69% respondents are quite positive towards the agricultural information provided by mobile technology while 31% express their minimal attitude towards the information. The researcher shows that the attitude level of the animators are moderate or the animators posses a moderate effective attitude regarding PROTIC project.

Practice level of the respondents

According to the KAP survey model, practice comes after knowledge and attitude. In this section, the researcher wants to find out the practice rates of the respondents after they have been provided with a lot of information by mobile technology. High knowledge and attitude level influence their practice level. Here the researcher has used the same method as in the previous two sections.

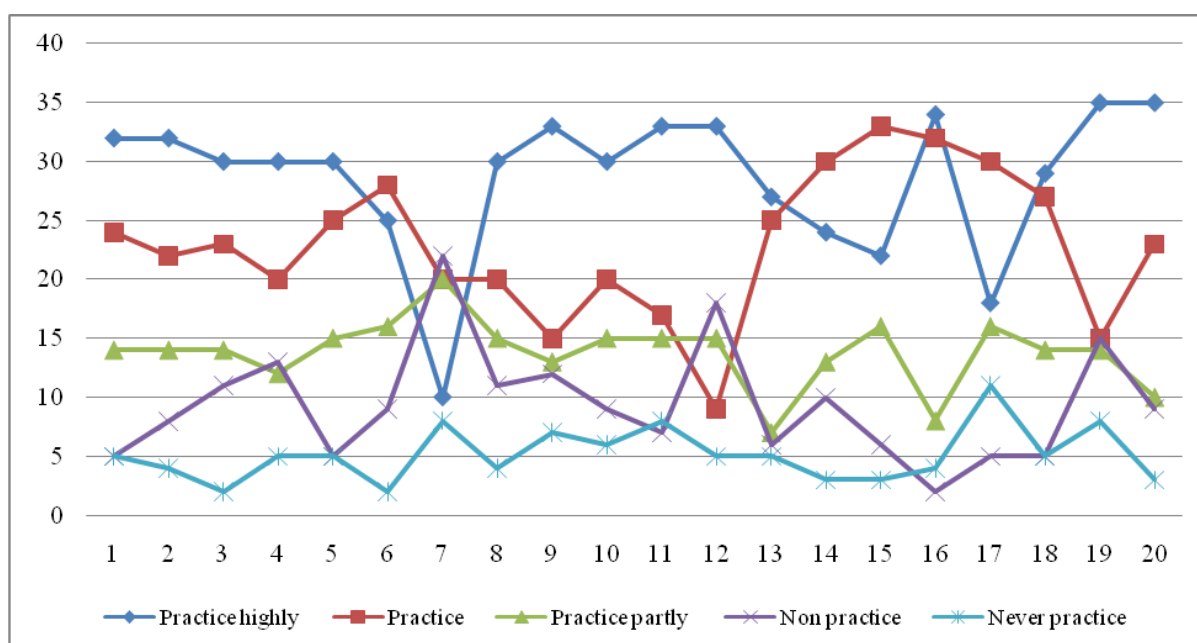


Fig. 06 Number of respondents according to the practice level

Fig. 6 depicts the number of respondents who highly practice the agricultural activities is less than the highly informed and strongly positive attitudinal respondents. Here less than 25 respondents choose to practice highly or practice in their daily life. On the other hand the number of respondent who partly practice, non practice or never practice are more higher than the partly informed, disformed or heavily disformed or partly positive, negative or strongly negative respondents.

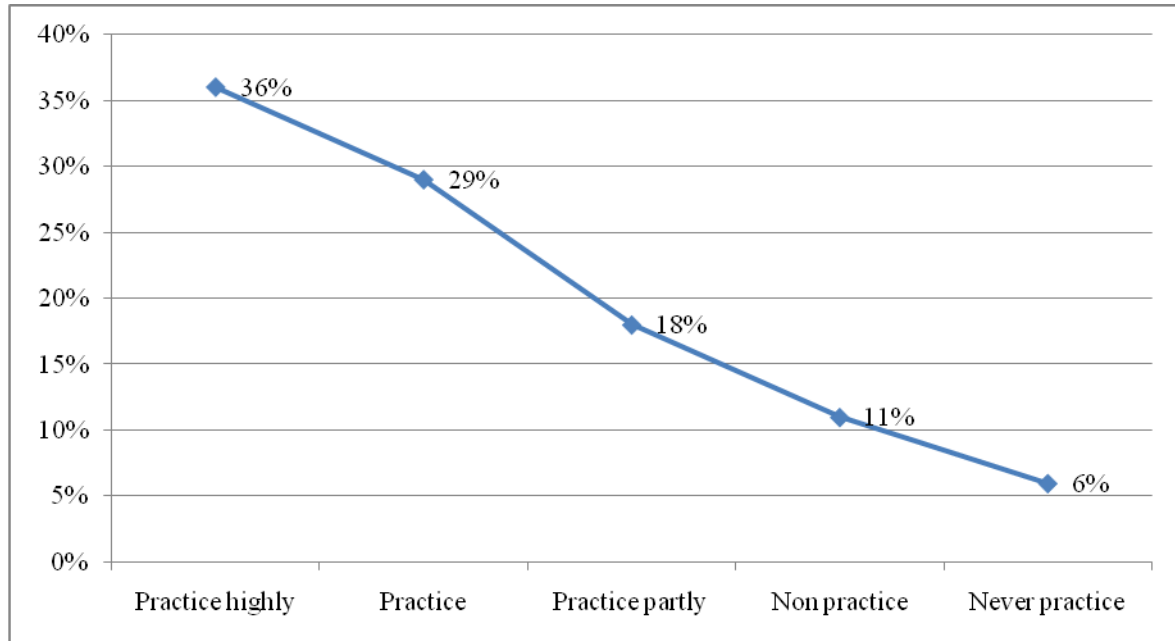


Fig. 7 percentage of respondents according to the practice level

The study has found that 36% respondents practice the information and instructions at a very high rate which has been indicated as highly practiced. Another 47% respondents moderately practice and 17% respondents are non practice or never practice. It shows that the respondents practice the information moderately which they get through various ways from the mobile technology.

4.5 KAP findings

According to the KAP (Knowledge, Attitude, and Practice) model, the presentation of data has been shown and now the results of the particular area are being shown together in a graph.

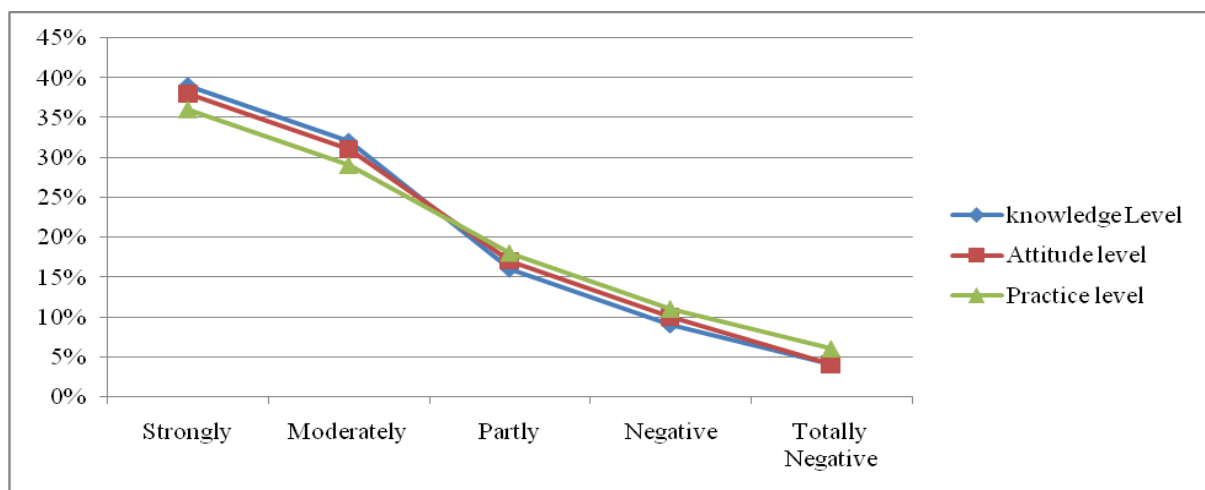


Fig. 08 women empowerment by interactive knowledge management

Fig. 08 is indicating that the knowledge and attitude level of the respondents is quite high than their practice level. That means the respondents are fully aware of the basic information of farming that is provided by PROTIC. The knowledge level and attitude level are quite same but it does not mean that they practice it in

their daily life. After all, the scenario of women empowerment is surely positive because of the intervention PROTIC by information.

Challenges of PROTIC to success

Studying about the effectiveness of PROTIC project’s action research in interactive knowledge management, the researcher has found some challenges that have a vital influence in success of the project. The animators face these challenges regularly. There were probable 15 challenges in the questionnaire. After collecting the data, the researcher analyzed and makes a rank of the challenges. In the 5 point likert scale, the researcher calculates points of the respondents against each challenge. From this, the researcher gets the following rank order of the challenges:

Table 1 Challenges of PROTIC to success

Serial no	Name of the Challenge	Percentage	Rank order
01	The phone remains out of connection for network problem.	84.38%	1
02	Cannot keep the phone running all the time because there is no electricity or sometimes regular load shading.	63.75%	2
03	There are lack of enough training.	36.25%	3
04	The information given by PROTIC does not match with our existing knowledge.	28.13%	4
05	PROTIC never supply the necessary input.	23.75%	5
06	I remain busy with various household activities so I get less time.	20.63%	6
07	I can’t use smartphone properly.	18.75%	7
08	I cannot always share my problems with PROTIC because of balance shortage in phone.	17.5%	8
09	PROTIC doesn’t understand our problems.	10.63%	9
10	As lack of education, there is a problem to understand anything.	7.5%	10
11	Drugs and agro-pharmaceutical drugs/fertilizers suggested by PROTIC are expensive for us.	6.88%	11
12	The other members of the house often keep the phone.	6.25%	12
13	The problem we talked about, PROTIC gives solution of different ones.	5.63%	13
14	There is a problem to understand their messages.	5.00%	14
15	The PROTIC app/call center does not always give accurate information.	1.88%	15

After analyzing the challenges, the researcher has found that the top challenge was “The phone remains switch off for network problem” which is faced by 84.38% respondents. So, it is the mostly faced challenges of PROTIC projects interactive knowledge management as the animators and PROTIC project’s employees communicate together mainly over mobile phone. They provide information and the animators also collect information using the mobile phone. If there phones are remain switched off then the animators face a lot of problems to interact with PROTIC. After analyzing the challenges, the researcher has listed 5 mostly faced challenges. These are being shown with figure 09.

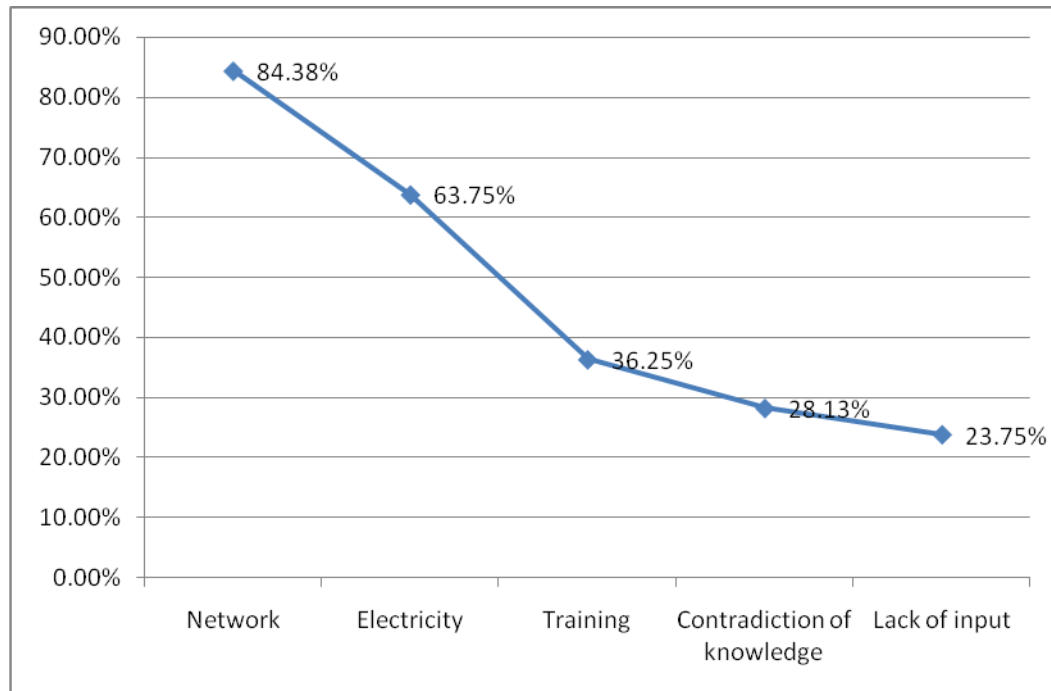


Fig. 09 Challenges of PROTIC

The researcher has found some challenges which are faced by most respondents.

- Network: The phone remains switch off for network problem.
- Electricity: Cannot keep the phone running all the time because there is no electricity.
- Training: There are lacks of enough training.
- Contradiction with indigenous knowledge: The information given by PROTIC does not match with our existing knowledge.
- Lack of input: PROTIC never supply the input. Sometimes the respondents inform and want to use new agricultural input. However, they cannot practice it in their daily activities because of lack of input.

Limitations of the study

The study was conducted with the highest sincerity so that the authenticity can be maintained. Despite this effort there are some problems and limitations that could not vanquished. As no study is beyond limitations there were some difficulties faced by the researcher in this study also. Some of the limitations which has been overcome but a few of them could not.

Here are the limitations:

1. The most significant limitation of social science research is that the human beings show different attitudes in terms of time, situation and many other social factors. The attitude of the respondents is volatile. Besides, a social reality can be viewed by different people in different ways, which may constrain their thinking and reasoning about the observed phenomenon (Bhattacharjee, 2012). In this research there was no control group to analyze the exact intervention of the project.
2. Time is another limitation of this study. The researcher could not spend so much time with the respondents to acquire more data. For shortage of time the researcher could not interview all the animators.
3. The researcher gathered data for this study from 80 respondents out of 100. The number of respondents may increase to have more authentic result.
4. As the respondents of the study were female farmers, they didn't have a huge time to interact with the researcher. Maximum female farmers are busy because of their household works. So, the researcher didn't get enough time to talk to a respondent in some situation.

V. RESULT ASSESSMENT

The main objective was to find out the empowerment scenario of rural female farmers while they got abundant information. The study tries to find the empowerment scenario of rural female farmers by using KAP model. The effectiveness of the project to empower female farmers was assessed through three categories: knowledge, attitude and practice. In knowledge level the researcher has find that about 71 percent respondents

are strongly or moderately informed while only 13 percent respondents did not get the information from the mobile technology.

In attitude level the study found that 69 percent respondents are highly positive or moderately positive towards the agricultural information provided by PROTIC. Besides, 14 percent respondents are negatively or motivated while rest 17 percent gain partly positive attitude.

In the final part of assessment procedure of female farmer's empowerment was assessed through the practice level of respondents. In practice level the study has found that 65 percent of the respondents have highly practice opportunity while 17 percent respondents have no opportunity to practice.

The second objective was to explore the challenges of the project to success. Here the study tries to find out the problems faced by the animators in empowering themselves. The researcher has found that there are some challenges faced by the animators. The highest number (84.38 percent) of respondents strongly agree that 'the phone remains switched off because of network problem'. Although network problem is not common feature of the other part of Bangladesh, the study area is a Char Land. So network problem is a common phenomenon of that area. Uninterrupted electricity supply is the second largest problem. About 63.75 percent respondents face the electricity problem because of no connection of electricity or the continuous load shading. Lack of training, contradiction with the indigenous knowledge and lack of agricultural input are consecutively third, fourth and fifth important problem for the respondents.

VI. CONCLUSION

The smart phone is really doing a significant job in the charland of Dimla, Nilphamari with the female farmers. Here the effectiveness of action research to motivate the rural women plays an important role. The female farmers have a little academic education and in some cases they have null, are now able to use a smartphone with most modern information technology. They are developing quickly in their agriculture and agro meteorology sectors with the help of smartphone support. Receiving the information from PROTIC's call center and apps using the smartphone given by PROTIC, they are now producing more crops than before and becoming solvent day by day. And this has become possible due to strong action research and interactive knowledge management system executed by PROTIC. When they face any problem regarding their farming activities or they need any information, they contact to the call center and get proper instructions. At last, we can conclude that the interactive knowledge management of PROTIC project seems effective so far.

ACKNOWLEDGEMENTS:

It is acknowledged that this research work has been conducted with the fellowship programme of the Pollissree, Dinajpur, Bangladesh which has been jointly collaborated with Monash University, Australia and Oxfam, Bangladesh. It has been conducted as per the framework of MOU signed between Pollissree, Dinajpur and Begum Rokeya University, Rangpur, Bangladesh.

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Md. Jahid Al Saba, et. al. "Empowering Rural Women through ICT in Agro-meteorological Practice in Bangladesh." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 27(04), 2022, pp. 58-71.