

EMPOWERING FARM WOMEN KNOWLEDGE GROUPS (FWKGs) ON CLIMATE SMART AGRICULTURE THROUGH MOBILE PHONE

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M.Sc. (Home Science)

**DOCTOR OF PHILOSOPHY IN HOME SCIENCE
(EXTENSION EDUCATION AND COMMUNICATION
MANAGEMENT)**



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By

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M.Sc. (Home Science)

**THESIS SUBMITTED TO THE
PROFESSOR JAYASHANKAR TELANGANA STATE
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DECLARATION

I, **Mrs. N. SUNITHA**, hereby declare that the thesis entitled **“EMPOWERING FARM WOMEN KNOWLEDGE GROUPS (FWKGs) ON CLIMATE SMART AGRICULTURE THROUGH MOBILE PHONE”** submitted to **Professor Jayashankar Telangana State Agricultural University** for the degree of **Doctor of Philosophy in Home Science** is the result of original research work done by me. I also declare that no material contained in the thesis has been published earlier in any manner.

Place : Hyderabad

(N.SUNITHA)

Date :

I.D. No. HHD/2016 -07

CERTIFICATE

Mrs. **N. Sunitha** has satisfactorily prosecuted the course of research and that thesis entitled **“EMPOWERING FARM WOMEN KNOWLEDGE GROUPS (FWKGs) ON CLIMATE SMART AGRICULTURE THROUGH MOBILE PHONE”** submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that neither the thesis nor its part thereof has been previously submitted by him/her for a degree of any University.

Date:

Dr. T. Sarah Kamala
Chairperson

CERTIFICATE

This is to certify that the thesis entitled “**EMPOWERING FARM WOMEN KNOWLEDGE GROUPS (FWKGs) ON CLIMATE SMART AGRICULTURE THROUGH MOBILE PHONE**” submitted in partial fulfillment of the requirements for the degree of ‘Doctor of philosophy in Home Science’ of the Professor Jayashankar Telangana State Agricultural University, Hyderabad is a record of the bonafide original research work carried out by Mrs. N. Sunitha under our guidance and supervision.

No part of the thesis has been submitted by the student for any other degree or diploma. The published part and all assistance and help received during the course of the investigations have been duly acknowledged by the author of the thesis.

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ABBREVIATIONS AND ACRONYMS

AEO	Agricultural Extension Officers
AICRP	All India Coordinated Research Project
CD	Compact Disc
CSA	Climate Smart Agriculture
DRDA	District Rural Development Agency
DVD	Digital Versatile Disc
FWKGs	Farm Women Knowledge Groups
FGDs	Focus Group Discussions
ICDS	Integrated Child Development Services
ICTs	Information and Communication Technology
KVKs	Krishi Vignan Kendra
MRDO	Mandal Parishad Development officer
MRO	Mandal Revenue officer
SERP	Society for Elimination of Rural Poverty
SHGs	Self Help Groups
SMS	Short Message Service
TV	Television
VLEW	Village Level Extension Worker

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ABSTRACT

Women play a core role in agriculture and contribute to sustainable development. Farm women who predominate among the world's poor, are at greater risk of environmental challenges, as they often lack the necessary means, to successfully adapt themselves the negative effects of climate change. The World Bank estimates that women farmers make up almost half of the world's farming population. But these women do more than just farming. They are caretakers to the land as well as for their families. They play a critical role in sustaining not only their homes, but also the entire food system, and this is especially true in developing nations. And they are especially more vulnerable to the threats posed by the climate change which is not just a rise in global temperatures. It impacts the farming industry, of which women make up more than 49 percent. They are more burdened with the issues of climate change, which includes irregular rainfall, floods, droughts and cyclones, and make their lives very miserable. Women's empowerment is a pre-requisite for enhancing. Social, economic and climate-resilience benefits. Rural women have unique knowledge, skills and experiences that are critical to promoting sustainable practices and combating the ill-effects of climate change.

Research also established that rural women farmers, who were formed into groups, are playing a very key role, in conserving biodiversity and protecting

indigenous crops that are more resilient to erratic climatic variability. They are also often at the forefront in adopting sustainable production methods in farming, energy and water. India is extremely vulnerable to the impacts of climate change, and significant measures are needed to build climate resilience and assist communities with adaptation.

Agriculture is the backbone of the Indian economy, out of which 56.6 per cent of the Indian populations are dependents on agriculture (GoI, 2011b). Agriculture in India defines familial tradition, social relations and gender roles. Female in the agricultural sector, whether through traditional means or industrial, for subsistence or as an agricultural laborer, represents a momentous demographic group. Agriculture is directly tied to issues such as economic independence, decision-making abilities, agency and access to education and health services and this manner has created externalities such as poverty and marginalization, and compounded issues of gender inequality.

Research shows that ICT as an important tool, in the communication of climate change mitigation technologies to the resource poor farm women. The new and emerging ICTs applied to mitigate impacts of climate change, highlights some smart applications, such as smart grid, mobile phone, ICT-enabled technologies. Among these, mobile phone has emerged as a most powerful, simple tool which can be operated by rural farm women and be empowered by the Climate Smart Agricultural practices with full participation to achieve sustainable development. It is easy to approach women farmers with improved knowledge and practice on sustainable agriculture practices when they are in groups. For the women farmers, it is also easy to come out of their household as the member of a Farm Women Knowledge Groups (FWKGs), who are also part of self-help group in which they share their group identity.

Once considered a luxury of the rich, mobile phones are now an everyday gadget for people across the globe. A mobile phone user in India crossed 581 million users in 2014 and has been on a steady rise over the last decade. India is estimated to have over 800 million mobile phone users in 2019. The Smartphone penetration into rural India is growing with around 36 percent of all Indian mobile phone users expected to own a Smartphone. With their mobile phones, the farmwomen can access data and relevant information on climate change, weather, pests and disease control and even access to finance and larger markets. This will help improve production and increase revenue generation for sustainable farming.

The present study entitled “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile phone” was carried out in

Moinabad and Maheswaram Mandals of Ranga Reddy district Telangana State. The study was proposed with the following objectives

- (i) To assess the knowledge and utilization of ICTs by the farm women
- (ii) To study the awareness of farm women on climate smart agriculture
- (iii) To conduct intervention on usage of mobile phone applications for climate smart agriculture among Farm Women Knowledge Groups (FWKGs)
- (iv) To study the impact of mobile phone applications intervention for climate smart agriculture among the Farm Women Knowledge Groups (FWKGs)
- (v) To assess empowerment of farm women on climate smart agriculture

Experimental research design was adopted for the study. Telangana state was chosen as the locale of the study. A total of 6 villages from Maheswaram Mandal /Block viz., Pendyal, Kalwakole, Ramachandraguda, Dubbacherla and Lillipur and 1 village from Moinabad Mandal/ Block i.e., Tholkatta were purposively selected for the study. Thus a total of 6 villages were selected from two selected mandals. A situational analysis was done with 120 farmwomen who are actively involved in farming, selected randomly. Out of this group, fifteen farm women who are actively engaged in farming, and literate, with access to Smart Mobile Phone were selected from each of the six (6) adopted villages of AICRP on Home Science purposively, totaling 90 members. The independent variables selected for the study were profile characteristics of farm women and profile characteristic of farm women knowledge groups. . The dependent variables selected for the study were knowledge on use of mobile phones, awareness of farm women on climate smart agriculture, knowledge index on climate smart agriculture, empowerment of farm women on climate smart agriculture were studied by using suitable scales. Descriptive analysis, chi-square, ANOVA and paired‘t’ test were used for analyzing the statistical data.

More than half percent (57.78%) of farm women belonged to the middle age group i.e. 26-35 year, 37.78% percent had completed their intermediate education and nearly cent per cent (86.67%) of farm women were married while 13.33% percent of farm women were widowed or divorced, highest percentage 91.11% of the farm women were having owned cultivable land with cent per cent of dry lands. Nearly forty per cent 38.89% of the farm women were having medium size of farms in between 3-5 acres of land.

Cent per cent (100%) of farm women have knowledge on receiving calls source of SMS received from mobile phones were from relatives (36.67%) and Cent per cent of farm women were having their knowledge on charging, receiving and making calls,

82.22 percentage in using calculator, calendar, alarm. Nearly 94.44 per cent of farm women were learning the knowledge about mobiles by attending training programmes reported.

Highest percentages (86.67%) of the farm women were not aware of global warming. Cent per cent of farm women were aware, regarding the incidence of increased temperature and change in seasonal climate variations. While nearly cent per cent of farm women responded positively in changing traditional irrigation methods (95.55%) 86.66 per cent responded in changing the use of chemicals pesticides and fertilizers.

Awareness of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture revealed that majority of farm women were aware about importance of organic fertilizers (80%) and usage of vermicomposting (13.33%) in soil management, crop rotation (46.67%) and mixed cropping (42.22%) in crop management, farm pond (64.44%) in water management, Hedge Lucerne (15.56%) in livestock management and crop tree livestock system (42.22%) in agro diversification. The of association between age, educational qualification and awareness of farm women knowledge groups on climate smart adaptive strategies i.e., soil, crop, water, livestock and agro-diversification management was found to be non-significant.

According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed among village wise overall impact. The 'F' value was found to be significant at 0.05 level in soil health test, vermicomposting, super Napier and hedge Lucerne and 0.01 level significance was found in intercropping, drip irrigation system, mulching and non-significant in seed treatment.

According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed with mobile phone usage. The 'F' value was found to be significant at 0.05 level in soil health test, vermicomposting, drip irrigation, mulching, super Napier and hedge Lucerne and 0.01 level significant was found in seed treatment and intercropping.

According to Correlation coefficient between Profile Characteristics of Farm Women Knowledge Groups and Knowledge Index of Farm Women Knowledge Groups on Adaptation Strategies for Climate Smart Agriculture Knowledge had significant positive relation was evident with age, marital status and work experience at 0.05 level of probability and at 0.01 level with education qualification, whereas non-significant relation in case of occupation and annual income.

When compared between the pre and post- mobile training on source of SMS received from mobile phones among the farmwomen were studied by using paired 't' test and it was found to be significant at 1% level while receiving SMS from family members, relatives, agricultural extension officer, PJTSAU, University/Researcher and school teachers, banks were found to be significant at 5% levels, indicating the increased frequency of exchange of information among the farm women.

Among farm women knowledge groups, awareness and knowledge on climate change and climate smart agriculture through mobile phones and trainings were improved. Significant association was found at 0.01 per cent level.

The Pre and Post empowerment of farm women regarding mobile messages for climate smart agriculture improved knowledge and it was found to be significant.

CHAPTER- I

INTRODUCTION

“Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bonds.”

– **Thomas Jefferson**

Eradicating poverty, ending hunger, and taking urgent action to combat climate change and its impacts are three objectives the global community has committed to achieve by 2030 by adopting the sustainable development goals. Agriculture has been an important instrument in eradicating hunger, poverty, and all forms of malnutrition. So, agriculture, and the way we manage it in the years leading up to 2030, will be a key determinant and climate change acts as an effective barrier to agricultural growth in many regions, especially in developing countries which are heavily dependent on rain-fed agriculture. Climate change impacts agriculture through several pathways. According to the 2014 IPCC report, all four dimensions of food security are potentially affected by climate change through their effects on agricultural production and the incomes of rural households, food prices and markets, and in many other parts of the food system (e.g., storage, food quality, and safety)

Reducing the vulnerability of agricultural systems to climate change – including the increased incidence of extreme weather events – and strengthening its adaptive capacity are therefore important priorities to protect and improve the livelihoods of the poor and allow agriculture to fully play its role in ensuring food security. Reducing emissions that contribute to global warming is crucial to secure global wellbeing, and the agricultural sector has considerable potential for emissions reduction while at the same time play its important role in poverty reduction and food security. In short, agriculture lies at the resolving urgent global priorities.

India is an Agrarian country and agriculture has always been a lifeline for India and remains one of the key drivers of our economy. Agriculture is the largest provider of livelihood in rural India. Worldwide, India ranks second in farm output and accounts for about 50 percentage of the country’s workforce and contributes 25 percent to India’s Gross Domestic Product (GDP).

Women’s involvement in agriculture and their contributions to food security has been widely recognized in the developing countries. Women play a key role in improving agricultural productivity and food security in the farming communities

(Agarwal 2013; Aly and Shields 2010). In the last few decades, women's involvement access to productive resources and decision-making roles in agriculture and allied sectors have been the focus areas of research and development in the global south. Research established that men and women's responsibilities, priorities, and access to resources and services at the community and household levels are responsible for the gender gap in agriculture in many developing countries (Quisumbing *et al.* 2014; FAO 2011). There is a clear linkage among social, economic, and gender dimensions in agriculture (Peterman *et al.* 2014; FAO2010a).

Rural women make up over a quarter the world's population and 43 percentages of women are the global agricultural labour force. They till the lands and plant seeds to feed nations. They ensure food security for their communities and build climate resilience.

In rural India 84 percentage of the women depend on the Agriculture for their livelihood. Life for a woman farmer is not easy. Managing responsibilities at home and in the farm, facing gender bias, being paid less, hardly having a say in decisions related to farming and so much more. They contribute to two-thirds of the world's work hours; produce 50 per cent of the world's food supplies. They work in fields, take care of families and manage household. Despite the services rendered by women in the family and workplace, they make up for nearly 70 per cent of the world's poor and more than 65 per cent of the illiterates. The growth in agricultural production has been stagnant for the past several years. It is still dependent primarily on the monsoons.

Saving our planet, lifting people out of poverty, advancing economic growth are one and the same. We must connect the dots between climate change, water scarcity, energy shortages, global health, food security and women's empowerment. Solutions to one problem must be solutions to all (Ban Ki moon 2019). Women play a major role in agriculture that encounters climate change and are closely related to poverty, when there is no much knowledge about the new technologies in agriculture, women face problem in doing farm work and have to depend on other external support. The extent of health hazards drudgery faced by farm women in farm activities are transplanting, harvesting under farm activities, secondly in threshing, drying and parboiling under postharvest activities shed cleaning, fodder collection and milking under livestock management. Their hard work had not only been unpaid but also remained mostly unrecognized. They performed on a daily basis the most tedious and back-breaking tasks in agriculture, animal husbandry and at home. They are invariably paid lower wages than men for the same agricultural work. Thus, it is very important to create awareness among farm

women about the farm activities with improved technologies that are to be disseminated. So, there is simultaneous need to empower them in real sense of women empowerment. Empowerment means an increase in the ability to exercise power and it plays a key role in shaping farm women's awareness, perceptions and knowledge. According to the census reports, involvement of rural women in economic activities has been increased further to household activities. In spite of women's participation in agriculture, their problems had been least noticed. Women's role was confined only to physical and social to generate four distinct functions i.e. mother, wife, homemaker and farm-labour. The role of farm-labour is equally important as that of other three roles. But her role as an active farm producer is rarely recognized though it is important for the family's survival. These unidentified and unrecognized farm women are answerable to keep the economy at a balanced pace and assist the nation to occupy a significant place in the world.

In other words, to empower the women significantly to achieve their perceived goals, firstly farm women need authority at home, secondly the necessity to promote the changes in increased income, skills and self-confidence, which in most cases they do not have. To empower farm women there is a need of an hour is to react to these challenges with collectiveness by formulating them into knowledge groups.

Knowledge group is a simple approach to transfer the information from input to an output to create awareness among farm women which may help in motivating the progress of an activity or a set of interrelated actions from beginning to end. Knowledge of farming techniques is crucial for productivity. However, farm women have an inadequate access to information related to farming and allied sectors. In the similar manner, of Self Help Groups (SHGs) at grass root level, immediately require development of platform to establish a strong linkage among the farm women, researchers and end users for quick and efficient dissemination of information, advisories and technologies related to the farming area for sustainability and productivity.

It is easy to reach farm women with improved knowledge and climate smart agriculture practices when they are formed into groups. When the farm women formed into groups with the intention of sharing knowledge regarding agricultural practices, marketing and produce may be called as Farm Women Knowledge Groups (FWKGs). Farm Women Knowledge Groups (FWKGs) is essential for bringing women working in agriculture into the mainstream and to empower them with direct access to knowledge of improved agriculture practices.

Farm women in India contribute most of the farm activities from land clearance to harvesting, yet their access to resources is less than their male counterparts. In spite of fact that mobile phone technology for farmers has started in developing countries, majority of the farmers still pertain to traditional agriculture systems. Similarly, mobile weather forecasting applications are available but farmers are still depending on IKSs “Indigenous Knowledge Weather Forecast” system which is based on myths and religious beliefs. Farm women are still extra reluctant to use the mobile phone for agriculture information communication and others. This may be due to technical illiteracy (Computer and mobiles). Even though most of the farm women prefer to visit agricultural stakeholders, they do not use mobile phone for SMS and email for communication. Still there are many challenges to use mobile phone and ICT technologies in agricultural sector of developing countries. This depends on the ability to access, gather, analyse and utilize information and knowledge (Jakhar, 2015).

Information and Communication Technology (ICT) is a powerful media of mass communication which speedily disseminates agriculture information but also help to bridge the gap between scientists, researchers and farmers. In other words, ICTs are the technologies which offer new ways for communicating and exchanging information and knowledge. Productivity and sustainability of small scale farm is an area where ICT can make a significant contribution. It includes a range of technologies starting from radio, television, telephone up to modern technologies like mobile phone, multimedia, internet and satellite based communication systems. The importance of ICT is not the technology as such, but it is enabling function in access to knowledge, information and communications, which are important elements in today’s economic and social interactions. The farmers are least equipped with proper tools for knowledge and information access to operate efficiently in making climate smart agriculture. Strong dependence of agriculture on monsoon makes this sector yet more vulnerable to the vagaries of the climate change. Moreover, climate smart agriculture would demand existing systems to be more efficient and effective in harnessing the latest technologies. Also, the dynamics of market forces affecting agriculture is expected to become more and more significant in future. Information refers to the patterned matter energy that affects the probabilities available to an individual making decision. To bridge the information gap between the farm women it is necessary to build up productivity and competitive market, different ICT interventions support should be given to farm women in both rural and under-developed areas to become efficient and productive. Agricultural extension programmes are facing major challenges in terms of cost-

effective outreach, solutions according to the needs of farm women and to make an image to become farm women friendly (Ramamritham, 2006). Therefore, immediate efforts are required to overcome the concerns of digital gap in the farm women.

A woman in farming requires constant inputs at every stage where new technological inputs provide better agricultural outputs. Among different available ICT tools, mobile is affordable and technology/tool easy handled which creates a new channel to communicate with others to get information and gain knowledge regarding climate smart agricultural adaptive strategies i.e., crop production depends on weather, agricultural practices and management of pests and diseases at right time to save crops and gain better results. So, there is a need of introducing mobiles to farm women for agriculture.

Mobile phones provide new approach to farm women to gain knowledge on agricultural adaptive strategies much more easily. Use of mobile phones leads to greater social cohesion and improved social relationships among farm women. It can help farm women to improve agricultural productivity by giving them access to basic new agricultural techniques and financial services in turn helping them to secure better prices for crops and a better return on investments. As their income improves with each harvest, they can invest in better seeds, fertiliser and chemicals. The greatest potential for improving women farmers' income comes from access to financial payments and agricultural information via mobile, together delivering approximately 75% of the total increase in agricultural income. However, short message service (SMS) and voice record have given improvements in social relations by sending weekly voice messages in local languages to farm women through mobile phones about best farming practices, weather forecasts, and regional market prices. Mobile phone based social networking in the developing countries goes to show the growing importance of this aspect Mobile phones are considered as important for climate smart agriculture (CSA) development. This technology has provided connectivity and offer benefits such as mobility and security to owners (Bayes *et al.* 1999, Goodman, 2005, Kwaku *et al.* 2006, Donner, 2006).

Climate change is indirectly affecting the livelihood conditions of the rural folk in multiple ways such as droughts, floods, and other extreme weather events. In order to cope with climate change, in improving agricultural practices and collectiveness response among farm women is necessary where they can improve with agricultural practices through mobile phones in order to make an agriculture has to become "climate smart". Actionable information, bundled together with latest climate friendly adaptive

technologies make farming a highly challenging occupation. Improved communication channels, enhanced by advances in information and communication technology and facilitated by greater use of mobile phones, have provided opportunities to address these challenges.

Climate Smart Agriculture (CSA) is defined as agriculture that sustainably increases productivity and enhances resilience or adaptation which reduces or removes greenhouse gases wherever possible for the development and achievement of national food security and goals (FAO, 2013). Components of climate smart agriculture consists of productivity, adaptation and mitigation. It is an approach for transforming and reorienting agricultural development under the new realities of climate change (Lipper *et al.* 2014). In recent years, climate change is emerging as a prominent issue in the world as it is most severely affecting agriculture in long term based on local weather conditions like temperature, rainfall, humidity, etc. It affects quantity and quality of crops, agricultural practices and inputs, soil erosion, reduction of crop diversity and changes in irrigation. It also pays concentration on the ecosystem and landscape management to conserve ecosystem services that are key to increase at the same time resource efficiency and resilience. Climate smart agriculture is a clear consideration of climatic risks that are happening more rapidly and with greater intensity than in the past. It requires changes in agricultural technologies and approaches to improve the lives of those still locked in food insecurity and poverty and to prevent the loss of gains already achieved.

STATEMENT OF PROBLEM

Farm women are most vulnerable to climate change and its effects because of their livelihoods, to a large extent. Nowhere this is true than in the India, where majority of the country's labor force finds employment in agriculture and its related activities. Especially farmers of developing nations in the subtropical region are facing many problems due to inadequate resource availability, poor economic conditions and frequent climatic stresses. This is even more crucial for the large majority of India's farmers who are small scale and marginal. For many such farmers, irrigation is a remote dream, drought wreaks havoc and unpredictable rains force families to migrate in search of work and economic security. The miscellaneous problems farmers face due to climate variations can be best understood and evaluated through a participatory approach. Understanding these problems is the first step to finding solutions that will make communities resilient to climate change. These problems have also raised a big question over food security in the coming future.

Now, using the same technology, a new initiative specifically targeting farm women to empower their knowledge by formulating them into knowledge groups and initiating short messages through mobile phones on climate smart agricultural adaptive strategies is formulated through this study.

Agricultural scenario in Telangana also demands for immediate action. The State of Telangana is facing decline in capital formation, high incidence of rural indebtedness. The long-term agricultural scenario in Telangana calls for attention going by the decline in state support for capital formation, fragmentation of land holdings and high incidence of rural indebtedness with 89 per cent of agricultural households under debt. Rampant land degradation and seasonal variation in rainfall are impeding the productivity and frequent instance of drought is affecting small and marginal farmers. The average size of holdings in the state is lower than that of all-India level at 1.16 ha and the position is more 'distressing' in respect of small and marginal farmers as their average size of land holding is 0.72 ha. The farmers are also unaware of the latest techniques in agriculture and farm practices suitable to their soil and water schemes. (NABARD, 2018). Empowerment of farm women on climate smart agriculture proved that If you teach a man to farm, his family will eat. If you teach a woman to farm, the community will eat. And, as the FAO reports, if women farmers gain access to the same resources as their male counterparts, the entire world will eat too. Considering the above facts, the study was formulated with the goal, to enhance knowledge among farm women through the Farm Women Knowledge Groups (FWKGs) by mobile phone messages to boost their productivity, also, advocate their access to information on agricultural adaptive strategies i.e. Climate Smart Agriculture.

Keeping this in view the study entitled “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile phone” was conducted based on the following objectives.

OBJECTIVES

1. To assess the knowledge and utilization of ICTs by the farm women
2. To study the awareness of farm women on climate smart agriculture
3. To conduct intervention on usage of mobile phone applications for climate smart agriculture among Farm Women Knowledge Groups (FWKGs)
4. To study the impact of mobile phone applications intervention for climate smart agriculture among the Farm Women Knowledge Groups (FWKGs)
5. To assess empowerment of farm women on climate smart agriculture

LIMITATION OF THE RESEARCH

The researches of social sciences have to face some limitations and present study has no exception to this rule. This study also had the limitation of time, resources and other facilities, which a student researcher would normally encounter. The study was conducted by structured Interview method, where the response may have the chance of biasness. Experimental research design is helpful for society as it helps improve everyday life but it has sometimes the difficulty in measuring the human experience. The conclusions are based on the data provided by the farm women. So, the validity and reliability depend on honesty of the farm women. Besides these usual limitations, this study also suffered from paucity of literature, since previous research studies available in this area are scanty. Despite all the constraints, every care was taken to make the study, as objective, as far as possible.

LAYOUT OF THE THESIS

This thesis is presented in six chapters. The first chapter introduces the topic of investigation, its specific objectives and limitations. Second chapter deals with the review of the relevant literature. The third chapter explains in detail, the materials and methods used in the investigation, such as sampling procedure, choice of variables, measurement of variables, procedures and techniques used for preparation of certain tools and statistical methods used in the study. The fourth chapter presents, the results of the research study. The fifth chapter deals with discussion of results on knowledge and empowerment of farm women on climate smart agricultural adaptive strategies. The last chapter contains summary of the study, besides the implications suggested. The appendices include interview schedule, list of village-wise farm women groups along with their mobile numbers and delivery report of short agricultural adaptive strategy messages.

Chapter II

REVIEW OF LITERATURE

A comprehensive review of literature is essential for any research endeavor. The main purpose of collecting the review of literature is to gain knowledge of different researches that are related to the research topic and to identify appropriate research design, methods of measuring concepts, analyze the data obtained, use of techniques to evaluate the drudgery factors and discuss the data collected. This chapter deals with the review of literature used for the study on “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile Phones”. The review has been discussed under following sub headings.

2.1 Profile of farm women

2.2 Utilization of Information and Communication Technologies by agriculture

2.3 Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

2.4 Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

2.1 Profile of farm women

Santhi and Kalirajan (2019) conducted a study in Orathanadu and Thiruvonam blocks of Orathanadu Taluk in Thanjavur District a with sample of 120 farm women selected based on proportionate random sampling procedure focused on profile characteristics of farm women in decision making behaviour. The farm women were interviewed and their response was recorded as per the interview schedule. Findings of the study revealed that nearly half of the respondents (46.67 %) found under middle age category. One-third of the respondents (37.50%) had middle level of education and 87.50 per cent of the respondents belonged to nuclear type of family. Majority of the farm women (97.50%) were found to have agriculture as their primary occupation. It was inferred that more than half of the respondents had 13-24 years of farming experience.

A study on profile characteristics of Farm Women Knowledge Groups (FWKGs) was conducted by Bansal and Joshi (2018). A total of hundred farm women were selected for the study. Results revealed that 70 percent belonged to young age group, 80 per cent were married and 81 percent had farming as their main occupation. Nearly three fourths

of the farmwomen (79 %) did not report any participation in other organization viz. Mahilmandal, Zila Panchayat and taluk Panchayat. Television set and newspaper were available at their own household for 96 per cent and 80 per cent farmwomen respectively.

Shreyansh *et al.* (2018) aimed at understanding the extent of participation of men and women in livestock management activities and gender disparities in different livestock activities. An exploratory research design was adopted for the study. Twenty farm women and twenty farm men were selected each from Bengaluru, Davangere and Belagavi district of Karnataka, thus a sample of 120 farmers were selected and interviewed. The results of the study revealed that, majority of farm women were involved in feeding the animals (90.00%) and cleaning the animal shed (88.33%), whereas, majority of male farmers were involved in management of income generating activities like mulching (90.00%) and sale of milk (91.66%). In case of decision making pattern, majority of women farmers were involved in health care of family (82.00%), but majority of men were involved in banking activities (92.00%). With respect to gender accessibility towards livestock activities, majority of men farmers were involved in cattle fair and Krishimela (96.66%) and women farmers were involved in marketing livestock products (75.00%). It was inferred that in India, livestock production was largely in the hands of women had considerable involvement and contribution but considerable gender inequalities did exist in Indian villages. It was suggested that efforts are required to increase the capacity of women to meet their strategic needs.

Meti *et al.* (2018) investigated participation of women in livestock production activities at two district municipalities of the Eastern Cape through a structured questionnaire and analyzed using descriptive statistics. The parameters investigated included age, educational background and marital status of women in livestock production. More than 60 per cent of women were married and approximately 42.5 per cent of the women were older than 60 years. A total of 45 per cent of these women had basic education with a mean family size of 4.4 ± 3.6 .

Adekunmi and Awoyemi (2017) assessed the use of Information and Communication Technologies (ICTs) for sustainable agricultural development among rural farmers of Ekiti State, Nigeria. One hundred and twenty rural farmers were randomly selected from the ADP zones of Ekiti, data was collected using structured interview schedule and subjected to descriptive and inferential statistics. The results of

the analysis revealed that the average age of the farmers was 42.6 years and majority (94.2%) of them were males who were married and almost 93.3 percent belonged to Christian religion.

Rai *et al.* (2017) explored socio-economic characteristics of tribal dairy farmers of Himachal Pradesh using exploratory research design among in randomly selected blocks of Una and Sirmaur district. The data was collected through personal interview with the help of pre-tested interview schedule from randomly selected 160 tribal dairy farmers (40 from each block). Study revealed that half (50.00%) of the farmers were having medium age group, 31.25 percent had primary level of education and 43.12 percent had medium family education status 45.62 percent had low herd size, 40.00 percent of the dairy farmers came under the medium category of the milk production and 42.50 percent of the respondents had low average animal productivity and 57.50 percent belonged to medium category of income level. It was further revealed that 41.88 percent of the respondents belonged to medium level of milk production. It was also found that 39.38 percent of farmers were belonged to high level of milk sale.

Krushnayadav and Revanna (2017) studied the socio economic status of 300 farm women from Sira taluk of Tumakuru district of Karnataka , India, selected randomly from age group of 20-60 years, who were willing to participate in the study. The data revealed that 69.33 per cent of the farm women were involved in agriculture, 16, 33 percent in animal husbandry, 10.67 percent in silk worm rearing, and 3.67 percent in poultry. It was found that 21.67 per cent of the farm women earned more than Rs. 6,032 per month followed by 45.33 per cent of them who earned between Rs.6,032 – Rs. 12,114 , whereas, 33 per cent of them earned less than Rs. 6,032. It was concluded that farm women contributed significantly to family income and it was recommended that they should also be integrated into the mainstream through better education, health and other support facilities.

Kafura *et al.* (2016) reported ICT extension tool used by 100 farmers selected by proportionate random sampling technique. Findings indicated that most of the farmers were young aged (54%), having secondary education (48%), small family (65%) small farm size (53%) and short-term service experience (62.2%). It was found that majority of had low faming experience (57%), medium annual income (69%) and low training

experience (59%). It was also indicated that most of them had medium organizational participation (57%), medium cosmopolite (65%), and medium innovativeness (68%).

Dayya and Bansal (2016) explored socio economic profile of 100 rural women, 25 from each village who were under NGO training at Udaipur District. Majority of the women were married (89%), illiterate (46%), had joint family (95%) with medium family size (48%). Family occupation of all the respondents (100%) was farming. More than three fourths of the women (77%) were in the age group of 31-45 years and belonged to Schedule Caste category (41%). Only eleven per cent respondents were the members of a formal organization i.e. Self-Help Group.

Paliwal and Maheshwari (2015) conducted a study on utilization of information and communication technologies (ICT) by farm women of Udaipur district of Rajasthan state, India. Findings of the study revealed that majority of the respondents belonged to 26-35 years age group, they were married, main occupations was farming and business/services, belonged to schedule tribe and schedule caste, were from nuclear family with medium size family and had no membership in any organization. Further, majority of the respondents had family income between Rs.10,000-20,000, had ownership of Television, mobile phone and newspaper. Major information sources used by the farm women were neighbors, relatives, friends and television.

Devaki *et al.* (2015) studied on socio-economic profile of livestock farm women of Thiruvallur district of Tamil Nadu through survey method. Results revealed that majority of the farm women were young, illiterate and maintained nuclear family with less than five members. Most of them belonged to either landless or marginal land holding group and availed credit from private sources. Most of those farm women had low level of annual income, low livestock possession, low mass media exposure, low economic motivation and low cosmopolite-localite contact. Their level of social participation was of medium nature with high level of extension agency contact.

Jain *et al.* (2012) analysed the socio-economic profile of 120 farm families from the selected villages of Sonapat district of Haryana and reported that the average size of land holding in the study area was 5.4 acres with a variation from size of land holdings from 1.11 acres for marginal to 12.1 acres for large farmers with an average land holding of 5.36 acres. The average size of the family was 5.5, having no relationship with size of land holdings as it was 5.5 in small farmers, 4.8 in medium farmers and 6.3 members in

large farmers. The literacy rate for both male and female population was impressive as it ranged from 77 to 92 per cent in case of males and 60 to 77 per cent in case of females which was above the Haryana state average for males (78.5 %) and females (55.7 %). The sample households consisted of 51 per cent of general caste, 33 per cent OBC and 15 per cent SC and only 1 per cent ST. Out of the total 120 selected farm families, 61 per cent were nuclear and the remaining 39 per cent were living in joint family system.

A study on use of information and communication technology (ICT) tools by rural farmers in Ratnagiri district was conducted by Armstrong and Gandhi (2012). Total samples of 100 farmers were selected and interviewed using structured questionnaire for data collection. Results revealed that 79 per cent were male and 21 per cent were female farmers. Age wise majority of the respondents, 60.5% were between 21-45 years, followed by 34% between 46-60 years 22 % above and 60 years. Eighty one per cent of farmers were literate. Income was the key constituent in adoption of ICTs whereas age, education etc. did not influence ICT adoption significantly. Large farmers were more interested to use ICTs.

Fawole and Olajide (2012) studied awareness and use of ICTs by 1992 farmers in Oyo state. Results indicated that 39.2 per cent of respondents were within the age bracket of 41-50 years and another 33.6 per cent were within 51-60 years of age. Majority of the farmers were male (88.6%) and 93% farmers were married (93%). More than one third (34.8%) had no formal education. Most farmers had household size of 6-10 members, 78.5 percent were small scale farm holders, cultivating 5 hectares of land or less, with an average annual income of 100,000 or less worth of local currency.

Idrisa *et al.* (2012) examined awareness and adaptation to climate change among farmers in the Sahel Savannah agro-ecological zone of Borno State, Nigeria. Analysis of adaptation practices used by the farmers showed that planting ahead of rains (97.78%) and planting of cover crops (80.00%) were the most used practices. Analysis of the relationship between socio-economic variables and use of climate change adaptation measures revealed that educational qualification and the number of extension contacts were the most important factors influencing the use of adaptation measures among the respondents. The main constraints on climate change adaptation measures by farmers in the study area were poor financial resources (86.67%) and unavailability of weather

information (77.78%). The study concluded that the majority of farmers were aware of climate change and its consequences.

Khursat Demiryurek *et al.* (2008) studied adoption of Agricultural Information Systems and Communication Networks: in case of dairy farmers in the Samsun Province of Turkey and found that farming people shared a common knowledge system i.e., indigenous knowledge system and farmers depend upon their current knowledge and traditional practices which were not generally based on scientific application.

Nivedita and Amit (2011) conducted on socio-economic status of farm women in Faizabad district of Uttar-Pradesh. The profile analysis of farm women with respect to the demographic characteristics revealed that majority of farm women were of old age, literate, belonged to backward caste, joint family, large family size, marginal land holding, lived in pucca houses (made of bricks and cement), cultivation as main occupation and labour as subsidiary of medium income group and belonged to medium socio-economic-status.

2.2 Utilization of ICTs for Agriculture

Kafura *et al.* (2016) focused on the extent of use of ICTs as extension tool by 100 farmers and found that 81.0 percent farmers used ICT tools to a at low extent only 19.0 percent used to a medium extent. High extent of use of ICTs was not observed among the farmers.

Ologeh *et al.* (2016) assessed adoption of space applications in Nigerian agricultural sector and the distribution of mobile phones to rural farmers by Government for easy access to Climate Smart Agriculture information from extension workers. It was found to be helpful to the local farmers through nourishing them with timely agricultural advice which enabled them to have higher crop yields and more efficient use of seeds, water and fertilizers. The farmers also received early warnings for drought, flooding and/or diseases on their mobile phones, thus maximizing its use.

Syiem and Raj (2015) conducted a study to find out the level of access and usage of ICTs among farmers of Meghalaya state of India. A total of 120 farmers were randomly selected for the study. The results showed that majority of the farmers owned mobile phones as well as television and radio. The most frequently used ICT was mobile phone. Mobile phones were widely used by the farmers for social communication, contacting middle men for the marketing of produce and contacting experts on real time

basis for getting agricultural advisories. Farmers also reported that mobile phones proved to be useful during health emergencies. Information services on availability of inputs, quality of inputs, and pest and disease management of crops were also used by the farmers through ICTs. Major problems in the use of ICTs by the farmers were lack of confidence in operating ICTs, erratic power supply, low network connectivity and lack of awareness of the benefits of ICTs.

A access and utilization of Information and Communication Technologies were explored by Paliwal and Maheswari (2015) from 100 farmers and revealed that all the farmers (100%) had access and utilized TV and mobile phone daily. Forty-eight per cent respondents also had access to radio, further, 30 per cent had access to internet and 20 per cent respondents had access to computer. Use of ICTs for agriculture, animal husbandry and general purpose was reported by few respondents only. The ICTs were reported to be used by the respondents for entertainment, news and personal communication. The benefits reported by the respondents in use of ICTs were knowledge of developmental programmes for women and children, saves time, getting latest information, information within no time, increase education, to know credit sources, get answer to each and every query and reduce face to face meetings.

Nayak and Rai (2014) opined that television was most useful mass media to get agriculture related information in comparison to radio and newspaper as it gave audio as well as visual effect to the viewers, however, it was felt that radio and newspaper have facilitated the adoption of farm technology to an appreciable extent.

Gandhi and Armstrong (2014) assessed use of ICTs for agricultural extension from a 100 randomly selected farmers using structured questionnaire and interviewing. In terms of usage of ICT services, 87 per cent of the farmers had access to one or the other ICT tool and the remaining 13 per cent had no access to any of the ICT tools. Many mobile phone networks like BSNL, Airtel, Vodafone, Tata-Docomo were available in the study area. The study also revealed about the source of agricultural information analysis that 97 per cent of the respondents received information from neighbors or fellow farmers, 94 per cent from government officers, 68 per cent from newspapers, 29 per cent from extension workers, 4 per cent from related websites and 2 per cent from magazines. No information was received by the private company and sales agents. Analysis of relationship between the source of information and the belief on the source revealed that,

94 per cent of the farmers believed the information given by the government officers, followed by 86 per cent on neighbors or fellow farmers, 73 per cent on newspapers, 34 per cent on the extension workers and lastly rely on the remaining sources of information.

Saurabh (2014) studied effect of communication media on women and reported that 60 percent women get their information from television and cinema, 16 per cent from print media, 14 per cent of from computer and 10 per cent women from radio.

Ariyo *et al.* (2013) assessed the role of mass media in the dissemination of agricultural technologies among farmers in Kaduna North local government area of Kaduna state. A random sampling technique was used for selecting sample. The total sample size was 108 respondents. Data were collected through a well structure interview schedule and analyzed with descriptive statistics and chi- square. The study showed that the respondents had different degree of accessibility to radio, television, telephone, internet, and newspaper/ bulletin. Radio was found to be more accessible (46.3%) and also the major source (60.19%) of agricultural technologies to the farmers. The study further revealed that 90.7 per cent of the respondents affirmed that mass media was effective in the dissemination of agricultural technologies while 9.3 per cent saw mass media as not effective. The chi- square analysis at 0.01 per cent level of probability showed that the use of mass media was effective in the dissemination of agricultural technologies in the study area.

Ansari and Pandey (2013) studied the potential and use of mobile phones by farmers. The study indicated that 83.34 per cent farmers owned a mobile phone for more than 2 years and 72.33 per cent received information related to agriculture from fellow farmers which had been their major means regarding the farming activities and information. All the farmers interviewed expressed that they would like to subscribe if Pantnagar University starts mobile based advisory service, while 45 percent were willing to pay a nominal fee of Rs.100/- per month. Regarding the type of services expected through such a mobile service, farmers wanted information like disease identification and control measures (27.7 %), fertilizer application dose, method & time (27.77%) harvesting time (25%), marketing (22.23%) and sowing time (19.45%).

Sharma *et al.* (2012) pointed that about 98.3 per cent of the farmers in Punjab, India possessed mobile phones. This indicated that there was an increased penetration of

ICTs among rural populations and therefore if appropriately used it can offer huge scope for development in rural areas.

Jain *et al.* (2012) conducted a study on ICTs access to farm women in the selected villages of Sonipat district of Haryana and revealed that there were about 150, 300 and 150 farmers' families in Palari Khurd, Jajal and Palra villages respectively. The extent of the farm women's access to ICT depicted a direct relationship with farm size. Radio and TV were accessible to nearly one-thirds of women farmers up to medium size farms while 4 out of 5 women farmers of large farms had access to ICT tools. Access to more modern means of ICT like phones and mobiles was less than 10 per cent for women having no land or very small farms while it increases to 67 per cent for those with large size farm. Access to computers was virtually nil in all categories barring few cases (10 %) among large size farm categories.

Jain *et al.* (2012) conducted a study on farm women access and ICTs tools use for agriculture and non-agriculture use. A total of 120 farm families were selected for the survey from the selected villages of Sonipat district of Haryana. Results showed that use of radio, television and a phone ranged from 17-30 per cent and does not differ significantly for agricultural and non-agricultural activities. The use of television was observed to be maximum for both agricultural and non-agricultural purposes. In spite of having access, the use of mobiles and computers by farm women was nil. There could be several plausible reasons for this. This may be because of their less linkage with outside agencies and knowledge centres due to their less mobility and other social and cultural reasons. The other reasons could be lack of skills and expertise for using the instruments or some tacit restrictions imposed by the male counterparts.

Iorliam *et al.* (2012) conducted a study to analyze adoption of ICT as a source of information on agricultural innovations among farm households in Nigeria. Data was collected through a structured questionnaire administered to one hundred and twenty Agricultural Development Programme (ADP) farmers sampled in Benue State. Results showed that Radio (46.7%), Newspapers (45.8%), contact farmers (42.5%), and extension agents (41.7%) ranked first, second, third and fourth respectively in terms of adoption by farmers. Level of education, and incomes were the significant ($P < 0.05$) determinants of ICT adoption.

Sekabira *et al.* (2012) determined a study for adoption of information and communication technology. Stratified random sampling was used to collect data using structured questionnaires from 150 farmers and 50 traders and analysed using STATA. Radio was most used old ICT whereas mobile phones were most used new ICTs. Expensive handsets, poverty, poor power supply, lack of expertise and poor network coverage limited ICT use. Farmers with knowledge of ICT groups and those thinking that ICTs benefited agriculture were more likely adopters of ICT-based MIS. Family size and land influenced farmers' adoption, whereas age, trading experience, family size and monthly expenses influenced traders' adoption. Farmers and traders who majorly used ICTs for making profit were more likely to use mobile phone whereas those who stayed further from towns were less likely to use the component.

Anastasios *et al.* (2010) studied availability of ICTs to the farmers. Almost all respondents (98.37%) had at least one dial telephone and 80.41 percent of them owned a television set. In addition, 74.29 percent and 50.61 percent of the farmers possessed a mobile telephone and DVD player, respectively. Few respondents had access to sophisticated technologies like satellite television (1.22%), global positioning systems (0.61%) or beepers (0.61%). It was clear that majority of farmers obtained information regarding production technologies, marketing, weather, crop insurance and government schemes and programmes through radio, television and mobile.

Dhaka and Chayal (2010) reported that the poor knowledge of facilitator about subject matter and inadequate infrastructure facility like power supply and internet facility in rural area were perceived constraints by respondent farmers for making best use of ICT services.

Mwakaje (2010) revealed that 68 percent respondents did not have money to buy the ICT facilities or services and few admitted that they did not have access to electricity for operating ICT (watching TV, charging mobile phones), while few others expressed that some of the ICT networks were either not available or reliable in their villages (15%). Others admitted that they did not know how to use ICT (4%) as well as how to access such facilities (3%).

Mandler (2008) reported that in Uganda, through SMS on mobile phone farmers could access up-to-date information about market prices, the weather and other matters

relevant to agriculture. It could access financial transactions, which was of benefit to the microfinance sector.

Anonymous (2007) reported that mobile phones presented an alternative for both data collection and dissemination in Bangladesh as they were being used in rural areas for their potential of connecting poor farmers with market price information system and also dissemination of agricultural information to the farmers.

Akpabio (2007) reported that in developing countries constraints related to ICTs usage were poor infrastructure, high cost, aggravated by the lack of skills and dissemination of inappropriate information to farmers, including language barrier.

Sharma (2007) found that television was the most (84.85%) information seeking source for the rural areas. Almanac was a main reference and information source for getting the information. Regarding Government schemes 76.46 percent people depend on radio/television to get information in rural areas.

Prathap and Ponnusamy (2006) revealed that traditional mass media, such as radio, television, print and recent, new media such as Internet have been playing a role in imparting knowledge to the farming community, for agricultural development, knowledge and information on important farm technologies, methods and practices need to be imparted to the farmers at the right time.

Shahnaz (2004) reported that agriculture represents the most important livelihood for the economy of Bangladesh. Access to daily prices of various agricultural commodities in major markets across the nation added remarkable energy to more efficient functioning of agricultural market. ICT played a major role in improving the activities of poor farmers and increasing their productivity and also helped to increase access to market information or lower transaction costs of poor farmers and traders.

Yussouf (2004) reviewed that village populaces (both producers and consumers) could check real market prices of the agro products by connecting to internet through the ICTs. It helped the farmer to have better bargain capacity in selling their produces. The easy online communication with consumers also helped in reducing the middlemen involvement. As a result, both the farmers and consumers were getting benefit.

Sethilkumar (2003) reported that less than one-fourth (17.77%) of the subjects accessed for farm information two to five times and 13.33 percent of subjects accessed through mobile phone more than five times during the course of study.

2.3 Awareness of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture

Chawla *et al.* (2018) conducted a study in four villages of Padampur panchayat smiti of Sriganaganagar district and revealed that majority of the respondents had high to medium level of knowledge about organic farming whereas more than three fourth of the respondents of organic villages had low level of knowledge about organic foods and none had high knowledge. In addition, it was revealed that respondents from non-organic village had less knowledge about organic farming and organic foods.

Kalita *et al.* (2017) had undertaken a study to analyze the knowledge, attitude and practices of farmers towards vermiculture technology. The study was conducted with 120 randomly selected farmers from the Jorhat district of Assam. Results revealed that 75.00 per cent of the farmers had medium level of knowledge, 74.17 percent had strong favorable attitude and 69.17 per cent of the respondents had medium practice level towards vermiculture technology. It was found that education and organizational membership had showed significant association with knowledge of the farmers towards vermiculture technology. It also further revealed that attending the training programme had also showed significant association with both attitude and practices of farmers towards vermiculture technology.

Asrat and Simane (2017) conducted a study on adaptation benefits of climate smart agricultural practices in the Blue Nile Basin. Data was collected from 734 randomly selected farm household heads and field observations. The study revealed that households that adopted the practices experienced higher productivity by 22.2 per cent over non-users implying that climate related risks that lead to yield variability were significantly reduced. Climate smart agriculture practices were knowledge intensive. Therefore, scaling up these adaptation benefits of climate smart agricultural practices requires public investment to raise awareness and provide technological support.

A study on participatory assessment of portfolios of climate smart agricultural practices for adapting rice-wheat cropping system to climate variability in climate smart villages of Haryana conducted by Kumar and Singh (2017) revealed that 65.67 percent of the respondents had medium level of awareness, 17.50 percent had high level awareness, and 16.67 percent had low level of awareness regarding climate smart agriculture. In case of adaptation, 79.17 percent had taken adaptation strategies like short

duration varieties; on the other hand, 71.67 per cent had crop-livestock system, 71.67 per cent mixed cropping, 76.67 per cent and 60.00 per cent of the respondents adopted animal manure and compost in their farm. Majority (81.67%) of the respondents had constraints faced by poor support of local and national authorities with climate related issue (Rank I), while 79.33 per cent lacked financial resources (Rank II) and 78.50 per cent lacked knowledge about adaptive practices (Rank III).

Adekunmi and Awoyemi (2017) assessed the use of Information and Communication Technologies (ICTs) for sustainable agricultural development among rural farmers of Ekiti State, Nigeria. The study was carried out in Ekiti State where one hundred and twenty farmers were randomly selected from the ADP zones in the states. Data were collected from rural farmers using structured interview schedule and were subjected to descriptive and inferential statistics. The major ICTs commonly used among the farmers were GSM mobile phone, radio, television and newspapers. Rural farmers in the area had a favorable perception about ICTs. Respondents in the area considered radio and television to be the most relevant sources of agricultural information to them. Results of the data showed that age ($r = 0.138$, $p < 0.01$) and Cosmo politeness ($r^2 = 0.045$; $P, 0.05$) of farmers had significant relationship with the use of ICTs for sustainable agricultural deployment. It was recommended that local language should be used to disseminate agricultural information via ICTs to rural farmers.

Patel *et al.* (2017) Petlad taluka of Anand district in Middle Gujarat region in a study revealed that 52 per cent farmers belonged high to very high category with respect to knowledge of soil testing and use of soil health for advance farming. These farmers adopted the technology to balance the dose of fertilizers for sustaining soil health. It was found that the technology was beneficial for sustaining soil health, lowering the input cost and improving the farm production

Kaske *et al.* (2017) conducted in Ethiopia to determine the use of mobile phones in agriculture. The study revealed that the majority (90.6%) of household heads made phone calls for agricultural purposes. Over three quarters (85.9%) of the household heads received phone calls related to agriculture. It was concluded that mobile phones were playing an important role as an information medium.

Raghuvanshi *et al.* (2017) indicated that all the farmers were found to be aware the climate change and majority of them reported “erratic rainfall, diminishing

agricultural yield and increase in temperature” as the indicators of climate change. The increasing industrialization, overpopulation and deforestation’ were perceived by farmers to be the main causes of climate change. Further, most of the farmers reported crop failures, migration to other places and flooding’ as three major consequences (impact) of climate change.

Patidar (2017) conducted a study in Rewa of Madhya Pradesh and reported that the crop management occupied the highest adaptation index (53.15) followed by water management (29.44), soil management (28.12), integrated weed management (22.60), integrated nutrient management (17.28) and integrated pest and disease management (5.62).

Chakraborty and Chakravarty (2017) conducted a study on awareness at the individual level and to collect individual response or reaction regarding climate change. Results revealed that issue of climate change adaptation came together and contemplate over the usefulness of using mobile applications in spreading awareness through ICTs. Apart from spreading awareness, they was also useful in collecting data at individual level regarding the effects of climate change on each of them through applications, which in return provided them solutions to deal with such situations and helped the policy makers and researchers to come up with a better statistic for further reference and analysis.

Singh and Singh (2017) advocated traditional agriculture as a climate-smart approach for the sustainable food production and deliberated the correlation between climate change and agriculture. Agroforestry, intercropping, crop rotation, cover cropping, traditional organic composting and integrated crop-animal farming could adopted as the model practices for climate-smart approach in agriculture. These practices not only helped adaptation to climate change but also enhance agricultural sustainability.

Murray *et al.* (2016) revealed that climate change and variability presented a major challenge to agricultural production and rural livelihoods, including livelihoods of women smallholder farmers. There were significant efforts underway to develop, deploy, and scale up Climate-Smart Agricultural (CSA) practices and technologies to facilitate climate change adaptation for farmers. However, there was a need for gender analysis of CSA practices across different farming and cultural systems to facilitate adoption by, and livelihood improvements for, women smallholder farmers. Climate change possessed

challenges for maintaining and improving agricultural and labor productivity of women smallholder farmers.

Davidson (2016) focused implementation model for irrigation regimes used by the Development community to achieve the goals of Climate Smart Agriculture (CSA) for improving agricultural production. The research identified gaps in the implementation of irrigation regimes and argued that an associative paradigm, climate-smart irrigation, was required to sustainably implement of CSA. The research also identified one important variable of climate-smart agriculture and illustrated how to "set-aside" land due to intensive cultivation was best accomplished by integrated climate-smart irrigation approach.

Dinesh *et al.* (2015) studied Climate-Smart Agriculture (CSA) by examining 19 CSA case studies, and assessed their effectiveness in achieving CSA, while also assessing other benefits, economic costs and benefits, barriers to adoption, success factors, and gender and social inclusion issues. The analysis concluded that CSA interventions could highly effective; achieving the three CSA objectives, while also generating additional benefits in a cost-effective and inclusive manner.

Kutir *et al.* (2015) studied farmers' awareness of climate change and their response to its effect in the North Bank Region of the Gambia. The findings revealed that 80.6 percent farmers were aware of climate change with an average awareness index of 0.586 (58.6%). Also, an overwhelming majority of 93.41 per cent of the farmers used crop diversifications, drought resistant cultivars, early maturing varieties among others as response strategy to climate change. The study concluded that farmers in the study area were fairly aware of climate change.

Stevens (2015) summarized existing knowledge about the economics of soil health, and suggested a methodology for studying the economics of soil health and revealed that soil health policies focused on increasing access to information and internalizing the positive externalities of healthy soils.

Sarkar and Padaria (2015) revealed that only 22 per cent farmers knew about climate change while 43 per cent respondents had knowledge about the diverse human induced causes of climate change. The study revealed the low knowledge and awareness level of the sample which suggested need for intensive extension education programme for their capacity building and information empowerment.

Douxchamps *et al.* (2015) studied adoption of soil and water conservation practices and other agricultural adaptation strategies in West Africa dry lands, although the adoption rates and intensity varied across types of practices and households. More than 70 per cent of the farmers used one to three practices, 21 per cent used four or five and only 8 per cent used six to nine practices.

Das (2014) studied adoption of ICTs for accessing agricultural information. The study is focused on rural area and has covered 51,770 farm households and limiting the ICTs to widely available sources, viz. radio, television and newspapers. The study has found that only 11.4 per cent of the farm households used at least one source of these ICTs, to access agricultural information. Using NSSO data, the radio was found to be a more important source of agricultural information compared to television and newspapers. In terms of farm-size, the large farmers used ICTs more to access agricultural information. Using of ICTs to access agricultural information increased with educational level of the household-head and formal training of a member of household engaged in agriculture.

Williams and Agbo (2013) evaluated of the use of ICT in agricultural technology delivery to farmers in Ebonyi state was conducted by and found that 54.17 per cent of the farmers had access to mobile phones, followed by radio (33.33%) and television (31.67%). Only 20 per cent of farmers had access to computer and 19.17 per cent had access to internet facility. Thirty two per cent of farmers were using ICTs to get information on new varieties followed by farmers to search for places where farm products are highly needed (25.83%), exchange knowledge and ideas with fellow farmers (25%), get information on market situation (24.17%) and searching for recent information or innovation in agriculture (22.50%). The use of ICTs was limited by technical, infrastructural, financial and institutional constraints.

Oyeyinka and Bello (2013) evidenced in the present research that mobile phones, radio and television were the most important tools of communication which could accessed by farmers for agricultural related information and knowledge Particularly, telephone facility (including mobile phones) has been reported to increase the opportunity of getting access to the people living in rural areas.

Verma (2013) studied status and prospectus of application of ICT in agriculture through extension functionaries and revealed that majority of respondents (56.25%) had

medium level of ICT application in agriculture. The extent of use of computer, internet, mobile phone, kisan call center and information kiosk in agriculture was noted to be 43.17, 39.31, 46.08, 36.40 and 27.52 per cent respectively by the extension personnel. There was no significant difference in the application of ICT between Government and NGOs extension functionaries.

Jamadar and Halikatti (2012) revealed that the majority (40.00%) of the farmers had low level of awareness about changes in the participation. Awareness of farmers about changes in the temperature revealed that more than half of the farmers (58.00%) had low level of awareness. With regard to awareness of the farmers about impact of climate change majority 48.00 per cent of farmers had low level of awareness in Bijapur district of Karnataka.

Chisita (2012) discussed the impact and scope of ICTs in dissemination of agricultural information and production among Zimbabwean small scale farmers. Farmer's access improved quality of agriculture information through modern media (internet and mobile). Social media, tele center and other ICT driven communication devices had immense potential to share knowledge and experience among small scale farmers. It was suggested that integration of ICT with agriculture could promote Zimbabwe as a leader in agriculture production. Communication networks also helped farmers make well informed decisions about what crops to plant and where to sell their produce and buy inputs.

Fawole and Olajide (2012) studied awareness and use of information communication technologies by farmers in Oyo state. A total of 192 farmers were interviewed. Results indicated greater awareness and use of old ICT as compared to new. While awareness of old ICTs like radio (98.8%) and television (94.7%) was widespread among farmers, fewer were aware of new ICTs such as mobile phones (80.9%), internet (26.6%), digital video disc (30.4%) and cable television (25.9%).

Jain *et al.* (2012) studied frequency of using ICT tools among 120 farm women from selected villages of Sonipat district of Haryana. Results indicated that about one-fourth of the women farmers used radio, TV and phones on a daily basis while only one out of eight women viewed TV on weekly basis. The rest of the women did not use any means of ICT. The pattern suggested that TV being the most popular means of

communication among farm women could use for dissemination of essential agricultural knowledge to them on a day to day basis.

Jamadar and Halikatti (2012) revealed that 92 percent farmers had taken adaptation measures like changing of the varieties from long to short duration, on the other hand, only 23.33 per cent have initiated changes in planting dates, regarding spacing between rows per plants 88.66 per cent of farmers have increased. Nearly thirty three per cent of the farmers had taken up ridges and furrows. In case of adaptation measures regarding drip irrigation and mulching, less than 10 per cent of farmers have adopted. This study was conducted in Bijapur district of Karnataka.

Lwoga *et al.* (2011) identified information and knowledge gaps in control of plant and animal diseases, marketing, credit and loan facilities. Apart from radio and cell phones, advanced technologies (i.e. internet and e-mail) and printed materials were used at lower rate in spite of their existence in rural communities. Farmer's information needs varied across gender group. Oral communication channels were effective way in delivering information and knowledge in the surveyed local communities when compared to ICTs.

Satyanarayan and Jagadeeswary (2010) conducted a study in Bangalore North taluka. Expost facto research design was used for selecting a total sample of 100 farmers randomly from the village. Majority of the livestock farmers had medium to low profile. Majority of the respondents had medium knowledge and medium extent of adoption in dairy management practices, whereas low knowledge level and low extent of adoption in sheep, goat and poultry management practices.

Thierfelder and Wall (2010), reported that farmers to cope with the effects of climate change, the most widely used coping strategy was selling livestock (85%) of the respondents, followed by changing consumption pattern (76%) of the respondents. Changing crop planting dates was the most preferred adaptation option (89%) of the respondents, while irrigation as an adaptation strategy was used only by 10 per cent of the surveyed farmers. Shortage of water for irrigation (83%) and shortage of money to buy necessary inputs (77%) were the major barriers to effective adaptation frequently.

Nosheen *et al.* (2010) analyzed gender specific sources of information regarding home and farm practices in Potohar Region. In this study, results revealed that most frequently used sources of information were from television (75%), friends (67.5%),

relatives (61%), radio (39%) and local farmers (37%). On the other hand the less frequently used information sources were input/output dealers, books/booklets and extension workers.

Sanjay *et al.* (2009) found that in the village Bighaiyan of Uttar Pradesh state about 40 per cent of farmer households' accessed information regarding modern agricultural techniques through mobile message service.

Mohan and Singh (2007) found that new ICT had the potential of providing massive amount, timely and relevant information to rural farmers in comprehensive and cost effective manner. Different kinds of ICT frequently used by rural farmers were electronic database access and search systems (database, teletext, and videotext), feedback systems, advisory systems (decision support system, expert systems, and knowledge systems), Networks (internet, electronic mail, computer conferencing) and multimedia.

Rao (2007) opined that there was a great scope and prospects for ICTs to move agriculture on the path of development for food production, related to agriculture including seeds, weather, and market rates, remedies for pest attack and crop diseases and latest technologies.

Gautam and Paliwal (2006) observed that ICT provides the flexibility in providing information on various methods of farming practices including the crops, commodities and enterprises accessibility to the information related to expertise and has been an effective alternative and comfortable in providing needed information of varying nature appropriate to the farming activities.

Gupta (2005) reported that 86 per cent of the farmers had access to a mobile phone which therefore contributed towards developing farmer's linkage with other people including extension experts.

Vedakumari (2005) reported that Information and communications technology (ICT) offered a great opportunity to facilitate the flow of information and technology services delivery especially to the farmers from the older ways of delivering information to the modern ways of information delivery systems. The reach of ICT in rural areas provide unique opportunities to producers of rural products, agriculture agro-processing products, rural handicrafts etc to have direct access to markets to ensure find right kind of

markets and reach these markets in minimum time without a number of middlemen involved.

Prasanna (2004) reported that ICT formed a bridge for global millennium development, and is crucial in providing the essential support in all avenues of the development. Sharing knowledge in areas to promote marketing, to provide access to research based information to the farmers about new genes, technologies, access to information on crop planting, disease control, pest identification and control, seed prices and market prices of agricultural products.

Kaini (2004) found that the use of ICTs like radio, television played a major role in delivering agricultural messages, and provided an opportunity to educate farmers for faster and better access to information required on supply of inputs, new technology, early warning systems (such as drought, pests, and diseases), credit, market etc.

Nigel *et al.* (2004) revealed that mobile phones have increased the efficiency of service delivery to the agro-based entrepreneurs (e.g. weather information, market prices), or opened opportunities for new services providing agriculture information through SMS.

Araya and Adjaye (2011) reported that farmers awareness and perceptions of soil erosion problem as a result of changes in climate, positively and significantly affect their decisions to adopt soil conservation measures. It was expected that improved knowledge and farming experience will positively influence farmers' awareness and decision to take up adaptation strategies.

2.4 Empowerment of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture

Villavicencio *et al.* (2018) summarized equity, empowerment and gender relations for climate-smart agriculture programming. Wider and more equitable gender sensitivity was now seen amongst policy makers and local government, with a corresponding enhanced and out-scaled uptake on CSA. Improved access to resources, information, markets and decision-making opportunities of women will bring them on par with men as equal partners in climate change and disaster risk reduction efforts. Application of social learning improved the adaptive capacities of women.

Chowdhury and Bajracharya (2018) found that introduction of climate smart technologies leads to a rise in productivity, water, and energy savings at field level. Therefore, it was suggested to extend analysis from the field to the basin level. Widespread adoption of such technologies might increase water and energy consumption, thereby offsetting the initial efficiency gains of climate smart technologies.

Ado *et al.* (2018) assessed farmers' awareness and perceptions of climate change impacts in Aguié Department, Niger Republic. Most of the farmers reported that effective adaptation to climate change impacts was highly dependent on the extent of community awareness and how farmers perceive the impacts of climate change. The study also highlighted that institutions targeting households' livelihood improvement and making decisions concerning climate change adaptation need to focus on media outreach in local languages, improving locally adapted extension services, and developing water use efficiency measures such as improved irrigation for effective and long-term adaptation.

Chowdary *et al.* (2018) evaluated knowledge level on Soil Health Management (SHM) and extent of adoption of SHC recommendations by beneficiary farmer and found that, nine respondents had followed recommendations for four years, 21 farmers for three years, 14 respondents for two years, and the rest nine respondents for one year. Among adopters of SHC recommendations, cent per cent of the farmers had adopted the SHC recommendations as such without any deviation. Whereas, among non-Adopters of SHC recommendations, an overwhelming proportion (92.45%) of farmers fell under excess adoption category. It was concluded that out of top five factors respondents determined that use of SHC recommendations were to improve soil health, good for crops and increasing yields, extension functionaries of SDA, interest, and past experience.

Mittal (2016) in a pilot project took two different states of India-Haryana and Bihar, analyzed the listening behavior of farmers, both men and women, to information provided by mobile phones, and contributed towards reducing information asymmetry among farmers moreover helped them in taking informed decisions, about input use, thus leading to savings on irrigation and reducing the cost of other inputs such as pesticides and fertilizers.

Carlisle (2016) explained about rational actor models inadequate to explain farmer decision-making, suggesting that researchers would do well to utilize interpretive frames that elucidate interactions among groups of people and take account of multiple

forms of capital. Reviewing recommendations for increasing the adoption of soil health practices, the study found that a complementary approach -- combining education, research, policy, measures to overcome equipment barriers, and efforts to address farm and food system context holds the most promise.

Chandana *et al.* (2014) studied the use of mobile communication for information sharing by Ginger farmers in the Kurunegala district in Sri Lanka. The analysis showed that more than 90 percent of ginger farmers in the Kurunegala district, in general, use mobile phone as a source of information sharing in their day-to-day life. Whereas the level of income, ability to use did not act as a barrier for this purpose, effective information sharing was hindered by the level of education of farmers. The mobile phone could promote with appropriate training and on correct usage, to disseminate vital information on farming practices to the farmers on time. This highlights importance of developing appropriate packages targeting farming community with right mix of market-based and regulatory incentives to facilitate information sharing and knowledge mobilization.

Isife *et al.* (2013) conducted a study on the role of ICT in poverty alleviation among rural farmers in Abia state and reported the level of ICT usage among respondents as high for radio (3.00), television (3.00), GSM telephone (2.80) and SMS message (2.80). The use of computer and projector were rated low 0.07 and 0.60 respectively. Also, were the uses of CD/DVD (2.40), file/slide (0.50), while the use of email and internet recorded no response. The study further reported the opinion of respondents that ICT could facilitate easy access to markets outside their domain through on-line business transaction (64%). When this occurs, the farmers enjoy increased negotiating power through direct contact with the buyers eliminating middlemen (66%), increased access to market (64%), increased profit by small holders (68%), facilitate easy contact between farmers on one side and marketers of farm inputs and buyers of produce (66%). Other positive impacts of ICT in poverty alleviation include easy dissemination of information about market conditions and export requirement (62%) and co-ordination and systematization of agricultural information (60%).

Adamides and Stulianou (2013) assessed ICT and mobile phone use for agricultural knowledge sharing by Cypriot farmers and found that majority of the respondents (98%) in Cyprus used the mobile phone as a source of agriculture

information and there were no differences between education groups and between crop farmers and their livestock counterparts concerning mobile phone usage. Mobile phones were are being used by farmers, not only as a person to person voice communication medium, but also, to provide access to information though sending message services, multimedia message service and access to the internet.

Raghuprasad *et al.* (2013) conducted a study in Karnataka State mainly to assess the knowledge level of farmers towards utilisation of ICT tools in farm communication. In each of the selected villages, initially a list of 25 farmers was prepared based on the farmers getting multi-message services, attended video conference programmes and using one or more ICT tools in getting farm information. From this list 10 farmers were selected randomly from each village, which constituted a sample of 120 respondents for the study. Findings of the study revealed that nearly 70 per cent of farmers had high to medium level of knowledge about utilisation of ICT tools and 30.83 per cent had low level of knowledge about ICT tools. Variables such as material possession, social participation, extension participation, mass media exposure and cosmopolitans had positive and significant relationship with knowledge of farmers about ICT tools at one per cent level of significance whereas; education and annual income had positive and significant relationship at five per cent level of significance. As the study revealed, most of the farmers had knowledge about the utility of ICT tools for farm communication, only limitation was the availability.

Armstrong *et al.* (2012) found that traditional farmers were not prompt to access internet as compared to innovative farmers. A framework was developed to support decision making of farmers followed by earlier attempts to identify agricultural information dissemination frameworks and discussed the delivery process of location specific expert agricultural knowledge to farming communities and suggested further elaborating of information flow and decision making processes among farmers.

Kameswari *et al.* (2011) opined that entire agricultural supply chain could be made more effective by the use of ICTs and also found that television was the most preferred source in comparison to radio because of its visual nature and diversified content. Agriculture information disseminated via. Internet would be feasible only under an effective institutional structure and arrangement. Though farmers accessed wide range of sources of information, they mostly relied on middlemen, local and official sources.

Islam and Tsujl (2011) emphasized the community information centers (CICs) to bridge the digital divide in Bangladesh. Commodity prices, weather information, crop planning, literacy programs, exam results, health information, school curriculum, government notifications, downloadable forms etc. were the services offered by CICs. However poor literacy rates, language barrier, lack of IT skills, unawareness of modern technologies were the major problems faced by rural farmers. They recommended that awareness promotion, use of modern network technologies, focused content management, cooperation among government and NGOs should be considered as important steps for the advancement of CICs.

Ali (2011) studied discussed the role of mass media in farmer's decision making of vegetable growers in Uttar Pradesh and empirically analyzed the factors affecting the adoption of information. Results revealed that information on input decisions and production techniques such as high yielding seeds, fertilizers, pesticides were primarily adopted from input dealers followed by local/ mandi, progressive farmers and relatives. Market price information was obtained from local/ mandi and input dealer whereas farmers got information on government policies largely from input dealer followed by mass media. Small land holdings, irrigation facility and using hired labor at their vegetable farms were more likely adopted mass media information.

Maumbe (2010) opined that rapid diffusion of mobile and wireless technologies was transforming agricultural development .The author advocated the development of “value-based” and “demand-driven” mobile agriculture services for the future growth and survival of mobile agriculture, which required greater competition among service providers, use of multi-lingual e-content, integration of indigenous knowledge, mobile agriculture curriculum, mobile cyber-security, and customized value-added services for rural communities.

Hassan (2009) identified the problems in ICT usage by rural farmers, the problems faced were as they were not much awareness on benefits of ICT, lack of skills or expertise in using ICT, lack of time spent on ICT, price of ICT being expensive, lack of training and technology accommodation on ICT usage, language problem, afraid to use ICT, lack of support from responsible agencies and lack of updated agriculture information on ICT.

Brussel (2009) suggested that adaptation practices to changes in climate by farmers included adjusting the timing of farm operations, technical solutions, choosing crops and adapting new genetic varieties to the expected length of the growing season and water availability and more resistant to new conditions of temperature and humidity, effective management of pest and disease control improving irrigation practices and recycling or storing water, improving soil management and introducing more heat tolerant livestock breeds and adapting diet patterns of animals under heat stress conditions.

Nagalakshmi and Narayanaswamy (2008) reported that ICT supported the decision making system by providing the services for the benefit of agricultural production, help in providing need based, and timely, accurate and quality information at a faster rate. Integrating ICT with agriculture has increased the opportunity for effective management support by accumulation and integration of knowledge and information from many sources.

Narayanaswamy (2008) studied on large scope of ICT use in agriculture which expressed that the perception of farmers about utility of websites for agriculture information was found to be very high and it could be a direct tool for increasing productivity and empowering the farmers for decision making.

Akpabio (2007) assessed that ICT could reach a larger number of people and at a higher level of interaction than other forms of media. ICT can also improve two-way information flow and act as catalysts for improved information sharing and greater participation community level, and can give new services to rural farmers as users. On the other hand ICT could help extension officials to gather, store, retrieve and disseminate a broad range of information required by farmers.

Mohan and Singh (2007) reported that the on line services offered by the ICT provide information on new technologies. It also helped in providing information services to the farmers on package of practices, disease/pest early warning system, weather forecasting, input supply, credit availability, crop insurance, and post-harvest technology at the earliest possible time. It was claimed online transfer by ICT turns to be cheaper and faster to trade on line than on paper based medium, telephone or fax. E-commerce enables the entrepreneurs to access global market information at their door step through

websites and open up new regional and global market to promote their products that fetch better price and increase farmer's earning.

Nhemachena and Hassan (2007) claimed that the common adaptation methods in agriculture include use of new crop varieties and livestock species that were better suited to drier conditions, irrigation, crop diversification, adaptation of mixed crop and livestock farming systems, and changing planting dates, using different crop varieties, changing planting and harvesting dates, increased use of water and soil conservation techniques, and diversifying from farm to non-farm activities to cope up with climate change.

Selvarani (2005) found that minimum calls of 825 were made during 2004 to the level II KCC at Agricultural Technology Information Centre (ATIC), in Tamil Nadu Agricultural Universities, Coimbatore. Further, it revealed that cent percent of the respondents (100%) opined that their extension agency contact had been increased after contacting KCCs received friendly manner, cent percent of the respondents (100.00%) revealed that the recommendations offered through Kisan Call Centres were accurate. More than one third (40.00%) of the respondents expressed that instant solutions to the agricultural problems were offered through KCCs. More than half of the respondents (60.00%) expressed the credibility of scientists as the major reason for contacting KCC and majority (80.00%) of the respondents followed recommendations received through KCCs and slightly less than one-fifths (16.67%) of the respondents expressed their satisfaction about services of KCCs.

Rohan (2004) noticed that the internet based ICT enhanced national agricultural research and extension system by improving the generation and collaborative use of agricultural knowledge and information system. Government researchers and extension workers based in rural villages could communicate with colleagues and experts in seconds rather than in days. Communication by email was very common among farmers in this information age. Farmers with the assistance from the agricultural instructor can communicate with agriculturists through email. When farmers needed to send visuals of their agriculture problem they could use either a scanned image or the digital still photograph and then could transfer as an attachment file. Extension workers could copy the email message to fellow officers to alert them to the disease specimen.

Bradshaw *et al.* (2004) found that adaptation options in the agricultural sector included, crop diversification, mixed crop, livestock farming systems, using different crop varieties, changing planting and harvesting dates, and mixing less productive, drought resistant varieties and high-yield water sensitive crops for coping up with climate change for better production.

Kumari (2003) reported that ICTs could improve the access of the poor farmer to micro credit, government services, market information, production, storage and marketing of farm and non-farm products. Further, ICT could also facilitate the generation and exchanges of community based information and stimulate the establishment of small and medium sized enterprises and expand their market base.

Chapter- III

MATERIALS AND METHODS

This chapter has been enriched with the detailed description of the methods and procedures followed in conducting the research in an organized manner. The investigation was carried out with the objective of the study ‘Empowering Farm Women Knowledge Groups (FWKGS) on Climate Smart Agriculture through Mobile Phones’ The research was carried in Maheshwaram and Moinabad mandals/ Blocks of Rangareddy district in the State of Telangana. Methods and procedures followed for measuring dependent and independent variables as well as techniques used for the collection and analysis of the data were presented under the following sub heads.

- 3.1 Research Design
- 3.2 Sampling Procedure
- 3.3 Variables and their Empirical Measurement
- 3.4 Instruments of Data Collection
- 3.5 Tools and Techniques used for collection of data
- 3.6 Statistical analysis
- 3.7 Conceptual framework of the study

3.1 RESEARCH DESIGN

Research Design is the most important and crucial aspect of the research methodology. It is a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings (Burns and Grove, 2003).

Experimental research design was used in the present investigation. Experimental research design is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.

Typically, an experiment is constructed to be able to explain some kind of causation. Keeping in view of the objectives of the study, type of variables, size of respondents and phenomena to be studied, the Experimental Research Design was selected as an appropriate design to investigate the variables and Empower Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile Phone.

3.2 SAMPLING PROCEDURE

Sampling procedure followed for the investigation is given below.

3.2.1 Locale of the study

Telangana state was chosen as the locale of the study, since the researcher belongs to the state and was familiar with local language and culture. Hence, building up rapport with the respondents would become easier and the results may be useful for the state.

3.2.2 Selection of the district

The study was conducted in Rangareddy district of Telangana. Rangareddy District was purposively selected for the study because All India Coordinated Research Project on Home Science (AICRP-HSc), under Professor Jayashankar Telangana State Agricultural University (PJTSAU), implemented by Indian Council of Agricultural Research (ICAR), is working with the farmwomen of the selected villages from this district. So far, no research study was undertaken by a student on Farm Women Knowledge Groups (FWKGS) and their Empowerment on Climate Smart Agriculture through Mobile Phone. As the researcher hails from the same area and was familiar with social conditions, local language and culture of the people, this could help her in building good rapport with the respondents.

Rangareddy district of Telangana state selected for the study is shown in (Fig 3.1 and Fig 3.2).



Figure 3.1. Map showing India

From each of the two selected mandals/ blocks, 5 villages from Maheshwaram Mandal / Block viz., Kalwakole , Dubbacherla, Pendyala, , Ramachandraguda, Lillipur. And one village from Moinabad Mandal/ Block i.e., Tholkatta were purposively selected for the study as they are the operational villages of AICRP-HSc. Thus, a total of 6 villages were selected from two selected mandals of the Rangareddy District. The geographical location of the selected villages is diagrammatically represented (Fig. 3.4a and Fig.3.4.b).



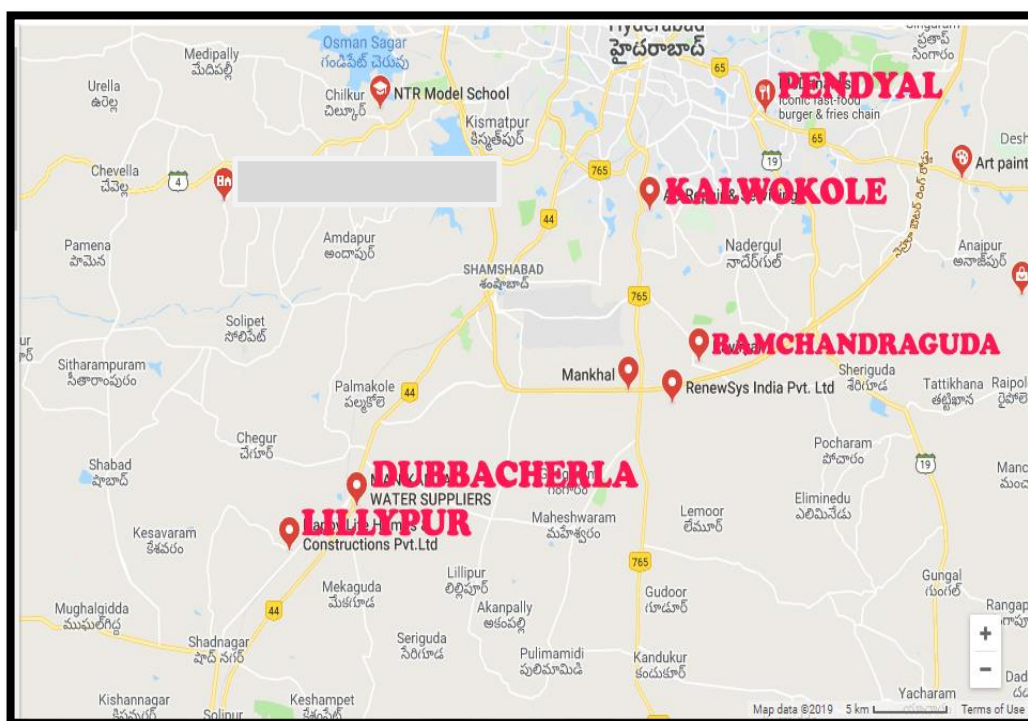
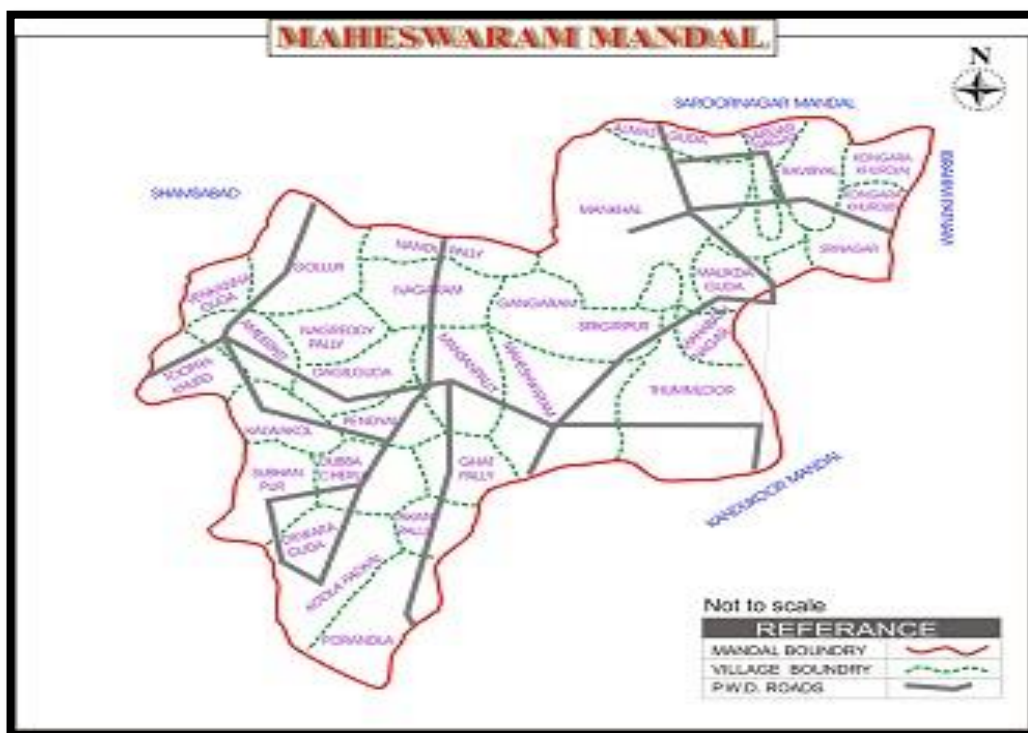


Figure 3.4b. Map showing villages of Maheshwaram Mandal

3.2.5 Selection of farm women

A situational analysis was done with 120 farmwomen, who are actively involved in farming were selected randomly from the six operational villages of All India Coordinate Research Project on Home AICRP-HSc). The list of farm women from

selected operational villages of AICRP-HSc was obtained through official contacts and direct contact and formed focused groups. Out of this group, fifteen farm women from each village, who actively engaged in farming, who are literate and with access to Smart Mobile Phone were selected from each of the six (6) adopted villages of AICRP on Home Science purposively, totaling 90 members (Fig. 3.5).

3.2.6 Sampling technique:

- Selection of village:** Six Adopted villages of AICRP- Home Science are selected purposively
- Selection of sample:** Literate Farm women, who are actively. doing farming with access to smart mobile phone are selected purposively.
- Sample size:** 90 farmwomen @ 15 each from each village Farm Women Knowledge Groups (FWKGs) from six adopted villages of AICRP- Home Science will comprise the sample.

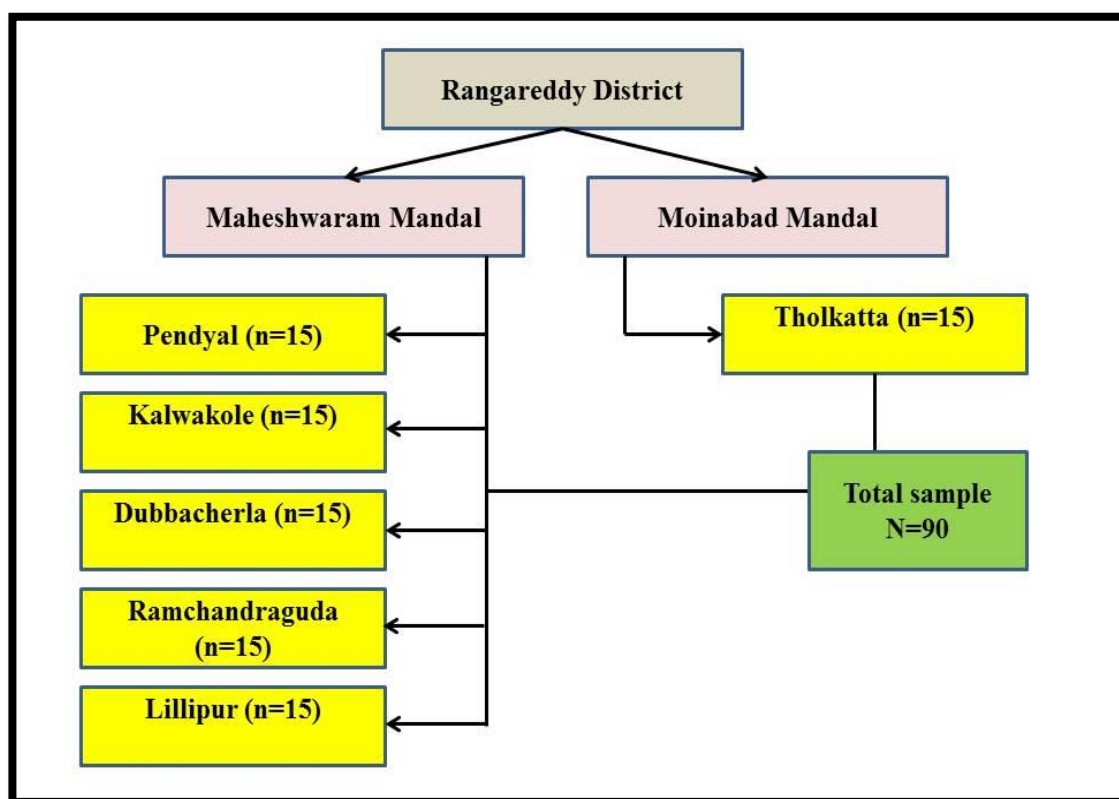


Figure 3.5. Flow chart for the selection of sample from different mandals of Telangana state

A detail of the sample study undertaken for Farm Women Knowledge Groups (FWKGs) selection procedure is shown in Table 3.1.

Table: 3.1 Details of Sample study undertaken

Table 3.1. Selection of mandals, villages and farm women				
S.No	Mandal	Village	No. of farm women respondents	No. of FWKGs Formed
1.	Maheshwaram	Pendyal	15	1
		Kalwakole	15	1
		Ramchandraguda	15	1
		Dubbacherla	15	1
		Lillipur	15	1
2.	Moinabad	Tholkatta	15	1
Total	2 Mandals	6 Villages	90	6 Groups

3.3 Variables and their Empirical Measurement

Based on the review of literature and in consultation with experts, agricultural and social scientists, Extension specialists the field variables for the study were selected. The variables, which were found to have relevance to the present investigation, were included in the study. The instruments used to measure the variables together with the procedure followed, have been described based on dependent and independent variables in detail.

Table 3.2 Variables and their empirical measurement		
S. No	Variables	Empirical Measurement
A.	Dependent Variables	
1	Knowledge of ICT	Schedule Developed for the Study
2	Usage of ICT	Schedule Developed for the Study
3	Knowledge on Climate Smart Agriculture	Knowledge Index Developed for the Study
4	Awareness on Climate Smart Agriculture	Schedule Developed for the Study
5	Empowerment	Empowerment Condition Index developed by <u>Sheikh Mohammed Mamur Rashid</u> <i>et al</i> (2016) with Modifications.
B.	Independent Variables	
	i. Profile Characteristics of Farm Women (120 sample)	
1.	Age	Chronological age of the farm

		women
2.	Educational qualification	Scale developed by Venkatramaiah (1991) with suitable modifications
3.	Marital status	Schedule developed for the study
4.	Family size	
5.	Type of family	
6.	Family occupation	
7.	Farm women's occupation	
8.	Annual income	
9.	Land holding	Number of acres possessed at the time of investigation
10.	Cultivable land	Schedule developed for the study
11.	Work experience in farming	
12.	Cultivation of Main crop	
13.	Source of information	
14.	Organizational participation	
15.	Contact with extension personnel	Scale developed by Badirinarayana (1997) with suitable modifications
16.	Knowledge and utilization of ICTs for farm women	Schedule developed for the study
	ii. Profile Characteristics of Farm Women Knowledge Groups (FWKGs) (90 sample)	
1	Age	Schedule developed for the study
2	Educational qualification	Schedule developed for the study
3	Marital status	Schedule developed for the study
4	Family size	Schedule developed for the study
5	Type of family	Schedule developed for the study
6	Family occupation	Schedule developed for the study
7	Farm women's occupation	Schedule developed for the study
8	Annual income	Schedule developed for the study
9	Land holding	Schedule developed for the study
10	Work experience in farming	Schedule developed for the study
11	Source of information	Schedule developed for the study

12	Organizational participation	Schedule developed for the study
13	Contact with extension personnel	Schedule developed for the study

3.3.1 Independent variables

3.3.1.1 Age: It was operationalized as the number of years completed by the farm women respondents at the time of interview. Based on the age, the respondents were grouped as young, middle aged and old aged. A score of one was given for every completed year. The farm women were grouped into three categories based on number of completed years as follows.

Category	Score
a. Young age (18-35 years)	1
b. Middle age (36-50 years)	2
c. Old age (Above 50 years)	3

3.3.1.2 Education qualification: Educational qualification was operationally defined as the formal institutional education the individual respondent. The village wise data was tabulated as shown below.

Category	Score
a. Illiterate	1
b. Primary School	2
c. Middle School	3
d. High School	4
e. College Education	5
f. Graduation & Above	6

3.3.1.3 Marital status: It was operationalized as the present status of the respondents and it was categorized into married, unmarried and widowed. Weightage of 1, 2, and 3 were given respectively for the purpose of computation.

Category	Score
a. Widow	1
b. Unmarried	2
c. Married	3

3.3.1.4 Family Size: It was operationalized as number of members in the family. According to the size of members in the family, the respondents were classified into small, medium and large family size.

Category	Score
a. Small	1
b. Medium	2
c. Large	3

3.3.1.5 Type of family: Respondents were categorized as either nuclear or joint family on the basis of number of generations of members living together.

Category	Score
a. Nuclear	1
b. Joint Family	2

3.3.1.6 Farm women's occupation: It was operationally defined as the work which the respondents involved for their livelihoods and earnings. It was categorized into farming, farming and service, farming and business and farming and daily wage.

Category	Score
a. Farming	1
b. Farming and business	2
c. Farming and service	3
d. Farming and daily wage Earner	4

3.3.1.7 Annual Income: Total annual income is operationally defined as the income generated from various sources in one year. Respondents were categorized into low, middle and high categories on the basis of total annual income.

S. No.	Category	Annual income (Rupees)
1	Low (50,000-1,00,000)	1
2	Medium (1,00,000-1,50,000)	2
3	High (Above 1,50,000)	3

3.3.1.8 Land holding: It was operationally defined as the total number of hectares of land based on owned and leased in by an individual family at the time of

investigation. Frequency and percentage distribution was used to classify the respondents were classified into landless, marginal, small, medium and large categories as follows (suggest by G.O.I.2011).

Category	Score
a. Landless	1
b. Marginal	2
c. Small	3
d. Medium	4
e. Large	5

3.3.1.9 Work Experience in Farming: In the present investigation based on the total years of involvement of farm women in farming operations. They were grouped into four categorized namely below 10 years, between 10-20 years, between 20-30 years and above 30 years.

Category	Score
a. 0-10 years	1
b. 10-20 years	2
c. 20- 30 years	3
d. Above 30 years	4

3.3.1.10 Source of information about farming: It was operationally defined as the availability of or exposure to different source of information about farming by the farm women. To measure the degree of source of information of the farm women, the different items included traditional knowledge, newspaper, KVKs, Agricultural University, AO/ Agricultural Extension Officer, television, radio, mobile phone, family members, neighbor's and scores assigned as yes (2) and no (1) for the purpose of computation.

Category	Score
a. Traditional Knowledge	Yes-2 No-1
b. News paper	
c. KVK	
d. Agricultural University	
e. AEO/ Agricultural Officer	
f. TV	
g. Radio	
h. Mobile phone	
i. Family members	
j. Neighbor's	

3.3.1.11 Extent of participation:

Participation was operationally defined as the involvement of farm women in organizations and institutional operations. To study the extent of participation of farm women in organization, a schedule on participation items was developed regarding self-help groups, anganwadi centre, mahila mandal, gram panchayat, zilla panchayat, taluk panchayat and farmer's organization. The respondents were asked to indicate their opinion and scoring as in case of the above i.e., regularly-3, occasionally-2 and never-1. Weightage of 3, 2, and 1 were given respectively for the purpose of computation.

Category	Score
a. Self Help Group	Regularly-3, Occasionally-2 Never-1
b. Anganwadi centre	
c. Mahilamandal	
d. Gram Panchayat	
e. Zilla panchayat	
f. Taluk panchayat	
g. Farmers organization	

3.3.1.12 Frequency of contact with extension personnel:

It was operationally defined as degree of contact of the respondent to different extension agencies. The degree of extension contact of the respondents was measured with the help of a scale developed by Badirinarayana (1997) with suitable modifications. The schedule contained the category namely 'frequency of contact'. The respondents were asked to indicate their opinion and scoring as in case of the above i.e., regularly-3, occasionally-2 and never-1. Weightage of 3, 2, and 1 were given respectively for the purpose of computation.

Category	Score
a. VLEW	Regularly-3, Occasionally-2 Never-1
b. AEO (Agriculture Extension	
c. Extension Officer	
d. Farmers Organisation	
e. Community Coordinator (SHG)	
f. Anganwadi Worker	
g. University Personnel	
h. NGO Personnel	
i. Bank Personnel	
j. Block Personnel (VAO & VRO)	

3.3.2 Dependent variables

3.3.2.1 Attitude towards ICTs:

To study the attitude of Farmwomen towards ICTs, a scale was developed for the study and was furnished in the Appendix Part I

In social research, attitude of a person or group towards social problems or any psychological object is of paramount importance. Edwards (1957) defined attitude as "the degree of positive or negative effect associated with some psychological object". Krech et al., (1962), considered attitude as an enduring system of positive and negative evaluations, emotional feelings and pro and con action tendencies with respect to social objects. The attitude towards a psychological object may be formed by the interrelation of cognition, feeling and action tendencies about the object.

The cognitive component of attitude consists of the beliefs which involve attributes like Strongly agree, Agree, Undecided, Disagree, and Strongly disagree. Good or bad etc. The feeling component refers to the emotions i.e likes and dislikes etc., which gives motivating character or action tendencies.

Construction and standardization of attitude Scale:

In order to measure attitude of Farmwomen towards ICTs, a scale was developed by adopting Likert (1932) method of summated ratings. Among the techniques available for attitude scale construction, Thurstone's method of Paired comparison technique and Equal appearing interval and Likerts' method of Summated rating are widely used.

Procedure of Attitude scale construction:

a). Collection of statements: The first step in the construction of attitude scale was to collect and select a lot of statements covering the entire universe of ICTs. As such, a large number of statements were collected from literature, expert opinions and feelings, in consultation with extension workers, scientists, department officials and holding informal conversation with progressive farmwomen in the study area. The overlapping statements were deleted and others were edited according to the criteria laid down by Thurstone and Chase (1929), Likert (1932), Edwards and Kilpatrick (1948), and Edwards (1957).

The respondents were asked to respond to each statement in terms of their agreement or disagreement with the statements on a five-point continuum viz., SA-Strongly Agree, A-Agree, UD-Un-decided, D-Disagree, SD-Strongly disagree with the scoring pattern of 5,4,3,2,1 respectively for positive statements and negative statements

1,2,3,4,5 respectively for each respondent for all the items. The instructions sheet and attitude statements are given in appendix 1.

Table 4.3.1 refers to the farm women's attitude towards ICTs. Farm women were asked to report on a 5-point scale as Strongly agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly disagree (1). Each point on the scale carried a score. These score values were not printed on the instrument but were shown here just to indicate the scoring pattern.

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

After getting the total Attitude Score, the respondents were classified into three groups viz. in Table 4.3.2 refers to the farm women's categories to their attitude towards ICTs and were further grouped as Strongly agree (5) + Agree (4) total frequency score, Undecided (3) total frequency score, Disagree (2) + Strongly disagree (1) total frequency score, each point on the scale total frequency score High, Medium and Low attitude.

3.3.2.2 Knowledge and Usage of ICT:

Knowledge was operationalised as familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning.

Usage is firmly established and generally accepted practice or procedure.

ICTs Stands for "Information and Communication Technologies." ICTs refer to technologies that provide access to information through telecommunications, primarily on communication technologies which include the Internet, wireless networks, cell phones, and other communication media.

ICTs do play a significant role in disseminating a wide range of information and advice leading to knowledge and attitude change among rural communities and especially farmwomen. It is also supporting rural communities to acquire new skills and creating new employment opportunities. This resulted in experimentation with various ICTs and its applications in areas such as agriculture, health, governance, financial

services, education and employment. Many of these initiatives clearly reveal the huge potential of ICTs in improving efficiency and effectiveness of reaching rural communities with relevant information like climate change, climate smart agriculture adaptation technologies etc.. These initiatives have also benefited rural women by way of access to new information and new employment opportunities. Studies have shown that women still face a number of constraints in fully benefiting from the potential of ICTs. Among the ICTs, mobile phones are playing a crucial role in disseminating agricultural information. The latest Socio-Economic and Caste Census indicates that 82 per cent of rural households own a mobile phone (SECC 2011). Eighty-one per cent of the women respondents reported that they had access to a phone, 13 per cent owned a phone, and another 68 per cent had access to their husband's or some other family member's phone. However, even among those who owned a mobile phone, only one-fifth wished to access agricultural information by means of the telephone. The reason was the lack of knowledge of how to use the phone: how to receive calls, how to make calls, use text messages and lack technical know-how of the hardware.

A schedule was developed for the study and was administered to the respondents to assess the knowledge and utilization of Information and Communication Technologies (ICTs) by farm women, their awareness and use of mobile phone, level of ICTs utilization, purpose for using ICTs and Preference of ICTs to receive information related to climate smart agriculture.

After assessment, the farmwomen were formed into Farm Women Knowledge Groups (FWKGs), consisting of 15 members in each group. One group from each experimental village totaling 6 villages with 6 FWKGs of 90 members were given training on hardware and usage of mobile phone.

3.3.2.3 Knowledge on use of mobile phones:

Knowledge in this context is operationalized as awareness or familiarity gained by experience of a fact or situation for use and functions of mobile phone.

Knowledge on use of mobile phone were categorized into use and functions of mobile phones, different parts of mobile and use of internet and social media apps, source of learning about the mobile phone, frequency of receiving SMS from mobile phone. Under this category, a schedule was developed for the study with a dichotomous scale. A two-point scale which presents options that are absolutely opposite each other i.e., Yes or No response scale, which does not give the respondent an opportunity to be neutral on her answer to a question. Different simple statements were framed to be

understood by the farm women and subjected to content validity and pre-tested and administered to both the respondent farm women for the measurement their pre and post- knowledge on use of mobile phones and functions. The farm women were asked to indicate the knowledge level on use of mobile phone in terms of Yes or No. To quantify the variable, scores 2 and 1 were given for Yes and No responses respectively. The results were interpreted that the higher the score, higher is the knowledge level.

3.3.2.4. Awareness and Knowledge on Climate Smart Agriculture

Climate Smart Agriculture (CSA) is operationalized as an integrated approach where agriculture is understood in a broad sense which includes crop and livestock production, forest management and fisheries (CCAFS and FAO 2014)

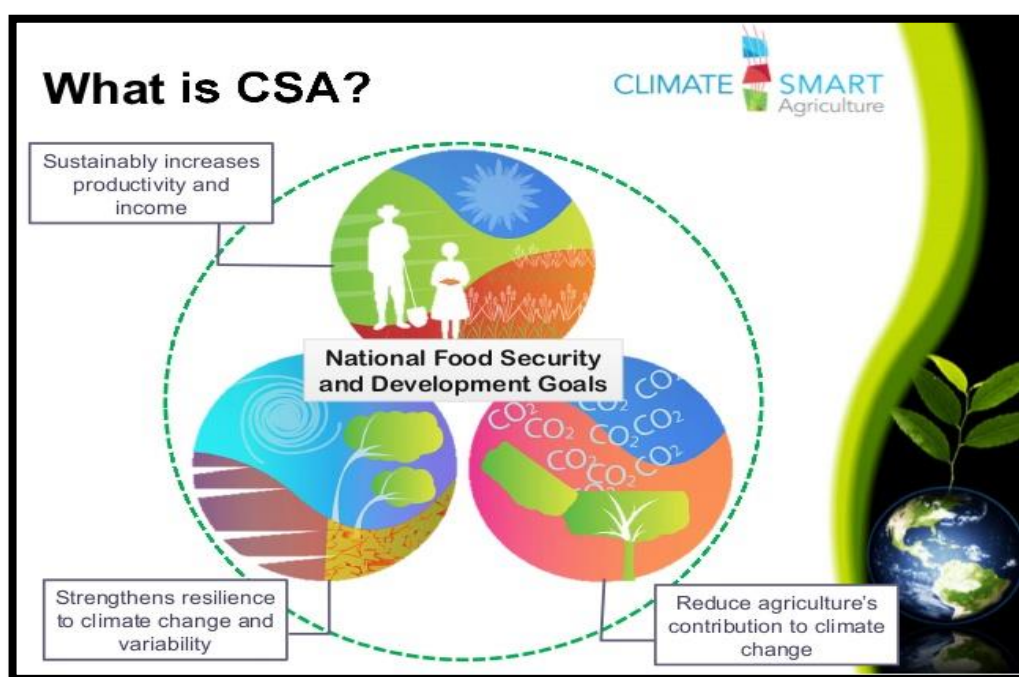


Figure 3.6. Climate Smart Agriculture

Agriculture affects and is affected by climate change in a wide range of ways and there are numerous entry points for initiating CSA programmes or enhancing existing activities. Climate-smart agriculture practices and technologies within seven entry points for CSA are soil management, crop management, water management, livestock management, forestry, fisheries and aquaculture, and energy management.

Climate-smart agriculture has a significant role to play in reducing the gender gap for women in agriculture. A targeted approach to address this gap is useful in developing a women-responsive climatic risk management plan focused on reducing their labor burden in agriculture, especially in areas with high climate risks.

The climate-smart agriculture (CSA) approach is emerging as a new paradigm for adapting agriculture to the changing climate. This approach seeks solutions that improve agricultural productivity, build resilient food production systems, and reduce greenhouse gas emissions (FAO 2010b; Steenwerth et al. 2014). CSA includes a range of technologies, practices, and services to minimize the impact of climate change in agriculture.

Based on the Focus Group Discussions (FGDs) with farmwomen, experts and department officials and existing local agricultural practices and climate conditions entry point practices viz. soil management, crop management, water management, livestock management were selected for the study. Due to severe draught no water ponds were available in the villages hence fisheries and aquaculture, forestry and energy management were omitted.

The selected entry point CSA practices after thorough discussions with the experts and FGDs with the FWKGs and their familiarity, available content in the local language, time constraint for the study and the familiarity of the researcher (as she is not from agricultural faculty), were further churned out. Two adaptation practices / technologies were identified under each category. The selected practices/ technologies further short listed based on the needs and immediate requirement of the farm women. They further simplified to equip them with rainfed agriculture season based on the existing climate change issues due to severe draught in the previous season, suitability to convert them into text, audio and video mobile messages and availability of time with the researcher, to identify the enlisted practices. The adaptation practices/ technologies under soil management-are Soil Health Test and Vermicomposting, under Crop management, Seed Treatment, Inter cropping, under Water management, Drip irrigation and Mulching and under livestock management, cultivation of fodders-such as Hedge lucerne and super Napier grass were selected.

Knowledge index was developed for all the eight CSA technologies following Item analysis and content validity for each component

3.3.3 CONTENT VALIDITY OF THE SCALE

Content validity is the degree to which a test measures what it is supposed to measure and consequently permit appropriate interpretation of scores (Gay *et al.* 2006). Item validity is concerned with whether the test items are relevant to the measurement of the intended content area. Content validity was determined by expert judgment. The experts in the topic covered by the test were asked to assess its content validity (Gay *et*

al. 2006). In the present investigation content validity of the measuring instruments was assessed with the help of experts from Department of Statistics/computer applications from Agriculture, Department. of plant pathology, Department of Entomology, Department of Agri Business Management, Department of Extension Education, Department of Resource Management and Consumer Sciences, Department of information and communication management and Department of Food Science and Nutrition. The judges were asked to give the opinion whether the ergonomic risk factors were work related and fit in the category specified. The second section had statements intended to evaluate the ergonomic implication of development technology. The judges were asked to state their agreement with each statement. The responses of the judges were coded. The items on which more than 95% of the agreement by judges were included in the final scale.

Awareness of farm women on climate smart agriculture were categorized into different adaptive strategies such as soil management, crop management, water management, livestock management and agro-diversification management. The farm women were asked to indicate the need analysis awareness on adaptive strategies in terms of I know or I don't know. To quantify the variable scores 2 and 1 were given for I know and I don't know respectively. The results were interpreted that higher the score, higher is the knowledge level.

3.3.3.1 Knowledge index on adaptation strategies for climate smart agriculture:

Impact of Mobile Phone Applications Intervention for Climate Smart Agriculture among the Farm Women Knowledge Groups (FWKGs)

Knowledge index was developed for were selected different climate smart agricultural strategies in terms soil health test and vermicomposting under soil management, seed treatment, intercropping under crop management, drip irrigation system, mulching under water management, super napier and hedge lucerne under livestock management. A scale was developed for the study and was furnished in the Appendix Part I

3.3.3.1.1 CSA intervention adaptation practice -Soil health test:

A set of items related to the soil health test has been collected and edited. Based on the consultations with experts and field level functionaries soil health test, the statements were appropriately modified and re-written. Finally, 6 statements which represented the "soil health test" related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of

frequency adherence to the soil health test i.e., I know, somewhat I know, I don't know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice-soil health test. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+ SD

3.3.3.1.2 CSA intervention adaptation practice -Vermicomposting:

A set of items related to the vermicomposting has been collected and edited. Based on the consultations with experts and field level functionaries vermicomposting, the statements were appropriately modified and re-written. Finally, 7 statements which represented the “vermicomposting” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the vermicomposting i.e., I know, somewhat I know, I don't know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice-vermicomposting. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean $\pm$ SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean $\pm$ SD

3.3.3.1.3 CSA intervention adaptation practice -Seed treatment:

A set of items related to the seed treatment has been collected and edited. Based on the consultations with experts and field level functionaries seed treatment, the statements were appropriately modified and re-written. Finally, 7 statements which represented the “seed treatment” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the seed treatment i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice- seed treatment. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.1.4 CSA intervention adaptation practice -Intercropping:

A set of items related to the intercropping has been collected and edited. Based on the consultations with experts and field level functionaries intercropping, the statements were appropriately modified and re-written. Finally, 7 statements which represented the “intercropping” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the intercropping i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice- intercropping. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.1.5 CSA intervention adaptation practice -Drip irrigation system:

A set of items related to the drip irrigation system has been collected and edited. Based on the consultations with experts and field level functionaries drip irrigation system, the statements were appropriately modified and re-written. Finally, 7 statements which represented the “drip irrigation system” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the drip irrigation system i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice-drip irrigation system. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.1.6 CSA intervention adaptation practice -Mulching:

A set of items related to the mulching has been collected and edited. Based on the consultations with experts and field level functionaries mulching, the statements were appropriately modified and re-written. Finally, 6 statements which represented the “mulching” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the mulching i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for

negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice-mulching. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.1.7 CSA intervention adaptation practice -Super Napier:

A set of items related to the super napier has been collected and edited. Based on the consultations with experts and field level functionaries super napier, the statements were appropriately modified and re-written. Finally, 6 statements which represented the “super napier” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the super napier i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice-super Napier. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.1.8 CSA intervention adaptation practice -Hedge Lucerne:

A set of items related to the hedge lucerne has been collected and edited. Based on the consultations with experts and field level functionaries hedge lucerne, the statements

were appropriately modified and re-written. Finally, 6 statements which represented the “hedge lucerne” related to various activities were selected and presented. The selected items were administered to the farm women beneficiaries on a 3-point continuum of frequency adherence to the hedge lucerne i.e., I know, somewhat I know, I don’t know with scores 3, 2 and 1 respectively for positive statements and 1, 2 and 3 respectively for negative statements. The average or mean score for each beneficiary was obtained through the responses of its respondents with positive and negative statements. The farm women respondents were classified in terms of having high, medium and low CSA intervention adaptation practice- hedge lucerne. On the basis of responses obtained from the farm women respondents the data were analyzed by using frequency and percentages.

The responses were classified into 3 categories based on their mean and SD as follows:

S.No	Category	Score
1	High	< Mean-SD
2	Medium	Mean $\pm$ SD
3	Low	>Mean+SD

3.3.3.2 Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture (CSA)

To assess the impact of farm women’s empowerment on climate smart agriculture, the developed scale by Sheikh Mohammed Mamur Rashid et al (2016) was taken and it is modified as per the research need. It consists of five factors i.e., economic, family and social, political, knowledge and psychological empowerment and combines them to gauge the overall effect of Empowerment of Farm Women Knowledge Groups on Climate Smart Agriculture by Mobile messages.. Each parameter was developed by the outputs of focused group discussion with the officials, experts, academicians and experienced farmers. As the perceived empowerment was measured by determining the five empowerment indicators, presented as the Empowerment Condition Index (ECI), the detail breakdown of each indicator is defined as such: (a) changes in Perceived economic empowerment- consists of income due to yield obtaining, saving money, investments, availing agriculture loans and purchase of farming inputs, (b) changes in Perceived family and social empowerment, considered by measuring changes in a respondent’s developing institutional contact, linkage with development departments, team spirit, leadership quality, group consensus to solve

problem,(c) changes in Perceived political empowerment, where political empowerment was considered through changes in level of social well-being activities, membership in the social organization, freedom of expression and conflict management. (d) changes in Perceived knowledge empowerment, considered by measuring changes in a respondent's use of machineries and equipment, knowledge on value addition, adaption of Climate Smart Agricultural (CSA) practices introduced and (e) changes in Perceived psychological empowerment, considered by measuring changes in a respondent's perceived motivation in farming, self-esteem, risk taking ability, confidence and decision making ability.

The farm women were asked to indicate the empowerment level in climate smart agriculture into very well, well, moderate, low, very low and not at all. To quantify the variable scores 6, 5, 4, 3, 2 and 1 were given for very well, well, moderate, low, very low and not at all respectively. A scale was developed for the study and was furnished in the Appendix Part I

Perceived economic, family and social, political, knowledge and psychological empowerment of farm women knowledge groups through mobile messages carry out paired t test pre and posttest The results were interpreted that the higher the score, higher is the knowledge level.

3.3.4 Intervention CSA adaptation practices through mobile phone applications - Text (SMS), Audio and Video messages on climate smart agriculture among Farm Women Knowledge Groups (FWKGs)

Based on purposively selected data of farm women, a group comprising of 15 farm women from each village were formed to empower their knowledge on climate smart agriculture. Farmwomen's registered mobile numbers were collected (Appendix II) these registered mobile numbers were separately entered into different groups based on their category as basic phones and smart mobiles and grouped them as village wise FWKGs for sending short messages and audio messages by using smscountry.com. (Appendix Part IV) Farm women with smart phones were formed into village wise WhatsApp group along with the local leaders for proper connectivity. Sent short messages audio messages and videos. These short messages (Appendix III) were directed to farm women on specific topic of CSA enlisted 3 months on day by day basis

and administered in different forms of voice, text and video through mobiles.

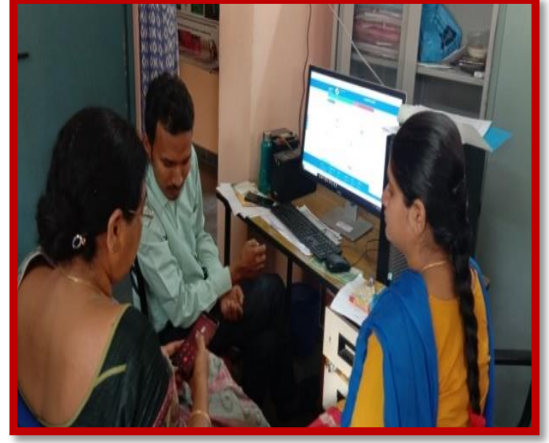
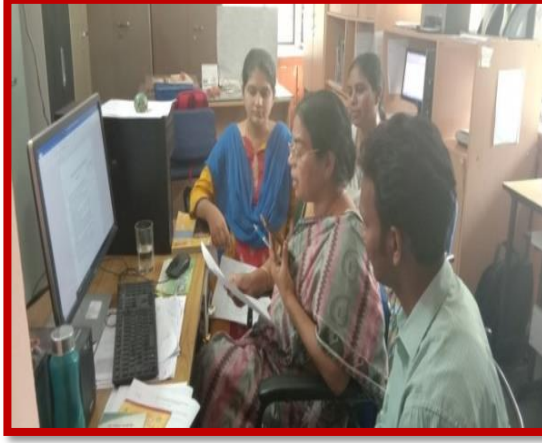
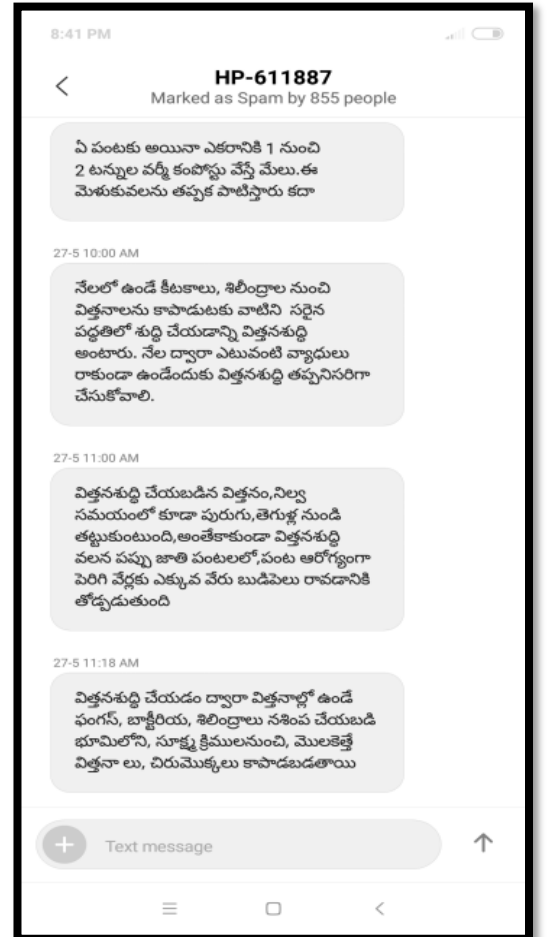
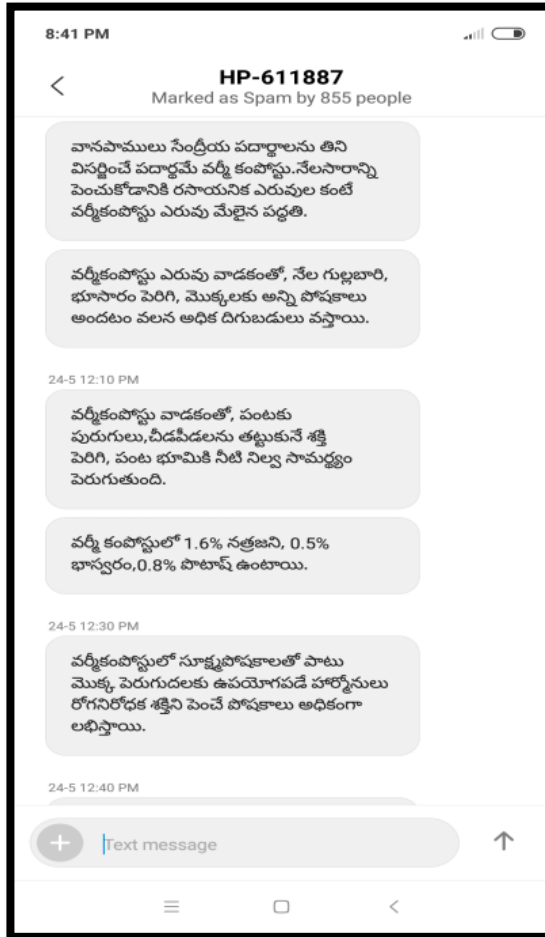
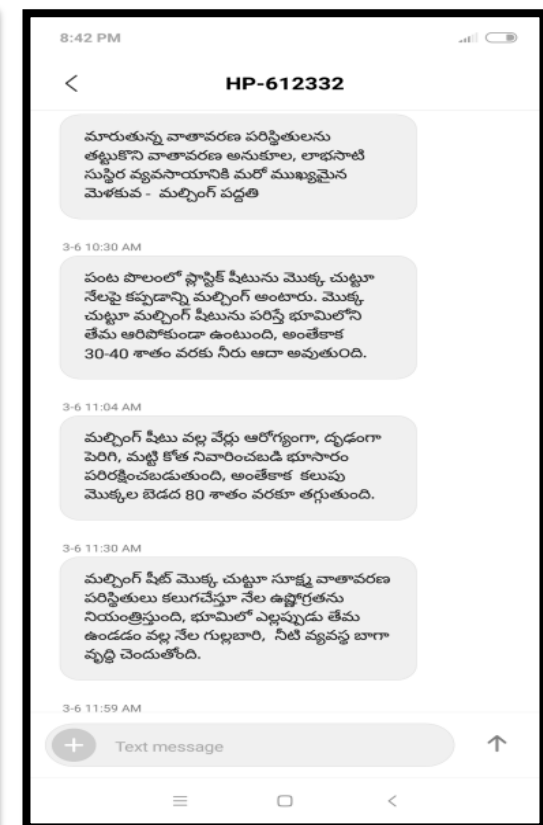
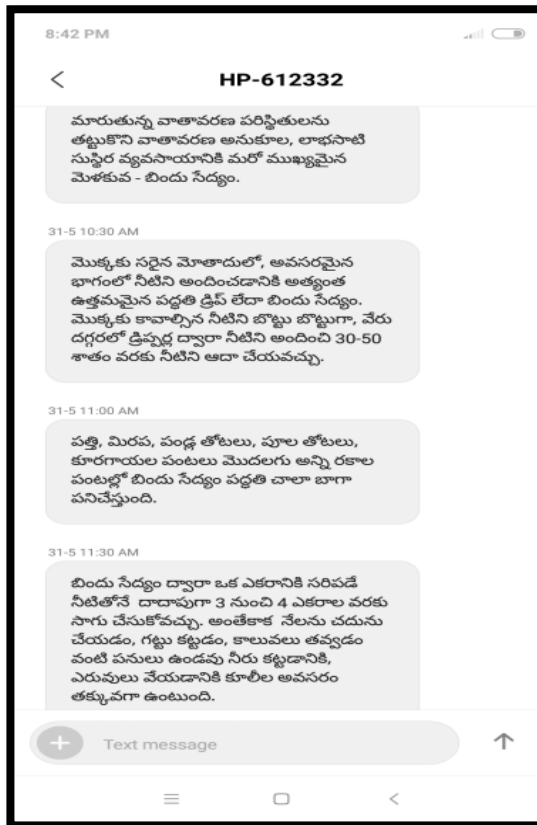
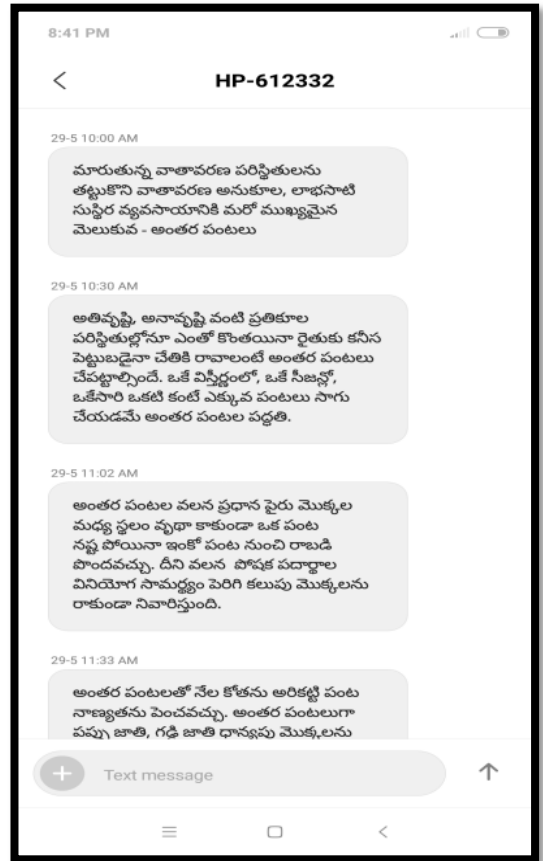
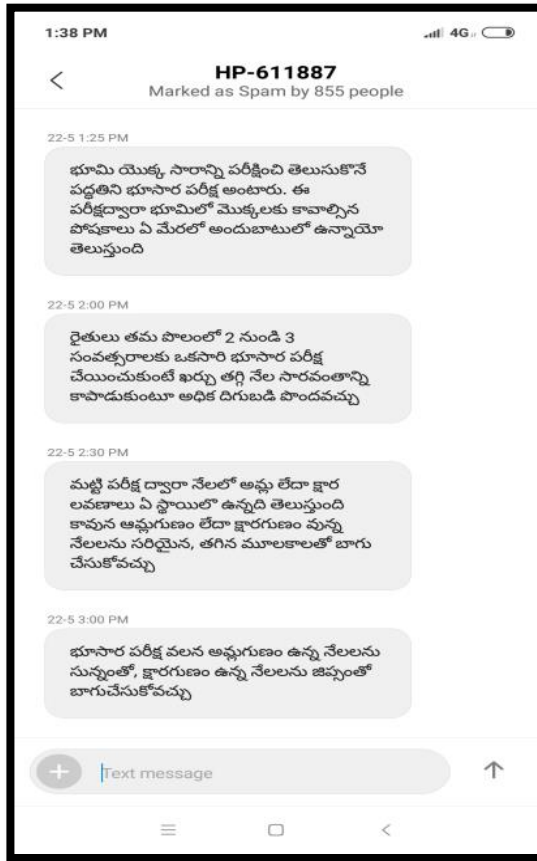


Plate 3.1. Audio recording processor on Intervention CSA adaptation practices through mobile phone applications





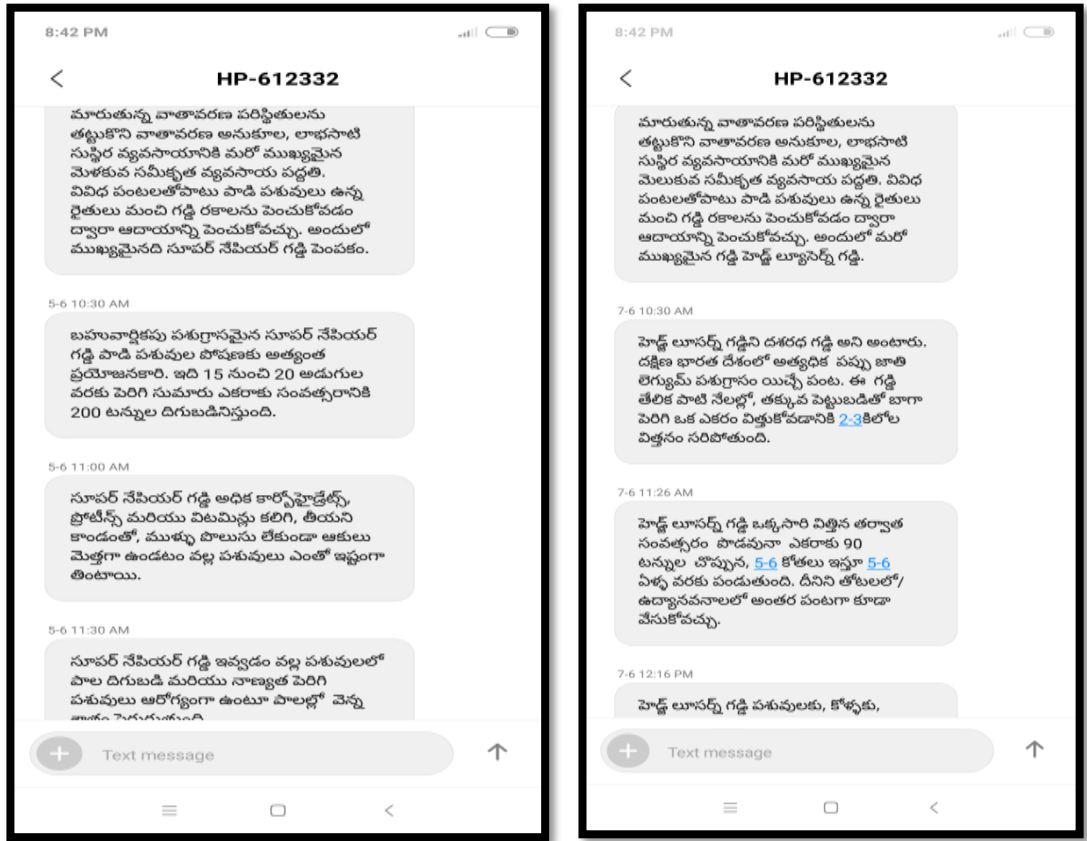


Figure 3.7. Text interventions for climate resilient adaptation by FWKGs

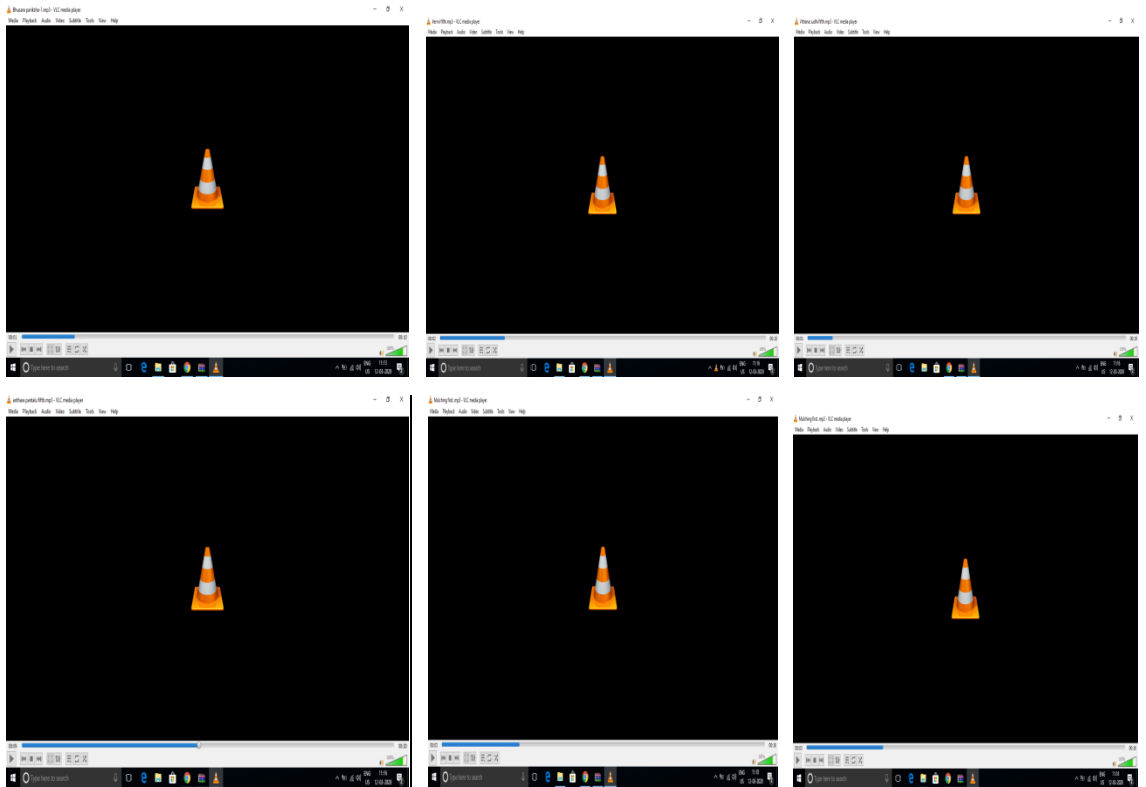


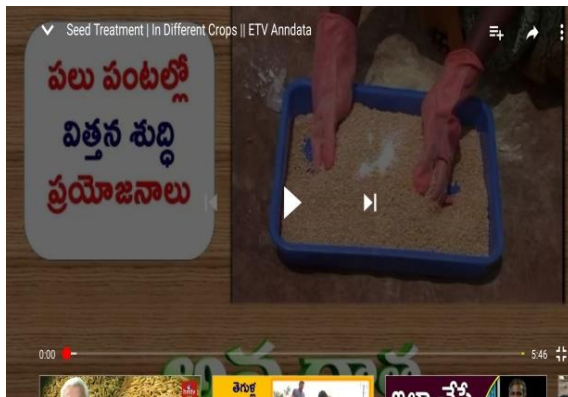
Figure 3.8. Audio interventions for climate resilient adaptation by FWKGs



Soil health test



Vermicomposting



Seed treatment



Intercropping



Drip irrigation system



Mulching



Super Napier



Hedge Lucerne

Figure 3.9. Video interventions for climate resilient adaptation by FWKGs

Farm women were asked to give their suggestions regarding short messages on climate smart agriculture adaptive strategies to cope with the drastic climate changes and their causes which were affecting the production by using SMScountry.com short messages processor given by on Appendix Part IV and SMS Delivery status Appendix Part V

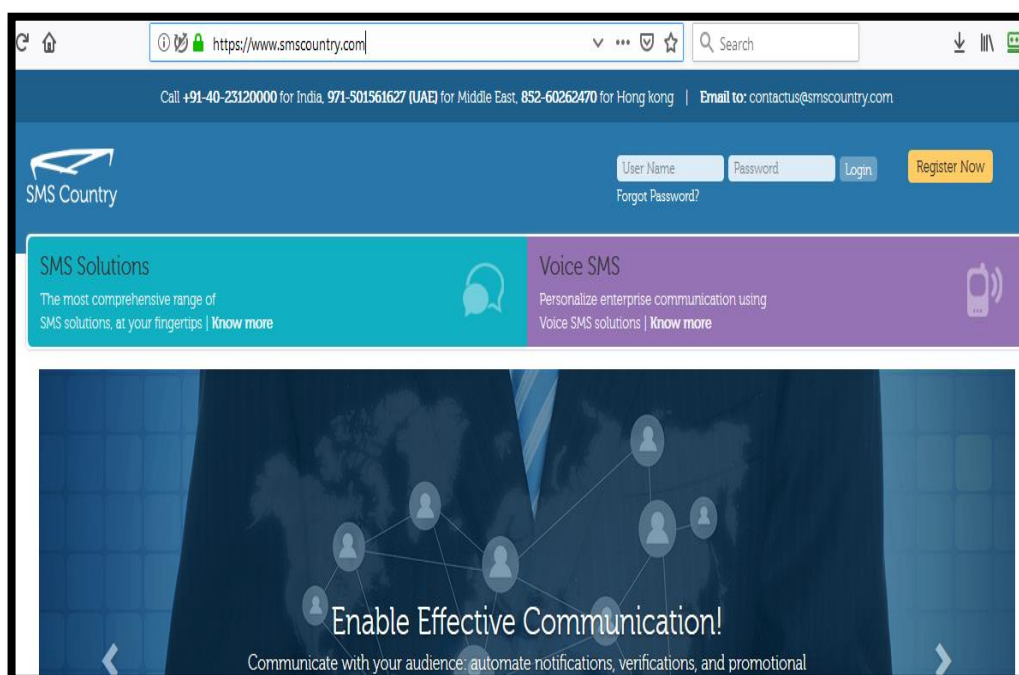


Figure 3.10. SMS country.com

3.4 Instruments of Data Collection:

Keeping in view the objectives and variables under study, an interview schedule was developed in consultation with the experts. The schedule was pre-tested in non-sample area and based on the pre-test results necessary modifications were made. The finalized schedule was used for data collection by personal interview method.

The schedule consisted of 7 parts.

Part I: Profile Characteristics of Farm Women

Part II: Profile Characteristics of Farm Women Knowledge Groups (FWKGs)

Part III: Knowledge of ICT

Part IV: Usage of ICT

Part V: Knowledge on Climate Smart Agriculture

Part VI: Awareness on Climate Smart Agriculture

Part VII: Empowerment

3.4.1 Reliability of the scale:

According to Mugenda and Mugenda (2003), the reliability of an instrument is the measure of the degree to which a research instrument yields consistent results or data after repeated trials. In order to test the reliability of the instrument to be used in the study, the test- retest method was used. The interview schedule was administered twice within an interval of two weeks after which an alpha coefficient reliability test was conducted and a reliability value of 0.87 was achieved for all the four study objectives. This was deemed to be suitable as advocated by Kothari (2004).

The same attitude scale was administered to the same 90 respondents after a lapse of 30 days. The coefficient of correlation between two sets of scores was obtained ($r=0.83$) and found to be significant at one percent level of probability. Hence the attitude scale was highly stable and dependent for measurement of attitude of farm women beneficiaries of farm women knowledge groups towards climate smart agriculture adaptive strategies.

3.4.2 Content validity of the scale

In the present study, the validity of the scale was examined with the help of content validity. According to Patton (2004) validity is the quality attributed to proposition or measures to the degree to which they conform to established knowledge or truth. An attitude scale is considered valid, for example, to the degree to which its results conform to other measures of possession of the attitude. Validity therefore refers to the extent to which an instrument can measure what it ought to measure.

It refers to the extent to which an instrument asks the right questions in terms of accuracy. Keeping in view of the specific objectives and different variables included in the study, a structured and comprehensive interview schedule was developed in consultation with experts, supervisors and professors from the department of foods and nutrition, department of statistics, department of soil science, department of entomology, department of agronomy, ARI and AICRP-IFS. Experts suggested indicating by tick or crossing for every item in the interview schedule if it measures what it is supposed to measure or not. The comments and suggestions made on the research instruments by different experts from their respective departments were done before the final data collection process took place. Most of the items included in the interview schedule were structured questions which were simple and easy to reply.



Plate 3.2. Content validation of interview schedule by experts from different departments

3.5 Tools and techniques used for data collection

3.5.1 Interview Schedule:

Interview is a face to face or one to one situation in which the interviewer gathers information about the individuals for research purpose.

Schedule is a set of questions with structured answers to guide an observer interviewer, researcher or investigator. It is a plan or guide line for investigation. In other words, the schedule is nothing but a list of questions which is necessary to test the hypothesis.

The device used for collecting data in the present study was interview schedule. The interview schedule was appended in Appendix-I.

3.5.2 Establishing rapport

Necessary rapport with the respondents was very important step as the respondents being farm women in the present research study. First few days were devoted to get acquainted with the respondents selected for the study, with the help of village organizations, self-help groups, village bookkeepers and local leaders. Later the investigator made informal and friendly visit to the farm women. In the light of difficulties encountered during the regular visits, the interview schedule was modified and made suitable changes. The final interview schedule prepared with suitable modification was appended in Appendix-I. All these methods helped the investigator in getting the cooperation in addition to valid and reliable information.

3.5.3 Methods of data collection

The data was collected by administering the structured interview schedule to the respondents. The questions were asked in local language i.e., Telugu. The women farmers were personally interviewed by the investigator which helped in getting the first hand information and gave an opportunity to observe the respondents personally. The response of each respondent was recorded in the interview schedule by the investigator with due care. Every effort was made to check and cross check the data collected from all the sample respondents.



Plate 3.3. Data collection from farm women by using Interview schedule

3.5.4 Preparation of report

The data collected through interview schedule was coded, tabulated, analyzed and presented in tables to make the findings meaningful and easily understandable. The findings emerged out of the data were suitably interpreted, discussed and necessary conclusions and inferences were drawn

3.6 Statistical analysis

The investigator interviewed all the selected farm women personally and the data were recorded directly on the schedule, which enabled her to get firsthand information and gave an opportunity to observe their reactions. Friendly atmosphere was maintained during the interview to see that the farm women were at ease and expressed their opinions freely, fairly and frankly.

Analysis means a critical examination of the assembled and grouped data for studying the characteristics of the object under study and for determining the patterns of relationships among the variables related to it. The relevant data collected from 90 farm women was tabulated and analyzed through simple frequencies, percentages, mean and standard deviation. The data gathered by using interview schedules presented in appropriate tables and figures and interpreted in results and discussion chapter. The collected data has been analyzed by the software statistical package for social science (SPSS) for interpretation and obtaining the results and conclusion of the study. The MS Excel was also used in data summarization process.

Keeping in view the objectives of the study and to draw logical conclusion, detailed statistical measures were used for interpreting the data in meaningful way. The various tests used were

- Arithmetic mean
- Frequency
- Percentage
- Standard deviation
- Analysis of variance
- Chi-square test
- ANOVA
- Correlation coefficient
- Paired 't' test

3.6.1 Arithmetic Mean:

The arithmetic mean is the quotient that results when sum of all the items in scores is divided by the number of items (n).

3.6.2 Frequency:

In statistics, the frequency (or absolute frequency) of an event is the number of times the event occurred in an experiment or study.

3.6.3 Percentage:

Percentages were used for standardization of size by calculating the number of individuals that would be in a given category if the total number of cases were 100.

3.6.4 Standard deviation:

The standard deviation is the square root of the mean of the sum of squares of the deviation taken from the mean of the distribution.

3.6.5 Analysis of Variance:

One-way ANOVA is used for measuring the significance of difference between four learning style modals in achieving learning.

3.6.6 Correlation coefficient:

It shows whether and how strongly pairs of variables are related. It was computed between different indicators.

3.6.7 Pearson's chi-square test:

Pearson's chi-square test was used to show association and comparison of proportions between variables. Chi-square test is a statistical measure used in the context of sampling analysis for comparing a variance to a theoretical variance.

3.6.8 Paired 't' test:

A paired t-test is a statistical procedure used to compare two population means where you have two samples in which observations in one sample can be paired with observations in the other sample.

Hypotheses

On the basis of objectives and variables incorporated the study, the following null hypotheses were framed for statistically confirming its acceptance.

H₀A1: There exists no significant association between awareness of farm women on soil management and selected independent variables of the study.

H₀A2: There exists no significant association between awareness of farm women on crop management and selected independent variables of the study.

H₀A3: There exists no significant association between awareness of farm women on water management and selected independent variables of the study.

H₀A4: There exists no significant association between awareness of farm women on livestock management and selected independent variables of the study.

H₀A5: There exists no significant association between awareness of farm women on agro-diversification management and selected independent variables of the study.

H₀B1: There exists no relationship between Farm Women Knowledge Groups on village hire adaptation strategies.

H₀B2: There exists no relationship between Farm Women Knowledge Groups on adaptation strategies with regard to Mobile phones.

3.6 Conceptual framework of the study

A conceptual framework or schematic model is a diagrammatic outlining the dominant elements of a system and their inter-relationship with respect to criterion variable (East West Centre, 1977).

In the light of the inference derived from evidences in the literature, conceptual framework has thus established which represents the important dimensions and postulated relationships among the variables. Dependent and independent variables were chosen based on the review of literature and in consultation with experts to critically examine the (nature and context of relationship) initiatives for empowerment, the extent of empowerment of farm women (Fig 3.13) which represents conceptual model for the study.

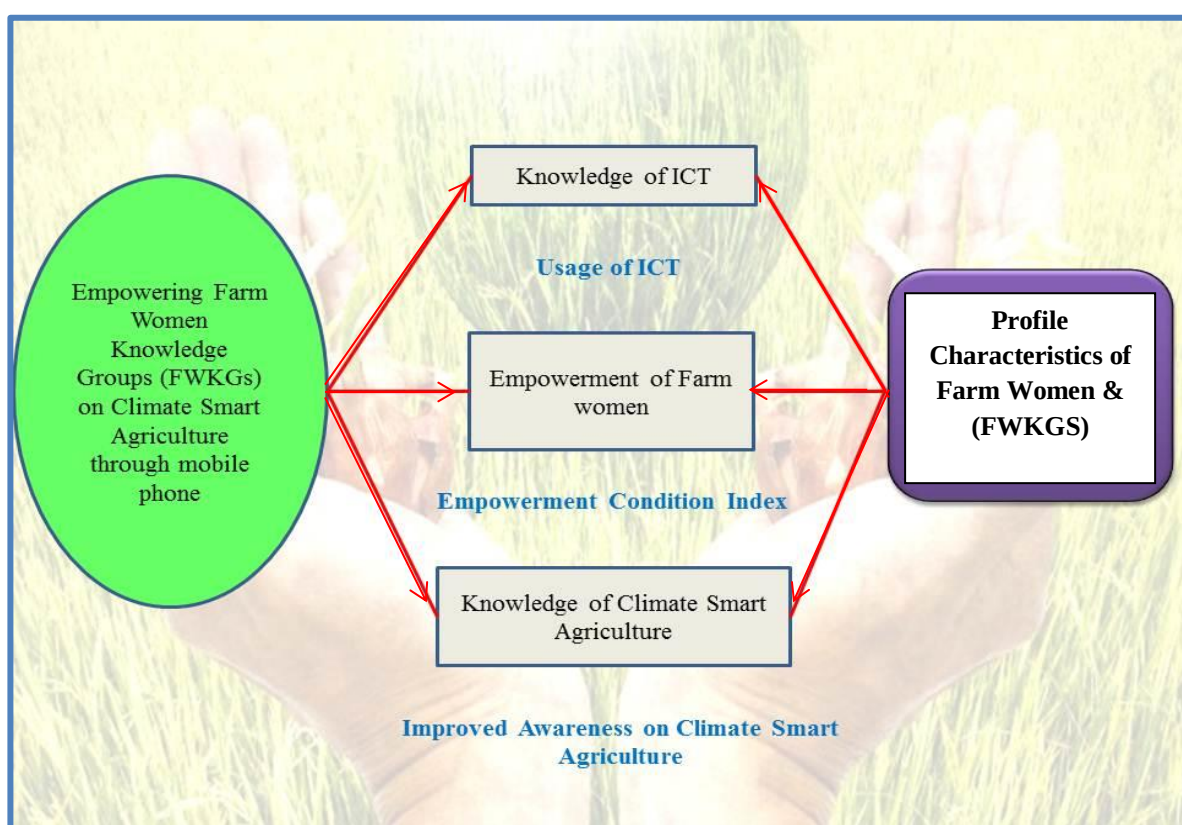


Figure 3.11. Conceptual Model of the study

CHAPTER IV

RESULTS AND DISCUSSION

The findings of the study on “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile Phones,” are presented and discussed in this chapter. The findings are presented under the following subheadings.

- 4.1 General profile of farm women
- 4.2 Knowledge and utilization of Information and Communication Technologies (ICTs) by farm women
- 4.3 Attitude of farm women towards Information and Communication Technologies (ICTs)
- 4.4 Formation of village wise Farm Women Knowledge Groups (FWKGs)
- 4.5 Profile characteristics of Farm Women Knowledge Groups (FWKGs)
- 4.6 Knowledge and usage of mobile phones by Farm Women Knowledge Groups (FWKGs)
- 4.7 Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Change
- 4.8 Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture
- 4.9 Knowledge index of Farm Women Knowledge Groups (FWKGs) on adaptation strategies for Climate Smart Agriculture
- 4.10 Intervention on usage of mobile phone applications for climate smart agriculture among Farm Women Knowledge Groups (FWKGs)
- 4.11 Impact of mobile phone applications intervention for climate smart agriculture among the Farm Women Knowledge Groups (FWKGs)
- 4.12 Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

4.1 General Profile of Farm Women

A situational analysis was done with 120 farm women selected randomly, who are actively involved in farming, from the six operational villages of All India Coordinate Research Project on Home AICRP-HSc) to study their profile characteristics. Profile of farm women were studied under the following heads viz. Personal - age, educational qualification, marital status, size of family, type of family, family occupation, farm women occupation,

annual income, land holding, cultivable land, work experience, main crop in cultivation, source of agriculture information about farming, organizational participation and frequency of contact with extension personnel. The data was tabulated, presented and discussed below.

Table 4.1.1. Distribution of farm women respondent by age (n=120)

Age groups	Frequency (N)	Percentage (%)
Young age - 18-35 years	45	37.50
Middle age - 36-50 years	52	43.33
Old age - > 50 years	23	19.17
Total	120	100.00
Mean±S.D	34.81±9.7	

It was operationalized as the number of years completed by the farm women respondents at the time of interview. Based on the age, the respondents were grouped as young, middle age and old age as distributed in table 4.1.1 and figure 4.1.1

Majority 43.33 per cent of the farm women are under middle age group i.e, between 36-50 years, followed by 37.50 per cent in young age group i.e. 18-35 years, while 19.17 per cent farm women were in the age group of above 50 years. From this, it was evident that majority 80.83% of the agricultural activities were being done by farm women who are young to middle aged women in the age group of 18 years to 50 years. Santhi and Kalirajan (2019) that reported nearly half of the farm women 46.67 per cent were under middle age category.

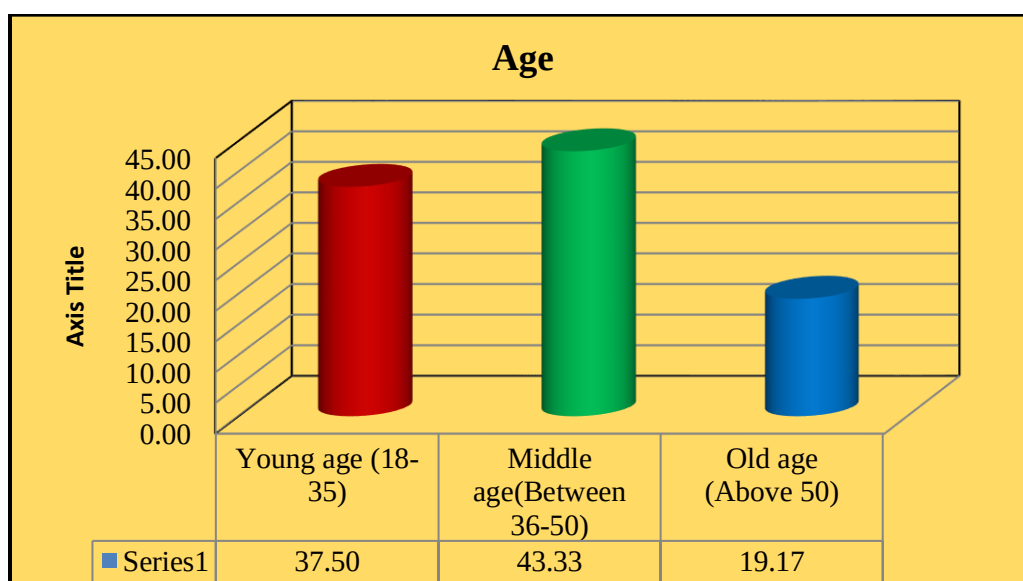


Figure 4.1.1. Distribution of farm women respondents by age

Table 4.1.2. Distribution of farm women respondents according to their Educational status

(n=120)		
Educational status	Frequency (N)	Percentage (%)
Illiterate	39	32.50
Primary School	13	10.83
Middle School/ Upper Primary School	18	15.00
High School	24	20.00
Intermediate	22	18.33
Graduation & Above	4	3.33
Total	120	100.00
Mean $\pm$ S.D	3.63 $\pm$ 1.42	

Educational status of the respondents was operationalized as the formal education undergone. The education level of farm women given in the table 4.1.2 and figure 4.1.2 nearly 33 percent (32.50%) of the farm women were illiterates, while 20 percent of farm women had completed their high school education followed by (18.33%) intermediate education while 15 percent and 11 percent of farm women had middle and 10.83 percent had primary level of education. Only least number of (3.33%) completed their graduation and above level of education. The results were in consonance with the findings of Bansal and Joshi (2018) who reported that one- thirds of the respondents (37.50%) had middle level of education.

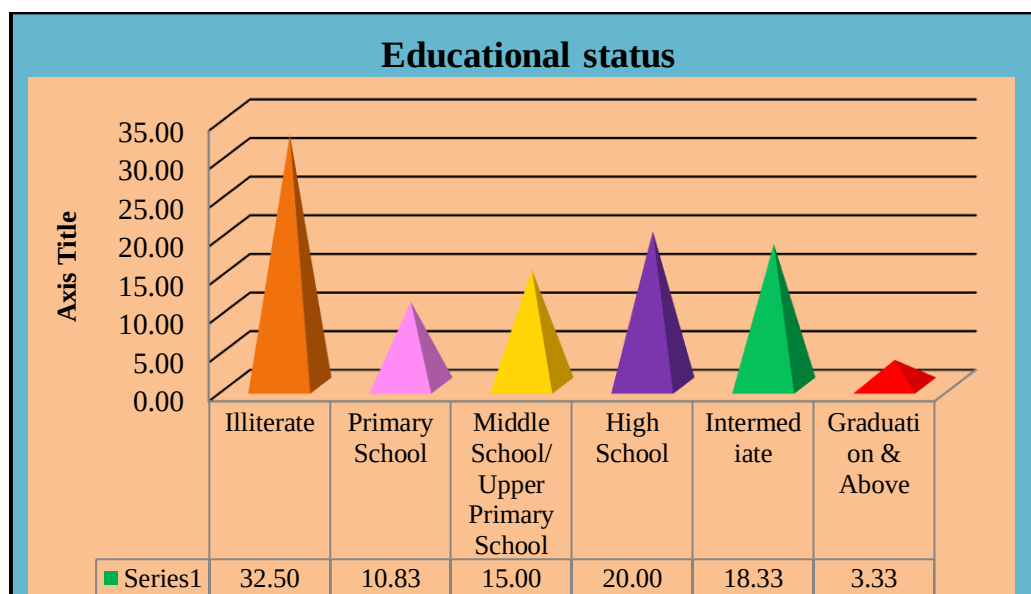


Figure 4.1.2. Distribution of farm women respondents according to their educational status

Table 4.1.3. Distribution of farm women respondents by marital status (n=120)

Marital status	Frequency (N)	Percentage (%)
Married	104	86.67
Unmarried	2	1.67
Widow/Divorced	14	11.67
Total	120	100.00
Mean±S.D	34.81±9.7	

It can be seen from table and figure 4.1.3 that highest (86.67%) percentage of farm women were married while 11.67 percent of them were widows and only a negligible percent of them (1.67%) were unmarried. Agriculture is the backbone of our country and women play a crucial role in agriculture and allied sectors. Married women and widows in the rural areas were involved in various labour intensive agricultural operations like weeding, hoeing, grass cutting, picking and harvesting.

Studies of Bansal and Joshi (2018) also reported that 80 percent of farm women were married and had farming (81%) as their main occupation.

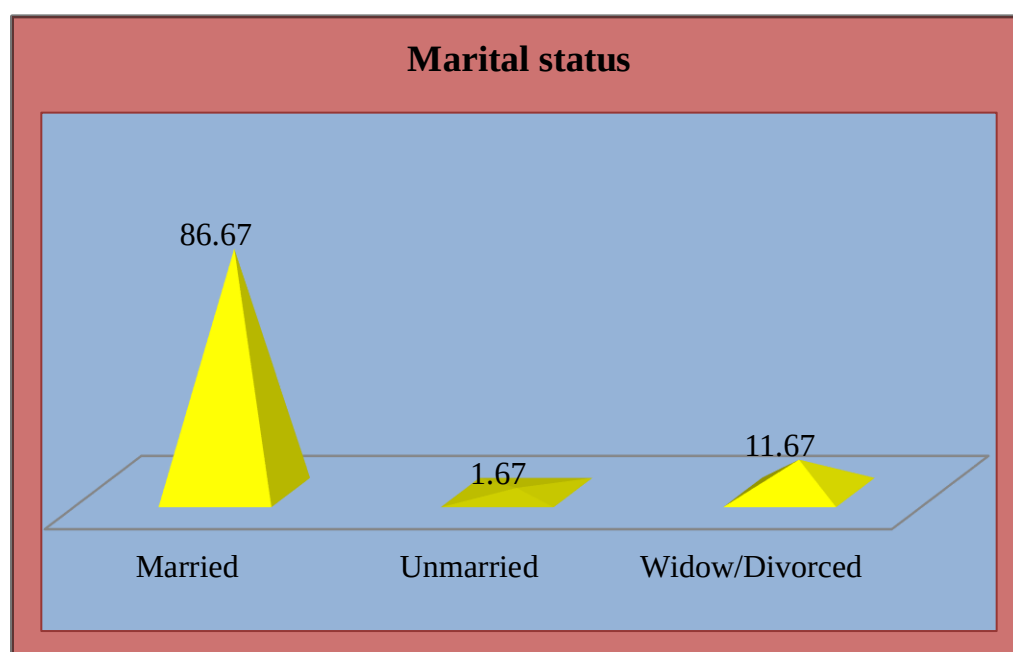


Figure 4.1.3. Distribution of farm women respondents by marital status

**Table 4.1.4. Distribution of farm women respondents by family size
(n=120)**

Family size	Frequency (N)	Percentage (%)
Small (less than 5 member)	101	84.17
Medium (5-7 member)	13	10.83
Large (7-9 member)	6	5.00
Total	120	100.00
Mean + S.D	2.96+1.3	

From Table and Figure 4.1.4 the results revealed that 84.17 per cent of the farm women belonged to small family category with less than five members in the family followed by medium category (5-7 member) in the family (10.83%) and only 5 percent of farm women belonged to large level category (7-9 members) in the family in line with viewing the reductions of joint and large families in now- a- day's societies.

Results were in the line of Upadhyay and Desai (2011) reported that majority (68.33%) of the farm women were from big family (more than 4 members), followed by small family (up to 4 members) 31.87 per cent. Due to Government policies and cost of living, more and more number of families having small families with one or two children. Apart from this, due to increasing demand for nuclear families and decreasing of joint families, the rate of number of children was also come down.

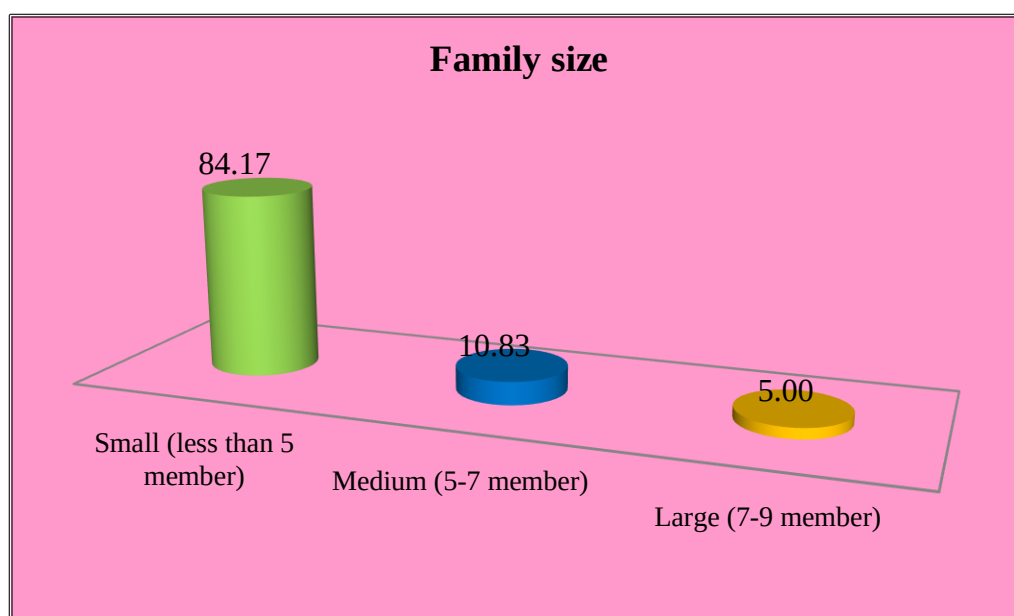


Figure 4.1.4. Distribution of farm women respondents by family size

Table 4.1.5. Distribution of farm women respondents according to type of family (n=120)

	Frequency (N)	Percentage (%)
Nuclear family	108	90.00
Joint family	12	10.00
Total	120	100.00
Mean $\pm$ S.D	1.10 $\pm$ 0.30	

90 percent of farm women belonged to nuclear families. Only 10 percent of farm women as shown table and figure 4.1.5 are from joint families indicating the decline of joint family system in Indian families. Dayya and Bansal (2016) reported that 48 percent of the farm women belonged to medium family size.

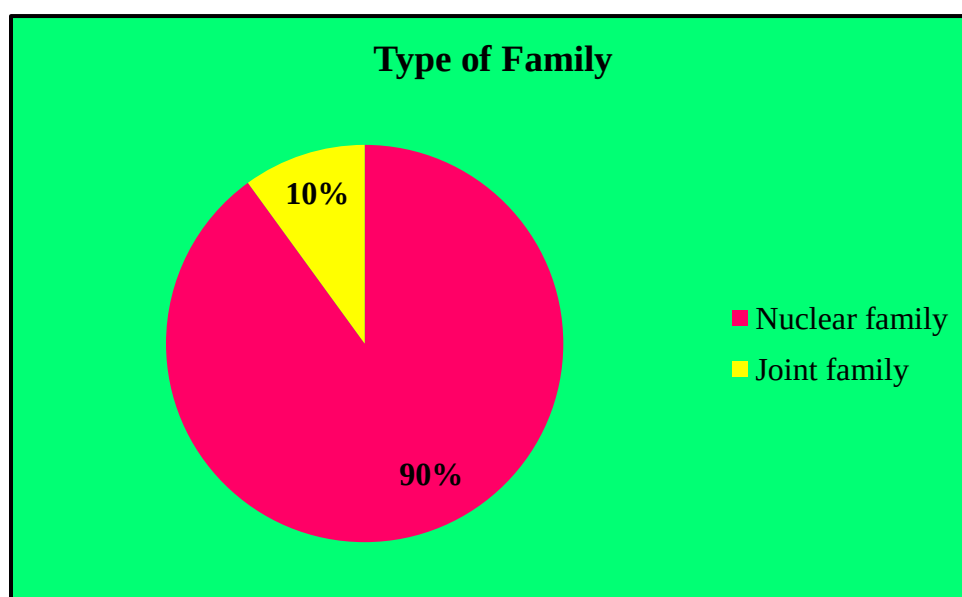


Figure 4.1.5. Distribution of farm women respondents by family type

Table 4.1.6. Distribution of farm women respondents by occupation of the family (n=120)

Family occupation	Frequency (N)	Percentage (%)
Farming	54	45.00
Farming and service	24	20.00
Farming and business	31	25.83
Farming and dailywage earner	11	9.17
Total	120	100.00
Mean $\pm$ S.D	3.01 $\pm$ 1.04	

Based on distribution of farm women family occupation, majority (45.00%) of the farm women practiced farming followed by 25.83 per cent practicing farming along with business, 20 percent practicing farming along with service, while farming with daily wage earnings was the least (9.17%) practiced by farm women It may be due to the interest of farm women to take up family occupation showing their active involvement in farming in one or other ways (Table & Fig 4.1.6)

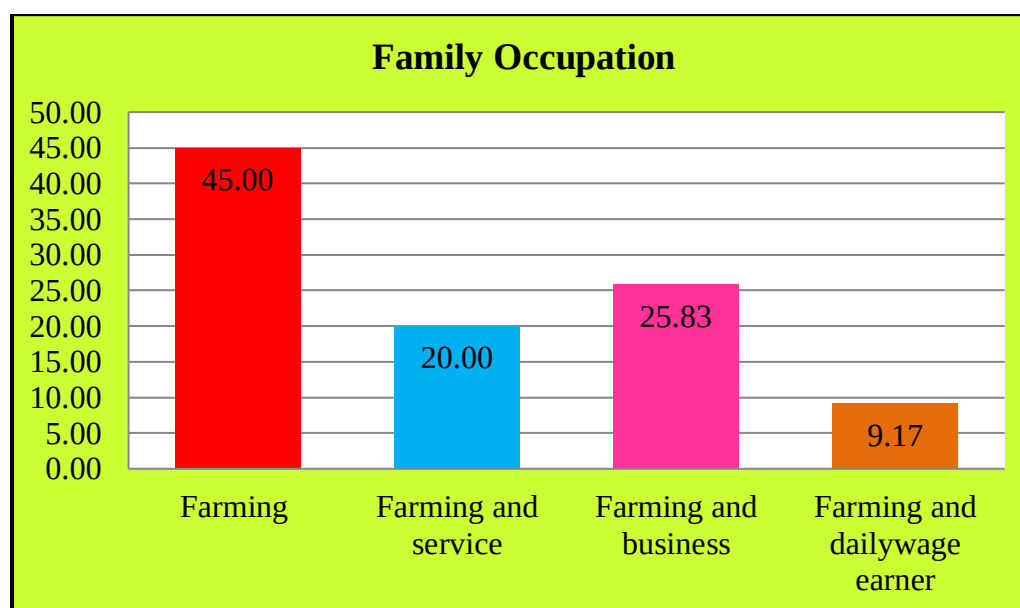


Figure 4.1.6. Farm women respondents by occupation of the family

Table 4.1.7. Distribution of farm women respondents by occupation (n=120)

Farm women occupation	Frequency (N)	Percentage (%)
Farming	57	47.50
Farming and service	19	15.83
Farming and business	27	22.50
Farming and daily wage earner	17	14.17
Total	120	100.00
Mean $\pm$ S.D	3.50 $\pm$ 0.89	

From the distribution of Table & Fig 4.1.7 Occupation of the farm women revealed that farming activity was engaged by the most (47.50%). Dayya and Bansal (2016), Paliwa and Maheshwari (2015) also reported the identical outcomes that the family occupation of all the respondents (100%) was farming. Farming along with business was next followed occupation (22.50%) of the farm women and almost equal percentage of the farm women

were engaged in farming along with service (15.8%) and farming cum daily wage earning (14.2%). From the study, it was evident that farm women were engaged in farming in one or other way showing the importance towards the family's earlier living style. It would be concluded that farming is the major occupation for the beneficiaries.

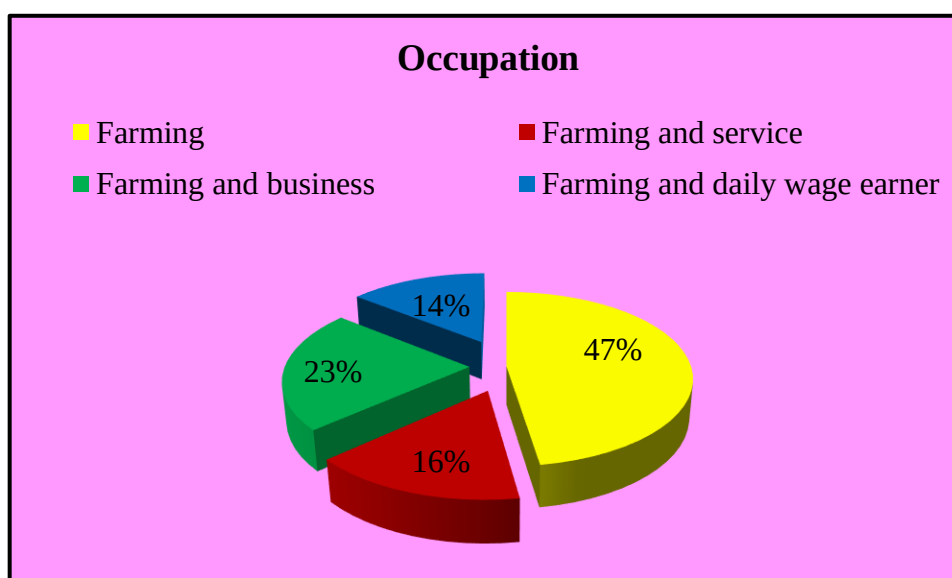


Figure 4.1.7. Distribution of farm women respondents by occupation

Table 4.1.8. Distribution of respondents according to their annual income (n=120)

Income levels	Frequency (N)	Percentage (%)
Low (50,000-1,0000)	49	40.83
Medium (1,0000-1,50,000)	54	45.00
High (Above 1,50,000)	17	14.17
Total	120	100.00
Mean $\pm$ S.D	1.73 $\pm$ 0.69	

Table and Fig 4.1.8 indicates that 45.00 percent of the overall respondents had medium income group and 40.83 percent had low income group followed by 14.17 percent had high-income group. Thus, it can be concluded that majority of the respondents had medium estimated income between (1,0000-1,50,000) followed by respondents having low estimated annual income and higher income group respondents.

This result matched with the Khuspe and Kadam (2012) reported majority of the respondents (76.66%) having medium annual income, 15.01 percent of respondents having high annual income, while (8.33%) respondents having low annual income.

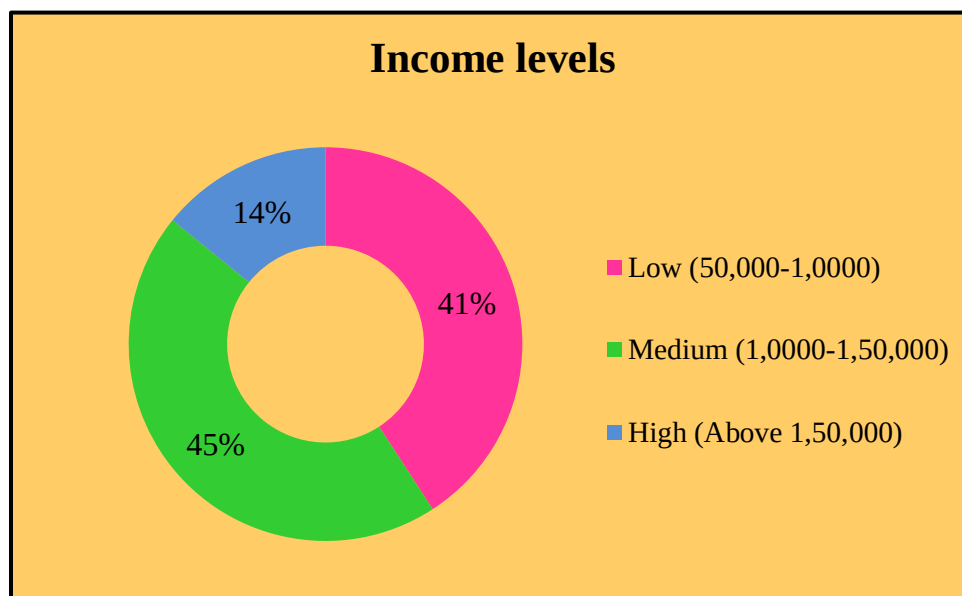


Figure 4.1.8. Distribution of respondents according to their annual income

Table 4.1.9. Distribution of farm women respondents by land holding (n=120)

Land holding	Frequency (N)	Percentage (%)
Landless	2	1.67
Marginal (below 0.01 acres)	23	19.17
Small (0.01-2.5 acres)	37	30.83
Medium (above 2.5 -7 acres)	42	35.00
Large (above 7 acres)	16	13.33
Total	120	100.00
Mean $\pm$ S.D	3.39 $\pm$ 0.99	

It is clear from the (Table and Fig 4.1.9) that thirty-five per cent of the farm women were holding medium land size for farming followed by small (30.83%) and marginal (19.17%) land holdings. Only 13.33 per cent of the farm women were having large land holding i.e., above 7 acres of land, whereas landless farm women were only 1.67 percent from the sample.

The findings of the study are in conformity with Anurag and Kumar (2012) in their study who also reported that majority of respondents were marginal and small. India possesses only 11 per cent of the world's arable land whereas the average size of the operational holdings declined to 1.16 ha. In 2010-11 from 1.23 ha in 2005-06. Share of female operational holders increased from 11.70 per cent in 2005-06 to 12.79 percent in 2010-11 (Agriculture census of India, 2012).

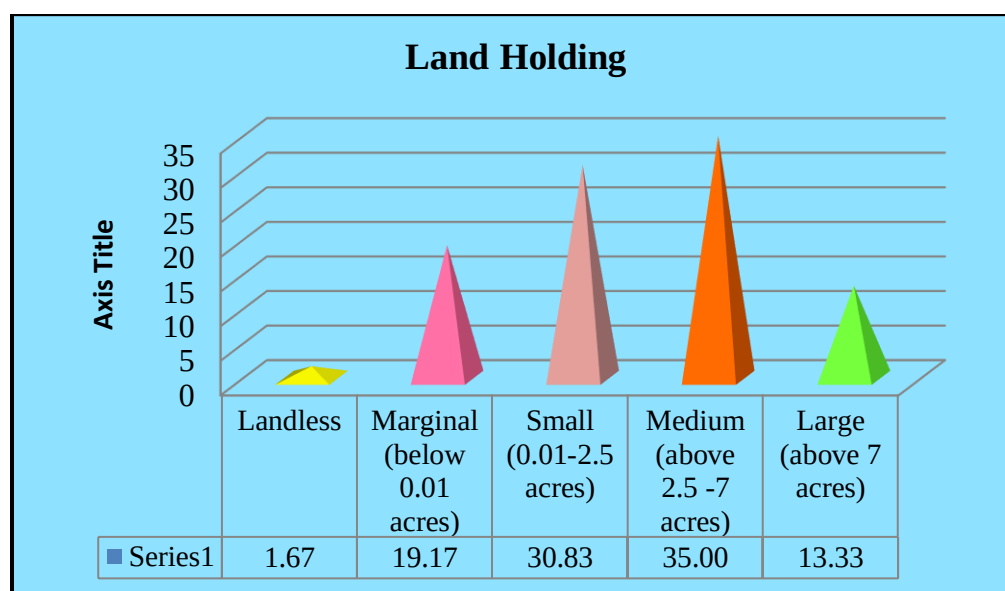


Figure 4.1.9. Distribution of farm women respondents by land holding

Table 4.1.10. Distribution of farm women respondents by cultivable land (n=120)

Cultivable land	Frequency (N)	Percentage (%)
Both own and leased	16	13.33
Leased	5	4.17
Own	99	82.50
Total	120	100.00
Mean + S.D	2.69±0.69	

According to cultivable land among the farmers, it was observed that highest number (82.5%) of farm women were having own lands while leased lands were found only among negligible farm women (4.17%) (Table and Figure 4.1.10).

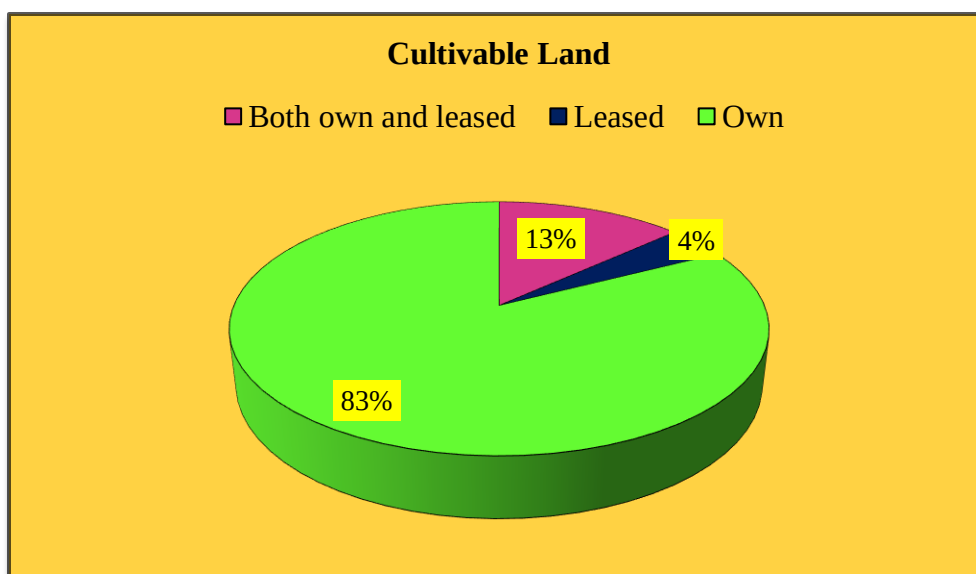


Figure 4.1.10. Distribution of farm women respondents by cultivable land

Table 4.1.11. Distribution of farm women respondents by work experience (n=120)

Work experience	Frequency (N)	Percentage (%)
0-10 years	36	30.00
10-20 years	44	36.66
20- 30 years	24	20.00
Above 30 years	16	13.34
Total	120	100.00
Mean±S.D	15.01±9.4	

With reference to distribution of farm women by work experience in farming, majority (36.66%) of the farm women were having between 10-20 years of work experience and near about 30percent of farm women were having above 0-10 years of work experience, whereas 20 per cent of farm women were having 20-30 years of work experience in farming, while only 13 per cent of farm women were having work experience of 30 years and above (Table & Fig 4.1.11). The present findings were in contrast with findings reported by Rathod *et al.* (2015). It was reported that more than three fourths (84%) of the farm women were having 0-30 years of farming experience.

Hence it can be concluded that the findings of the study were in line with the study conducted by Santhi and Kalirajan (2019) which revealed that majority of the farm women were in middle - age category, with middle level of education, nuclear family type,

agriculture as their major occupation, medium level of farming experience, information source utilization, innovativeness, risk orientation, economic motivation, self-confidence, with low level of extension agency contact, with positive attitude towards farming and low level of socio-economic status

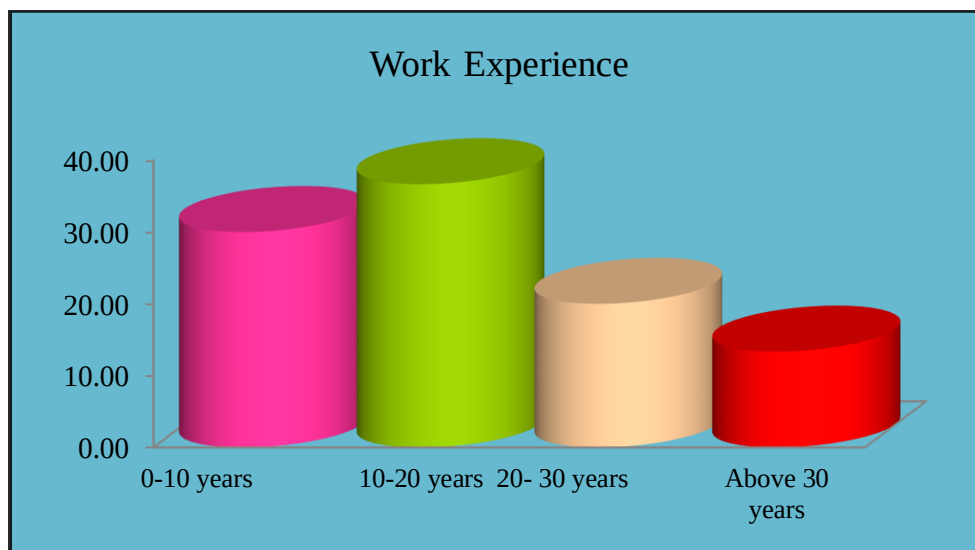


Figure 4.1.11. Distribution of farm women respondents by work experience

Table 4.1.12. Distribution of farmwomen respondents according to cultivation of main crops

(n=120)	
Main crops	Frequency (%)
Cereals (paddy, maize)	95 (79.17)
Pulses (red gram dhal)	67 (55.83)
Flowers (Chrysanthemum, lily, jasmine and rose)	80 (66.67)
Vegetables (all types)	92 (76.67)
Cotton	105 (87.50)

Table 4.1.12 indicates the main crops cultivated in the selected locale by the farm women. It is disclosed that cotton was the major crop grown (87.50%) by the farm women followed by cereals (79.17%) such as paddy and maize. Vegetables (76.67%) and flowers (66.67%) were other main crops grown while pulses (55.83%) were the less grown crops by farm women indicating the shortage of irrigation water facilities in the region leading to the

low production and requirement of awareness and activities for conservation of water as well as climate resilient strategies to be implemented in the region. As this region of Telangana is rainfed due to erratic distribution of rain fall, areas are subjected to drought. In the state, 63 percent of the crop is rain fed, which is exposed to the hostilities of climate. 84 percent of the irrigated area is through bore wells and dug wells. Awareness and knowledge are improving water use efficiency is very important and urgent actions were required, as about 85 percent of farmers are either marginal or small with fragmented land holding (Ref: Raji reddy 1971, PJTSAU)

Table 4.1.13. Distribution of farmwomen respondents' source of agricultural information about farming

(n=120)	
Source of agricultural information	Frequency (%)
Traditional Knowledge	120 (100.00)
News paper	28 (23.33)
KrishiVignanKendra (KVKs)	12 (10.00)
Agricultural University	30 (25.00)
Climate related agricultural Counseling	00
Agricultural Extension Officer (AEO)	52 (43.33)
Television (TV)	58 (48.33)
Radio	35 (29.17)
Mobile phone	34 (28.33)
Family members (traditional knowledge)	120 (100.00)
Neighbors	98 (81.66)

Table 4.1.13 indicates that cent per cent (100%) of information about farming was received through traditional knowledge through family members by farm women. As most of the farm women were from traditional farming background and their ancestors were involved usually in farming as India is an agrarian society. Next by neighbors (81.66%).The neighbors play a greater role in farming in Indian agriculture and influence the farmwomen. Almost 48

per cent of farm women were getting farming related information from television and Agricultural Extension Officer (AEO) (43.33%). Farming information received from radio is about 29 percent and mobile phones was about 28 percent, while only minimal (10%) percent of farm women were getting information from Krishi Vignan Kendra (KVKs) as there are no KVKs working nearby locale of the study.

The findings were in coincidence with Paliwal and Maheswari (2015) in their study on access and utilization of Information and Communication Technologies who explored that all the respondents (100%) had accessed and utilized TV and Mobile Phone daily for their agriculture related information. While the findings were in disparity with Syiem and Raj (2015) from their study who found that level of access and usage of ICTs among farmers of Meghalaya that (100%), all the farmers owned mobile phones as well as television and radio and the most frequently used ICT was mobile phone.

Table 4.1.14. Percent distribution of farm women respondents according to their organizational participation

(n=120)			
Organizational participation	Regularly F (%)	Occasionally F (%)	Never F (%)
Self Help Groups	98 (81.67)	16 (13.33)	6 (5.00)
Anganwadi centre	59 (49.17)	35 (29.17)	26 (21.67)
Mahila mandal	11 (9.17)	31 (25.83)	78 (65.00)
Gram Panchayat	34 (28.33)	62 (51.67)	24 (20.00)
Mandal/block Panchayat	29 (24.17)	37 (30.83)	54 (45.00)
Zilla Panchayat	24 (20.00)	34 (28.33)	62 (51.66)
Farmers organization	26 (21.67)	43 (35.83)	51 (42.50)
Mean	30.36	25.59	29.76
SD	24.47	11.54	20.94

Table 4.1.14 and Figure 4.1.12 reveals that the regularity of farm women's participation in different organisations. Majority of the farmwomen (81.67%) were participating actively in Self-Help Groups (SHGs) on regular basis as active members of SHGs. The SHGs movement is very strong in combined Andhra Pradesh State and now in

Telangana State. This is followed by Anganwadi Centre (49.17%) as they have children between the age group of 2-5 year, followed by Gram Panchayat meetings (28.33%), Mandal/block Panchayat (24.17%), Farmer's organization (21.67%) and Zilla Panchayat (20 percent). With the advent of 73rd amendment to the constitution of India, a large number of woman entrants came into the political arena as elected representative with the one third representation at all the three levels of grass root organizations of local bodies viz. Gram Panchayat, Mandal/block Panchayat and Zilla Parishad. So many farm women became Sarpanch/presidents, Mandal or block presidents and Zilla Parishad presidents and ward members. Hence they are representing as office bearer. Apart from this they were also in local committees. Only small number (20%) of farm women were participating in Mahila Mandals as there are no Mahila mandals in the state after initiation of SHGs by the DRDA (District Rural Development Agency) and SERP (Society for Elimination of Rural Poverty) and with the World Bank initiated pilot projects. This percentage may be the older farmwomen who might have participated when they are young. Bansal and Joshi (2018) in the study reported that more than half of the farm women were participating regularly in self-help groups, very few of them (4-8%) in Anganwadi centre and Gram Panchayat while a majority of them (79-100%) didn't have any participation in other organization viz. Mahila Mandal, Zilla Panchayat and Mandal panchayat.

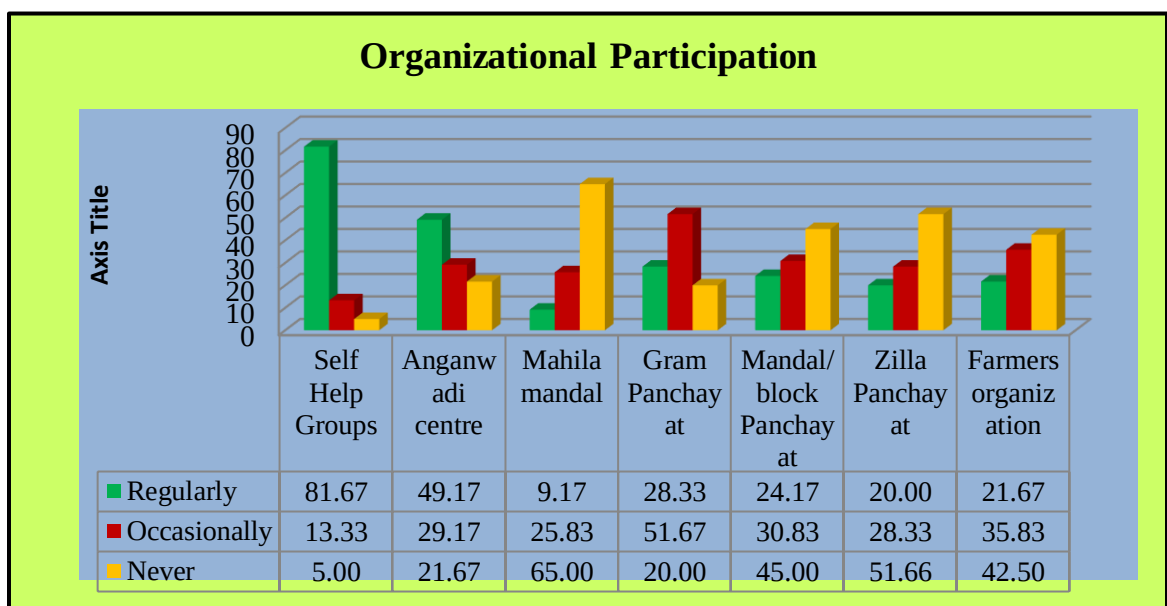


Figure 4.1.12. Percent distribution of farm women respondents according to their organizational participation

Table 4.1.15. Total number of frequency farm women respondents according to their organizational participation

(n=120)

S.No	Organizational participation	Frequency	Percentage
1	High	281	33.45
2	Medium	258	30.71
3	Low	301	35.83
Total		840	100.00

120*7=840

The results from of table 4.1.15 and fig 4.1.13 indicate that majority (35.83%) of the respondents had low level organizational participation. However it was found that organizational participation was found to be high among (33.45%) percent and medium among (30.71%) percent this can attributed due presence of SHG group leaders, Anganwadi teachers, ASHA workers, Village Sarpanch and educated farm women respondents.

Findings are consistent with study made by Bandi and joshi (2007) revealed that (79.00%), (12.00%), (9.00%) farm women respondents showed moderate, less and high level of organizational participation respectively.

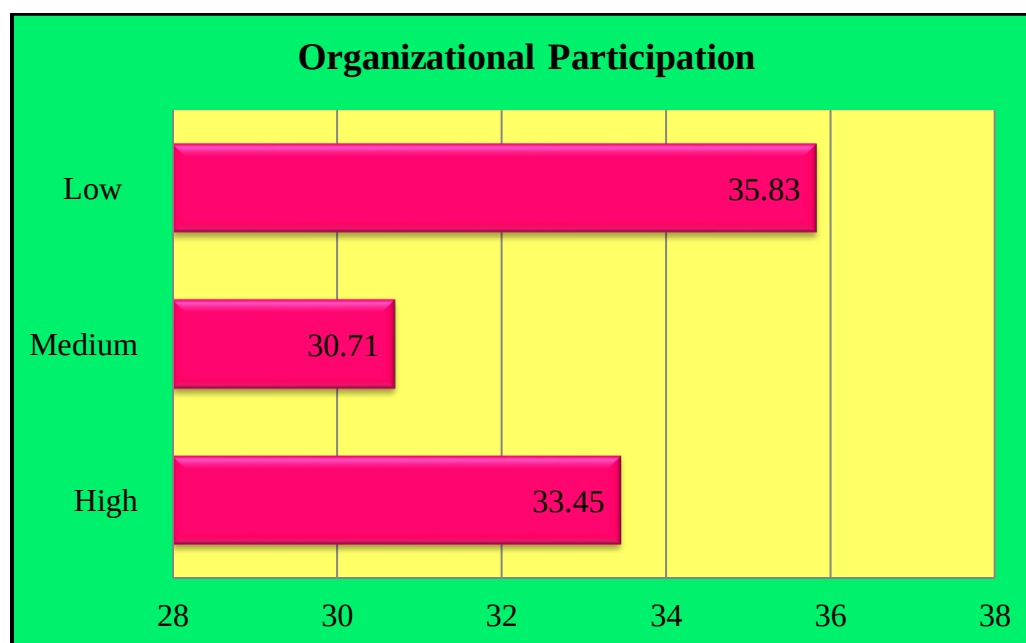


Figure 4.1.13. Total number of frequency farm women respondents according to their organizational participation

Table 4.1.16. Distribution of farm women respondents according to frequency of contact with extension personnel

(n=120)

Extension personnel	Regularly F (%)	Occasionally F (%)	Never F (%)
Village Level Extension Worker	34 (28.33)	74 (61.67)	12 (10.00)
Agriculture Extension Officer (AEO)	30 (25.00)	75 (62.50)	15 (12.50)
Extension officer (ICDS)	33 (27.50)	62 (51.67)	25 (20.83)
Farmers organizations	34 (28.33)	70 (58.33)	16 (13.33)
Community coordinator (SHGs)	82 (68.33)	30 (25.00)	8 (6.67)
Anganwadi Worker	70 (58.33)	33 (27.50)	17 (14.17)
University personnel	10 (8.33)	28 (23.33)	82 (68.33)
NGOs Personnel	14 (11.67)	20 (16.67)	86 (71.67)
Bank Personnel	46 (38.33)	53 (44.17)	21 (17.50)
Block personnel (MDO & MRO)	27 (22.50)	80 (66.67)	13 (10.83)
Mean	38.00	52.50	29.50
SD	22.67	22.76	29.11

With regard to frequency of farm women contacts with extension personnel, majority of the farm women were in regular contact with Community Coordinators (68.33%) of Self-Help Groups of Government and Anganwadi workers of Department of Integrated Child Development Scheme (58.33%). Self Help Group (SHG) formed by the Government under the Society for Elimination of Rural Poverty (SERP) is a strong body with effective organization structure with continuous monitoring and evaluation. The mission and vision of SERP is to empower the disadvantaged communities to overcome all social, economic, cultural and psychological barriers through self-managed organizations called Self Help Group (SHG). Hence there is continuous handhold and participation in Self Help Group (SHGs).

Regular Contact with extension personnel was only 25 percent and nearly 50 percent are on occasional contact. As the Government of Telangana was active with Raithu Bandhu scheme', farmers and farm women were in contact with them (58.33). With University Personnel only 8 percent of them had regular contact while 23 percent had occasional contact. This is due to AICRP-Home Science. Project's operational villages (Table 4.1.16 and Figure 4.1.14).

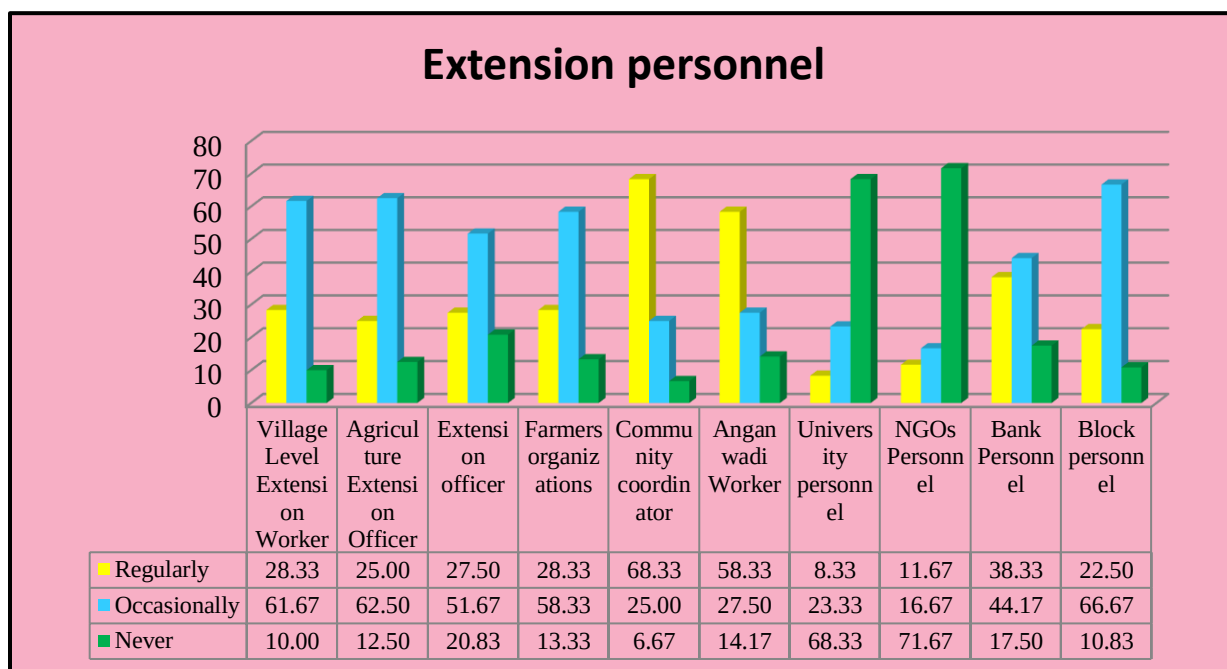


Figure 4.1.14. Distribution of farm women respondents according to frequency of contact with extension personnel

Table 4.1.17. Total number of frequency farm women respondents according to frequency of contact with extension personnel

(n=120)

S.No	Extension personnel	Frequency	Percentage
1	High	380	31.67
2	Medium	525	43.75
3	Low	295	24.58
	Total	1200	100.00

$$120 \times 10 = 1200$$

It is evident from table 4.1.17 and Fig 4.1.15 that majority (43.75%) of the respondents had medium level of frequency contact with extension personnel, because of

given the nature of occupation of SHG members have better rapport with extension personnel. Further it was reported that nearly one third of respondents had regular contact with officials. However it was found that close to one fourth of respondents had poor interaction with officials because of low levels of awareness among uneducated respondents.

Kiran *et al* (2012) in the study reported that majority of the farm women had low (80.00%) to medium level of extension participation. This may be due to the fact that the farm women had middle education level and less opportunity to them for associating in extension activities.

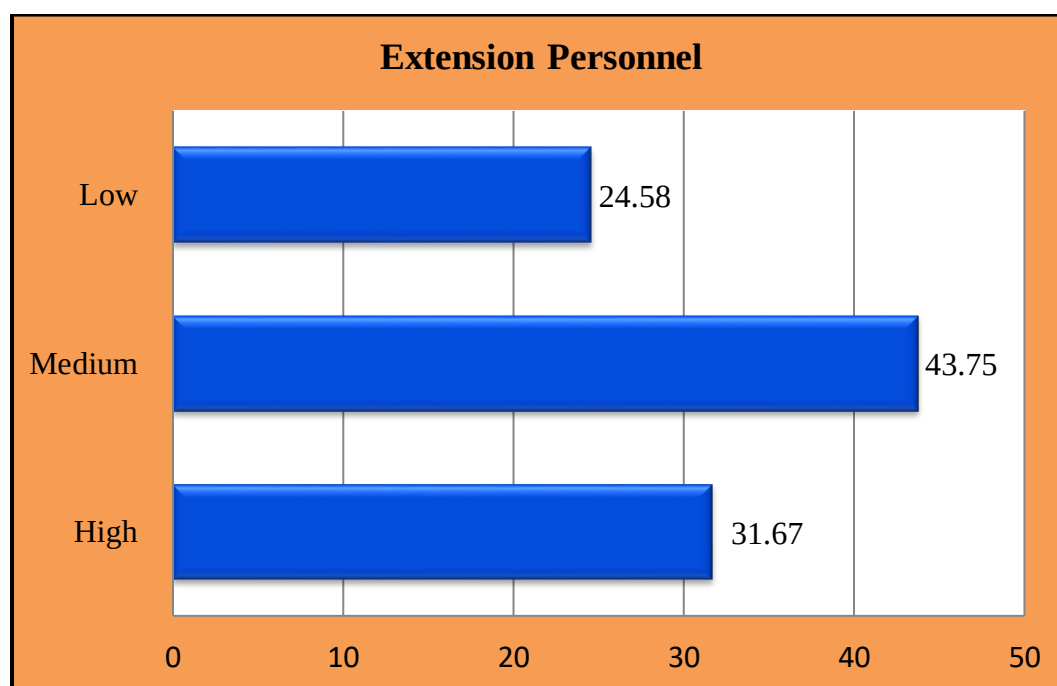


Figure 4.1.15. Total number of frequency farm women respondents according to frequency of contact with extension personnel

4.2 Knowledge and Utilization of Information and Communication Technologies (ICTs) by Farm Women

Knowledge and utilization of ICTs by farm women dealt in detail about the knowledge and utilization of ICTs i.e., availability, accessibility, awareness, use and utilization. It also studied frequency, purpose, attitude and preference of farm women towards ICTs.

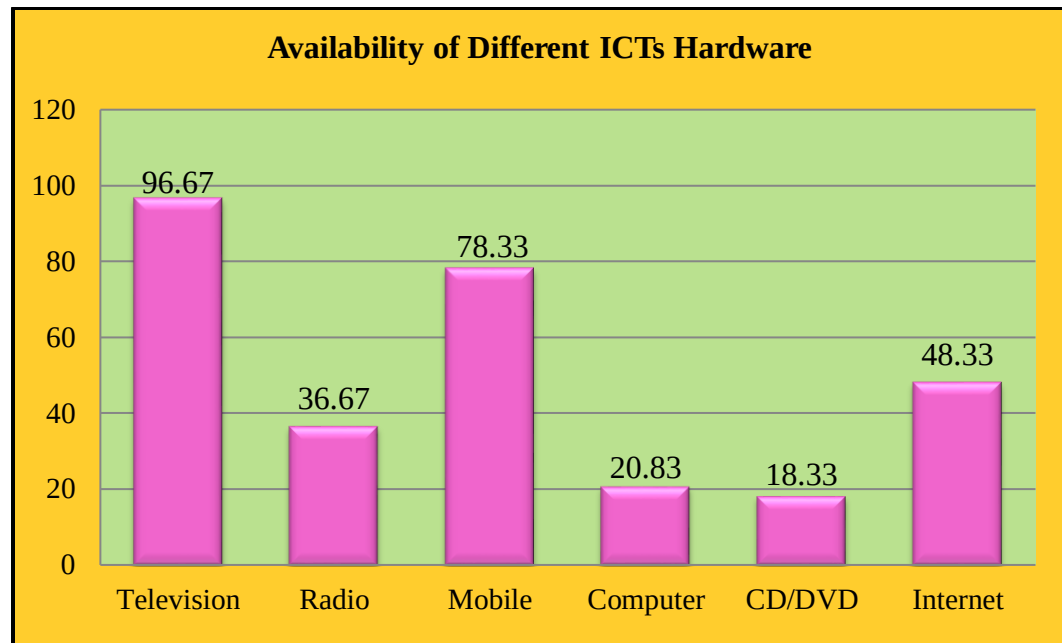


Figure 4.2.1. Availability of different ICTs hardware

Data presented in Fig 4.2.1 clearly reveals that highest percentage (96.67%) of the farm women watching television for as it was the cheapest and most common source of entertainment and a status symbol in the rural areas. Next most available ICT hardware was mobile phone (78.33%). screening the day to day requirement of mobiles by all categories of people. Whereas lowest percentage (18.33%) of farm women were having CD/DVDs for storing data. This may be due to less number having network availability in the villages.

The findings of the study were in contrast with the study conducted by Paliwas and Maheshwari (2015) while revealed that majority of the respondents had family income between Rs. 10,000 - 20,000, had ownership of TV, mobile phone and Newspaper. Major information sources used were by the respondent's neighbor, relatives, friends and TV. Anastasios *et al.* (2010) reported availability of ICTs to the farmers. Almost all respondents (98.37%) had at least one dial telephone and 80.41% of them owned a television set. In addition, 74.29 percent and 50.61 percent of the farmers possessed a mobile telephone and DVD player, respectively.

Table 4.2.1. Distribution of farm women respondents according to accessibility of different ICTs hardware
(n=120)

ICTs hardware	Extent of Access		
	Complete F (%)	Partial F (%)	No access F (%)
Television	102 (85.00)	14 (11.67)	4 (3.33)
Radio	38 (31.67)	56 (46.67)	26 (21.67)
Mobile	81 (67.50)	20 (16.67)	19 (15.83)
Computer	20 (16.67)	17 (14.17)	83 (69.17)
CD/DVD	18 (15.00)	20 (16.67)	82 (68.33)
Internet	58 (48.33)	29 (24.17)	33 (27.50)
Mean	52.83	26.00	41.16
SD	33.90	15.53	33.42

It was clear from Table 4.2.1 and fig 4.2.2 Distribution of Farm Women according to accessibility of different ICTs hardware reveals that majority (85%) of farm women were having complete access to television as it was the most common source of entertainment followed by mobile (67.50%). Subsequently in the present period a mobile has become essential to everyone in day to day life.

The study is in concurrence with results of Paliwal and Maheswari (2015) a study on access and utilization of Information and Communication Technologies where the results revealed that all the respondents (100%) had accessed and utilized TV and Mobile Phone daily and were most used for entertainment, news and personal communication by the respondents.

Partial availability was observed among half the farm women (46.67%) for radio, while no access was established for computer and CD/DVDs (69.17%) and (68.33%) respectively 11.67 per cent of the farm women were watching television partially.

The findings of the study were in line with the study by Jain *et al.* (2012) that showed use of radio, TV and phones ranged from 17.30 percent and do not differ significantly for farm women access and ICT tools use for agricultural and non-agricultural activities.

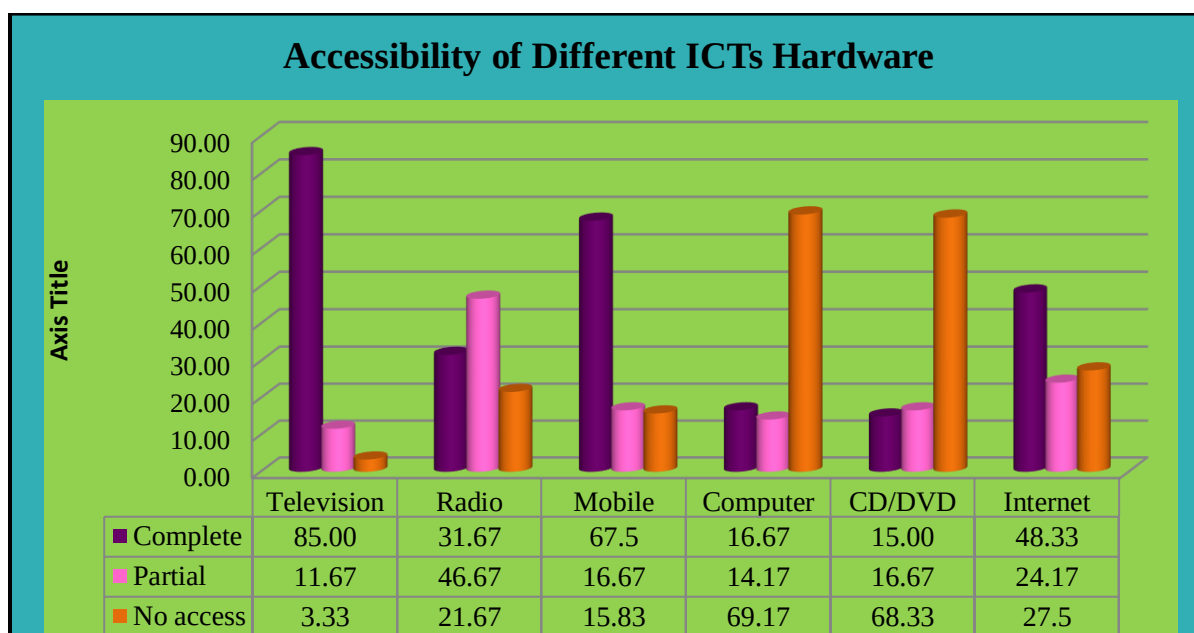


Figure 4.2.2. Distribution of farm women respondents according to accessibility of different ICTs hardware

Table 4.2.2. Percentage distribution of farm women respondents according to their awareness and use of different ICT tools and services

(n=120)

ICT tools and services		Awareness F (%)		Use F (%)	
		Yes	No	Yes	No
Mobile without internet	Calling	120 (100%)	00	105 (87.50)	15 (12.50)
	SMS	75 (62.50)	45 (37.50)	45 (37.50)	75 (62.50)
	Memory stick/ Memory card	58 (48.33)	62 (51.66)	38 (31.66)	82 (68.33)
Mobile with internet	WhatsApp	70 (58.33)	50 (41.67)	33 (27.50)	87 (72.5)
	Face book	57 (47.50)	63 (52.50)	15 (12.50)	105 (87.50)
	YouTube	87 (72.50)	33 (27.50)	33 (27.50)	87 (72.5)
	Games/ movies/ songs	65 (54.17)	55 (45.83)	30 (25.00)	90 (75.00)
	Accessing different internet sites (Ex. Agri Apps, Shopping)	51 (42.50)	69 (57.50)	21 (17.50)	99 (82.50)
Computer /laptop without internet	Office documents/ presentations etc.	80 (66.66)	40 (33.33)	15 (12.50)	105 (87.50)
	Movies/songs/photos	82 (68.33)	38 (31.66)	31 (25.83)	89 (74.16)
Computer/laptop with internet	Office documents/ presentations etc.	57 (47.50)	63 (52.50)	12 (10.00)	108 (90.00)
	Social media	57 (47.50)	63 (52.50)	9 (7.50)	111 (92.50)
	Accessing different internet sites Ex. Google	26 (21.67)	94 (78.33)	9 (7.50)	111 (92.50)

It was clear from the Table 4.2.2 Cent percent of the farm women were aware of calling persons without internet followed by sending SMS (75%). When it comes to the mobiles with internet services awareness level was satisfactory. (58.33%). Farm women were aware of and opted to use YouTube (72.50%), WhatsApp (58.33%), Games/ movies/ songs (54.17%), Face book (47.50%), and accessing different internet sites (42.50%) evidencing the widespread use of the social media in the society. When it comes to the awareness part of computers and laptops with internet more than fifty percent (68.33%) per cent of farm women were aware of their use for office documents/presentations, but, usage of the same was only 10 percent this may be because women were not involved in the office or job

works. The results were in line with that of Jain *et al.* (2012) who conducted a study on ICTs access to farm women in selected villages of Sonipat district of Haryana which revealed that access to computers is virtually nil in all categories barring few cases (10 per cent each) among large farm size categories.

Hence it can be concluded that awareness of ICT tools and the actual usage by the farm women may not be same. Regarding the awareness of mobile phones, 100 per cent of the farm women were aware and use them for calling only, while significant number of women use for SMS or for utilizing memory stick and card. In case of social networks, majority of women are aware of them but lesser number actually use them. Regarding computer and internet applications, significant number are aware of them but very few use them to obtain information about agriculture and other ICT tools.

Table 4.2.3. Distribution of farm women respondents by level of ICTs utilization

(n=120)

ICTs Tools	Level of ICTs utilization		
	Regularly F (%)	Occasionally F (%)	Rarely F (%)
Television	93 (77.50)	19 (15.83)	8 (6.67)
Radio	30 (25.00)	48 (40.00)	42 (35.00)
Mobile	58 (48.33)	29 (24.17)	33 (27.50)
Computer	18 (15.00)	24 (20.00)	78 (65.00)
CD/DVDs	16 (13.33)	19 (15.83)	85 (70.83)
Internet	48 (40.00)	44 (36.60)	28 (23.33)
Mean	43.83	30.50	45.66
SD	29.21	12.62	29.99

Result in Table 4.2.3 and Fig 4.2.4 shows level of ICTs utilization that majority (78%) of the farmwomen were regularly utilizing television, while 16 percent (15.83%) of them utilize occasionally and only (6.67%) utilise rarely. Nearly half of the farmwomen (40%) utilize the Radio occasionally, while 35 percent use rarely and only 25 percent of them are utilising it regularly contradicting the study result by Khondokar Humayun Kabir (2015)

in his study ‘Attitude and Level of Knowledge of Farmers on ICT based Farming’ reported majority (84%) had television sets while all had used a television set. Furthermore, 84.0% of the farmers had skills on how to operate television set. However, 87.0% farmers used Radio while 31.0% had Radio and 55.6% of the farmers had skill on how to operate Radio.

With reference to the level of ICTs utilization, highest percentage (77.50%) of farm women were using television for watching news/movies/songs and lowest percentage (13.33%) were using CD/DVDs for storage purpose. Bansal and Joshi (2018) in their study reported that majority of the farm women (96%) owned television set and 11 percent farm women owned radio. Television was used by 70 percent farm women always, while 26 percent used it sometimes. Radio was not used by majority of farm women, 6 percent farm women used it rarely and only 5percent farm women used it sometimes.

The findings of the study were in line with the study conducted by Kafura *et al.* (2016) presented that majority (81.0%) of the respondents use ICT tools at low extent and only 19.0 percent of the respondents use ICT tools at medium extent. High extent of use was not observed among the respondents.

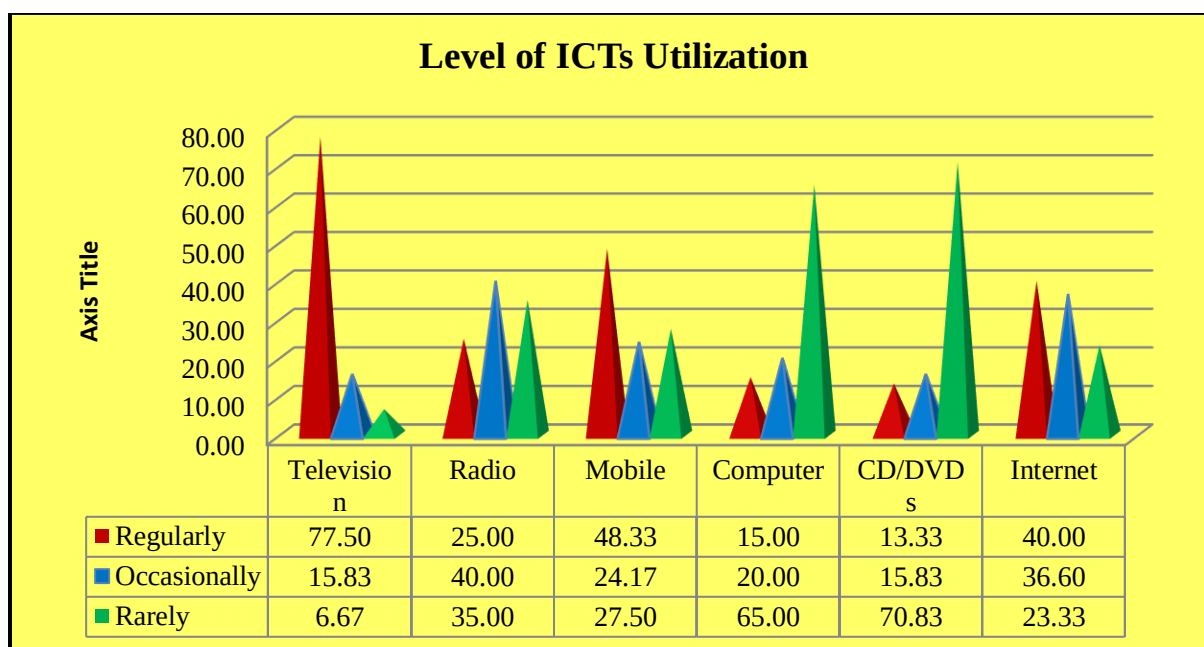


Figure 4.2.3. Distribution of farm women respondents by level of ICTs utilization

**Table 4.2.4. Distribution of farm women undergone training related to ICTs
(n=120)**

Training Related to ICTs	Frequency	Percentage
Mobile phones	00	00
Basic of computer	12	10.00
Use of internet	00	00

From the distribution of Table and Fig. 4.2.4 findings of the study revealed that only ten per cent of farm women were undergone training related to ICTs to gain knowledge.

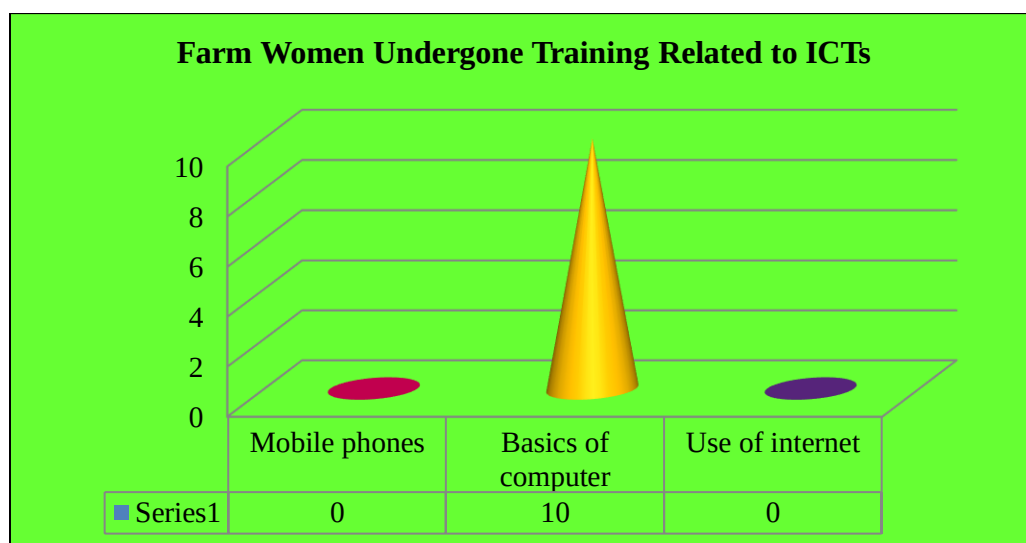


Figure 4.2.4. Percentage of farm women undergone training related to ICTs

Table 4.2.5. Distribution of farm women respondents according to frequency of usage of ICTs tools

(n=120)

ICT tools	Frequency of usage			
	Always F (%)	Sometimes F (%)	Rarely F (%)	Never F (%)
Television	92 (76.67)	13 (10.83)	12 (10.00)	3 (2.50)
Radio	51 (42.50)	23 (19.17)	21 (17.50)	25 (20.83)
Mobile	62 (51.67)	26 (21.67)	13 (10.83)	19 (15.83)
Computer	16 (13.33)	18 (15.00)	22 (18.33)	64 (53.33)
CD/DVD	15 (12.50)	17 (14.17)	20 (16.67)	68 (56.67)
Internet	45 (37.50)	25 (20.83)	15 (12.50)	35 (29.17)
Mean	46.83	20.33	17.17	35.67
SD	29.17	5.12	4.35	25.71

Table and Fig 4.2.5 refers to the frequency of usage of different ICT tools. Farm women were asked to report on a 4-point scale as always (4), sometimes (3), rarely (2) and never (1). The results revealed that three-fourth (76.67%) of farm women were always using television that it was the most common means of entertainment with varied range of programmes and serials being attracting the common women and only around 13per cent (12.50%) of farm women were using CD/DVDs. Mean scores of usage of ICT tools by the farm women were always (46.83), sometimes (20.30%), rarely (17.16) and never (35.66).

The findings of the study were in line with the study conducted by Jain *et al.* (2012) indicated that about one-fourth of the women farmers use radio. TV and phones on a daily basis while only one out of eight women viewed TV on weekly basis. The rest of the women did not use any means of ICT. The pattern suggested that TV being the most popular means of communication among farm women can be used for dissemination of essential agricultural knowledge to them on a day to day basis.

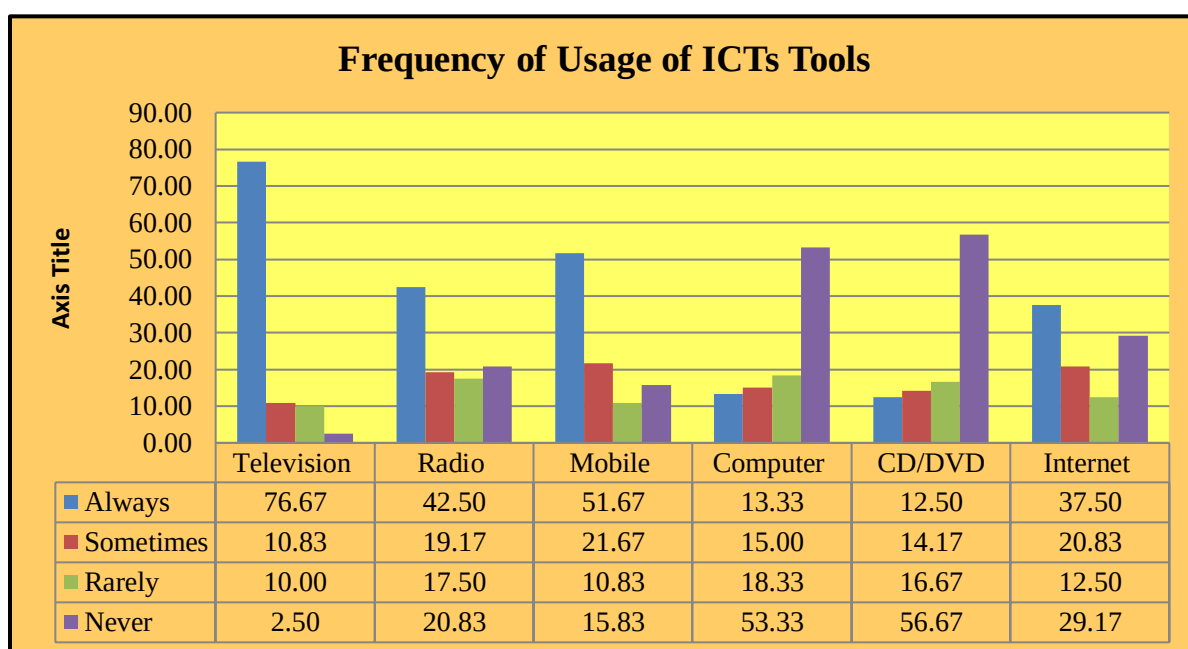


Figure 4.2.5. Distribution of farm women respondents according to frequency of usage of ICTs tools

Table 4.2.6. Distribution of farm women respondents according to their purpose for using ICTs

(n=120)

Variables	Education F (%)	Health F (%)	Business F (%)	Agriculture F (%)	Entertainment F (%)
Television	60 (50.00)	65 (54.16)	30 (25.00)	57 (47.50)	120 (100)
Radio	11 (9.16)	22 (18.33)	5 (4.16)	30 (25.00)	57 (47.50)
Mobile	48 (40.00)	58 (48.33)	25 (20.83)	32 (26.66)	90 (75.00)
Computer	22 (18.33)	15 (12.5)	12 (10.00)	5 (4.16)	18 (15.00)
CD/DVD	18 (15.00)	11 (9.16)	00	3 (2.50)	20 (16.66)
Internet	52 (43.33)	43 (35.83)	20 (16.66)	25 (20.83)	60 (50.00)
Mean	35.17	35.67	15.33	25.33	60.83
SD	20.58	22.96	11.69	19.91	39.67

It was clear from the Table 4.2.6 that majority of farm women were using television for watching programmes for entertainment purpose (100%), followed by health purpose (54.16%), educational purpose (50%), and agricultural purpose (47.50%) and for business purpose (25%) as television is the most viewed and had wide range of programmes being broadcasted among all other ICTs.

It can be concluded that among the six ICT tools, the responding farm women mostly used television and followed by mobile phone and internet. Even though television is mostly available for everybody, the significant use of mobile phone and internet is very important, as mobile phone is personally and always available with the women and is an important tool to disseminate information. Most of the ICT tools used for entertainment purpose and moderately used to access information regarding education, health and agriculture.

The results were in line with findings of Syiem and Raj (2015) who found that majority of the farmers owned mobile phones as well as television among which most frequently used ICT was mobile phone. Mobile phones were widely used by the farmers for social communication.

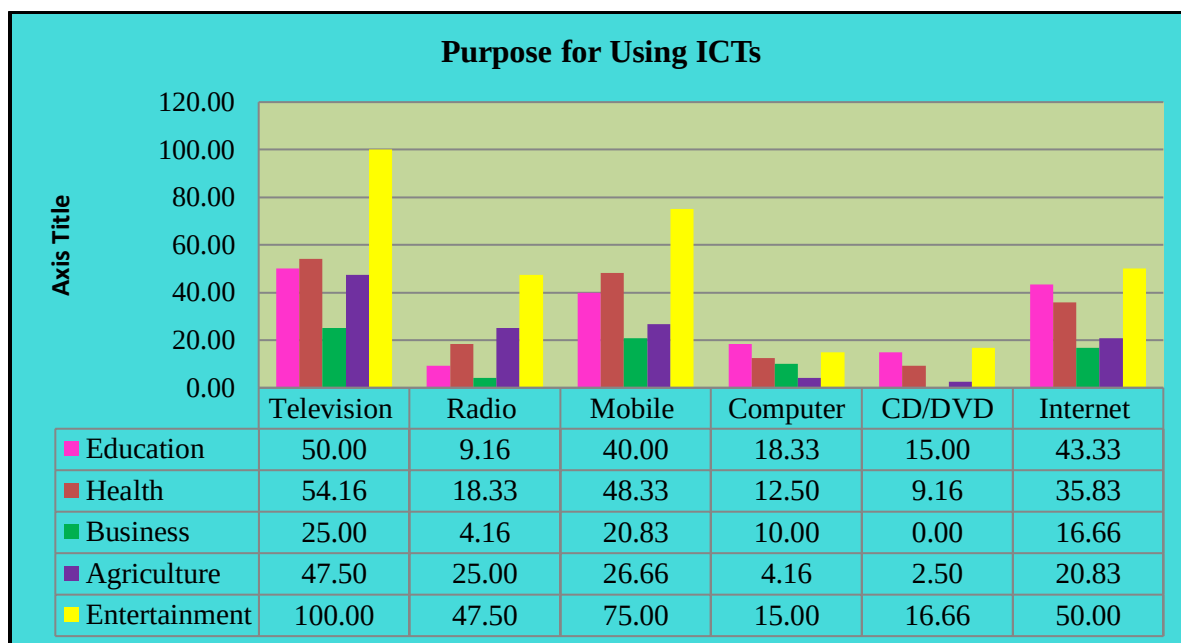


Figure 4.2.6. Distribution of farm women respondents according to their purpose for using ICTs

Table 4.2.7. Preference of ICTs to receive information related to Climate Smart Agriculture

(n=120)

ICT Tools	Yes F (%)	No F (%)	Rank
Mobile	98 (81.67)	22 (18.33)	I
Television	93 (77.50)	27 (22.50)	II
Radio	69 (57.50)	51 (42.50)	III
Internet	56 (46.67)	64 (53.33)	IV
CD/DVD	32 (26.67)	88 (73.33)	V
Computer	18 (15.00)	102 (85.00)	VI

Table and Fig 4.2.7 depicts the preference of ICTs to receive information related to Climate Smart Agriculture (CSA) ranked as per priority of farm women based on frequency. Data highlighted farm women ranked mobiles the was highest preference for

calling/SMS/watching and listening followed by television (2ndrank) for watching different programmes, radio (3rd rank) for listening agricultural related programmes, songs and news, internet (4th rank) for gathering information related to smart agriculture, CD/DVDs (5th rank) for storing/listening and watching movies and computer (6th rank) for downloading documents/presentations/movies/songs.

This may be due to the erratic connectivity of internet facilities in the interior part of villages and less number of farm women also felt that the ICT usage is necessary for their children and youth to get information regarding their academics and to build their career and also felt that ICTs helps in acquiring needed knowledge regarding farming/agriculture.

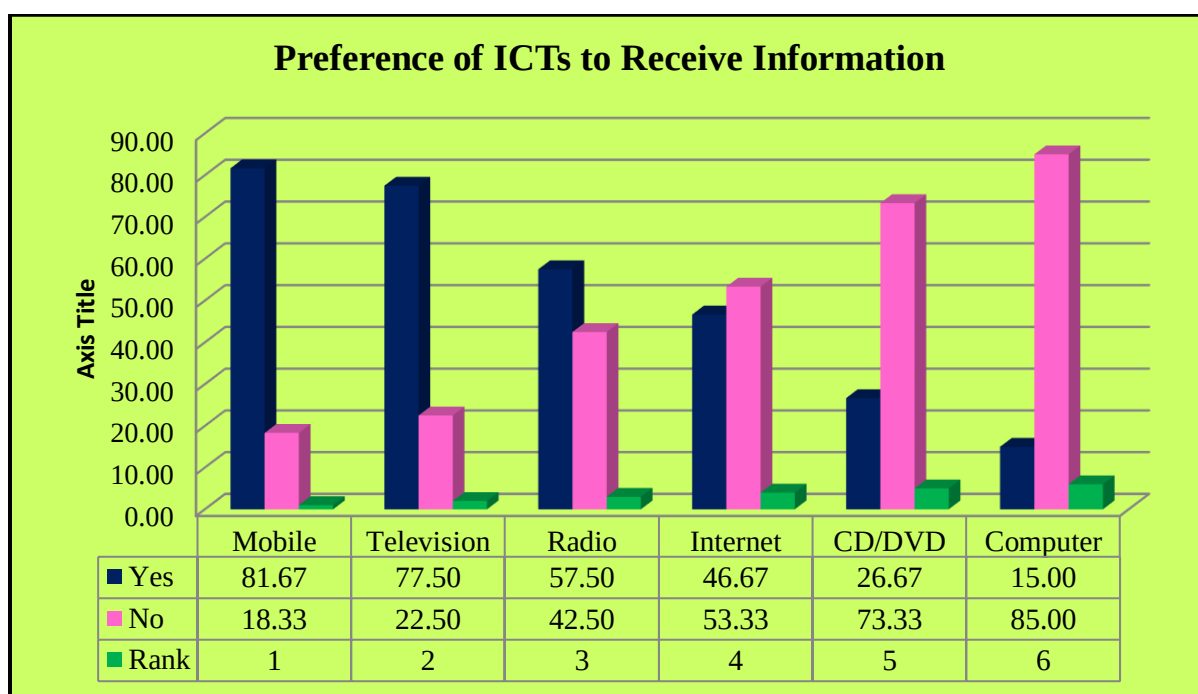


Figure 4.2.7. Preference of ICTs to receive information related to Climate Smart Agriculture

4.3 Attitude of Farmwomen towards Information and Communication Technologies (ICTs)

Table 4.3.1. Percent distribution of respondents according to their attitude towards ICTs

(n=120)

Statements	SA 5	A 4	Total SA+A=	UD 3	Total = UD	D 2	SD 1	Total D+SD=	Mean score
I feel updated whenever using ICTs to find any information	38 (31.67)	35 (29.17)	60.84	24 (20.00)	20.00	15 (12.50)	8 (6.67)	19.17	3.67
Use of ICTs is a wastage of time	38 (31.67)	7 (5.83)	37.50	27 (22.50)	22.50	29 (24.17)	19 (15.83)	40.00	3.29
ICTs helps the farm women in decision making	56 (46.67)	15 (12.50)	59.17	40 (33.33)	33.33	7 (5.83)	2 (1.67)	7.50	3.97
Use of ICTs makes life more complicated	00	2 (1.67)	1.67	1 (0.83)	0.83	57 (47.50)	60 (50.00)	97.50	1.54
ICTs improves the farm women output	57 (47.50)	17 (14.17)	61.67	40 (33.33)	33.33	3 (2.50)	3 (2.50)	5.00	4.02
ICTs helps farm women to acquire needed knowledge	50 (41.67)	21 (17.50)	59.17	43 (35.83)	35.83	4 (3.33)	2 (1.67)	5.00	3.94
Serves as a link between government and farm women	53 (44.17)	16 (13.33)	57.50	38 (31.67)	31.67	9 (7.50)	4 (3.33)	10.83	3.88
ICTs motivate farm women to adopt new technology	51 (42.50)	16 (13.33)	55.83	44 (36.67)	36.67	8 (6.67)	1 (0.83)	7.50	3.90
ICTs demonstrate improved technologies to farm women	54 (45.00)	19 (15.83)	61.33	42 (35.00)	35.00	4 (3.33)	1 (0.83)	4.16	4.01
Use of ICTs creates isolation from the other population	00	00	0.00	39 (32.50)	32.50	54 (45.00)	27 (22.50)	67.50	2.10
I feel proud to be able to access the internet at any time	51 (42.50)	24 (20.00)	62.50	38 (31.67)	31.67	2 (1.67)	5 (4.17)	5.84	3.95
ICTs connect people with latest trends of technology	52 (43.33)	23 (19.17)	62.50	37 (30.83)	30.83	3 (2.50)	5 (4.17)	6.67	3.95

*** SA- Strongly Agree, A- Agree, UD- Un-decided, D-Disagree, SD- Strongly disagree**

Table 4.3.1 refers attitude of the farm women towards ICTs.

Attitudes are pre-dispositions which are very difficult to get transferred unless new information and awareness is created for changing the traditional ideas and values with the intertwined traditions superstitions, and biases imbibed to individuals from childhood, more

so in case of farmwomen. Benton (1993) reported that self- confidence, managerial skills and impact of the programme raised positive attitude towards the programme.

Attitude of the farmer women' towards Information and Communication Technologies (ICTs) A-five-point rating scale ranging from "fully agree" to "not at all" was developed to measure the attitude of the farmers" towards climate change effects on agriculture. The attitude of the farmers" towards climate change effects on agriculture was computed by adding all scores obtained from 20 statements of climate change observed by the respondents. The attitude of farmers towards climate change ranged from 20 to 100 where 20 indicating unfavorable attitude towards climate change and 100 indicating favorable attitude.

Attitude of the farmwomen' towards Information and Communication Technologies (ICTs) a -five-point rating scale ranging from strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1) was developed to measure the attitude of farmwomen towards ICTs. Each point on the scale carried a score. These score values were not printed on the instrument but were shown here just to indicate the scoring pattern.

According to the mean score of farm women's attitude towards ICTs revealed that it improves the farm women output (4.02), demonstrate improved technologies to farm women (4.01), helps the farm women in decision making (3.97), makes farm women to feel proud in accessing internet at any time and connect people with latest trends of technology (3.95), helps farm women to acquire needed knowledge (3.94), motivates farm women to adopt new technology (3.90), serves as a link between government and farm women (3.88), it makes the farm women to feel updated whenever used ICTs for finding any information regarding farming (3.67). Farm women also felt using of ICTs is wastage of time (3.29), using of ICTs creates isolation from the other population (2.10) and using of ICTs makes life more complicated (1.54). This may be due to the problems as not having own ICTs tools, lack of interest, financial problems, lack of confidence in operating ICTs, lack of time, lack of technical knowledge, signal problem, non-functioning of ICTs, inadequate physical facilities, lack of electricity and inadequate repair facilities. Overall it can be said that there is need to promote ICTs use to obtain agriculture and animal husbandry information.

Table 4.3.2. Total frequency of respondent's categories to their attitude towards ICTs (n=120)

S.No	Category	Frequency	Percentage
1	High attitude	695	48.26
2	Medium attitude	413	28.68
3	Low attitude	332	23.06
	Total	1440	100.00

$$120 \times 12 = 1440$$

It could be inferred from the (Table 4.3.2 and fig 4.3.1) that majority of the respondents (48.26%) had high attitude towards ICTs followed by medium 28.68 percent and low 23.06 percent categories to their attitude towards ICTs respectively.

Raghuprasad *et al* (2012) reported that overall attitude of farmers towards ICT tools revealed that more than two-fifth (40.83%) of the farmers had favorable attitude towards ICT tools followed by 31.67 per cent had least favorable attitude and 27.50 per cent had most favorable attitude.

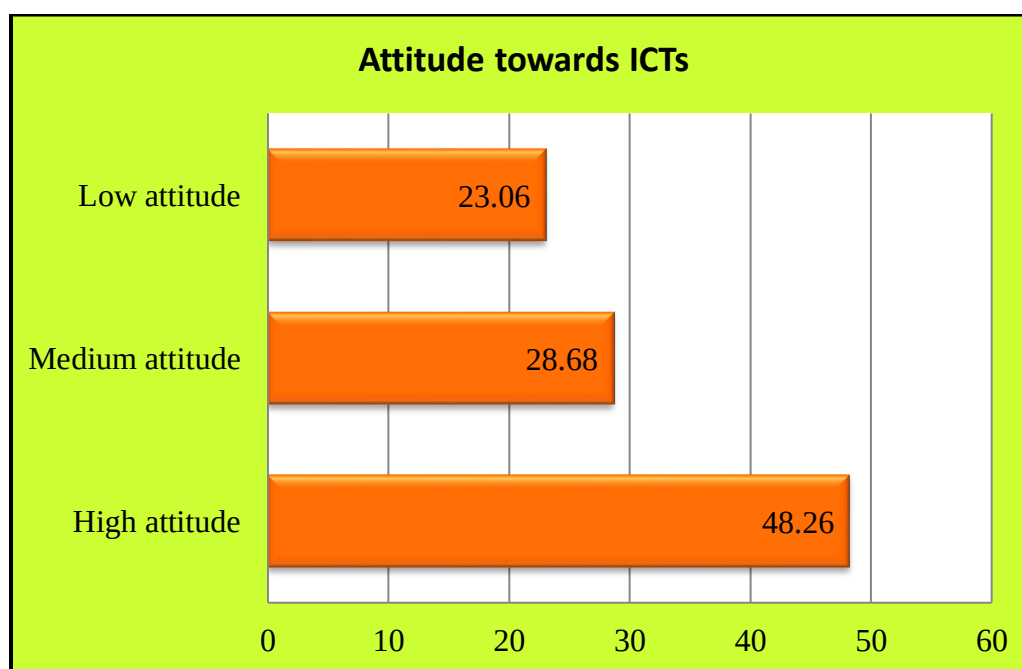


Figure 4.3.1. Total frequency of respondent's categories to their attitude towards ICTs

4.4 Formation of village wise Farm Women Knowledge Groups (FWKGs)

The starting point for a world without poverty and hunger is the rural world. An estimated 3 billion people – around 40 per cent of the global population – live in the rural areas of developing countries. Most depend on small, family farms for their income and sustenance. They grow the food that feeds their nations, 80 per cent of the women, children and men living in extreme poverty live in these rural areas. And these farms grow the food that feeds us all.

Farms grow the food that feeds us all. Investing in rural people is a long-term solution to so many of the problems we face today. Hunger, poverty, youth unemployment and forced migration – all have deep roots in rural areas; and all can be vastly improved through investing in small-scale agriculture and inclusive rural development. In sub-Saharan Africa, investment in agriculture is up to 11 times more effective in reducing extreme poverty than investment in any other sector. Successful small farms provide jobs for unskilled labourers. Small family farms generate income that is spent in rural communities and stimulates rural economies, which in turn contribute to peace and security

Women do want to stay in agriculture, they are proud to be farmers, but only if they are empowered, have information, access land freely, control resources (how their money is spent).and can achieve all that they are happy to stay in agriculture and help to feed their nation. For this they need to be in groups. The change starts here. Farmwomen were formed into groups of 15 members collective from each village and named them as Farm Women Knowledge Groups. They not only share the knowledge through mobile information but also focus on learning skills and building capacities, self-esteem, increasing access to information and resources, and promoting collective action and community organizing for climate smart agriculture.

For the formation of village wise Farm Women Knowledge Groups (FWKGs) from the Rangareddy district of Telangana state, two Mandals were selected by purposive simple random sampling. Five villages from Maheshwaram Mandal /Block viz., Pendyal, Kalwakole, Ramchandraguda, Dubbacherla and Lillipur and one village from Moinabad Mandal/ Block i.e., Tholkatta were selected. Thus, a total of 6 villages were selected from

two selected Mandals. From each village 15 literate farm women were selected to form a Farm Women Knowledge Groups (FWKGs) for the study (Table 4.23).

Table 4.4.1. Formation of village wise Farm Women Knowledge Groups (FWKGs)

S. No	Name of the village	No. members	Farm Women Knowledge Groups (FWKGs)
1.	Tholkatta	15	1
2.	Dubbacherla	15	1
3.	Lillipur	15	1
4.	Kalwakole	15	1
5.	Pendyal	15	1
6.	Ramachandraguda	15	1
	6 villages	90 Members	6 (FWKGs)

4.5 Profile Characteristics of Farm Women Knowledge Groups (FWKGs)

This section deals with the findings and discussions regarding the characteristics of Farm Women Knowledge Groups (FWKGs)

Table 4.5.1. Profile Characteristics of Farm Women Knowledge Groups (FWKGs)

(n=90)				
Variables	Personal information	Frequency (N)	Percentage (%)	Mean $\pm$ S. D
Age in years	Young age (18-25)	18	20.00	30.52 $\pm$ 5.6
	Middle age (Between 26-35)	52	57.78	
	Old age (Above 36)	20	22.22	
Educational qualification	Can read and write	5	5.56	4.01 $\pm$ 1.2
	Primary School	6	6.67	
	Middle School	14	15.56	
	High School	27	30.00	
	Intermediate	34	37.78	
	Graduation & Above	4	4.44	
Marital Status	Married	78	86.67	30+42
	Unmarried	00	00	
	Widow/Divorced	12	13.33	
Family size	Small (less than 5 member)	32	35.56	6.01 $\pm$ 1.9
	Medium (5-7 member)	50	55.56	
	Large (7-9 member)	08	8.89	
Farm women's occupation	Farming	33	36.67	22.5+7.59
	Farming + Service	16	17.78	
	Farming +Business	23	25.56	
	Farming + Daily Wage Earner	18	20.00	
Annual income	Low (50,000-1,0000)	27	30.00	30+10.81
	Medium (1,0000-1,50000)	42	46.67	
	High (Above 1,50000)	21	23.33	

From the table 4.5.1 and figure 4.5.1 more than half percent (57.78%) of farm women belonged to the middle age group i.e. 26-35 years while almost equal percent of farm women were belonged to young age group (22%) and old age group (20%). It is showing that middle aged farm women were actively participating in performing the farming activities.

Prime part of the farm women (37.78%) had completed their intermediate education followed by high schooling education (30%) and middle schooling (15.57%) while only few (4.44%) of farm women had done their graduation and above education.

Nearly cent per cent (86.67%) of farm women were married while (13.33%) of farm women were widowed or divorced.

Nearly sixty per cent (55.56%) belonged to the medium family with 5-7 members while about only ten percent (8.89%) of farm women belonged to the large families comprising of 7-9 members in their families with farming (36.67%) as their main occupation. The findings were in line with the findings of Bhople and Patki (1998) and Yadav and Grover (2012) who revealed that 68 per cent and 55 per cent of farm women laborers belonged to nuclear type of families.

India is renowned for the joint family structure as majority of the rural families predominantly dependent on agriculture where it involves family labour. But there has been a gradual disintegration of the joint family system and emergence of 'nuclear family'. The study reported that more than half of the per cent (55.56%) of families as Nuclear families with medium size of 3-5 members reflecting the rise of the nuclear families even in rural Indian agricultural families.

It was observed that 46.67 percent of the overall respondents had medium while 30 percent had low income and 23.33 percent had high-income. Thus, it can be concluded that majority of the respondents had medium estimated income between (Rs1,00,00-1,50,000) followed by respondents having low estimated annual income and higher income group respondents.

Hence it can be concluded that more than half percent of farm women belonged to the middle age group between 26-35 years with intermediate education and married. Farm women were belonged to the medium family with 5-7 members. Kumawat (2017) also reported in their study, 47 per cent farm women belonged to age group of 31-45 years.

Majority of the farm women were married (88%) and illiterate (55%). Majority of the farm women (70%) belonged to the category of low socio-economic status.

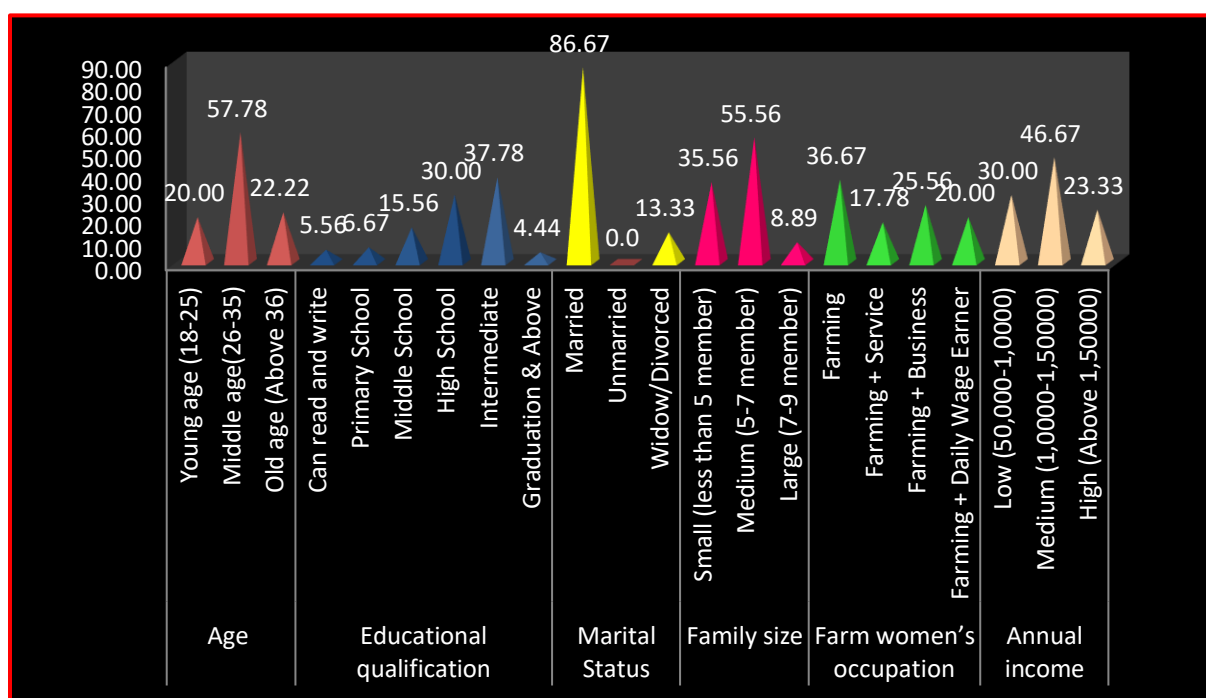


Figure 4.5.1. Profile Characteristics of Farm Women Knowledge Groups (FWKGs)

Table 4.5.2. Distribution on agricultural information related to Farm Women Knowledge Groups (FWKGs)

(n=90)				
Variables	Category	Frequency (N)	Percentage (%)	Mean $\pm$ S.D
Cultivable land (hec.)	Both own and leased	6	6.67	--
	Leased	2	2.22	
	Own	82	91.11	
Cultivable land	Dry land	90	100	--
	Wet land	00	00	
	Combination	00	00	
Work experience in cultivation	1-5 years	18	20.00	11.28 $\pm$ 4.9
	6-10 years	33	36.67	
	11-15 years	23	25.56	
	Above 15 years	16	17.78	
Farm size	Marginal (Less than 1)	6	6.67	4.40 $\pm$ 2.2
	Small (1-3)	32	35.56	
	Medium (3- 5)	35	38.89	
	Large (above 5)	17	18.89	

Table 4.5.2 and figure 4.5.2 refers that highest percentage (91.11%) of the farm women were having owned cultivable land whereas lowest percentage (2.22%) of farm women were having leased cultivable land. While 6.67 per cent of farm women were having both owned and leased cultivable land.

Cent percent of farm women's lands were dry lands representing the dry climatic conditions of central Telangana zones.

With regard to work experience of farm women, 36.67 per cent of the farm women were having 6-10 years of experience in farming activities whereas 17.78 per cent of farm women were having above 15 years of work experience. Nearly one fourth, of farm women were having 11-15 years of work experience (25.56%) and one fifth's farm women with 1-5 years of work experience (20%). The mean sample of farm size was 11.28 with a standard deviation of 4.9.

Nearly forty percent (38.89%) of the farm women were having medium size of farms within 3-5 acres of land followed by small size of farms (35.56%) within 1-3 acres, large size of farms (18.89%) with more than 5 acres of land and marginal size of farms (6.67%) i.e., less than 1 acre of land. The mean sample of farm size was 4.40 with a standard deviation of 2.2. The reason attributed for majority of farm women belonging to marginal category may be due to fragmentation, which is common phenomenon in the nuclear family system than the traditional joint family system.

Hence it can be concluded that majority of the farm women were having their own and dry lands for cultivation. Farm women also had 6-10 years of work experience with medium size family. The present findings were in contrast to findings as reported by Fabiyi *et al.* (2007) as the farm women majority of the farm women had middle and young age category with 13-24 years farming experience.

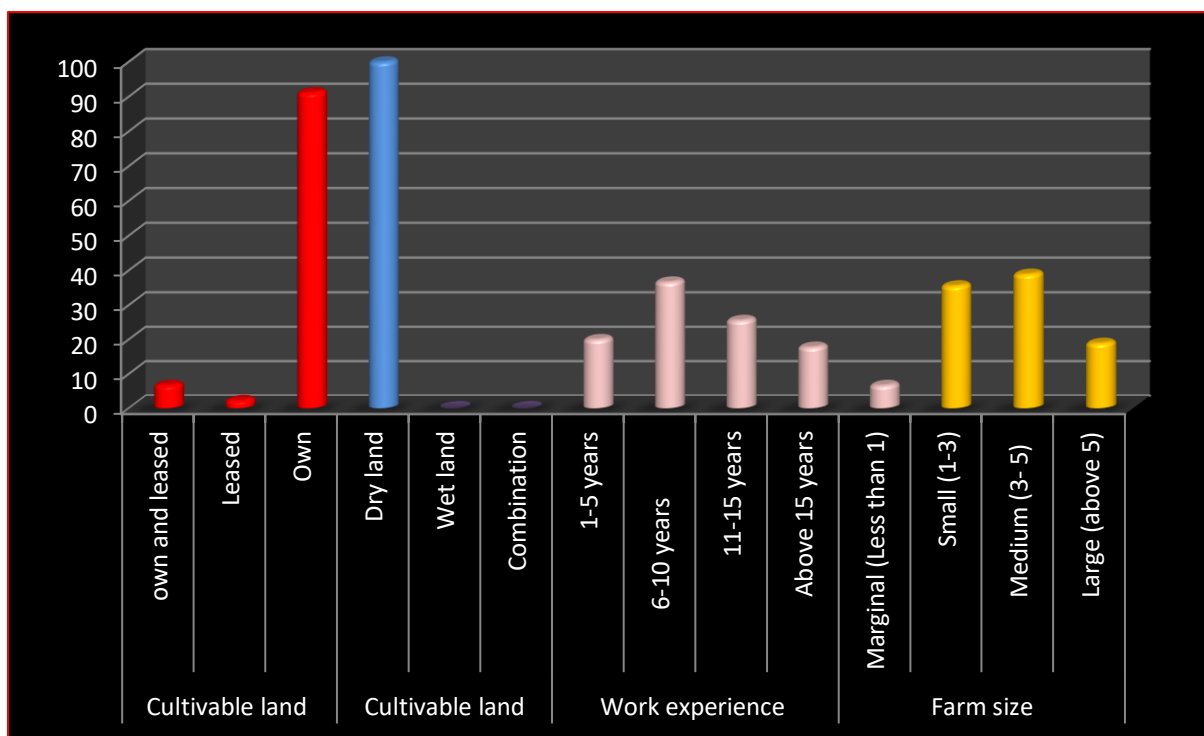


Figure 4.5.2. Distribution on agricultural information related to Farm Women Knowledge Groups (FWKGs)

Table 4.5.3. Distribution of Farm Women Knowledge Groups (FWKGs) according to Cultivation of Main crops

Main crops	(n=90)	
	Yes F (%)	No F (%)
Cereals (paddy, maize)	76 (84.44)	14 (15.56)
Pulses (Red gram dhal)	54 (60.00)	36 (40.00)
Flowers (Chrysanthemum, lily, jasmine and rose)	68 (75.56)	22 (24.44)
Vegetables (all types)	72 (80.00)	18 (20.00)
Cotton	82 (91.11)	8 (8.89)

Table 4.5.3 gives a picture of the main crops grown within the locale of the study. The most (91.11%) grown crop in the selected villages was cotton followed by cereals (84.44%), all types of vegetables (80.00%), flowers (75.56 %), while pulses were grown

relatively in few (60.00 %) areas as a result of less irrigation facilities in the selected areas. From this it was evident that Telangana regions were victims of climate change as well the real estate boom that has prevailed from past decade with which farmers and farm women had started leaving the farming and entered into real boom.

Table 4.5.4. Source of agricultural information about farming by Farm Women Knowledge Groups (FWKGs)

(n=90)		
Sources	Yes F (%)	No F (%)
Traditional Knowledge	90 (100.00)	00
News paper	20 (22.22)	70 (77.78)
Krishi Vignan Kendra's (KVKs)	7 (7.78)	83 (92.22)
Agricultural University	30 (33.33)	60 (66.67)
Climate related agricultural Counseling	00	90 (100.00)
Agricultural Extension Officer (AEO)	38 (42.22)	52 (57.78)
Television (TV)	54 (60.00)	36 (40.00)
Radio	38 (42.22)	52 (57.78)
Mobile phone	35 (38.88)	55 (61.11)
Family members	90 (100.00)	00
Neighbors	78 (83.33)	12 (13.33)

Table 4.5.4 marked the various sources of information related to farming obtained by the farm women. Cent percent of farm women were noticed to have information of farming from traditional knowledge, family members, and neighbor as well with which it can be understandable that the farming was followed by all the farm women associates through whom their ancestors have passed the information and faming knowledge to their descendants. More than half (60.00%) of farm women rely on television for their farm in formation followed by radio (42.22%) and Agriculture Extension Officer (42.22%). This may be with increased number of channels providing agriculture related programmes in

appropriate timings farm women. These findings are in accordance with the findings of Khursat Demiryurek (2008) who reported that information regarding farming is mainly based on farmers' current knowledge and traditional practices and are not generally based on scientific application.

Table 4.5.5. Organizational participation of Farm Women Knowledge Groups (FWKGs)

(n=90)

Organizational participation	Frequency		
	Regularly F (%)	Occasionally F (%)	Never F (%)
Self Help Groups	71 (78.89)	14 (15.56)	5 (5.56)
Anganwadi centre	44 (48.89)	26 (28.89)	20 (22.22)
Mahila mandal	8 (8.89)	33 (36.67)	49 (54.44)
Gram Panchayat	25 (27.78)	48 (53.33)	17 (18.89)
Mandal Panchayat	23 (25.56)	47 (52.22)	20 (22.22)
Zilla panchayat	19 (21.11)	50 (55.56)	21 (23.33)
Farmer's organization	20 (22.22)	49 (54.44)	21 (23.33)

From the distribution of Table 4.5.5 Figure 4.5.3 farm women were in regular participation with Self Help Groups (78.89%) followed by Anganwadi centres (48.89%) evincing the empowerment of rural farm women after association with the SHGs. While occasional participation was seen in Zilla Panchayat (55.56%) followed by Gram Panchayat (53.33%) by the farm women and no participation was witnessed in Mahila Mandal for 54.44 percent of farm women as there are no Mahila Mandals existing with the introduction of Self Help Groups (SHGs) in the grass root level Rural Development.

In contrast with this result Dayya and Bansal (2016) also reported 89 per cent of the farm women had no organizational membership whereas 11 per cent farm women were members of formal organization (SHGs).

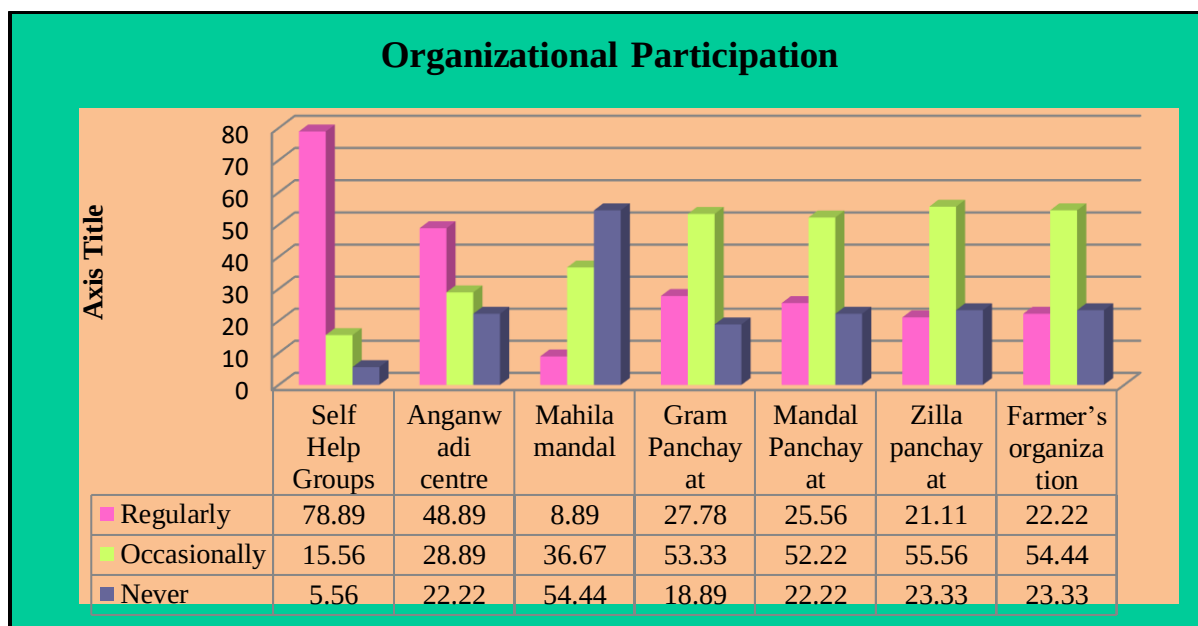


Figure 4.5.3. Organizational participation of Farm Women Knowledge Groups (FWKGs)

Table 4.5.6. Frequency of contact with extension personnel by Farm Women Knowledge Groups (FWKGs)

(n=90)

Extension personnel	Frequency		
	Regularly F (%)	Occasionally F (%)	Never F (%)
Village level extension worker (VLEW)	28 (31.11)	51 (56.67)	11 (12.22)
Agriculture extension officer	21 (23.33)	60 (66.67)	9 (10.00)
Extension officer (ICDS)	23 (25.56)	52 (57.78)	15 (16.67)
Farmer's organization	31 (34.44)	49 (54.44)	10 (11.11)
Community coordinator (SHGs)	57 (63.33)	25 (27.78)	8 (8.89)
Anganwadi Worker	51 (56.67)	26 (28.89)	13 (14.44)
University personnel	36 (40.00)	24 (26.66)	30 (33.33)
NGOs personnel	14 (15.56)	15 (16.67)	61 (67.78)
Bank personnel	21 (23.33)	37 (41.11)	32 (35.56)
Block personnel (MDO & MRO)	23 (25.56)	55 (61.11)	12 (13.33)

From the Table 4.5.6 and Figure 4.5.4 the frequency of contact with different extension personnel by farm women was given. It was evident that Community Coordinators of Self-Help Groups (63.33%) were the regularly contacted extension personnel followed by Anganwadi worker (56.67%). Most of the farm women were brought under the SHG fold for their overall and economic development. Coming to the occasional participation Agricultural Extension Officer was the most (66.67%) occasionally met extension person followed by Extension Officer (57.78%) and VLEW (56.67%). Majority (67.78%) of farm women never met NGO personnel to know the information regarding farming/agriculture.

The findings of the study were in line with the study conducted by Bansal and Joshi (2018) which revealed that nearly half of the farm women (44-57%) occasionally contacted various extension officials. VLEW were contacted regularly by 29 per cent of farm women. But the university officials were not at all contacted by them. This may be due to the reason that farm women get in touch with extension agents only for getting information on the availability of credit and during disease outbreaks.

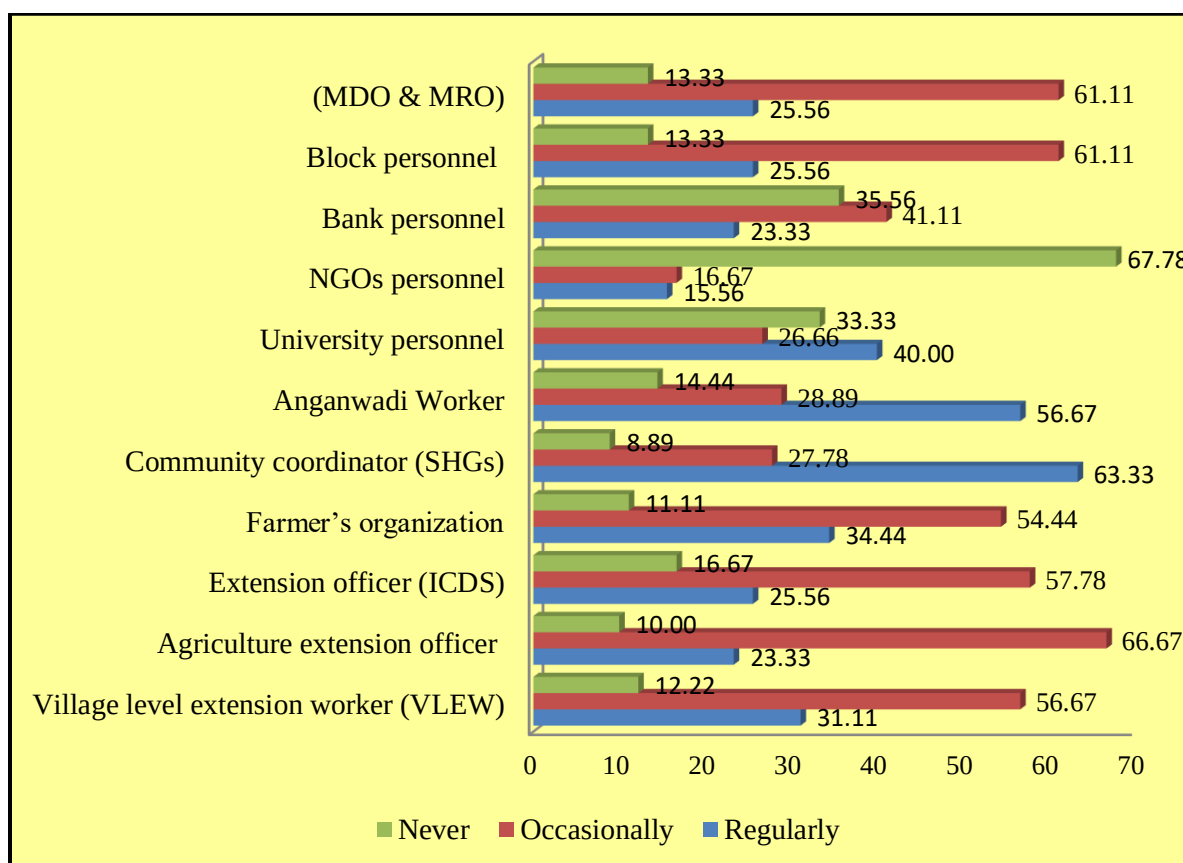


Figure 4.5.4. Frequency of contact with extension personnel by Farm Women Knowledge Groups (FWKGs)

4.6 Knowledge and Usage of Mobile phone by Farm Women Knowledge Groups (FWKGs)

4.6.1 Before training- Knowledge and Usage of Mobile by Farm Women Knowledge Groups (FWKGs)

This section deals with the pre-knowledge test for Farm Women Knowledge Groups (FWKGs) on use of mobile phones in terms of use, functions, different parts of mobile and use of internet and social media apps among participants, knowledge on source of learning and frequency of receiving SMS from mobile phone were studied. The data was formulated, tabulated and presented below.

Table 4.6.1.1. Knowledge and usage of mobile phone functions by Farm Women Knowledge Groups (FWKGs)

(n =90)

S. No	Attributes	Yes F (%)	No F (%)
1.	Do you know how to use mobile phone	58 (64.44)	32 (35.56)
2.	Do you know how to charge or recharge your mobile phone	68 (75.56)	22 (24.44)
3.	Do you know how to receive your calls	90 (100.00)	00
4.	Do you know how to send SMS	38 (42.22)	52 (57.78)
5.	Do you know how to open your received SMS	38 (42.22)	52 (57.78)
6.	Do you know how to save contact number in your mobile phone	32 (35.56)	58 (64.44)
7.	Do you know how to make and receive phone calls	58 (64.44)	32 (35.56)
8.	Do you know use calculator, calendar, alarm etc in your mobile	29 (32.22)	61 (67.77)
9.	Do you know how to use internet	33 (36.67)	57 (63.33)
10.	Do you know how to use social media apps (whats App, YouTube)	33 (36.67)	57 (63.33)

According to knowledge on use and functions of mobile, the data revealed that cent per cent (100%) of farm women have knowledge on receiving calls. An equal percentage

(64.44%) of farm women was having knowledge on using mobile in making and receiving the calls. Almost three fourth (75%) of farm women were aware of recharging their mobiles. Very a smaller number of farm women (42.22%) had knowledge on how to send SMS (Table 4.6.1.1).

Therefore, the extent of use of ICT tools was low to medium. Use of any tool depends on awareness and knowledge on the tool. The low and medium extent of use of different ICT tools might be due to lack of awareness and knowledge on the ICT tools. The cost of the ICT tools might be another reason of low to medium extent of use as most of the farmers in the study area hold small farm size and have medium level of annual income.

Table 4.6.1.2. Knowledge on source of learning about mobile phone by Farm Women Knowledge Groups (FWKGs)

(n =90)

S. No	Sources	Yes F (%)	No F (%)
1.	Family members	46 (51.11)	44 (48.89)
2.	Friends and relatives	38 (42.22)	52 (57.78)
3.	By trying mobiles for knowing about apps	20 (22.22)	70 (77.78)
4.	By attending training	00	90 (100)

From the Table 4.6.1.2, knowledge on source of learning about mobiles were reported that family members (51.11%) were the first learning institute for any person to learn followed by friends and relative's 42.22 percent and 22.22 percent of farm women were trying mobiles for knowing about apps.

This may be due to the limited resources and lack of facilities in addition to lack of proper marketing facilities for their products. An overwhelming majority of the farm women were not trained therefore family members and their capacity to maintain the communication effectively was difficult.

**Table 4.6.1.3. Frequency of receiving SMS from mobile phone by
Farm Women Knowledge Groups (FWKGs)**
(n =90)

S. No	Source of SMS	Yes F (%)	No F (%)
1.	Family Members	22 (24.44)	68 (75.56)
2.	Relatives	33 (36.67)	57 (63.33)
3.	KVKs	00	90 (100.00)
4.	Agricultural Extension officer	00	90 (100.00)
5.	PJTSAU, University/Researcher	00	90 (100.00)
6.	School teacher	23 (25.56)	67 (74.44)
7.	Banks	32 (35.56)	58 (64.44)

The data related to source of SMS received from mobile phones were from relatives (36.67%) and banks (35.56%). Other message includes from school teachers (25.56%) regarding their children's home works and events, family members (24.44%) for sharing their personal feelings.

From the study, it was indicated that SMS source was purely personal, and they were not getting any messages from any other organizations (Table 4.6.1.3).

4.6.2 After Training- Knowledge and Usage of mobile phone by Farm Women Knowledge Groups (FWKGs)

This section deals with the post-knowledge test for Farm Women Knowledge Groups (FWKGs) on use of mobile phones in terms of use, functions, different parts of mobile and use of internet and social media apps among participants, knowledge on source of learning and frequency of receiving SMS from mobile phone were studied. The data was formulated, tabulated and presented below.

Table 4.6.2.1. Knowledge and usage of mobile phone functions by Farm Women Knowledge Groups (FWKGs)

(n =90)

S. No	knowledge on use and functions of mobile phones	Yes F (%)	No F (%)
1.	Do you know how to use mobile phone?	85 (94.44)	5 (5.55)
2.	Do you know how to charge your mobile phone?	90 (100.00)	00
3.	Do you know how to receive your calls?	90 (100.00)	00
4.	Do you know how to send SMS?	82 (91.11)	30 (33.33)
5.	Do you know how to open your received SMS?	87 (96.67)	3 (3.33)
6.	Do you know how to save contact number in your mobiles?	84 (93.33)	6 (6.66)
7.	Do you know how to make and receive phone calls	90 (100.00)	00
8.	Do you know use calculator, calendar, alarm etc.	74 (82.22)	16 (17.77)
9.	Do you know how to use internet	83 (92.22)	7 (7.77)
10.	Do you know how to use social media apps (whats App, YouTube).	84 (93.33)	6 (6.66)

According to post knowledge on use and functions of mobile, the data revealed that cent per cent of farm women were having their knowledge on charging, receiving and making calls followed by receiving SMS (96.67%), how to use mobile phone (94.44%), equal percentage (93.33%) were having knowledge on saving contact numbers and how to use social media, internet (92.22%), sending SMS (91.11%) and using calculator, calendar, alarm (82.22%). This may be due to the spread on usage of mobile phones among all categories of societies (Table 4.6.2.1).

The results are in line with findings of Jain *et al.* (2012) which reported radio and TV are accessible to more compared to modern means of ICTs like phones and mobiles for small farmers. Jakhar (2015) also reported that Information Technology has changed our daily lives radically over the recent years, for example, the user of mobile phones to make calls and send text messages, use of internet for searching information, use of email for communication over the internet etc.

Table 4.6.2.2. Knowledge on source of learning about mobile phone by Farm Women Knowledge Groups (FWKGs)

(n =90)

S. No	Sources	Yes F (%)	No F (%)
1.	Family members	72 (80.00)	18 (20.00)
2.	Friends and relatives	56 (62.22)	34 (37.78)
3.	By trying mobiles for knowing about apps	82 (91.11)	8 (8.89)
4.	By attending training programmes	85 (94.44)	5 (5.56)

From the Table 4.6.2.2, it is shown that nearly 94.44 per cent of farm women were learning the knowledge about mobiles by attending training programmes followed by trying mobiles by their own for knowing about apps (91.11%) from family members (80%) and friends and relatives (62.22%).

This was evidence of the effort of the investigator in making an initiation for providing the mobile trainings to the farm women.

Table 4.6.2.3. Frequency of receiving SMS from mobile phone by Farm Women Knowledge Groups (FWKGs)

(n =90)

S. No	Source of SMS	Yes F (%)	No F (%)
1.	Family Members	58 (64.44)	32 (35.56)
2.	Relatives	66 (73.33)	24 (26.67)
3.	KVKs	00	00
4.	Agricultural extension officer	25 (27.78)	65 (72.22)
5.	PJTSAU, University/Researcher	82 (91.11)	8 (8.89)
6.	School teacher	52 (57.78)	38 (42.22)
7.	Banks	52 (57.78)	38 (42.22)

The data related to source of SMS received by farm women from mobile phones reported that 91.11 per cent of farm women were receiving SMS from PJTSAU, University/Researcher followed by relatives (73.33%), family members (64.44%). Equal

percentage (57.78%) of farm women were receiving SMS from schoolteacher and banks. Least percentage (27.78%) of farm women was receiving SMS from agricultural extension officer (Table 4.6.2.3). This may be the consequences of the initiation of mobile messages received by the farm women knowledge groups on climate smart agricultural adaptive strategy messages.

Nosheen *et al.* (2010) report revealed that most frequently used sources of information were from television (75%), friends (67.5%), relatives (61%), mobile phone (39%) and local farmers (37%). On the other hand, the less frequently used information sources were input/output dealers, books/booklets and extension workers.

The training given to them in the intervention increased their ability to understand messages they were receiving from varied sources such as University/Researcher, School teacher and banks

4.7 Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Change

This section deals with the finding and discussions regarding the awareness of farm women on climate change. It includes level of knowledge, variables influencing production and adaptability of farm women towards climate change.

Climate Smart Agriculture (CSA) is an approach that guides actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. It tackles with three objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible.

It encompasses adapting to climate challenges in some regions and responding to opportunities offered by climate in others. Climate risks are best addressed through increasing adaptive capacity which can bring immediate benefits and can reduce the adverse impacts of climate change.

Table 4.7.1. Awareness of Farm Women Knowledge Groups (FWKGs) on causes of climate change

(n= 90)

Statement	Level of knowledge		
	Fully aware F (%)	Somewhat aware F (%)	Not aware F (%)
Deforestation	16 (17.78)	10 (11.11)	64 (71.11)
Increase in number of vehicles	8 (8.89)	22 (24.44)	60 (66.67)
Overpopulation	5 (5.56)	24 (26.67)	61 (67.78)
Industries/ factories	12 (13.33)	18 (20.00)	60 (66.67)
Use of pesticides	5 (5.56)	14 (15.56)	71 (78.89)
Fossil fuel and farm waste	4 (4.44)	12 (13.33)	74 (82.22)
Use of electrical appliances	4 (4.44)	10 (11.11)	76 (84.44)
Pollution	10 (11.11)	18 (20.00)	62 (68.89)
Global warming	4 (4.44)	8 (8.89)	78 (86.67)
Natural disaster	8 (8.89)	13 (14.44)	69 (76.67)
Rapid urbanization	5 (5.56)	10 (11.11)	75 (83.33)

Table 4.7.1 refers to the degree of change in the level of knowledge on the causes of climate change. According to the level of knowledge on the causes of climate change, 86.67 per cent of the farm women were not aware of global warming, use of electrical appliances (84.44%), rapid urbanization (83.33%), burning of fossils and farm waste (82.22%). Only very few farm women were aware of deforestation (17.78%) followed by industries/factories (13.33%), pollution (11.11%), increase in number of vehicles and natural disaster (8.89%),

overpopulation and use of pesticides (5.56%), burning of fossils and farm waste, use of electrical appliances and global warming (4.44%).

Raghuvanshi et al. (2017) indicated that all the farm women were found to be aware the climate change and majority of them reported “erratic rainfall, diminishing agricultural yield and increase in temperature” as the indicators of climate change. The increasing industrialization, overpopulation and deforestation’ were perceived by farmers to be the main causes of climate change.

Table 4.7.2. Knowledge of Farm Women Knowledge Groups (FWKGs) on climate variable influencing production (n =90)

Incidence	Degree of change in percentage (%)			
	Extreme F (%)	Moderate F (%)	Minor/Ne gligible F (%)	None F (%)
Drought	19 (21.11)	71 (78.88)	00	00
Flood	16 (17.77)	74 (82.22)	00	00
Increased temperature	90 (100.00)	00	00	00
Change in growing season	90 (100.00)	00	00	00

Table 4.7.2 refers to the degree of change in the level of knowledge on climate variable influencing production. Cent per cent of farm women regarding the incidence of increased temperature and change in growing season reported extreme degree of change, as they could perceive the decline in production and productivity during this season of time. The level of knowledge on climate change variable influencing production and its degree of change with the incidence of flood (82.22%) and drought (78.88%) was reported moderately.

Sarkar and Padaria (2015) reported only 22 per cent farmers knew about climate change while 43 per cent respondents had knowledge about the diverse human induced causes of climate change. The low knowledge and awareness level of the sample which suggested need for intensive extension education programme for their capacity building.

Table 4.7.3. Readiness of Farm Women Knowledge Groups (FWKGs) on adaptability to climate change

(n = 90)

Adaptation strategies	Yes F (%)	No F (%)
Diversification of crop varieties	68 (78.55)	22 (24.44)
Change in planting calendar	90 (100.00)	00
Change in use of chemical pesticides and fertilizers	78 (86.66)	12 (13.33)
Implementing soil conservation methods	85 (94.44)	5 (5.55)
Adopting water harvesting techniques	90 (100.00)	00
Change in agronomic practices i.e., mulching of soil	76 (84.44)	14 (15.55)
Changing the traditional irrigation methods	86 (95.55)	4 (4.44)
Switching from mono cropping to integrated farming systems	90 (100.00)	00
Adoption of crop rotation	74 (82.22)	16 (17.58)
Adoption of intercropping	90 (100.00)	00
Use of soil health cards	90 (100.00)	00
Preventing/reducing soil erosion	90 (100.00)	00

As shown in Table 4.7.3, adaptation practices for climate change reported and responded positively by cent per cent of farm women for planting calendar, water harvesting techniques, mono cropping to integrated farming systems, intercropping, soil health cards and in preventing/reducing soil erosion. While nearly cent per cent of farm women responded positively in changing traditional irrigation methods (95.55%) and in implementing soil conservation methods (94.44%).

Farm women 86.66% percent responded positively for changing the use of chemicals pesticides and fertilizers followed by agronomic practices i.e, mulching of soil (84.44%), adopting crop rotation (82.22%) and in diversification of crop varieties (78.55%). Kumar and Singh (2017) revealed that 65.67 percent of the respondents had medium level of awareness,

17.50 percent had high level awareness, and 16.67 percent had low level of awareness regarding climate smart agriculture. In case of adaptation, 79.17 percent had taken adaptation strategies like short duration varieties; On the other hand, 71.67 percent had crop-livestock system, 71.67 per cent mixed cropping, 76.67 per cent and 60.00 percent adopted animal manure and compost in their farm.

Singh and Singh (2017) reported traditional agriculture as a climate-smart approach for the sustainable food production and deliberated the correlation between climate change and agriculture. Agroforestry, intercropping, crop rotation, cover cropping, traditional organic composting and integrated crop-animal farming could be adopted as the model practices for climate-smart approach in agriculture. These practices not only helped adaptation to climate change but also enhanced agricultural sustainability.

Based on the need analysis of farmwomen in the context of climate change, it was demonstrated that, despite the evidence of the growing impact of climate and other socio-economic drivers, the following areas of knowledge were preferred to receive SMS (Short Message) in recognition of geographically determined preferences, and adoption of options related to ecosystem-based management, livelihoods security and technology development is based on the multiple factors which differently influence farmers' choices on the range of adaptation options empowering women.

The following Climate Smart Agriculture adaptive technologies were identified, and their knowledge was assessed.

4.8 Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

This section deals with the findings and discussions regarding the awareness of Farm Women Knowledge Groups on climate smart agriculture. Awareness includes different climate smart knowledge of improved agriculture practices viz. soil management, crop management, water management, livestock management and agro-diversification.

Table 4.8.1. Awareness of Farm Women Knowledge Groups (FWKGs) on CSA-soil management

(n=90)

S. No	Items	I Know		I Don't Know	
		Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
1.	Aware of soil health test	14	15.56	76	84.44
2.	Aware on usage of vermicomposting	12	13.33	78	86.67
3.	Aware of organic fertilizers	72	80.00	18	20.00
4.	Aware about legumes and green manure	26	28.89	64	71.11
5.	Aware on use of compost	53	58.89	37	41.11
6.	Aware about use of animal manure	42	46.67	48	53.33
7.	Aware of bio-fertilizer	15	16.67	75	83.33

According to awareness on soil management in climate smart agriculture it is shown that 80 per cent of farm women were aware about importance of organic fertilizers followed by uses of compost (58.89%), uses of animal manure (46.67%), legumes and green manure (28.89%), bio-fertilizer (16.67%), soil health test (15.56%) and usage of vermicomposting (13.33%) (Table 4.8.1). Farm women had only awareness but no much knowledge about soil health test and usage of vermicomposting.

Kumar and Singh (2017) reported that 65.67 percent of the respondents had medium level of awareness, 17.50 percent had high level awareness, and 16.67 percent had low level of awareness regarding climate smart agriculture. In case of adaptation, 79.17 percent had taken adaptation strategies like short duration varieties; on the other hand, 71.67 per cent had crop-livestock system, 71.67 per cent mixed cropping, 76.67 per cent and 60.00 per cent of the respondents adopted animal manure and compost in their farm.

Table 4.8.2. Awareness of Farm Women Knowledge Groups (FWKGs) on CSA-crop management

(n=90)

S. No	Items	I Know		I Don't Know	
		Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
1.	Aware of intercropping	23	25.56	67	74.44
2.	Aware of seed treatment	19	21.11	71	78.89
3.	Aware of crop rotation	42	46.67	48	53.33
4.	Aware of Planting drought resistant varieties of crops	28	18.89	62	68.89
5.	Aware of crop diversification	32	35.56	58	64.44
6.	Aware about change in cropping pattern and planting calendar	22	24.44	68	75.56
7.	Aware of mixed cropping	38	42.22	52	57.78

With regard to awareness on soil management in climate smart agriculture revealed it was that highest percentage of the farm women were aware of crop rotation (46.67%) and mixed cropping (42.22%). Lowest percentage of the farm women were aware of planting drought resistant varieties of crops (18.89%) (Table 4.8.2),

As the farm women were very much aquatinted with traditional knowledge and were not much aware of crop management techniques.

Kutir *et al.* (2015) report revealed that 80.6% percent of the farmers were aware of climate change with an average awareness index of 0.586 (58.6%). Also, an overwhelming majority of 93.41 per cent of the farmers used crop diversification, drought resistant cultivars, and early maturing varieties among others as response strategy to climate change. The study concluded that farmers in the study area were fairly aware of climate change.

**Table 4.8.3. Awareness of Farm Women Knowledge Groups (FWKGs) on
CSA- water management**

(n=90)

S. No	Items	I Know		I Don't Know	
		Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
1.	Aware about drip irrigation	33	36.67	57	63.33
2.	Aware of mulching	22	24.44	68	75.56
3.	Aware of water efficient crops varieties	14	15.56	76	84.44
4.	Aware about farm pond	58	64.44	32	35.55
5.	Aware of micro irrigation	24	26.67	66	73.33
6.	Aware of water harvesting	38	42.22	52	57.78

From the Table 4.8.3 farm women reported that they were aware of farm pond (64.44%) since they might have seen farm ponds in earlier years of farming done by their parents or grandparents followed by water harvesting (42.22%), drip irrigation (36.67%), micro irrigation (26.67%) and mulching (24.44%).

Land and water management plays a key role in climate smart agriculture. Wide scale implementation of climate-smart soil and water management practices could enhance climate change adaptation and mitigation.

**Table 4.8.4. Awareness of Farm Women Knowledge Groups (FWKGs) on
CSA- livestock management**

(n=90)

S. No	Items	I Know		I Don't Know	
		Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
1.	Aware about super Napier is better fodder management	12	13.33	78	86.67
2.	Aware regarding Lucerne hedge in better fodder management	14	15.56	76	84.44
3.	Aware about azolla is better fodder management	12	13.33	78	86.67

As per livestock management, 15.56 percent of the farm women were aware about Lucerne hedge and equal percentages (13.33%) were aware of both Napier and Azolla for better fodder management (Table 4.8.4).

Table 4.8.5. Awareness of Farm Women Knowledge Groups (FWKGs) on CSA-agro-diversification
(n=90)

S. No	Items	I Know		I Don't Know	
		Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
1.	Awareness regarding crop-tree systems (agro forestry systems)	33	36.67	57	63.33
2.	Awareness regarding reduced tillage	15	16.67	75	83.33
3.	Aware about crop-tree-livestock system	38	42.22	52	57.78
4.	Awareness regarding integrated farming system model	26	28.89	64	71.11
5.	Awareness regarding space between rows/plants	38	42.22	52	57.78

In agro diversification, the findings from the study revealed that equal percentage of farm women were aware of crop tree livestock system and regarding space between rows/plants. (42.22%) Least percentage (16.67%) of farm women were aware of reducing tillage activity (Table 4.8.5), Zero tillage is one of the climate resilient suggested technologies to farm women.

4.8.1 Association between need analysis on awareness of (FWKGs) on climate smart agriculture and selected independent variables of the study

Association between need analysis on awareness of farm women on climate smart agriculture and selected independent variables of the study was tested statistically. The hypothesis formulated states that there exists a significant association between the awareness of farm women on climate smart agriculture and selected independent variables i.e., age and educational qualification.

Awareness of farm women on climate smart agriculture was selected and further examined with selected independent variables.

HA: There exists a significant association between need analysis awareness of farm women on climate smart agriculture and selected independent variables of the study.

To test the hypothesis HA, the null hypothesis H_0A with the following sub null hypothesis were formulated

H_0A1 : There exists no significant association between need analysis awareness of farm women on soil management and selected independent variables of the study.

H_0A2 : There exists no significant association between need analysis awareness of farm women on crop management and selected independent variables of the study.

H_0A3 : There exists no significant association between need analysis awareness of farm women on water management and selected independent variables of the study.

H_0A4 : There exists no significant association between need analysis awareness of farm women on livestock management and selected independent variables of the study.

H_0A5 : There exists no significant association between need analysis awareness of farm women on agro-diversification management and selected independent variables of the study.

Table 4.8.1.1. Association between selected independent variables with awareness on CSA-soil management

S. No	Soil management	χ^2 value (n=90)	
		Age	Educational qualification
1.	Aware of soil health test	27.324 ^{ns}	8.09 ^{ns}
2.	Aware on usage of vermicomposting	23.252 ^{ns}	8.49 ^{ns}
3.	Aware of organic fertilizers	25.345 ^{ns}	3.97 ^{ns}
4.	Aware about legumes and green manure	27.068 ^{ns}	8.68 ^{ns}
5.	Aware on use of compost	19.053 ^{ns}	4.65 ^{ns}
6.	Aware about use of animal manure	18.632 ^{ns}	4.00 ^{ns}
7.	Aware of bio-fertilizer	12.763 ^{ns}	2.54 ^{ns}

H_0A1 : There exists no significant association between need analysis awareness of farm women on soil management and selected independent variables of the study.

When the association between the age, educational qualification and need analysis awareness of farm women on soil management were studied by using chi square test, no

association was found between age, educational qualification and need analysis awareness of farm women on soil management (Table 4.8.1.1), therefore, the null hypothesis is accepted.

Table 4.8.1.2. Association between selected independent variables with awareness on CSA-crop management

(n=90)

S. No	Crop management	χ^2 value	
		Age	Educational qualification
1.	Aware of intercropping	27.06 ^{ns}	2.48 ^{ns}
2.	Aware of seed treatment	17.17 ^{ns}	0.64 ^{ns}
3.	Aware of crop rotation	21.15 ^{ns}	1.45 ^{ns}
4.	Aware of planting drought resistant varieties of crops	13.06 ^{ns}	5.31 ^{ns}
5.	Aware of crop diversification	25.19 ^{ns}	6.08 ^{ns}
6.	Aware about change in cropping pattern and planting calendar	28.78 ^{ns}	12.12 ^{ns}
7.	Aware of mixed cropping	13.63 ^{ns}	6.63 ^{ns}

H₀A2: There exists no significant association between need analysis awareness of farm women on crop management and selected independent variables of the study.

When the association between the age, educational qualification and need analysis awareness of farm women on crop management were studied by using chi square test, no association was found between age, educational qualification and need analysis awareness of farm women on crop management (Table 4.8.1.2), and null hypothesis is accepted.

Table 4.8.1.3. Association between selected independent variables with awareness on CSA-water management

(n=90)

S. No	Water management	χ^2 value	
		Age	Educational qualification
1.	Aware about drip irrigation	18.99 ^{ns}	8.54 ^{ns}
2.	Aware of mulching	20.95 ^{ns}	10.27 ^{ns}
3.	Aware of water efficient crops varieties	19.30 ^{ns}	3.61 ^{ns}
4.	Aware about farm pond	18.25 ^{ns}	3.69 ^{ns}
5.	Aware of micro irrigation	23.96 ^{ns}	2.58 ^{ns}
6.	Aware of water harvesting	29.60 ^{ns}	7.49 ^{ns}

H₀A3: There exists no significant association between need analysis awareness of farm women on water management and selected independent variables of the study.

When the association between the age, educational qualification and need analysis awareness of farm women on water management were studied by using chi square test, no association was found between age, educational qualification and need analysis awareness of farm women on water management (Table 4.8.1.3) therefore, null hypothesis is accepted.

Table 4.8.1.4. Association between selected independent variables with awareness on CSA-livestock fodder management (n=90)

S. No	Livestock fodder management	χ^2 value	
		Age	Educational qualification
1.	Aware about super Napier is better fodder management	20.98 ^{ns}	7.40 ^{ns}
2.	Aware regarding Lucerne hedge in better fodder management	21.49 ^{ns}	7.25 ^{ns}
3.	Aware about azolla is better fodder management	16.38 ^{ns}	1.35 ^{ns}

H₀A4: There exists no significant association between need analysis awareness of farm women on livestock management and selected independent variables of the study.

When the association between the age, educational qualification and need analysis awareness of farm women on livestock management were studied by using chi square test, no association was found between age, educational qualification and need analysis awareness of farm women on livestock management (Table 4.8.1.4), and null hypothesis is accepted.

Table 4.8.1.5. Association between selected independent variables with awareness on CSA-agro-diversification

(n=90)

S. No	Agro-diversification	χ^2 value	
		Age	Educational qualification
1.	Awareness regarding crop-tree systems (agro forestry systems)	25.56 ^{ns}	3.66 ^{ns}
2.	Awareness regarding reduced tillage	16.31 ^{ns}	1.22 ^{ns}
3.	Aware about crop-tree-livestock system	28.47 ^{ns}	6.57 ^{ns}
4.	Awareness regarding integrated farming system model	22.60 ^{ns}	4.71 ^{ns}
5.	Awareness regarding space between rows/plants	16.33 ^{ns}	9.90 ^{ns}

H₀A5: There exists no significant association between need analysis awareness of farm women on agro-diversification management and selected independent variables of the study.

When the association between the age, educational qualification and need analysis awareness of farm women on agro-diversification management were studied by using chi square test, no association was found between age, educational qualification and need analysis awareness of farm women on agro-diversification management (Table 4.8.1.5), and null hypothesis is accepted.

4.9 Knowledge index of Farm Women Knowledge Groups (FWKGs) on adaptation strategies for Climate Smart Agriculture

4.9.1 Before intervention- knowledge index of Farm Women Knowledge Groups (FWKGs) on adaptation strategies for Climate Smart Agriculture

This section deals with the findings and discussions regarding the knowledge index on adaptation strategies for climate smart agriculture. Under this, different climate smart agricultural strategies were selected and collected data for knowing their pre-knowledge levels on soil health test, vermicomposting under soil management, seed treatment, intercropping under crop management, drip irrigation system, mulching under water management, super Napier and hedge Lucerne under IFS and livestock management. The data was formulated, tabulated and presented below.

Table 4.9.1.1. Knowledge index on CSA- Soil Health Test**(n=90)**

S. No.	Statements	Frequency		
		I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that soil test helps in identifying the fertility and nutrient levels of the land	10 (11.11)	4 (4.44)	76 (84.44)
2.	Do you know that the fertile lands should be tested at least once in three years	00	00	90 (100.00)
3.	Do you know soil test minimizes the other expenses like use of pesticides and other chemicals	8 (8.89)	4 (4.44)	78 (86.67)
4.	Do you know soil test balances acidic and alkalinity soil	00	00	90 (100.00)
5.	Do you know with soil test, the soil can be corrected by adding calcium and gypsum for the soil with increased acidic and alkaline conditions respectively	00	00	90 (100.00)
6.	Do you know vermicomposting need to be used maintain the quality of soil	8 (8.89)	6 (6.67)	76 (84.44)

It shown from Table 4.9.1.1 that 11.11 per cent of the farm women knew that the soil test helps in identifying the fertility and nutrient levels of the land and equal percentage (8.89%) of the farm women knew that the soil testing minimizes the other expenses (use of pesticides and other chemicals) and maintains the quality of the soil by using vermicomposting.

Cent per cent of the farm women did not know that the fertile lands should be tested at least once in three years, soil test balances acidic and alkalinity soil and soil could be corrected by adding calcium and gypsum for the soil with increased acidic and alkaline conditions respectively.

Table 4.9.1.2. Total frequency of knowledge index on CSA- Soil Health Test (n=90)

S.No	Category	Frequency	Percentage
1	High	26	4.81
2	Medium	14	2.59
3	Low	500	92.59
	Total	540	100.00

$$90 \times 6 = 540$$

Table 4.9.1.2 and Fig 4.9.1.1 indicate that majority (92.59%) of the farm women respondents had low level of knowledge index on CSA- soil health test, followed by high and medium level knowledge index on CSA- soil health test with 4.81 and 2.59 per cent, respectively.

Further it was noticed that knowledge index on CSA- Soil Health Test among the farm women vary due to lack of education and low social organizational participation among the low category group and respondents with high and medium category was found among educated farm women belonging to Asha workers, Anganwadi teachers, Village Sarpanch and SHG group leaders.

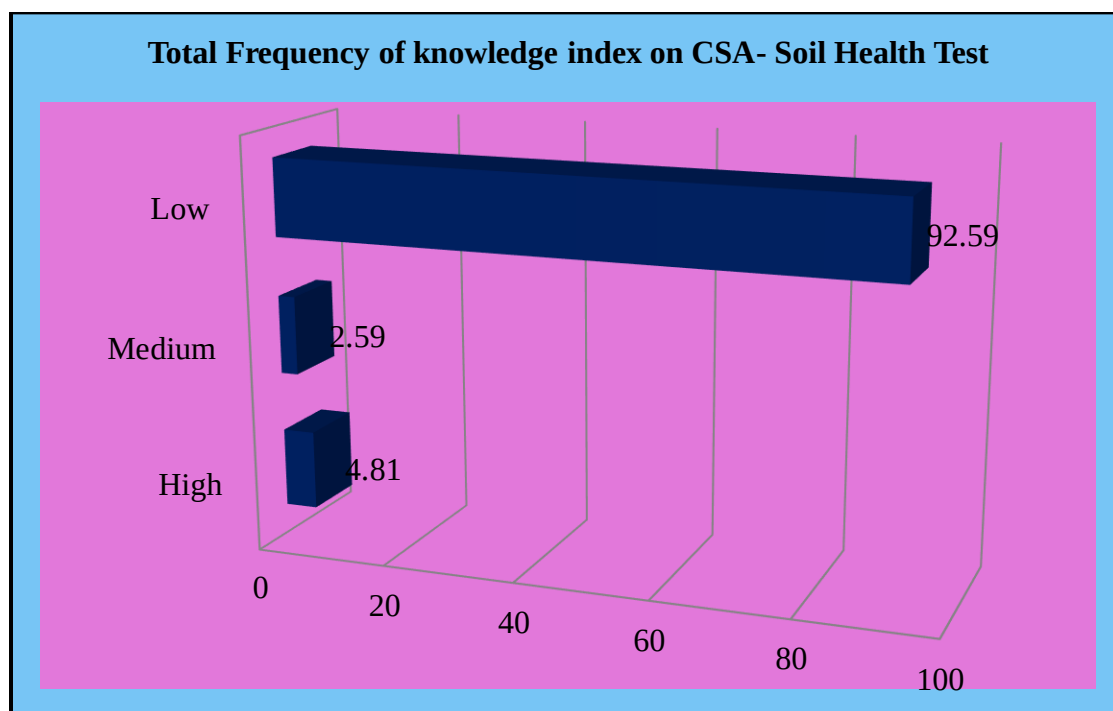


Figure 4.9.1.1. Total frequency of knowledge index on CSA- Soil Health Test

Table 4.9.1.3. Knowledge index on CSA- Vermicomposting**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that use of vermicomposting improves the soil fertility	8 (8.88)	4 (4.44)	78 (86.66)
2.	Do you know vermicomposting sustain the quality of soil than chemicals	00	14 (15.55)	76 (84.44)
3.	Do you know vermicomposting increases plant nutritive value	10 (11.11)	4 (4.44)	76 (84.44)
4.	Do you know the soil water conservation can be increased with the use of vermicomposting	00	12 (13.33)	78 (86.66)
5.	Do you know vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium	00	00	90 (100.00)
6.	Do you know vermicomposting enriches soil with microorganisms	00	00	90 (100.00)
7.	Do you know two tons of vermicomposting is required for one-acre fertile land	00	00	90 (100.00)

Table 4.9.1.3 depicts that 11.11 per cent of the farm women knew that vermicomposting increases plant nutritive value, and, only 8.88 percent knew about the use of vermicomposting in improved the soil fertility.

While 15.55 per cent of the farm women somewhat knew about the vermicomposting to sustain the quality of soil followed by increased soil water conservation increased with the use of vermicomposting (13.33%),only 4.44percent knew that vermicomposting increases plant nutritive value and the use of vermicomposting improves the soil fertility respectively.

Cent per cent of the farm women did not know about vermicomposting having composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium, vermicomposting enriching soil with microorganisms and that two tons of vermicomposting is required for one-acre fertile land.

Table 4.9.1.4. Total frequency of knowledge index on CSA- Vermicomposting (n=90)

S.No	Category	Frequency	Percentage
1	High	18	2.86
2	Medium	34	5.40
3	Low	578	91.75
	Total	630	100.00

90*7=630

The results from Table 4.9.1.4 and Fig 4.9.1.2 indicate that majority (91.75%) of the farm women respondents represent low category knowledge index on CSA-vermicomposting due to poor knowledge about the benefits of vermicomposting, followed by medium (5.40%) and high (2.86%) as results of knowledge sharing with village agriculture extension officer.

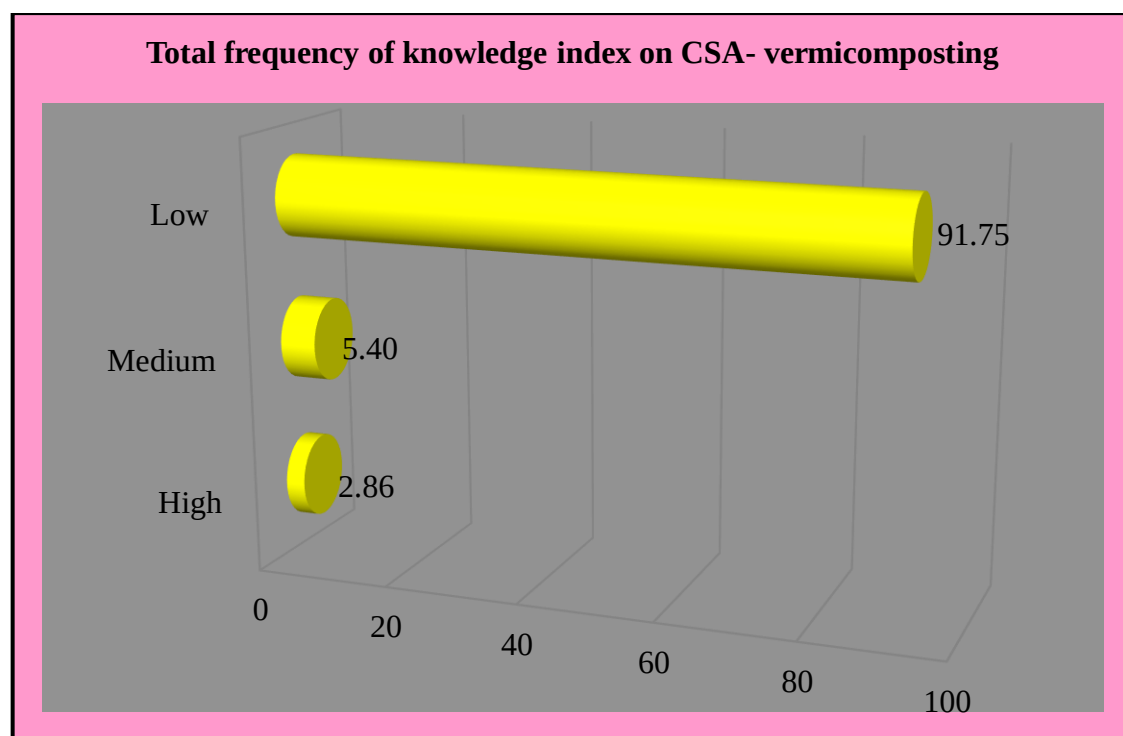


Figure 4.9.1.2. Total frequency of knowledge index on CSA-Vermicomposting

Table 4.9.1.5. Knowledge index on CSA- Seed Treatment**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that seed treatment is required to inhibit soil borne diseases	10 (11.11)	9 (10.00)	71 (78.89)
2.	Do you know seed treatment kills seed borne pathogens/insects	6 (6.67)	8 (8.89)	76 (84.44)
3.	Do you know seed treatment increases the life span of the seeds	00	11 (12.22)	79 (87.78)
4.	Do you know seed treatment enhances the root formation of the pulse crops	00	00	90 (100.00)
5.	Do you know seed treatment can be prepared with cow milk	5 (5.56)	10 (11.11)	75 (83.33)
6.	Do you know seed treatment can be prepared with cow urine	12 (13.33)	14 (15.56)	64 (71.11)
7.	Do you know seed treatment can be prepared with cow bijaamruthum	8 (8.89)	12 (13.33)	70 (77.78)
8.	Do you know seed treatment gives uniform crop stand, even in adverse conditions (less/high moisture)	00	00	90 (100.00)

Table 4.9.1.5 refers to knowledge index on seed treatment, 13.33 per cent of farm women knew about the preparation of the seed treatment with cow urine, followed by seed treatment required to inhibit soil prone diseases (11.11%), seed treatment preparation with cow bijaamruthum (8.89%), and that seed treatment kills seed borne pathogens/insects (6.67%) followed by seed treatment preparation with cow milk (5.56%).

A small percent of farm women knew about seed treatment preparation with cow urine (15.56%), and cow bijamruthum (13.33%), and that life span of seeds can be increased by seed treatment (12.22%), seed treatment with cow milk (11.11%), and inhibit in soil borne diseases with soil treatment (10.00%) and killing seed borne pathogens/insects by seed treatment (8.89%).

Table 4.9.1.6. Total frequency of Knowledge index on CSA- Seed Treatment
(n=90)

S.No	Category	Frequency	Percentage
1	High	41	5.69
2	Medium	64	8.89
3	Low	615	85.42
	Total	720	100.00

$$90 \times 8 = 720$$

The results from Table 4.9.1.6 and Fig 4.9.1.3 indicate that majority (85.42%) of the farm women respondents belong to low category knowledge index on CSA-seed treatment due lack social participation and awareness. Respondents with medium (8.89%) and high (5.69%) total frequency of knowledge index on CSA- seed treatment can be attributed to educated group and are active participant of village and SHG group meetings conducted by NABARD-Banks and inputs gathered from TV shows.

Sanjeev Kumar (2012) reported that the age old environmental friendly disease management practice like sanitation, crop rotation, mixed cropping, adjustment of date of sowing, fallowing, summer ploughing, green manuring composting etc.

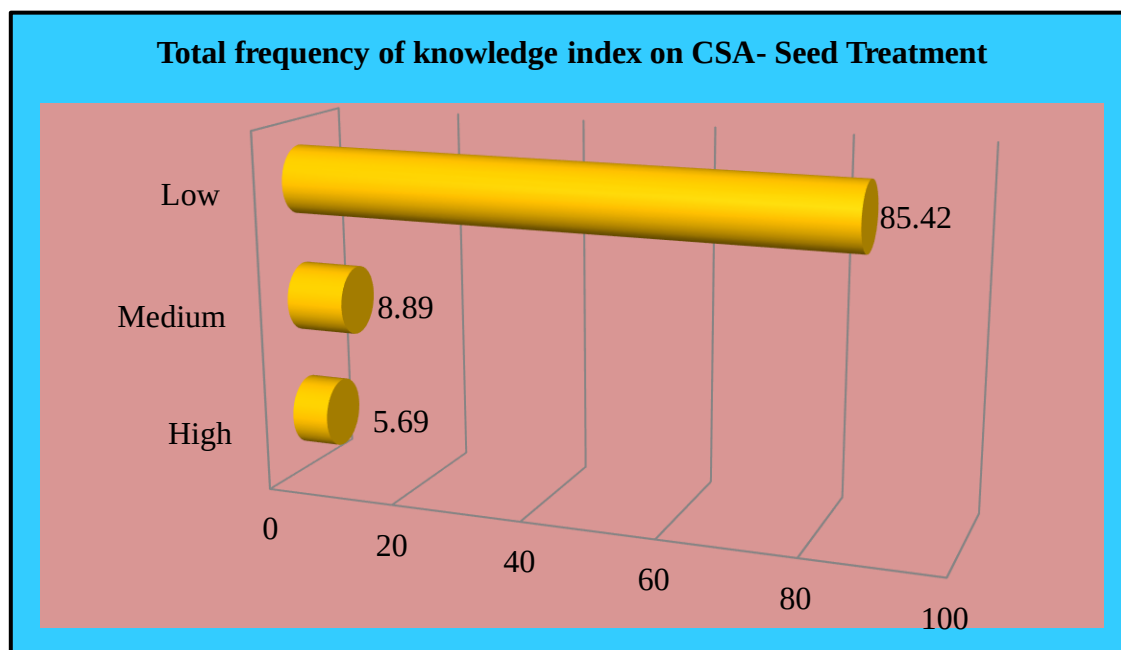


Figure 4.9.1.3. Total frequency of Knowledge index on CSA- Seed Treatment

Table 4.9.1.7. Knowledge index on CSA- Intercropping**(n=90)**

S.No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know intercropping which helps in cultivating more than one crop in the same field	12 (13.33)	16 (17.78)	62 (68.89)
2.	Do you know intercropping gives additional yield income	15 (16.67)	20 (22.22)	55 (61.11)
3.	Do you know intercropping increase nutritive value	00	00	90 (100.00)
4.	Do you know intercropping controls weed	00	13 (14.44)	77 (85.56)
5.	Do you know intercropping acts as an insurance against failure of crops in abnormal year	6 (6.67)	12 (13.33)	72 (80.00)
6.	Do you know intercropping provide shade and support to the other crop	00	15 (16.67)	75 (83.33)
7.	Do you know intercropping maintain the soil fertility as the nutrient uptake is made from both layers of soil	00	6 (6.67)	84 (93.33)

From Table 4.9.1.7, knowledge index on intercropping revealed that farm women knew about intercropping increased the yield (16.67%), intercropping helps in cultivating more than one crop in the same field (13.33%) and intercropping acts as an insurance against failure of crops in abnormal year (6.67%).

It also revealed that farm women somewhat knew about intercropping increased the yield (22.22%), intercropping helps in cultivating more than one crop in the same field (17.78%), intercropping provided shade and support to the other crop (16.67%), intercropping control weeds (14.44%), intercropping acts as an insurance against failure of crops in abnormal year (13.33%) and intercropping maintain the soil fertility as the nutrient uptake is made from both layers of soil (6.67%) per cent of farm women did not know that intercropping helps in increasing nutritive value.

Table 4.9.1.8. Total frequency of knowledge index on CSA- Intercropping
(n=90)

S.No	Category	Frequency	Percentage
1	High	33	5.24
2	Medium	82	13.02
3	Low	515	81.75
	Total	630	100.00

$$90 \times 7 = 630$$

Table 4.9.1.8 and Fig 4.9.1.4 indicate that majority (81.75%) of the farm women respondents had low category level of knowledge index on CSA-intercropping due low exposure towards social participation and less scope to interaction with agriculture department as most of them low educated.

Respondents with medium and high-level knowledge index on CSA- intercropping test with 13.02 and 5.24 per cent, respectively due wide exposure to agri related meetings and interaction with officials from agriculture department.

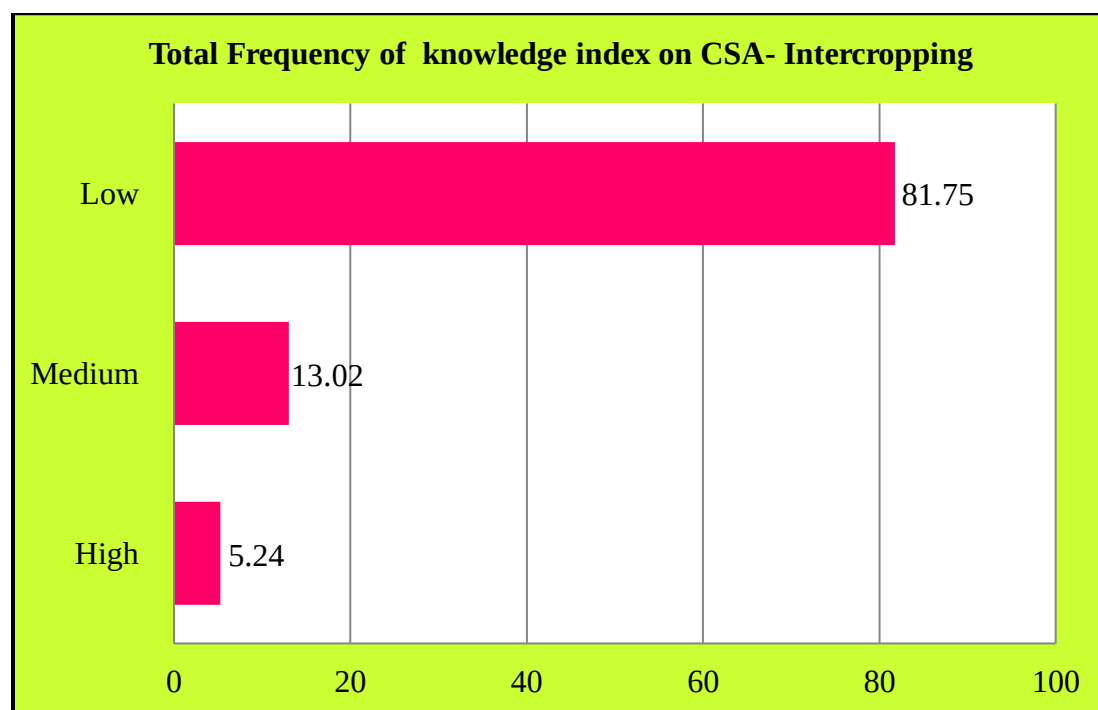


Figure 4.9.1.4. Total frequency of Knowledge index on CSA- Intercropping

Table 4.9.1.9. Knowledge index on CSA- Drip Irrigation System**(n=90)**

S.No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know drip irrigation system conserves water	22 (24.44)	11 (12.22)	57 (63.33)
2.	Do you know in drip irrigation, foliage remains dry and reducing the risk of disease	00	12 (13.33)	78 (86.66)
3.	Do you know drip irrigation lessen soil erosion	12 (13.33)	8 (8.89)	70 (77.78)
4.	Do you know drip irrigation controls seed growth due to spot watering	8 (8.89)	11 (12.22)	71 (78.89)
5.	Do you know drip irrigation, labour cost is less than other irrigation methods	13 (14.44)	15 (16.67)	62 (68.89)
6.	Do you know drip irrigation will not require land leveling and bundling	9 (10.00)	10 (11.11)	71 (78.89)
7.	Do you know drip irrigation system reduces energy costs	8 (8.89)	5 (5.56)	77 (85.56)

It is clear from Table 4.9.1.9 that 24.44 per cent of farm women knew about drip irrigation system that conserves water, and drip irrigation labour cost was less than other irrigation methods (14.44%), drip irrigation lessen soil erosion (13.33%), drip irrigation not required land leveling and bundling (10%), equal percentage (8.89%) knew about drip irrigation controls weed growth due to spot watering and drip irrigation system reduces energy costs.

It also revealed that 16.67 per cent of farm women somewhat knew that drip irrigation labour cost is less than other irrigation methods followed by in drip irrigation foliage remains dry and reducing the risk of disease (13.33%), equal percentage farm women somewhat knew that (12.22%) of 11.11 percent somewhat know that drip irrigation system conserves water and controls seed growth due to spot watering, drip irrigation will not require land leveling and bundling whereas, less percentage of farm women knew about drip irrigation lessen soil erosion(8.89%) and it reduces energy costs (5.56%).

Majority of the respondents are not aware about usefulness of drip irrigation system. There is an urgent need to stimulate or create awareness on drip system. This could help in mitigating the drought/ effects or climate change.

Table 4.9.1.10. Total frequency of knowledge index on CSA- Drip Irrigation System (n=90)

S.No	Category	Frequency	Percentage
1	High	72	11.43
2	Medium	72	11.43
3	Low	486	77.14
	Total	630	100.00

$$90 \times 7 = 630$$

It is evident from Table 4.9.1.10 and Fig 4.9.1.5 that majority (77.14%) of the farm women respondents had low level of knowledge index on CSA- drip irrigation system and further it involved high cost and lack of awareness on subsidy offered by government. Respondents belonging to educated group correlate to high and medium level knowledge index on CSA- drip irrigation system with 11.43 and 11.43 per cent, respectively.

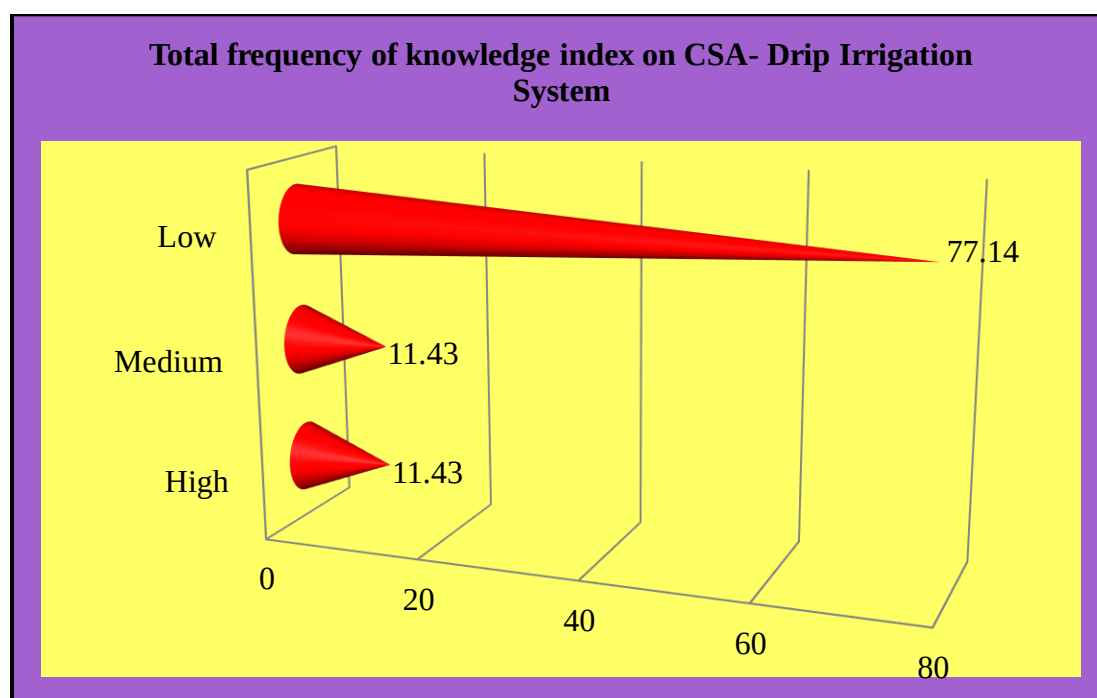


Figure 4.9.1.5. Total frequency of knowledge index on CSA- Drip Irrigation System

Table 4.9.1.11. Knowledge index on CSA- Mulching**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is mulching	12 (13.33)	10 (11.11)	68 (75.56)
2.	Do you know mulching improves nutrient and retains water in the soil	9 (10.00)	11 (12.22)	70 (77.78)
3.	Do you know mulching reduces and controls soil erosion	00	00	90 (100.00)
4.	Do you know mulching reduced the growth of weeds	9 (10.00)	13 (14.44)	68 (75.56)
5.	Do you know mulching regulates soil temperature	6 (6.67)	12 (13.33)	72 (80.00)
6.	Do you know mulching promotes activities of soil friendly microorganisms	00	00	90 (100.00)

According to knowledge index on mulching, 13.33 per cent of farm women knew about mulching whereas 6.67 percent of farm women knew that mulching regulates soil temperature. Equal percentage (10%) of farm women knew that mulching improves nutrient and retains water in the soil and also it reduces the growth of weeds (Table 4.9.1.11).

Results also reported that mulching reduces the growth of weeds (14.44%) followed by mulching regulates soil temperature (13.33%), mulching improves nutrient and retains water in the soil (12.22%) and knew about mulching (11.11%).

Cent per cent of farm women did not know about how mulching reduces and controls soil erosion and how it promotes activities of soil friendly microorganisms.

Table 4.9.1.12. Total frequency of knowledge index on CSA- Mulching**(n=90)**

S.No	Category	Frequency	Percentage
1	High	36	6.67
2	Medium	46	8.52
3	Low	458	84.81
	Total	540	100.00

$$90 \times 6 = 540$$

A glance at table Table 4.9.1.12 and Fig 4.9.1.6 it can be concluded that majority (84.81%) of the farm women respondents had low level of knowledge mulching. Respondents belonging to SERP (Society for Elimination of Rural Poverty) group were given training on modern agriculture practices as such represent medium 8.52 per cent and high-level knowledge index on CSA- mulching 6.67 per cent, respectively.

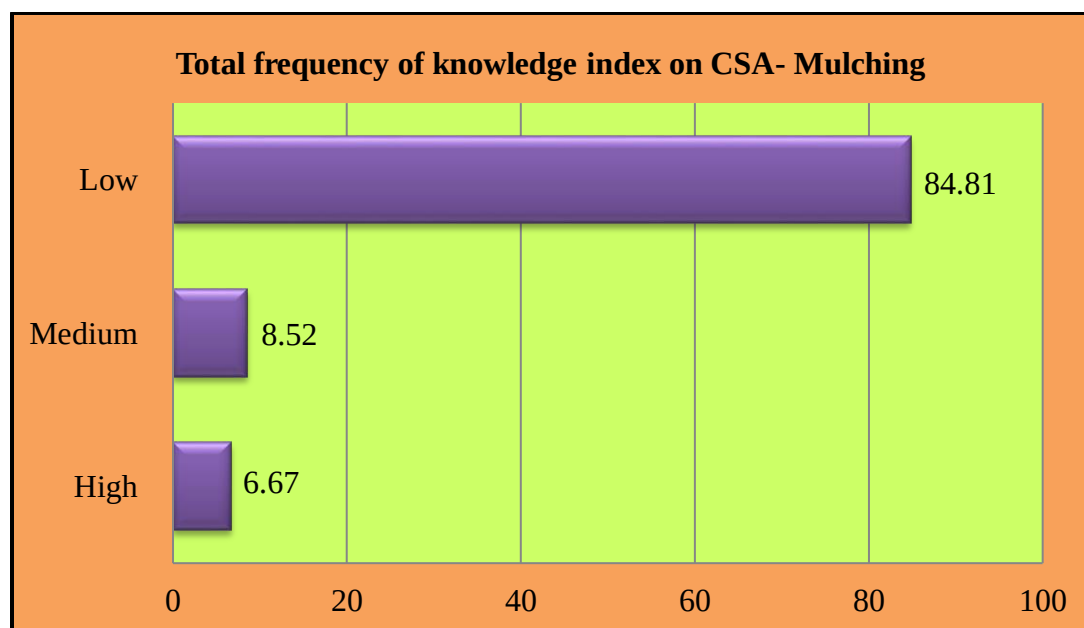


Figure 4.9.1.6. Total frequency of knowledge index on CSA- Mulching

Table 4.9.1.13. Knowledge index on CSA- Super Napier

(n=90)				
S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is super Napier grass	7 (7.78)	5 (5.56)	78 (86.67)
2.	Do you know super Napier grass has high protein, carbohydrate, vitamins	00	00	90 (100.00)
3.	Do you know super Napier grass grows faster upto 10 feet in 59 days	00	00	90 (100.00)
4.	Do you know super Napier grass is the best fodder crops for dairy cattle	4 (4.44)	8 (8.89)	78 (86.67)
5.	Do you know super Napier grass improves the quality of livestock's milk	00	00	90 (100.00)
6.	Do you know silage can be prepared with super Napier grass	00	00	90 (100.00)

From the distribution of Table 4.9.1.13, the results revealed that 7.78 per cent of farm women knew about super Napier grass and 4.44 per cent knew that super Napier grass is in best fodder crop for dairy cattle.

Only 8.89 per cent of farm women somewhat knew about super Napier grass which is in best fodder crops for dairy cattle and 5.56 percent of farm women knew about super Napier grass.

Cent per cent of farm women did not know that super Napier grass helps in high protein, carbohydrate, vitamins, that, by it grows faster upto 10 feet in 59 days that it improves the quality of livestock's milk and that silage can be prepared with super Napier grass.

Table 4.9.1.14. Total frequency of knowledge index on CSA- Super Napier (n=90)

S.No	Category	Frequency	Percentage
1	High	11	2.04
2	Medium	13	2.41
3	Low	516	95.56
	Total	540	100.00

$$90 \times 6 = 540$$

It is evident from Table 4.9.1.14 and Fig 4.9.1.7 that majority (95.56%) of the farm women respondents had low level of knowledge index on CSA- Super Napier. Further respondents with medium and high-level knowledge index on CSA- Super Napier belong to educated group with frequent interaction with govt. officials and village meetings.

Lowe *et al.* 2003; Anderson *et al.* 2008; Tessema (2008) reported that Napier grass is often preferred by smallholders and, e.g. in east Africa, constitutes up to 80% of forage grown. This has been attributed to its wide range of adaptation, vigorous growth, high biomass productivity and deep root system to survive under drought conditions.

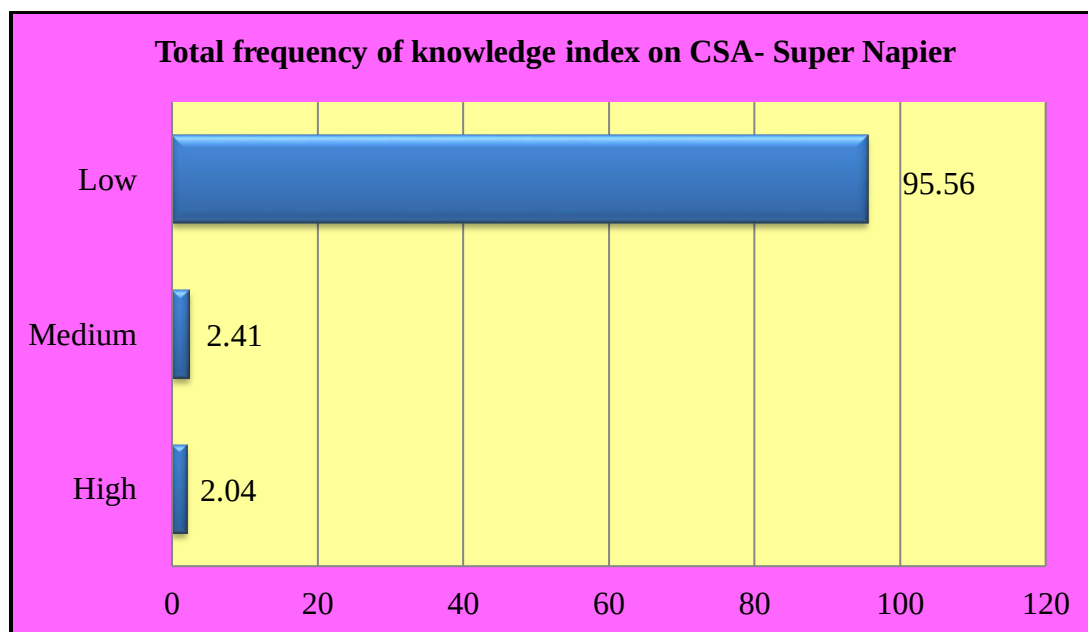


Figure 4.9.1.7. Total frequency of knowledge index on CSA- Super Napier

Table 4.9.1.15. knowledge index on CSA- Hedge Lucerne

(n=90)

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is hedge Lucerne grass	10 (11.11)	4 (4.44)	76 (84.44)
2.	Do you know hedge Lucerne grass yields for 5 to 6 years	00	9 (10.00)	81 (90.00)
3.	Do you know hedge Lucerne grass yield up to 90 tons per acre	00	00	90 (100.00)
4.	Do you know hedge Lucerne grass has high protein content	00	00	90 (100.00)
5.	Do you know hedge Lucerne grass is one of the best feed to livestock highly digestible	00	12 (13.33)	78 (86.67)
6.	Do you know it benefits in high rate of growth in cattle with increased yield in milk	00	00	90 (100.00)

It was observed from the Table 4.9.1.15 that only 11.11 per cent of farm women knew about hedge Lucerne grass whereas 4.4 per cent of farm women somewhat knew about it. Hedge Lucerne grass was one of the best feeds to livestock highly digestible (13.33%) and it yields for 5 to 6 years (10%).

Cent per cent of farm women did not know that the hedge Lucerne grass yields up to 90 tons per acre has high protein content and benefits in high rate of growth in cattle with increased yield in milk.

Hence, it can be concluded that few farm women knew about the advantages of soil health test, vermicomposting, seed treatment, intercropping, drip irrigation system, mulching, super Napier and hedge Lucerne grass.

Table 4.9.1.16. Total frequency of knowledge index on CSA- Hedge Lucerne (n=90)

S.No	Category	Frequency	Percentage
1	High	10	1.85
2	Medium	25	4.63
3	Low	505	93.52
	Total	540	100.00

$$90 \times 6 = 540$$

It was observed from the Table 4.9.1.16 and Figure 4.9.1.8 that majority (93.52%) of the farm women respondents had low level of knowledge index on CSA- Hedge Lucerne because of poor information base on benefits of Lucerne grass, whereas respondents with medium and high-level knowledge index on CSA- Hedge Lucerne with 4.63 and 1.85 per cent, respectively.

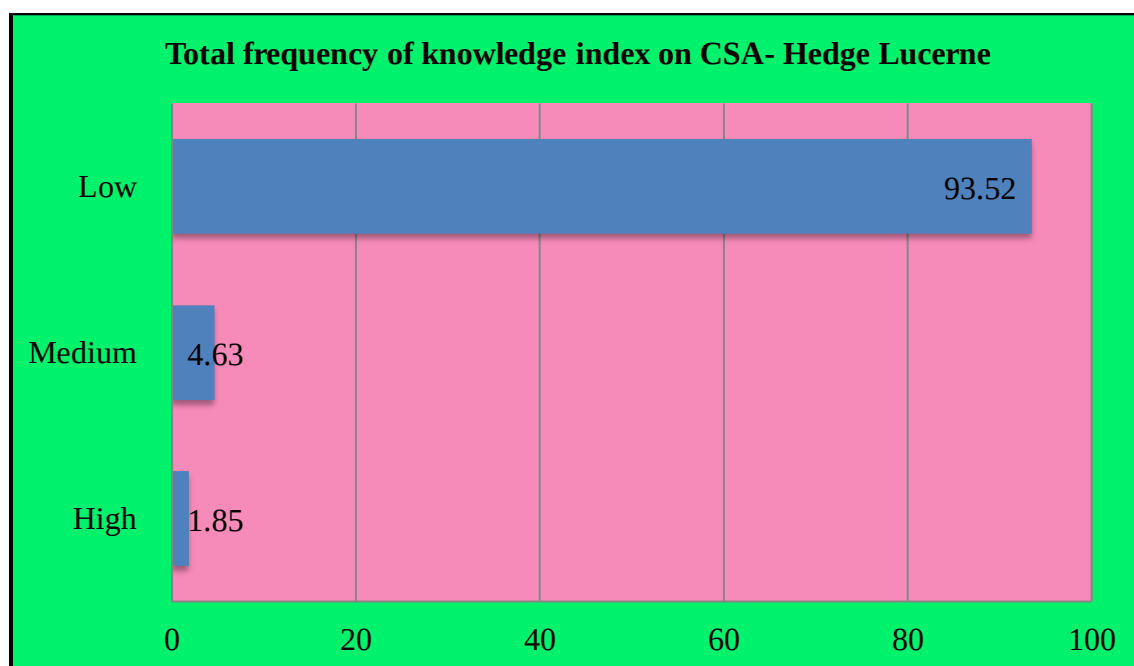


Figure 4.9.1.8. Total frequency of knowledge index on CSA- Hedge Lucerne

4.9.2 After intervention- knowledge index of Farm Women Knowledge Groups (FWKGs) on adaptation strategies for climate smart agriculture

This section deals with the findings and discussions regarding the knowledge index levels of Farm Women Knowledge Groups on adaptation strategies for climate smart agriculture after receiving the intervention.

Under this, different climate smart agricultural strategies were selected, synthesized into topic wise statements and collected data for knowing their post-knowledge levels soil health test, vermicomposting under soil management, seed treatment, intercropping under crop management, drip irrigation system, mulching under water management, super Napier and hedge Lucerne under IFS and livestock management. The data was formulated, tabulated and presented below.

Table 4.9.2.1. Knowledge index on CSA- Soil Health Test

(n=90)

S. No.	Statements	Frequency		
		I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that soil test helps in identifying the fertility and nutrient levels of the land	76 (84.44)	6 (6.67)	8 (8.89)
2.	Do you know that the fertile lands should be tested at least once in three years	82 (91.11)	00	8 (8.89)
3.	Do you know soil test minimizes the other expenses like use of pesticides and other chemicals	74 (82.22)	10 (11.11)	6 (6.67)
4.	Do you know soil test balances acidic and alkalinity soil	68 (75.56)	13 (14.44)	9 (10.00)
5.	Do you know with soil test, the soil can be corrected by adding calcium and gypsum for the soil with increased acidic and alkaline conditions respectively	63 (70.00)	16 (17.78)	11 (12.22)
6.	Do you know vermicomposting need to be used maintain the quality of soil	80 (88.89)	6 (6.67)	4 (4.44)

It shown from Table 4.9.2.1 majority (91.11%) of the farm women came to know about the importance of fertility of lands and fertility of soils should be tested at least once in three years to maintain the quality of the soil (88.89%), soil test in identifying the fertility

and nutrient levels of the land (84.44%), in minimizing the other expenses i.e. use of pesticides and other chemicals (82.22%), in balancing acidic and alkalinity soil (75.56%) and in correcting the soil by adding calcium and gypsum for the soil with increased acidic and alkaline conditions (70%) respectively.

The findings of the study were in line with the study conducted by Stevens (2015) which summarized on existing knowledge about the economics of soil health, suggested a methodology for studying the economics of soil health and revealed that soil health policies focused on increasing access to information and internalizing the positive externalities of healthy soils.

After the intervention, study participants gained knowledge regarding soil health test. They received information messages like text. Audio, video through mobile phone application and usage of mobile phone.

Table 4.9.2.2. Total frequency of knowledge index on CSA- Soil Health Test (n=90)

S.No	Category	Frequency	Percentage
1	High	443	82.04
2	Medium	51	9.44
3	Low	46	8.52
	Total	540	100.00

$$90 \times 6 = 540$$

Table 4.9.2.2 and Fig 4.9.2.1 indicate that majority (82.04%) of the farm women respondents had high level of knowledge index on CSA- soil health test due to imparting training through SMS Country.com software enabled text ,audio and whatssup video clippings on benefits of soil health test to the members. However it was reported that few member represented medium and low-level knowledge index on CSA- soil health test with 9.44 and 8.52 per cent due to poor response audio messages and least preference to given text message.

The findings were in coincidence with Patel *et al* (2017) the result revealed that 52 per cent respondent belonged high to very high category with respect to knowledge of soil testing for advance farming.

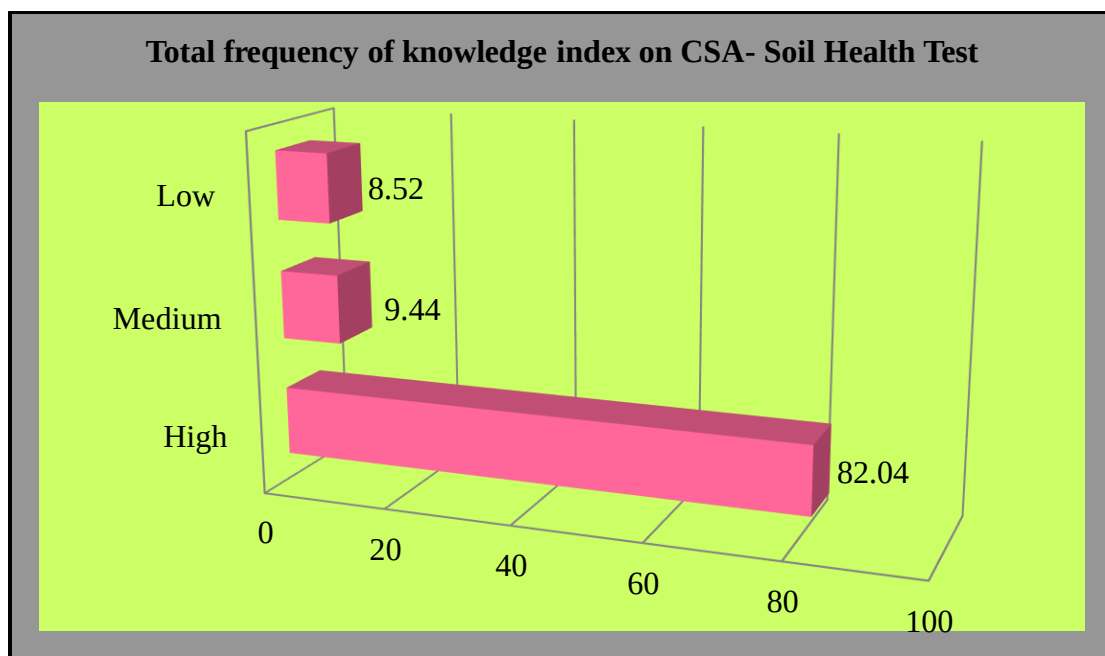


Figure 4.9.2.1. Total frequency of knowledge index on CSA- Soil Health Test

Table 4.9.2.3. Knowledge index on CSA- Vermicomposting

(n=90)

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that use of vermicomposting improves the soil fertility	73 (81.11)	9 (10.00)	8 (8.89)
2.	Do you know vermicomposting sustain the quality of soil than chemicals	71 (78.89)	13 (14.44)	6 (6.67)
3.	Do you know vermicomposting increases plant nutritive value	73 (81.11)	10 (11.11)	7 (7.78)
4.	Do you know the soil water conservation can be increased with the use of vermicomposting	70 (77.78)	15 (16.67)	5 (5.56)
5.	Do you know vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium	58 (64.44)	19 (21.11)	13 (14.44)
6.	Do you know vermicomposting enriches soil with microorganisms	64 (71.11)	17 (18.89)	9 (10.00)
7.	Do you know two tons of vermicomposting is required for one acre fertile land	78 (86.67)	7 (7.78)	5 (5.56)

With regard to Table 4.9.2.3, highest percentage (86.67%) of farm women knew that two tons of vermicomposting is required for one-acre fertile land whereas equal percentage (81.11%) of farm women knew about the uses of vermicomposting that it improves the soil fertility and plant nutritive value.

It also revealed that the vermicomposting sustains the quality of soil than chemicals (78.89%), soil water conservation can be increased with the use of vermicomposting (77.78%), and enriching the soil with microorganisms (71.11%) , 64.44 per cent of farm women knew about vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium after the interventions. There was increase in knowledge level among the respondents after the intervention.

The findings of the study were in line with the study conducted by Kalita et al. (2017) who reported while analyzing the knowledge, attitude and practices of farmers towards vermiculture technology from the data of Jorhat district of Assam that 75.00 per cent of the respondents had medium level of knowledge and had strong favorable attitude (74.17%) and 69.17 per cent of the respondents had medium practice level towards vermiculture technology.

Table 4.9.2.4. Total frequency of knowledge index on CSA- Vermicomposting (n=90)

S.No	Category	Frequency	Percentage
1	High	487	77.30
2	Medium	90	14.29
3	Low	53	8.41
	Total	630	100.00

$$90 \times 7 = 630$$

The results from Table 4.9.2.4 and Fig 4.9.2.2 indicate that majority (77.30%) of the farm women respondents high category knowledge index on CSA- vermicomposting, results of good response from members and found be interesting about the benefits of vermicomposting through video and audio messages. Respondents with medium (14.29%) and low (8.41%) total frequency of knowledge index on CSA- vermicomposting result of preoccupied household chores among the members. Anuradha Ranjan Kumari (2018)

reported that majority of farm women vermi compost training programme maximum (60.00%) of respondents belonged to medium knowledge category followed by high and low.

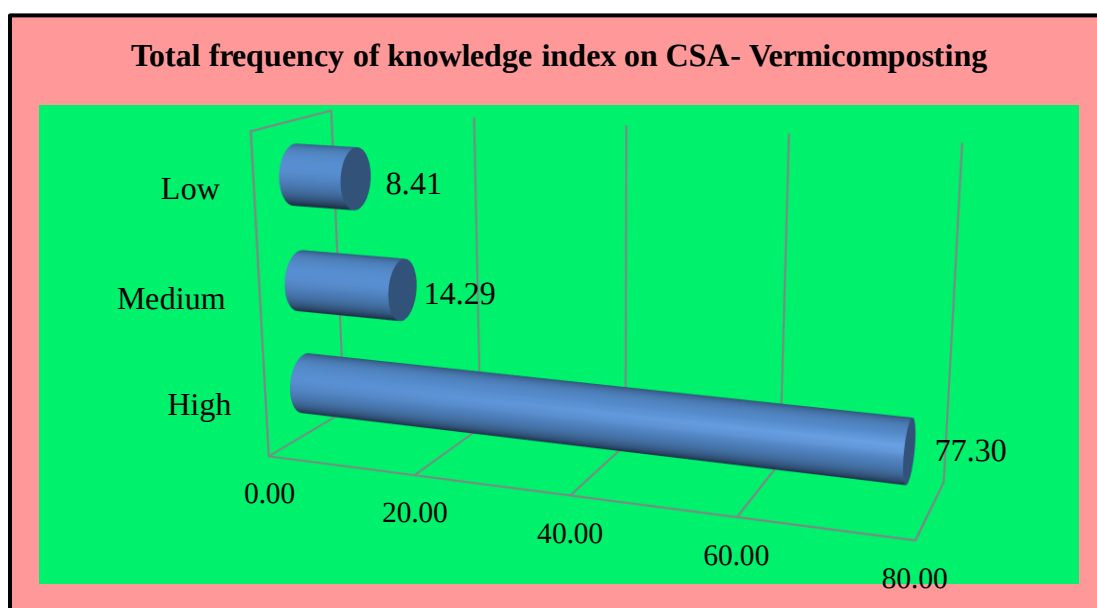


Figure 4.9.2.2. Total frequency of knowledge index on CSA- Vermicomposting

Table 4.9.2.5. Knowledge index on CSA- Seed Treatment

(n=90)

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know that seed treatment is required to inhibit soil prone diseases	76 (84.44)	6 (6.67)	8 (8.89)
2.	Do you know seed treatment kills seed borne pathogens/insects	68 (75.56)	12 (13.33)	10 (11.11)
3.	Do you know seed treatment increases the life span of the seeds	72 (80.00)	10 (11.11)	8 (8.89)
4.	Do you know seed treatment enhances the root formation of the pulse crops	68 (75.56)	12 (13.33)	10 (11.11)
5.	Do you know seed treatment can be done with cow milk	79 (87.78)	4 (4.44)	7 (7.78)
6.	Do you know seed treatment can be done with cow urine	79 (87.78)	5 (5.56)	6 (6.67)
7.	Do you know seed treatment can be done with cow bijaamruthum	76 (84.44)	8 (8.89)	6 (6.67)
8.	Do you know seed treatment gives uniform crop stand, even in adverse conditions (less/high moisture)	65 (72.22)	10 (11.11)	15 (16.67)

Table 4.9.2.5 refers to post knowledge index on seed treatment which revealed that equal percentage of farm women knew about the preparation of the seed treatment with cow milk and cow urine (87.78%) followed by the seed treatment required to inhibit soil prune diseases with cow bijaamruthum (84.44%),

Farm women know that seed treatment increases the life span of the seeds (80%), seed treatment kills seed borne pathogens/insects and enhances the root formation of the pulse crops (75.56%) and it gives uniform crop stand, even in adverse conditions (less/high moisture) (72.22%). There was increase in knowledge level among the respondents after the intervention.

**Table 4.9.2.6. Total frequency of Knowledge index on CSA- Seed Treatment
(n=90)**

S.No	Category	Frequency	Percentage
1	High	583	80.97
2	Medium	67	9.31
3	Low	70	9.72
	Total	720	100.00

90*8=720

The results from Table 4.9.2.6 and Fig 4.9.2.3 indicate that majority (80.97%) of the farm women respondents' high category knowledge index on CSA-seed treatment, due interest shown by group members as they many reported the problem of poor seed sprouting during pre-intervention period. Farm women with poor education and lack of smart phones represented low (9.72%) and medium (9.31%) total frequency of knowledge index on CSA-seed treatment.

The findings of the study were in line with the study conducted by Sharma *et al* (2015) lack of awareness to seed treatments at farmer's level is one of the limiting factors in disease management and hence, efforts should be made at farmer's level to adopt the technology.

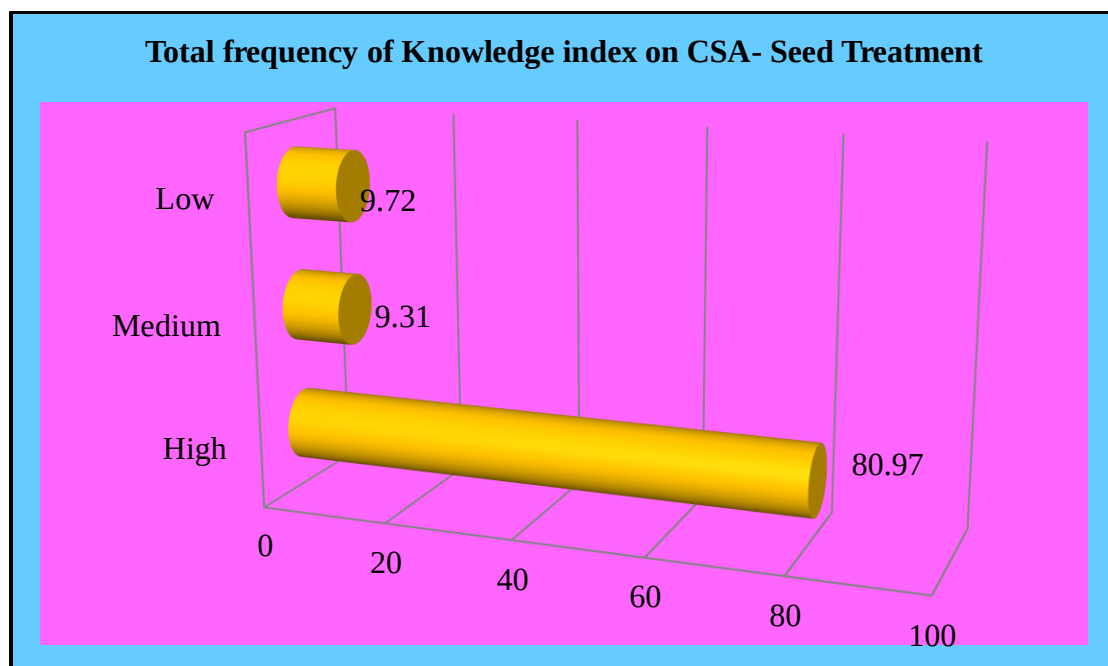


Table 4.9.2.3. Total frequency of Knowledge index on CSA- Seed Treatment

Table 4.9.2.7. Knowledge index on CSA- Intercropping

(n=90)

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know intercropping which helps in cultivating more than one crop in the same field	85 (94.44)	5 (5.56)	00
2.	Do you know intercropping gives additional yield	73 (81.11)	10 (11.11)	7 (7.78)
3.	Do you know intercropping increase nutritive value	72 (80.00)	7 (7.78)	11 (12.22)
4.	Do you know intercropping controls weed population	70 (77.78)	12 (13.33)	8 (8.89)
5.	Do you know intercropping acts as an insurance against failure of crops in abnormal year	74 (82.22)	10 (11.11)	6 (6.67)
6.	Do you know intercropping provide shade and support to the other crop	71 (78.89)	13 (14.44)	6 (6.67)
7.	Do you know intercropping maintain the soil fertility as the nutrient uptake is made from both layers of soil	68 (75.56)	12 (13.33)	10 (11.11)

From table 4.9.2.7, the findings of the study revealed that highest (94.44%) percentage of farm women know about intercropping which may help in cultivating more than one crop in the same field and that intercropping acts as an insurance against failure of crops in abnormal year (82.22%), intercropping gives additional yield income (81.11%), intercropping increases nutritive value (80%), intercropping provides shade and support to the other crop (78.89%), intercropping controls weed (77.78%) and intercropping maintain the soil fertility as the nutrient uptake is made from both layers of soil (75.56%). Now majority of the respondents are aware about beneficial effects of the intercropping practice.

Singh and Singh (2017) reported agroforestry, intercropping, crop rotation, cover cropping, traditional organic composting and integrated crop-animal farming could adopt as the model practices for climate-smart approach in agriculture. These practices not only helped adaptation to climate change but also enhanced agricultural sustainability.

Table 4.9.2.8. Total frequency of knowledge index on CSA- Intercropping
(n=90)

S.No	Category	Frequency	Percentage
1	High	513	81.43
2	Medium	69	10.95
3	Low	48	7.62
	Total	630	100.00

$$90 \times 7 = 630$$

Table 4.9.2.8 and Fig 4.9.2.4 indicate that majority (81.43%) of the farm women respondents had high category level of knowledge index on CSA-intercropping, this can be attributed to knowledge gained through training on benefits of inter cropping. For example many were aware of intercropping but had poor knowledge base on what type inter crops must be sown for good yield.

During post intervention period members were imparted training of inter cropping with variety of plants especially chrysanthemum/Marigold to be grown for pollination and acts insect repellent. Further few Respondents could not respond properly to the audio and text messages due to low level of education were found to be medium and low-level knowledge index on CSA- intercropping test with 10.95 and 7.62 per cent, due to.

The findings were in coincidence with Francis (1989) results on intercropping; in 53% of the experiments intercropping reduced the pest, and in 18% increased the pest than the pure cropping. Increasing pests can be due to several reasons, such as the second crop is a host for pests in intercropping, or increasing the shade in canopy, provides favorable conditions for pests and pathogens activity.

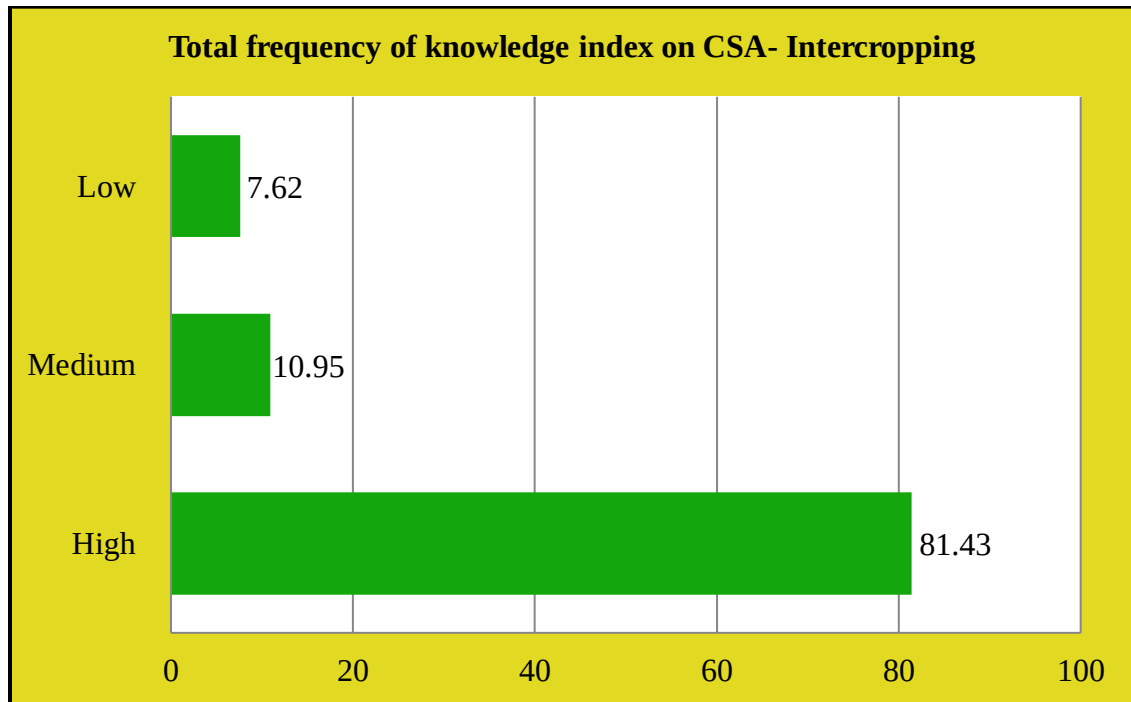


Figure 4.9.2.4. Total frequency of knowledge index on CSA- Intercropping

Table 4.9.2.9. Knowledge index on CSA- Drip Irrigation System**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know drip irrigation system conserves water	74 (82.22)	11 (12.22)	5 (5.56)
2.	Do you know in drip irrigation, foliage remains dry and reducing the risk of disease	67 (74.44)	15 (16.67)	8 (8.89)
3.	Do you know drip irrigation lessen soil erosion	76 (84.44)	8 (8.89)	6 (6.67)
4.	Do you know drip irrigation controls seed growth due to spot watering	71 (78.89)	13 (14.44)	6 (6.67)
5.	Do you know drip irrigation, labour cost is less than other irrigation methods	74 (82.22)	13 (14.44)	3 (3.33)
6.	Do you know drip irrigation will not require land leveling and bunding	76 (84.44)	10 (11.11)	4 (4.44)
7.	Do you know drip irrigation system reduces energy costs	71 (78.89)	12 (13.33)	7 (7.78)

It is clear from Table 4.9.2.9, that equal percentage (84.44%) of farm women knew that drip irrigation lessens soil erosion and it did not require land leveling and bunding farm women also know that drip irrigation system conserves water and labour cost was less than other irrigation methods (82.22%), drip irrigation controls seed growth due to spot watering and reduces energy costs (78.89%) and in drip irrigation foliage remains dry thereby reducing the risk of disease (74.44%).

The participants after intervention became aware about the drip irrigation system and they want to implement this drip irrigation system in their farms as they really like the concept.

Table 4.9.2.10. Total frequency of knowledge index on CSA- Drip Irrigation System**(n=90)**

S.No	Category	Frequency	Percentage
1	High	509	80.79
2	Medium	82	13.02
3	Low	39	6.19
	Total	630	100.00

$$90 \times 7 = 630$$

It is evident from Table 4.9.2.10 and Fig 4.9.2.5 that majority (80.79%) of the farm women respondents had high level of knowledge index on CSA- drip irrigation system as result of interest shown by members because drip irrigation found to be highly beneficial to less water resource members further it serves as weed control and rational use of water results in low exploitation of ground for better output. Farm women with medium and low-level knowledge index on CSA- drip irrigation system with 13.02 and 6.19 per cent, due to high cost of drip irrigation equipment and no other of source of income than agriculture.

Bunker *et al* (2012) it was found that 23.75 per cent, 60.00 per cent and 16.25 per cent beneficiary farm women were in low, medium and high knowledge level, respectively regarding drip irrigation technology. The beneficiary farm women possesses highest knowledge level of of the fact that drip irrigation technology save the water as compared to other method of irrigation' whereas they had least knowledge about the type of drippers widely used for fruit crops in drip irrigation technology.

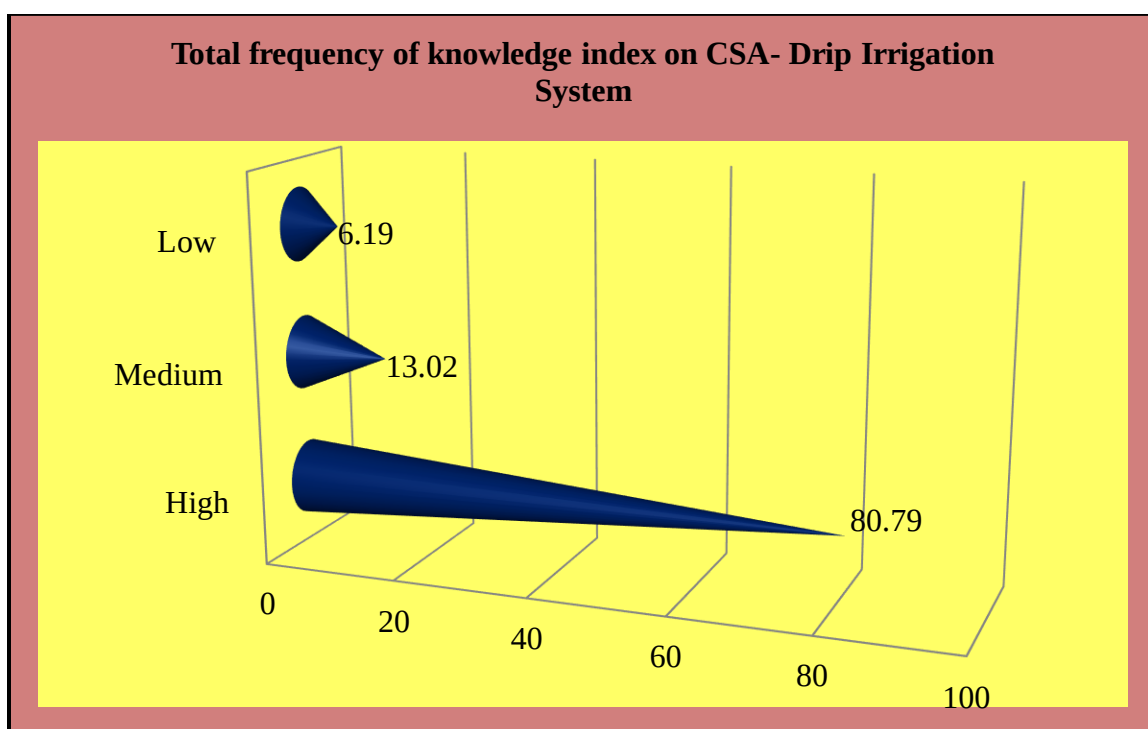


Figure 4.9.2.5. Total frequency of knowledge index on CSA- Drip Irrigation System

Table 4.9.2.11. Knowledge index on CSA- Mulching**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is mulching	76 (84.44)	6 (6.67)	8 (8.89)
2.	Do you know mulching improves nutrient and retains water in the soil	74 (82.22)	10 (11.11)	6 (6.67)
3.	Do you know mulching reduces and controls soil erosion	72 (80.00)	12 (13.33)	6 (6.67)
4.	Do you know mulching reduced the growth of weeds	76 (84.44)	9 (10.00)	5 (5.56)
5.	Do you know mulching regulates soil temperature	65 (72.22)	16 (17.78)	9 (10.00)
6.	Do you know mulching promotes activities of soil friendly microorganisms	61 (67.78)	21 (23.33)	8 (8.89)

According to post-knowledge index on mulching 84.44 per cent of farm women knew about mulching and how it reduces the growth of weeds mulching that improves nutrient and retains water in the soil (82.22%),that mulching controls soil erosion (80.00%), mulching regulates soil temperature (72.22%) and that mulching helps in promoting activities of soil friendly microorganisms (67.78%) (Table 4.9.2.11).

Jabran (2019) reported that advantages of black plastic mulch surpass the straw mulch, but straw has a lower cost, easy availability, and no residue. Black plastic mulch is likely to provide higher weed control, water conservation, and other benefits but has a higher cost and leaves residues in the soil.

Table 4.9.2.12. Total frequency of knowledge index on CSA- Mulching**(n=90)**

S.No	Category	Frequency	Percentage
1	High	424	78.52
2	Medium	74	13.70
3	Low	42	7.78
	Total	540	100.00

$$90 \times 6 = 540$$

A glance at table Table 4.9.1.12 and Fig 4.9.2.6 it can be concluded that majority (78.52%) of the farm women respondents had high level of knowledge index on CSA-mulching as most of members found mulching to be cost benefit due to less pest attack ,weed control, for good yield , followed by medium 13.70 per cent and low-level knowledge index on CSA- mulching 7.78 per cent, due lack of interest and poor response, given the high cost of equipment.

Jabran (2019) reported that mulching the soil with materials such as straw or plastic covering (black plastic has been the most common) has been found to conserve water and soil, add organic matter and nutrients to the soil (straw, compost, or wood remains), regulate the soil temperature, enhance biological activities in the soil, positively modify the field microclimate, and negatively impact the weeds, disease pathogens, and insect pests. Black plastic and straw have been the most utilized mulch types globally.

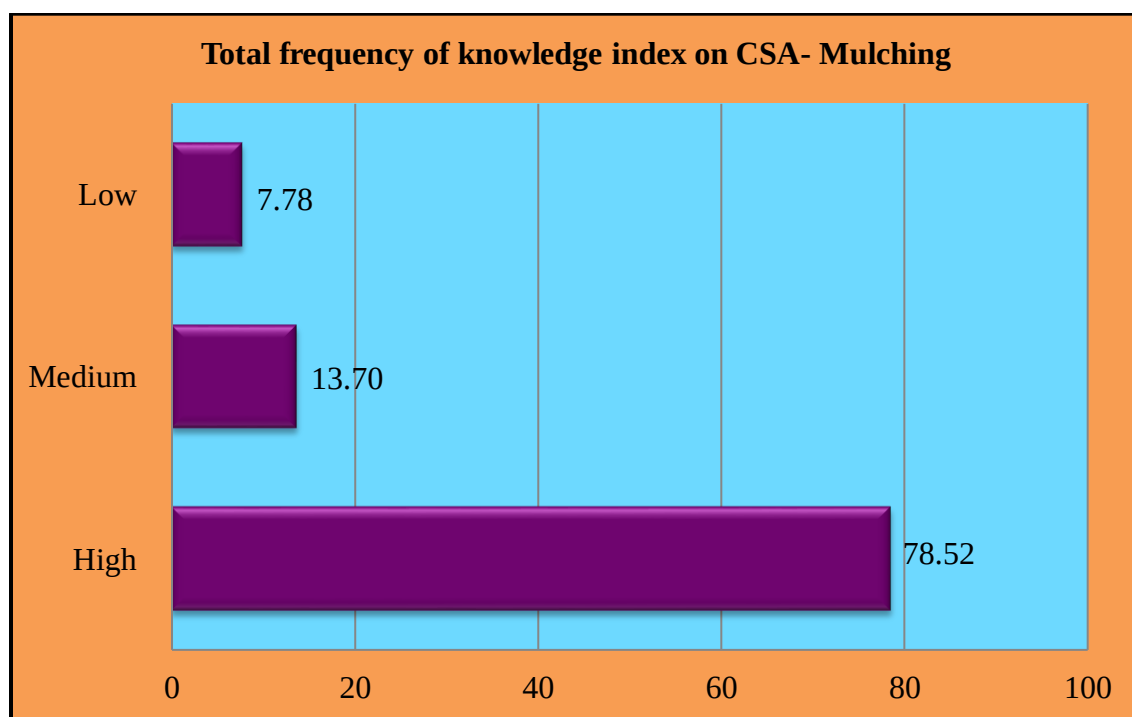


Figure 4.9.2.6. Total frequency of knowledge index on CSA- Mulching

Table 4.9.2.13. Knowledge index on CSA- Super Napier**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is super Napier grass	73 (81.11)	12 (13.33)	5 (5.56)
2.	Do you know super Napier grass has high protein, carbohydrate, vitamins	65 (72.22)	18 (20.00)	7 (7.78)
3.	Do you know super Napier grass grows faster upto10 feet in 59 days	70 (77.78)	15 (16.67)	5 (5.56)
4.	Do you know super Napier grass is the best fodder crops for dairy cattle	72 (80.00)	12 (13.33)	6 (6.67)
5.	Do you know super Napier grass improves the quality of livestock's milk	70 (77.78)	14 (15.56)	6 (6.67)
6.	Do you know silage can be prepared with super Napier grass	62 (68.89)	17 (18.89)	11 (12.22)

From the distribution of Table 4.9.2.13, the results revealed that 81.11 per cent of farm women knew about super Napier grass and that super Napier grass was the best fodder crops for dairy cattle (80%). Equal percentage (77.78%) of farm women knew that super napier grass grows faster upto10 feet in 59 days and it improves the quality of livestock's milk, farm women also know that super Napier grass has high protein, carbohydrate, vitamins (72.22%) and silage can be prepared with super Napier grass (68.89%). Most of the respondents expressed that they are aware of the benefits of super napier grass.

Satyanarayan and Jagadeeswary (2010) reported majority of the livestock farm women had medium to low profile. Majority of the respondents had medium knowledge and medium extent of adoption in dairy management practices, whereas low knowledge level and low extent of adoption in sheep, goat and poultry management practices.

Table 4.9.2.14. Total frequency of knowledge index on CSA- Super Napier (n=90)

S.No	Category	Frequency	Percentage
1	High	412	76.30
2	Medium	88	16.30
3	Low	40	7.41
	Total	540	100.00

$$90 \times 6 = 540$$

It is evident from Table 4.9.2.14 and Fig 4.9.2.7 that majority (76.30%) of the farm women respondents with livestock had high level of knowledge index on CSA- Super Napier. Respondents with no livestock asset base found to be medium and low-level knowledge index on CSA- Super Napier with 16.30 and 7.41 per cent, respectively.

Rai and Thakur (2017) reported that majority 35.63 percent of the respondents were in medium category of average milk productivity, followed by 42.50 percent in low category and rest were in high category on super napier fodder.

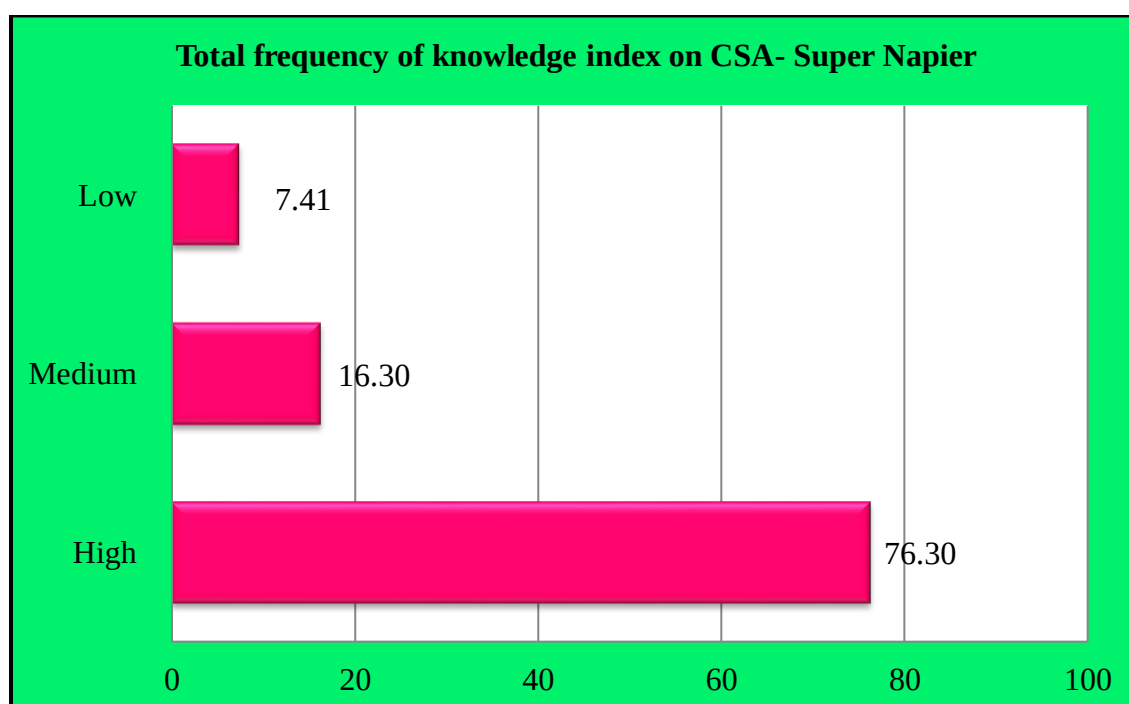


Figure 4.9.2.7. Total frequency of knowledge index on CSA- Super Napier

Table 4.9.2.15. Knowledge index on CSA- Hedge Lucerne**(n=90)**

S. No	Statements	I know F (%)	Somewhat I know F (%)	I don't know F (%)
1.	Do you know what is hedge Lucerne grass	78 (86.67)	8 (8.89)	4 (4.44)
2.	Do you know hedge Lucerne grass yields for 5 to 6 years	72 (80.00)	10 (11.11)	8 (8.89)
3.	Do you know hedge Lucerne grass yield up to 90 tons per acre	70 (77.78)	15 (16.67)	5 (5.56)
4.	Do you know hedge Lucerne grass has high protein content	62 (68.89)	20 (22.22)	8 (8.89)
5.	Do you know hedge Lucerne grass is one of the best feed to livestock highly digestible	75 (83.33)	9 (10.00)	6 (6.67)
6.	Do you know it benefits in high rate of growth in cattle with increased yield in milk	73 (81.11)	10 (11.11)	7 (7.78)

It was observed from the Table 4.9.2.15, that 86.67 percent of farm movement knew about hedge Lucerne grass that hedge Lucerne grass is one of the best feed to livestock which is highly digestible (83.33%), that hedge lucerne grass benefits in high rate of growth in cattle with increased yield in milk (81.11%), that hedge Lucerne grass yields for 5 to 6 years (80%) yield up to 90 tons per acre (77.78%) and has high protein content (68.89%).

Patidar (2017) reported in Rewa of Madhya Pradesh and reported that the crop management occupied the highest adaptation index (53.15) followed by water management (29.44), soil management (28.12), integrated weed management (22.60), integrated nutrient management (17.28) and integrated pest and disease management (5.62).

The participants were unaware about super Napier grass and hedge Lucerne grass before the intervention the programme but after the intervention they learnt about super Napier and hedge Lucerne grasses which would improve the milking capacity of the animals and as it is the drought prone area it would reduce the requirement of water.

Table 4.9.2.16. Total frequency of knowledge index on CSA- Hedge Lucerne (n=90)

S.No	Category	Frequency	Percentage
1	High	430	79.63
2	Medium	72	13.33
3	Low	38	7.04
	Total	54	100.00

$$90 \times 6 = 540$$

It was observed from the Table 4.9.2.16 and Figure 4.9.2.8 that majority (79.63%) of the farm women respondents had high level of knowledge index on CSA- Hedge Lucerne, as members showed great interest for growing grass with less water and better results .However some farm women represented medium and low-level knowledge index on CSA- Hedge Lucerne with 13.33 and 7.04 per cent, due to poor response from semi-educated members and lack of interest and low livestock asset.

Menhas *et al.* (2014) reported it was observed that women in some areas perform other activities like cleaning of feeding troughs (7.7%) for cattle and this was found to be the least among all the activities performed in relation to livestock management practices.

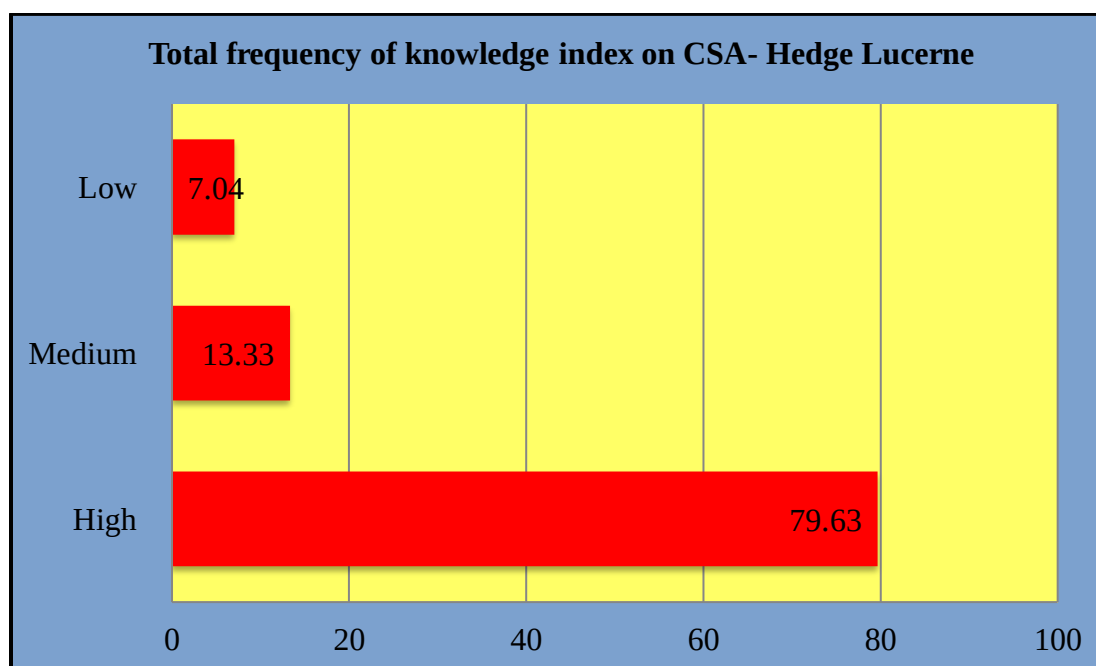


Figure 4.9.2.8. Total frequency of knowledge index on CSA- Hedge Lucerne

4.9.3 Impact of adaptation strategies of CSA by mobile phone among Farm Women Knowledge Groups (FWKGs) of different villages

To study the impact of knowledge index of farm women knowledge groups with regard to different villages.

The following hypotheses were formulated to test the relationship between independent and dependent variables.

HB: There exists a relationship between Farm Women Knowledge Groups on adaptation strategies with regard to village wise and mobile phones.

To test the hypotheses H_A the null hypotheses H_0A with the following sub null hypotheses were formulated.

H_0B1 : There exists no relationship between Farm Women Knowledge Groups on adaptation strategies with regard to village wise.

H_0B2 : There exists no relationship between Farm Women Knowledge Groups on adaptation strategies with regard to Mobile phones. The F test was employed for studying the impact.

According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed among village wise overall impact. The 'F' value was found to be significant at 0.05 level for soil health test, vermicomposting, super Napier and hedge lucerne and 0.01 level significant for intercropping, drip irrigation system, mulching and non-significant for seed treatment (Table 4.66).

Table. 4.9.3.1. Impact of CSA adaptation strategies through mobile phone intervention among Farm Women Knowledge Groups (FWKGs)

(n=90)

Villages	Mean score							
	Soil health test	Vermicomposting	Seed treatment	Intercropping	Drip irrigation system	Mulching	Super Napier	Hedge Lucerne
Tholkatta	16.53	20.06	21.60	20.00	19.80	16.93	17.40	17.26
Lillipur	16.00	18.33	21.73	19.00	19.73	16.06	16.46	16.66
Ramchandraguda	15.26	18.60	22.40	18.60	19.46	16.26	16.86	16.13
Kalwakole	16.61	19.2	21.33	19.00	18.80	16.73	16.33	16.73
Dubbacherla	17.53	18.86	21.66	19.73	19.40	16.40	15.66	16.46
Pendyala	17.40	17.86	21.60	18.66	18.13	15.06	14.06	14.86
F ratio	6.748	3.203	0.542	2.589	2.708	2.770	7.676	5.071
p-value	0.000*	0.01**	0.744 ^{ns}	0.032*	0.026*	0.023*	0.000**	0.000**
** Significant at 1% level * Significant at 5% level ns-non significant								

In case of Farm Women Knowledge Groups on adaptive strategies i.e. soil health test, vermicomposting, super Napier and hedge Lucerne intercropping, drip irrigation system, mulching. The null hypothesis was rejected.

In case of seed treatment, null hypothesis was accepted.

There exists a relationship between Farm Women Knowledge Groups on adaptive strategies i.e. soil health test, vermicomposting, super Napier and hedge Lucerne intercropping, drip irrigation system, mulching with regard to village wise.

H₀B₂: There exists no relationship between Farm Women Knowledge Groups on adaptation strategies with regard to mobile phones.

According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed among village wise overall impact. The 'F' value was found to be significant at 0.05 level for soil health test, vermicomposting, drip irrigation, mulching, super Napier and hedge Lucerne and 0.01 level significant for seed treatment and intercropping (Table. 4.9.3.1).

Araya and Adjaye (2011) reported that farm women awareness and perceptions of soil erosion problem as a result of changes in climate positively and significantly affect their decisions to adopt soil conservation measures. It was expected that improved knowledge and farming experience will positively influence farmers' awareness and decision to take up adaptation strategies.

Table. 4.9.3.2. Impact of Farm Women Knowledge Groups (FWKGs) on CSA adaptation strategies by different mobile phone application

(n=90)

Villages	Mean score							
	Soil health test	Vermicomposting	Seed treatment	Intercropping	Drip irrigation system	Mulching	Super Napier	Hedge Lucerne
SMS	14.42	15.97	19.543	17.23	17.35	15.45	14.34	15.68
SMS and Voice	15.32	16.50	20.43	18.46	18.57	16.24	15.57	16.46
SMS ,Voice and videos	17.65	17.53	21.75	20.97	19.87	17.86	16.24	17.41
F ratio	2.547	2.789	3.764	3.523	3.212	2.96	2.67	2.05
p-value	0.03*	0.02*	0.01**	0.01**	0.02*	0.02*	0.03*	0.04*
** Significant at 1% level * Significant at 5% level ns-nonsignificant								

In case of Farm Women Knowledge Groups on adaptive strategies i.e. soil health test, vermicomposting, seed treatment, intercropping, drip irrigation system, mulching, super Napier and hedge Lucerne. The null hypothesis was rejected.

There exists a relationship between Farm Women Knowledge Groups on adaptive strategies i.e. soil health test, vermicomposting, seed treatment, intercropping, drip irrigation system, mulching, super Napier and hedge Lucerne with regard to mobile phones. (Table. 4.9.3.2)

Nigel *et al.* (2004) reported mobile phones have increased the efficiency of service delivery to the agro-based entrepreneurs (e.g. weather information, market prices), or opened opportunities for new services providing agriculture information through SMS.

4.9.3.3 Correlation coefficient between Profile Characteristics of Farm Women Knowledge Groups (FWKGs) & knowledge index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture

It was apparent from table 4.9.3.3.1 that Correlation coefficient between Profile Characteristics of Farm Women Knowledge Groups (FWKGs) & Knowledge Index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture has shown significant trend as explained below.

Testing of hypothesis

Null hypothesis

There will not any relation between Knowledge Index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture and Profile Characteristics of Farm Women Knowledge Groups (FWKGs) of the respondents.

Empirical hypothesis

There will be relation between Knowledge Index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture and Profile Characteristics of Farm Women Knowledge Groups (FWKGs) of the respondents.

Table: 4.9.3.3.1. Correlation coefficient between Profile Characteristics of Farm Women Knowledge Groups (FWKGs) & Knowledge Index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture

(n=90)

S.No	Profile Characteristics of Farm Women Knowledge Groups (FWKGs)	Correlation coefficient (r)
1	Age	0.03*
2	Education Qualification	0.01**
3	Marital Status	-0.04*
4	Occupation	0.22 NS
5	Annual Income	-0.14 NS
6	Work Experience	0.02*

*: Significant at 0.05 level of probability

** : Significant at 0.01 level of probability

NS: Non-significant

According to data shown in the table 4.9.3.3.1, Knowledge and age group of members are observed and found to have a correlation of +.03. This means that there is correlation, or relationship, between the two variables there is positively associated. Thus study concludes knowledge has significant positive relation was evident with age, because higher the age group, higher the capability of understanding levels.

Understanding the correlation between two variables, knowledge and education, it was found that there is positive and strong relationship between education and knowledge. This indicates that exposure to agriculture training among the educated members are found to be effective than the uneducated.

Further it was found there is negative correlation between knowledge and marital status. This indicates that knowledge and marriage inversely related.

Based on the study results association between occupation and knowledge are found to be positive but not strongly related. This indicates that occupation of member has relationship with knowledge they have acquired during the training period.

The relationship between income and knowledge found to be negative. Given the study results it was found that lower income members have urge to earn more through knowledge based trainings than the higher income groups.

Study findings state that there is positive correlation between the variables with work experience associated with variable values of knowledge .Further ,study observes significant relationship between these variables.

To sum up, knowledge results were positively consistent with the age, education, occupation and work experience.

Anuradha Ranjan Kumari (2018) reported that variables like age and martial stats showed negative and significant relationship with the extent of participation of respondents in agricultural and allied activities. Other variables like educational qualification and Occupation did not show any relationship with the extent of participation of the farm women in agricultural and allied activities.

4.10 Intervention on Usage of Mobile Phone Applications for Climate Smart Agriculture among Farm Women Knowledge Groups (FWKGs)

One of the objectives of the study was to enhance knowledge index levels of the farm women on adaptive strategies of climate smart agriculture through mobile interventions using different techniques were studied below in detail.

An attempt was made based on awareness level and need analysis of farm women on climate smart agriculture. Literature, articles, magazines, books, videos were browsed for the collection of different climate smart agriculture adaptation techniques tested and reported by researchers in different respective areas.

Further the collected literature based on farm women's requirement was categorized into climate smart agriculture adaptive strategies viz., soil management, crop management, water management, livestock management and agro-diversification management.

Literature was synthesized and formulated into statements under each category and were finalized by the subject experts. These finalized statements were further simplified into short messages and translated into local language.

Discussion with farm women provided a list of 8 interventions, as well as yield-improving potential. Accordingly, considering the local crop agro-climate, social conditions and women 'participation in different agricultural activities, CSA technologies and practices were selected that had improvement in productivity and farm income. Then they were administered to the farm women and based on the need analysis, the topics were further short listed and the fine-tuned as suggested by the farm women.

Based on purposively selected data of farm women, a group comprising of 15 farm women from each village were formed to empower their knowledge on climate smart agriculture. Farm women registered mobile numbers were collected (Annexure-II) these registered mobile numbers were separately entered into different groups based on their category as basic phones and smart mobiles and grouped them for sending short messages by using smscountry.com.

Farm women with smart phones were formed into village wise WhatsApp group along with the local leaders for proper connectivity sent short messages audio messages, and videos. These short messages were directed to farm women on specific topic of CSA enlisted 3 Months on day by day basis and administered in different forms of voice, text and video through mobiles.

Personal village wise visits were done to explain regarding climate smart agriculture adaptive strategy messages to improve their knowledge on farm activities. Feedback were collected by directly contacting farm women whether the short messages were

- Received or not
- Readable or not
- Useful or not
- Followed or not



Plate 4.1. Training programmes on climate smart agriculture through mobile messages



Plate 4.2. Interventions on climate smart agriculture through mobile messages

Based on their feedback, farm women's impact on knowledge levels of climate smart agriculture through mobile messages were assessed and presented below.

4.11 Impact of Mobile Phone Applications Intervention for Climate Smart Agriculture among the Farm Women Knowledge Groups (FWKGs)

This section deals with the pre and post-knowledge test for farm women on use of mobile phones in terms of use, functions, different parts of mobile and use of internet and social media apps among participants, knowledge on source of learning and frequency of receiving SMS from mobile phone were studied. The data was formulated, tabulated and presented below.

Table 4.11.1. Comparison between knowledge on usage and functions of mobile phone by Farm Women Knowledge Groups (FWKGs)

(n=90)

S. No	Attributes	Mean scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know how to use mobile phone	1.46	1.94	7.506**	0.0001
2.	Do you know how to charge your mobile phone	1.83	2.00	4.219**	0.0001
3.	Do you know how to receive your calls	1.94	2.00	2.288**	0.025
4.	Do you know how to send SMS	1.42	1.91	7.676**	0.0001
5.	Do you know how to open your received SMS	1.48	1.96	8.647**	0.0001
6.	Do you know how to save contact number in your mobile phone	1.61	1.93	5.929**	0.0001
7.	Do you know how to make and receive phone calls	1.75	2.00	5.366**	0.0001
8.	Do you know use calculator, calendar, alarm etc.	1.43	1.82	5.692**	0.0001
9.	Do you know how to use internet	1.46	1.92	7.661**	0.0001
10.	Do you know how to use social media apps (whats App, YouTube)	1.64	1.93	4.682**	0.0001
**-Significant at 1% level					

Table 4.11.1 depicts the knowledge on use and functions of mobile phones of the farm women when compared between the pre and post-test evaluation, it was found to be significant at one percent level in using mobiles, social media apps, internet, recharging the mobile phones, calling and receiving calls, receiving and sending SMS, saving contact number showing the impact of the mobile trainings.

There was a clear demarcation between post and pretest Women are receptive and gained knowledge on mobile usage after the intervention.

Table 4.11.2. Comparison between on sources of learning of (FWKGs) about mobile phone

(n=90)

S. No	Sources	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Family members	1.51	1.80	4.280**	0.0001
2.	Friends and relatives	1.42	1.62	2.628**	0.010
3.	By trying mobiles for knowing about apps	1.22	1.91	14.038**	0.0001
4.	By attending training	1.00	1.94	38.897**	0.0001

Table 4.11.2 provides the comparative data of farm women about learning sources of mobile phone operations between prior and after mobile trainings. The results were significant at one percent levels showing the positive influence of the mobile trainings which has generated curiosity among the farm women to acquire the knowledge of mobile operations from different available sources.

Table 4.11.3. Comparison of frequency of receiving SMS from mobile phone by (FWKGs)

(n=90)

S. No	Source of SMS	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Family Members	1.24	1.64	5.550**	0.0001
2.	Relatives	1.36	1.73	4.897**	0.0001
3.	Agricultural Extension officer	1.00	1.27	5.851**	0.0001
4.	PJTSAU, University/Researcher	1.00	1.91	30.203**	0.0001
5.	School teacher	1.25	1.57	4.700**	0.0001
6.	Banks	1.35	1.57	2.884*	0.005

When compared between the pre and post- mobile training on source of SMS received from mobile phones among the farm women by using paired 't' test and it was found to be significant at one percent level while receiving SMS from family members, relatives, agricultural extension officer, PJTSAU, University/Researchers and school teacher, while, SMS from banks were found to be significant at 5 percent level indicating the increased frequency of exchange of information among the farmwomen (Table 4.11.3)

4.11.1 Impact of adaptation strategies of climate smart agriculture by Farm Women Knowledge Groups (FWKGs)

This section deals with the findings and discussions regarding comparison of pre and post Knowledge Index on Adaptation Strategies of Farm Women for Climate Smart Agriculture. Knowledge index -Under this, selected different climate smart agricultural strategies and collected data for knowing increase in their knowledge levels after the intervention given in the form of text, voice and video messages on climate smart agriculture strategies viz. soil health, vermicomposting under soil management, seed treatment, intercropping under crop management, drip irrigation system, mulching under water management, Super Napier fodder and Hedge Lucerne grass under Integrated Farming System (IFS) and livestock management. The data was formulated, tabulated and presented below.

Table 4.11.1.1. Impact of CSA practice soil health test through mobile intervention (n=90)

S. No.	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know that soil test helps in identifying the fertility and nutrient levels of the land	1.26	2.75	13.558**	0.0001
2.	Do you know that the fertile lands should be tested at least once in three years	1.00	2.82	30.203**	0.0001
3.	Do you know soil test minimizes the other expenses like use of pesticides and other chemicals	1.22	2.75	16.356**	0.0001
4.	Do you know soil test balances acidic and alkalinity soil	1.00	2.65	23.935**	0.0001
5.	Do you know with soil test, the soil can be corrected by adding calcium and gypsum for the soil with increased acidic and alkaline conditions respectively	1.00	2.57	19.277**	0.0001
6.	Do you know vermicomposting need to be used maintain the quality of soil	1.24	2.84	20.333**	0.0001

Table 4.11.1.1 refers that knowledge index of farm women on soil health test when compared pre and post-test, it was found to be significant at one percent level in terms of knowing about the soil health test helping in identifying the fertility and nutrient levels of the land, fertile lands testing at least once in three years, soil test minimizing the other expenses like use of pesticides and other chemicals, soil test balances acidic and alkalinity soil, correcting the soil by adding calcium and gypsum for the soil with increased acidic and alkaline conditions.

Table 4.11.1.2. Impact of CSA practice vermicomposting through mobile intervention

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know that use of vermicomposting improves the soil fertility	1.22	2.72	15.767**	0.0001
2.	Do you know vermicomposting sustain the quality of soil than chemicals	1.15	2.72	23.337**	0.0001
3.	Do you know vermicomposting increases plant nutritive value	1.26	2.73	14.639**	0.0001
4.	Do you know the soil water conservation can be increased with the use of vermicomposting	1.13	2.72	23.770**	0.0001
5.	Do you know vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium	1.00	2.50	19.277**	0.0001
6.	Do you know vermicomposting enriches soil with microorganisms	1.00	2.61	22.975**	0.0001
7.	Do you know two tons of vermicomposting is required for one-acre fertile land	1.00	2.81	33.233**	0.0001

When knowledge index on vermicomposting was compared between pre and post intervention, it was found to be significant at one percent level among farm women namely for the aspects such as vermicomposting improves the soil fertility, sustain the quality of soil than chemicals, increases plant nutritive value, soil water conservation can be increased with the use of vermicomposting, Vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium, vermicomposting enriches soil with microorganisms, vermicomposting is required for one acre fertile land (Table 4.11.1.2).

Singh and Singh (2017) reported traditional agriculture as a climate-smart approach for the sustainable food production and also deliberated the correlation between climate change and agriculture. Agroforestry, intercropping, crop rotation, cover cropping, traditional organic composting and integrated crop-animal farming can be adopted as the model practices for climate-smart approach in agriculture. These practices are not only for adaptation of climate change but also enhance agricultural sustainability.

Table 4.11.1.3. Impact of CSA practice seed treatment through mobile intervention

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know that seed treatment is required to inhibit soil prune diseases	1.32	2.75	15.108**	0.0001
2.	Do you know seed treatment kills seed borne pathogens/insects	1.22	2.64	16.439**	0.0001
3.	Do you know seed treatment increases the life span of the seeds	1.12	2.71	21.015**	0.0001
4.	Do you know seed treatment enhances the root formation of the pulse crops	1.00	2.64	23.092**	0.0001
5.	Do you know seed treatment can be prepared with cow milk	1.22	2.80	17.940**	0.0001
6.	Do you know seed treatment can be prepared with cow urine	1.42	2.81	14.922**	0.0001
7.	Do you know seed treatment can be prepared with cow bijaamruthum	1.31	2.77	16.357**	0.0001
8.	Do you know seed treatment gives uniform crop stand, even in adverse conditions (less/high moisture)	1.00	2.55	19.265**	0.0001

Significant was found at 1 percent when the pre and post- intervention of farm women knowledge index were compared on seed treatment, such as seed treatment is required to inhibit soil prune diseases, that seed treatment kills seed borne pathogens/insects, increase the life span of the seeds, enhances the root formation of the pulse crops, gives uniform crop stand. Even in adverse conditions (less/high moisture), and can be prepared with cow milk, cow urine and cow bijaamruthum (Table 4.11.1.3).

**Table 4.11.1.4. Impact of CSA practice intercropping through mobile intervention
(n=90)**

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know intercropping which helps in cultivating more than one crop in the same field	1.44	2.94	17.860**	0.0001
2.	Do you know intercropping gives additional yield income	1.55	2.73	10.586**	0.0001
3.	Do you know intercropping increase nutritive value	1.00	2.67	23.266**	0.0001
4.	Do you know intercropping controls weed	1.14	2.68	19.485**	0.0001
5.	Do you know intercropping acts as an insurance against failure of crops in abnormal year	1.26	2.75	18.052**	0.0001
6.	Do you know intercropping provide shade and support to the other crop	1.16	2.72	20.935**	0.0001
7.	Do you know intercropping maintain the soil fertility as the nutrient uptake is made from both layers of soil	1.06	2.64	21.299**	0.0001

From Table 4.11.1.4, it is revealed that knowledge index on intercropping of farm women was highly significant at 1 percent level for cultivating more than one crop in the same field, that inter cropping gives additional yield income, increases nutritive value, controls weed, acts as an insurance against failure of crops in abnormal year, provides shade and support to the other crop and maintain the soil fertility as the nutrient uptake is made from both layers of soil.

It is critically important to recognize the policy relevance of these findings. This study captures the impact of ICT application on climate. It demonstrates the capacity of ICTs to enhance or create awareness and not to replace public extension systems.

Table 4.11.1.5. Impact of CSA practice drip irrigation system through mobile intervention

(n=90)

S.no	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know drip irrigation system conserves water	1.61	2.76	10.793**	0.0001
2.	Do you know in drip irrigation, foliage remains dry and reducing the risk of disease	1.13	2.65	20.909**	0.0001
3.	Do you know drip irrigation lessen soil erosion	1.35	2.77	15.219**	0.0001
4.	Do you know drip irrigation controls seed growth due to spot watering	1.30	2.72	15.219**	0.0001
5.	Do you know drip irrigation, labour cost is less than other irrigation methods	1.45	2.78	14.471**	0.0001
6.	Do you know drip irrigation will not require land leveling and bundling	1.31	2.80	17.133**	0.0001
7.	Do you know drip irrigation system reduces energy costs	1.23	2.71	15.126**	0.0001

Highly significant relationship was found at 1 percent level when pre and post- test data of farm women when compared on knowledge index on drip irrigation such as drip irrigation conserves water and that foliage remains dry and reduce the risk of disease, lessen soil erosion, controls seed growth due to spot watering, labour cost is less than other irrigation methods, will not require land leveling and bundling and reduces energy costs (Table 4.11.1.5).

Table 4.11.1.6. Impact of CSA practice mulching through mobile intervention

(n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know what is mulching	1.37	2.75	14.828**	0.0001
2.	Do you know mulching improves nutrient and retains water in the soil	1.32	2.75	14.705**	0.0001
3.	Do you know mulching reduces and controls soil erosion	1.00	2.73	28.514**	0.0001
4.	Do you know mulching reduced the growth of weeds	1.34	2.78	15.651**	0.0001
5.	Do you know mulching regulates soil temperature	1.26	2.62	14.236**	0.0001
6.	Do you know mulching promotes activities of soil friendly microorganisms	1.00	2.58	23.133**	0.0001

When compared pre and post knowledge index data on mulching, it was found to be highly significant at 1 percent level among the farm women regarding mulching like knowing about mulching, improving nutrient and retains water in the soil that mulching regulates soil temperature, promotes activities of soil friendly microorganism and mulching reduces and controls soil erosion and growth of weeds (Table 4.11.1.6).

Table 4.11.1.7. Impact of CSA practice Super Napier through mobile intervention (n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know what is super Napier grass	1.21	2.75	19.109**	0.0001
2.	Do you know super Napier grass has high protein, carbohydrate, vitamins	1.00	2.64	25.013**	0.0001
3.	Do you know super Napier grass grows faster upto 10 feet in 59 days	1.00	2.72	29.100**	0.0001
4.	Do you know super Napier grass is the best fodder crops for dairy cattle	1.17	2.73	20.477**	0.0001
5.	Do you know super Napier grass improves the quality of livestock's milk	1.00	2.71	27.735**	0.0001
6.	Do you know silage can be prepared with super Napier grass	1.00	2.56	21.114**	0.0001

When compared knowledge levels of farm women on super Napier, it was found to be significant at 1 percent level among the farm women regarding Super Napier, like Super Napier has high protein, carbohydrate, vitamins, grows faster upto 10 feet in 59 days is best fodder crop for dairy cattle that improves the quality of livestock's milk and that silage can be prepared with super Napier grass pre and post knowledge levels (Table 4.11.1.7).

Table 4.11.1.8. Impact of CSA practice is Hedge Lucerne through mobile intervention (n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Do you know what is hedge Lucerne grass	1.26	2.82	16.382**	0.000
2.	Do you know hedge Lucerne grass yields for 5 to 6 years	1.10	2.71	22.413**	0.0001
3.	Do you know hedge Lucerne grass yield up to 90 tons per acre	1.00	2.72	29.100**	0.0001
4.	Do you know hedge Lucerne grass has high protein content	1.00	2.60	23.353**	0.0001
5.	Do you know hedge Lucerne grass is one of the best feed to livestock highly digestible	1.13	2.76	22.318**	0.0001
6.	Do you know it benefits in high rate of growth in cattle with increased yield in milk	1.00	2.73	27.597**	0.0001

Highly significant relationship was found at 1 percent level between knowledge index levels of farm women on hedge Lucerne like hedge Lucerne grass yields for 5 to 6 years, yield up to 90 tons per acre, hedge Lucerne grass has high protein content that it is best feed to livestock which is highly digestible and that benefits in high rate of growth in cattle with increased yield in milk (Table 4.11.1.8).

4.12 Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

Empowerment is being the slogan since 9th plan and encouraging group formation. . Empowerment is defined a collective undertaking, involving both individual and collective action. Group farming is a collective action introduced by Kerala Government in 1989 which helped women farmers to take highest returns from agriculture.

Under this section selected different climate smart agricultural strategies and collected data for knowing empowerment level perceived among the farm women after the intervention given in the form of text, voice and video messages on climate smart agriculture strategies viz. economic empowerment, family and social empowerment, political empowerment, knowledge empowerment and psychological empowerment. The data was formulated, tabulated and presented below.

Empowerment Condition Index

To assess the empowerment of farm women on climate smart agriculture, the researcher adopted the ‘Empowerment Condition Index’ developed by Sheikh Mohammed Mamur Rashid *et al* (2016) with modifications. It consists of five factors - economic, family and social, political, knowledge and psychological empowerment and combines them to gauge the overall effect of Climate Smart Agriculture.

Each parameter was developed by the outputs of focused group discussion with the officials, experts, academicians and experienced farmers. The impact/change of all the related variables were counted using a numeric value and if required, an equivalence factor was adjusted with the counted score, considering the number of members in FWKG group with pre and post test results. Distribution of Farm Women Knowledge Group respondents’ level of empowerment based on their changed value.

Table 4.12.1. Perceived economic empowerment of farm women knowledge groups through mobile messages

S. No	Statements	Mean Scores		‘t’-test	p-value
		Pre-test	Post-test		
1.	Helps in increased income due to knowledge and adoption	2.55	3.73	6.498**	0.0001
2.	Helps in saving money	2.75	3.47	4.844**	0.0001
3.	Promotes investments properly	2.66	3.41	4.978**	0.0001
4.	Purchase of inputs of farming and reduce chemical fertilizers cost	2.78	3.66	5.505**	0.0001
5.	Know e-marketing	2.38	3.21	5.437**	0.0001

The pre and post test results presented Table 4.12.1, indicated economic empowerment as there was a highly significant relationship in increased income, saved money, promoted investments, purchased inputs of farming and reduced chemical fertilizers cost and knew about e-marketing due to knowledge and adoption of mobile messages by farm women. The plausible reason might be that the climate smart agriculture practices enhances the sustainability and the agriculture as a whole, there by enhanced certainty of returns to some extent.

Table 4.12.2. Perceived family and social empowerment of farm women knowledge groups through mobile messages

(n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Helps in developing institutional contact	2.96	3.62	5.220**	0.0001
2.	Linkage with developing departments	3.28	3.55	3.389**	0.0001
3.	Family recognizes the ability	3.05	3.62	4.924**	0.0001
4.	Team spirit	2.94	3.77	5.267**	0.0001
5.	Leadership quality	3.05	3.83	5.110**	0.0001
6.	Group consensus to solve problem	2.88	3.78	5.265**	0.0001
7.	Equipped with accessing modern knowledge with mobile phone on par with other family members	3.16	3.84	4.551**	0.0001

In family and social empowerment of farm women on mobile messages when compared in both pre-test and post-test empowerment evaluation, it was found highly significant relationship at 1 percent level in developing institutional contact, linkage with departments, family recognizing the ability, team spirit, leadership quality, group consensus to solve problem, equipped with accessing modern knowledge with mobiles on par with other family members (Table 4.12.2). The effort itself is post-test which includes providing access to resources ultimately empowering them on social parameters, which might have reflected in the significant results.

Table 4.12.3. Perceived political empowerment of farm women knowledge groups through mobile messages

(n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Participation in social well-being activities	2.55	3.30	5.093**	0.0001
2.	Membership in the social organization	2.83	3.67	5.766**	0.0001
3.	Freedom of expression	3.04	3.77	5.070**	0.0001
4.	Conflict management	2.81	3.68	5.375**	0.0001
5.	Key person in the community for latest agriculture information	2.88	3.78	5.265**	0.0001

When compared pre-test and post-test political empowerment evaluation, a highly significant relationship was found in social well-being activities, social organization, and freedom of expression, conflict management and key person in the community for latest agriculture information on mobile messages. (Table 4.12.3).

The selected persons for providing information access would have led them to become the sources for latest agriculture information among the community.

Table 4.12.4. Perceived psychological empowerment of farm women knowledge groups through mobile messages

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Motivation in farming	2.37	3.68	7.072**	0.0001
2.	Self esteem	2.66	3.91	6.649**	0.0001
3.	Willing for risk taking ability	2.70	3.86	6.597**	0.0001
4.	Confidence	2.68	3.62	5.689**	0.0001
5.	Decision making ability	2.85	4.11	6.901**	0.0001

When compared pre-test and post-test psychological empowerment of farm women on mobile messages, highly significant relationship was found in empowering motivation, self-esteem, willing for risk taking ability, confidence and decision-making ability among farm women through mobile messages (Table 4.12.4).

The socio-economic empowerment might be the driving force or motivating factor. Hence, the responses on motivation empowerment are significant and positive

Table 4.12.5. Perceived knowledge empowerment of farm women knowledge groups through mobile messages

(n=90)

S. No	Statements	Mean Scores		't'-test	p-value
		Pre-test	Post-test		
1.	Use of vermicompost as organic farming helping climate change	1.71	3.70	10.695**	0.0001
2.	Knowledge on climate friendly and adoption practices of seed treatment	2.11	3.63	7.732**	0.0001
3.	Knowledge on soil testing techniques.	2.24	3.88	6.756**	0.0001
4.	Knowledge on inter cropping practices	2.95	3.88	5.184**	0.0001
5.	Adoption of water management practices drip irrigation, mulching	2.85	3.96	6.064**	0.0001
6.	Knowledge on ifs practices Growing hedge Lucerne, growing super napier grass	1.90	3.90	9.736**	0.0001

Knowledge empowerment of farm women on mobile messages when compared in both pre and post-test, it was found to have highly significant relationship at 1 percent level in the use of vermicomposting as organic farming and knowledge on climate friendly and adoption practices of seed treatment, soil testing techniques, inter cropping practices, drip irrigation, mulching, IFS practices, growing hedge Lucerne and super napier grass (Table 4.12.5). Empowering vulnerable women farmers of Farm Women Knowledge Groups through Mobile for promoting climate smart agriculture to achieve significant sustainable development

The findings of the study revealed that “Empowering Farm Women Knowledge Groups (FWKGs), on Climate Smart Agriculture through Mobile Phone has positive impact on farm women.

. The findings of the study revealed that “Empowering Farm Women Knowledge Groups (FWKGs), on Climate Smart Agriculture through Mobile Phone” has significant and positive impact on farm women. The researcher like to suggest two policy level implications. 1) The government should implement such projects on a larger scale all over the country 2) To

popularise climate smart agricultural technologies and messages government should implement integrated message apps developed by various government and private organisations and should link them to Agricultural Universities, Krishi Vignan Kendras and the government agriculture and allied departments for communication using the popular print and electronic media so that more and more people get aware of this knowledge and will be empowered to meet the climate based challenges.

Empirical Model of the Study

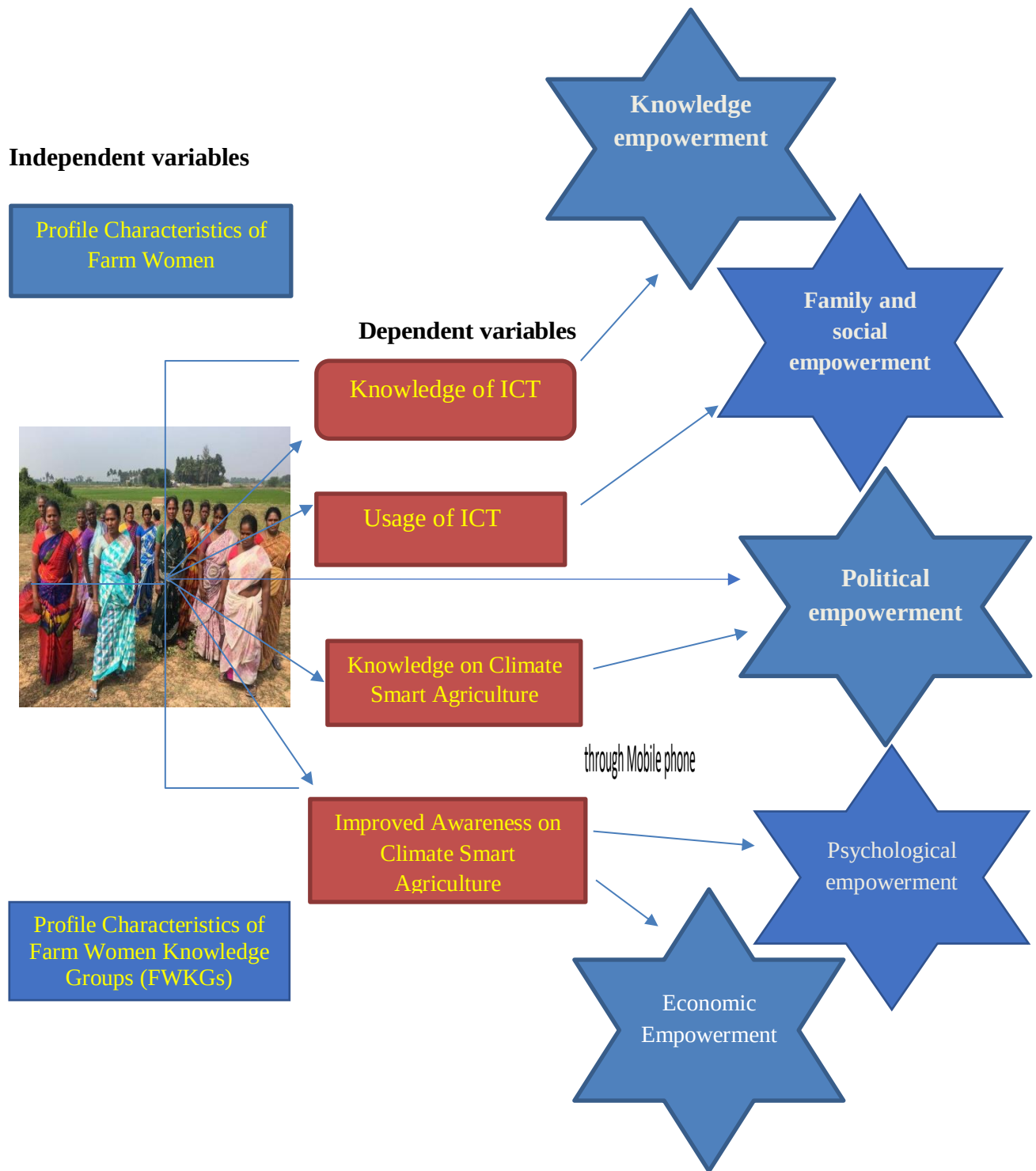


Figure 4.13. Empowerment of Farm Women Knowledge Groups on Climate Smart Agriculture through Mobile Phone

Chapter V

SUMMARY AND CONCLUSIONS

The present study entitled “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through Mobile phone” was carried out in Moinabad and Maheshwaram mandals of Ranga Reddy district Telangana State. Farm women play a key role in performing different activities in agriculture. Farm women are performing agricultural activities manually in different methods, from land clearance method to harvesting method even though the availability of tools/implements and procedures are in existence to support and safeguard their work. In spite of knowing the risk factors, they still continue with their age old traditional methods. Hence there is a need for Climate Smart Agricultural practices, across different farming methods, to facilitate adoption and thereby the livelihood improvement for the women farmers, through the use of mobile phones. Thus, climate change poses challenges, for maintaining and improving agricultural and labor productivity of the women farmers, by empowering farm women.

The purpose of studying the “Empowering Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture through mobile phone” was done with the following objectives

- (i) To assess the knowledge and utilization of ICTs by the farm women
- (ii) To study the awareness of farm women on climate smart agriculture
- (iii) To conduct intervention on usage of mobile phone applications for climate smart agriculture among Farm Women Knowledge Groups (FWKGs)
- (iv) To study the impact of mobile phone applications intervention for climate smart agriculture among the Farm Women Knowledge Groups (FWKGs)
- (v) To assess empowerment of farm women on climate smart agriculture

Experimental research design was adopted for the study. Telangana state was chosen as the locale of the study. A total of 5 villages from Maheshwaram Mandal /Block viz., Pendyal, Kalwakole, Ramachandraguda, Dubbacherla and Lillipur and a village from Moinabad Mandal/ Block i.e., Tholkatta were purposively selected for the study. Thus, a total of 6 villages were selected from two selected mandals of Ranga Reddy District. Situational analysis was done to enquire into the existing situation of

farmwomen, their agricultural practices, problems, needs and priorities with regard to Climate Smart Agricultural (CSA) practices and use of Information and Communication Technologies (ICT) with specific reference to mobile phone, with 120 farmwomen who are actively involved in farming, were selected randomly. Out of these groups, fifteen farm (15) women actively engaged in farming, literate and with access to Smart Mobile Phone, were selected from each of the six (6) adopted villages of AICRP on Home Science purposively, totaling 90 members. The independent variables selected for the study were Profile Characteristics of Farm Women (120 sample) and Profile Characteristics of Farm Women Knowledge Groups (FWKGs) (90 sample) viz. age and educational qualification, Marital status, Family size, Type of family, Family occupation, Farm women's occupation, Cultivation of Main crop, Annual income, Land holding, Cultivable land, Work experience in farming, Source of information, Organizational participation, Contact with extension personnel, Knowledge and utilization of ICTs for farm women, etc.

The dependent variables selected for the study were Knowledge of ICT, Usage of ICT, Knowledge on Climate Smart Agriculture, Awareness on Climate Smart Agriculture, Empowerment, were studied by using suitable statistical Scales. Descriptive analysis, chi-square, ANOVA, Correction coefficient and paired't' test was used for analyzing the statistical data.

General profile of farm women (120 sample)

- Majority (43.33%) of the farm women fell under the 2nd age group of middle age i.e., between 36-50 years followed by 37.50per cent belonged to young age group i.e., 18-35years, whereas 19.17 per cent of farm women were in the age group of above 50 years.
- Nearly 33 percent (32.50%) of the farm women were illiterates and negligible percentage (3.33%) of the farm women had completed their graduation and above level of education.
- Highest (86.67%) percentage of farm women were married while only a negligible percent them were widows and only few (1.67%) were unmarried.

- Majority (84.17%) of the farm women belonged to small family category with less than three members in the family and only 5 percent of farm women belonged to large level category (7-9 members) in the family.
- Highest percentage (90%) of farm women belonged to the nuclear families. Only 10 percent of farm women were from joint families indicating the depletion of joint family system in Indian families.
- Majority (45%) of the farm women were having farming as occupation followed by 25.83 per cent having farming along with business and 20 percent farming along with service, while only 9.17 percent were farming with daily wage earnings which the least.
- Farming was the most engaged activity (47.5%) and farming cum daily wage earning (14.2%) was the least engaging activity.
- Majority of the respondents had medium estimated income between (1,0000-1,50,000) followed by respondents having low estimated annual income and higher income group respondents.
- Thirty-five per cent of the farm women were holding medium level land size for farming followed by small (30.83%) land holdings. Only 13.33 per cent of the farm women were having large land holding whereas landless farm women were the least among the respondents (1.67%).
- Highest number (99%) of farm women were having own lands while those having leased lands were found negligible among the farm women (4.17%).
- Majority (36.66%) of the farm women were having between 10-20 years of work experience and near about (30%) of farm women were having above 0-10 years of work experience.
- Cotton was the major crop grown (87.50%) by the farm women followed by cereals (79.17%) such as paddy and maize. Vegetables (76.67%) and flowers (66.67%) were other main crops grown, while, pulses (55.83%) were the less grown crops by farm women indicating the shortage of irrigation water facilities in the region leading to the low production and requirement of awareness and activities for conservation of water as well as climate resilient strategies, to be implemented in the region. Due to severe drought in the region the water bodies

i.e natural water ponds and tanks dried up and they have changed and diversified their crops to cotton, maize and other floriculture crops. Paddy is grown for their consumption.

- Most of the farm women were from traditional farming background and their ancestors were involved usually in farming as India is an agrarian society and our culture is agriculture. Next, the source information is by their neighbor's (81.66%). While, only negligible (7.78 %) percent of farm women were having information from Krishi Vignan Kendras (KVKs) , as there are no KVKs nearby the research area. This negligible percent information may be due to their familiarity with their friend or neighbor's contacts.
- About 82 per cent (81.67%) of the farm women were participating in Self-Help Groups (SHGs) on regular basis as almost all members are active members of SHGs and these SHGs are very strong in combined Andhra Pradesh State and as well as now in Telangana State. Only small number (20%) of farm women were participating in Mahilamandals as there are no Mahilamandals in the state after initiation of SHGs by the DRDA (District Rural Development Agency) and SERP (Society for Elimination of Rural Poverty) and with the World Bank initiated pilot projects. The women farmer who belongs to old age group were the erstwhile members of Mahilamandals in the state.
- Majority of the farm women were in regular contact with community coordinators (68.33%) and Anganwadi worker (58.33%) with Self Help Group (SHGs) .The government under the Society for Elimination Of Rural Development (SERP), under the Department of Rural Development and PanchayatRaj has initiated encouraging measures to empowerment of rural women from every household by bringing them into the fold of SHGs. SHG is strong body with effective organization structure, social mobilization, institutional building, capital formation, with continuous monitoring and evaluation, and is functioning at grass root level. Hence, there is continuous handholding and participation in Self Help Group (SHGs).
- Contact with external personnel was very weak including extension officer (20.83%), farmer's organization (13.33%), Agricultural Extension officers (AEO)

(12.50%), Block Personnel (10.83%), Village Level Extension Officers (VLEW) (10%), but higher for University Personnel (68.33%). This may be due to social and cultural barriers existing in the village where most of the officials contacting men folk. The contact with University personnel is attributed to the presence of All India Coordinated Research Project on Home Science (AICRP- HSc), from Professor Jayashankar Telangana State Agricultural University (PJTSAU), which recently adopted the villages as operational villages.

Knowledge and utilization of Information and Communication Technologies (ICTs) by farm women (120 sample)

- Highest percentage (96.67%) of the farm women were utilizing television for entertainment, whereas least percentage (18.33%) of farm women were having CD/DVDs.
- Majority (85%) of farm women were having complete access to television as it was the most common source of entertainment followed by mobile (67.50%).
- Partial availability was observed among half of the farm women (46.67%) while no access was established for computer and CD/DVDs by 69.17%percent and (68.33%) percent respectively.
- For 2017, the number of Smartphone users in India is estimated to reach 299.24 million, with the number of Smartphone users worldwide forecast to exceed 2.3 billion users. Mobile phones have penetrated into rural areas. Farm women are no exception. Cent percent of the farm women were aware of making calls without internet, followed by SMS (75%) but usage of the same was only 10 percent and this may be as women were not familiar with the advanced features in operation of mobiles except making calls and receiving them.
- Highest percentage (77.50%) of farm women were using television for watching news/movies/songs and small percentage (13.33%) were using CD/DVDs for storage purpose.
- Only ten per cent of farm women had undergone training related to ICTs to gain knowledge indicating

- Three-fourths (76.67%) of farm women were always using television, and only one-third (12.50%) of farm women were using CD/DVDs because of the change due to digital technology.
- Cent percent farm women were using television for watching programmes for entertainment purpose (100%) and least percentage of farm women were using ICTs for business purpose (25%).
- Highest preference was given for calling/SMS/watching and listening music in mobile phones and last preference was given for downloading documents/presentations/movies/songs.
- According to the mean score of farm women's attitude towards ICTs revealed that the problems as not having own ICTs tools, lack of interest, financial problems, lack of confidence in operating ICTs, lack of time, lack of technical knowledge, signal problem, non-functioning of ICTs, inadequate physical facilities, lack of electricity and inadequate repair facilities. Overall it can be said that there is need to promote ICTs use to obtain agriculture and animal husbandry information.
- Majority of the farm women respondents (48.26%) had high attitude towards ICTs followed by medium 28.68 percent and low 23.06 percent categories to their attitude towards ICTs respectively.

General Profile Characteristics of Farm Women Knowledge Groups (FWKGs) (90 sample)

- More than half percent (57.78%) of farm women belonged to the middle age group i.e. 26-35 years, while, almost equal percent of farm women belonged to young age group (22%) and old age group (20%).
- Prime part of the farm women (37.78%) had completed their intermediate education while only few (4.44%) farm women had done their graduation and above education.
- Nearly 87 per cent (86.67%) of farm women were married while the rest (13.33%) of farm women were either widowed or divorced.
- Nearly sixty per cent (55.56%) belonged to the medium family with 4-6 members while about only ten percent (8.89%) of farm women belonged to the large families comprising of 7-8 members in their families with farming (36.67%) as

their main occupation. More than half of the per cent (55.65%) of families were nuclear families with medium size of 3-5 members reflecting the rise of the nuclear families even in rural Indian agricultural families.

- Cent per cent of farm women's 46.67 percent of the overall respondents had medium while 30 percent had low income and 23.33 percent had high-income.
- Highest percentage (91.11%) of the farm women were having own cultivable land whereas very negligible percentage (2.22%) of farm women were having leased cultivable land.
- Cent per cent of farm women's lands were of dry lands representing the dry climatic conditions of central Telangana zones.
- Regarding work experience of farm women, 36.67 per cent of the farm women were having 6-10 years of experience in farming activities whereas only 17.78 per cent of farm women were having above 15 years of work experience.
- Nearly forty per cent (38.89%) of the farm women were having medium size of farms with 3-5 acres of land followed by small size of farms (35.56%) within 1-3 acres, large size of farms (18.89%) with more than 5 acres of land and marginal size of farms (6.67%) i.e., less than 1 acre of land.
- The most (91.11%) grown crop in the selected villages was cotton followed by cereals (84.44%), all types of vegetables (80.00%), flowers (75.56 %) while pulses were grown only in few (60.00 %) areas as a result of less irrigation facilities in the selected areas.
- Cent per cent farm women were noticed to have information of farming from traditional knowledge, family members, and neighbours.
- Farm women were in regular participation with Self Help Groups (78.89%) followed by Anganwadi centres (48.89%) evincing the empowerment of rural farm women after association with the SHGs.
- Community Coordinators of Self-Help Groups (63.33%) were the regularly contacted extension personnel followed by Anganwadi workers (56.67%).

Knowledge and Utilization of Information and Communication Technologies (ICTs) by Farm Women Knowledge Groups (FWKGs)

- Cent per cent (100%) farm women have knowledge on receiving calls and very a smaller number of farm women (42.22%) had knowledge on how to send SMS.
- Family members (51.11%) were the first learning institute for any person to learn, followed by friends and relatives (42.22%) and 22.22 per cent of farm women were trying mobiles for knowing about apps.
- The data related to source of SMS received from mobile phones were mostly from relatives (36.67%) and banks (35.56%).
- Cent per cent of farm women were having their knowledge on charging, receiving and making calls and using calculator, calendar, alarm (82.22%).
- Nearly 94.44 per cent of farm women were learning the knowledge about mobiles by attending training programmes followed by trying mobiles by their own for knowing about apps (91.11%), from family members (80%), and friends and relatives (62.22%).
- Majority (91.11%) of farm women were receiving SMS from PJTSAU, University/Researchers followed by relatives (73.33%), family members (64.44%) and a low percentage (27.78%) of farm women were receiving SMS from agricultural extension officers

Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Change

- Highest percentage (86.67%) of the farm women were not aware of global warming, use of electrical appliances (84.44%) and burning of fossils and farm waste, use of electrical appliances and global warming (4.44%).
- Cent per cent of farm women regarding the incidence of increased temperature and change in growing season was reported extreme degree of change and its degree of change with the incidence of flood (82.22%) and drought (78.88%) was reported moderately.
- Nearly cent per cent of farm women responded positively in changing traditional irrigation methods (95.55%) and in implementing soil conservation methods (94.44%).

- 86.66 per cent farm women responded to change the use of chemicals, pesticides and fertilizers followed by adopting agronomic practices i.e., mulching of soil (84.44%), adopting crop rotation (82.22%) and in diversification of crop varieties (78.55%).

Awareness of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture

Awareness of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture revealed that majority of farm women were aware about importance of organic fertilizers (80%) and usage of vermicomposting (13.33%) in soil management, crop rotation (46.67%) and crop rotation (42.22%) in crop management, farm pond (64.44%) in water management, hedge lucerne (15.56%) in livestock management and crop tree livestock system (42.22%) in agro diversification. The association between age, educational qualification and awareness of farm women knowledge groups on climate smart adaptive strategies i.e., soil, crop, water, livestock and agro-diversification management was found to be non-significant.

Pre and post knowledge index on adaptation strategies for climate smart agriculture

- Pre-knowledge index on adaptation strategies for climate smart agriculture revealed that cent per cent of the farm women did not know about the fertile lands should be tested at least once in three years, that vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium, that vermicomposting enriches soil with microorganisms and that two tons of vermicomposting is required for one acre fertile land, that seed treatment with bio fertilizers such Rhizobium, enhances the root formation of the pulse crops and gives uniform crop stand, even in adverse conditions (less/high moisture), that intercropping helps in increasing nutritive value, that mulching reduces and controls soil erosion which promotes activities of soil friendly microorganisms, that super Napier grass helps in high protein, carbohydrate, vitamins that it grows faster upto 10 feet in 59 days which improves the quality of livestock's milk and that silage can be prepared with super Napier grass, hedge Lucerne grass which yield up to 90 tons per acre, having high protein content to benefit in high rate of growth in cattle

with increased yield in milk. Among farm women, 86.66 per cent did not know about drip irrigation which helps in foliage to remain dry reducing the risk of disease and drip irrigation system that reduces energy costs (85.56%).

- Pre-knowledge index on adaptation strategies for climate smart agriculture revealed that cent per cent of the farm women (92.59%) of the farm women respondents had low level of knowledge index on CSA- soil health test, followed by majority (91.75%) of the farm women respondents represent low category knowledge index on CSA- vermicomposting, followed by majority (85.42%) of the farm women respondents belong to low category knowledge index on CSA- seed treatment due lack social participation and awareness, followed by majority (81.75%) of the farm women respondents had low category level of knowledge index on CSA-intercropping, followed by majority (77.14%) of the farm women respondents had low level of knowledge index on CSA- drip irrigation system, followed by majority (84.81%) of the farm women respondents had low level of knowledge mulching, followed by majority (95.56%) of the farm women respondents had low level of knowledge index on CSA- Super Napier, followed by majority (93.52%) of the farm women respondents had low level of knowledge index on CSA- Hedge Lucerne.
- Post-knowledge index on adaptation strategies for climate smart agriculture revealed that majority of farm women knew about the importance of fertility of lands and fertility of soils should be tested at least once in three years (91.11%), highest percentage (86.67%) of farm women knew that two tons of vermicomposting is required for one acre fertile land, followed by seed treatment with bio fertilizers, that enhanced the root formation of the pulse crops (75.56%), intercropping that increases nutritive value (80%), mulching that helps in promoting activities of soil friendly microorganisms (67.78%), drip irrigation helping foliage to remain dry there by reducing the risk of disease (74.44%). Equal percentage (77.78%) of farm women knew super Napier grass grows faster upto 10 feet in 59 days and it improves the quality of livestock's milk and, super Napier grass has high protein, carbohydrate, vitamins (72.22%). Farm women knew silage can be prepared with super Napier grass (68.89%). hedge Lucerne

grass yield up to 90 tons per acre (77.78%) and hedge Lucerne grass has high protein content (68.89%).

- Post-knowledge index on adaptation strategies for climate smart agriculture revealed that majority of farm women majority (82.04%) of the farm women respondents had high level of knowledge index on CSA- soil health test, followed by majority (77.30%) of the farm women respondents high category knowledge index on CSA- vermicomposting, followed by majority (80.97%) of the farm women respondents' high category knowledge index on CSA-seed treatment, followed by majority (81.43%) of the farm women respondents had high category level of knowledge index on CSA-intercropping, followed by majority (80.79%) of the farm women respondents had high level of knowledge index on CSA- drip irrigation system, followed by majority (78.52%) of the farm women respondents had high level of knowledge index on CSA-mulching, followed by majority 81.11 per cent of farm women knew about super Napier grass, followed by majority (79.63%) of the farm women respondents had high level of knowledge index on CSA- Hedge Lucerne.
- According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed among village wise overall impact. The 'F' value was found to be significant at 0.05 level in soil health test, vermicomposting, super Napier and hedge Lucerne, and, 0.01 level significant in intercropping, drip irrigation system, mulching, and, non-significant in case of seed treatment.
- According to Farm Women Knowledge Groups on adaptive strategies, analysis of variance was performed with mobile phone usage. The 'F' value was found to be significant at 0.05 level in case of soil health test, vermicomposting, drip irrigation, mulching, and super Napier and hedge Lucerne, and, 0.01 level significance was found in seed treatment and intercropping.
- According to Correlation coefficient between Profile Characteristics of Farm Women Knowledge Groups (FWKGs) & Knowledge Index of Farm Women Knowledge Groups (FWKGs) on Adaptation Strategies for Climate Smart Agriculture Knowledge had significant positive relation was evident with age, marital status and work experience at 0.05 level of probability and at 0.01 level

with education qualification, whereas non-significant relation in case of occupation and annual income.

Impact of Mobile Phone Applications Intervention for Climate Smart Agriculture among the Farm Women Knowledge Groups (FWKGs)

- Knowledge on use and functions of mobile phones of the farm women when compared between the pre and post-test evaluation, it was found to be significant at 1% level in using mobiles, social media apps, internet, charging the mobile phones, calling and receiving calls, receiving and sending SMS, saving contact number showing the impact of the mobile trainings.
- Learning sources of mobile phone operations between prior and after mobile trainings found to be significant at 1 percent level showing the positive influence of the mobile trainings which has generated curiosity among the farm women to acquire the knowledge of mobile operations from different available sources.
- When compared between the pre and post- mobile training test on source of SMS received from mobile phones among the farm women by using paired ‘t’ test, it was found to be significant at 1percent level on receiving SMS from family members, relatives, agricultural extension officer, PJTSAU, University/Researcher and school teacher while SMS from banks were found to be significant at 5 percent level indicating the increased frequency of exchange of information among the farmwomen.

Impact of mobile phone applications intervention for climate smart agriculture among the Farm Women Knowledge Groups (FWKGs)

Knowledge index of farm women on soil health test when compared between pre and post-test, it was found to be significant at 1percent level in terms of knowing about the soil health test helping in identifying the fertility and nutrient levels of the land, fertile lands testing at least once in three years, that soil test minimizes the other expenses like use of pesticides and other chemicals, that soil test balances acidic and alkalinity soil, correcting the soil by adding calcium and gypsum for the soil with increased acidic and alkaline conditions.

- Knowledge index on vermicomposting between pre and post tests intervention, was found to be significant at 1percent level among farm women, namely knowledge increased that vermicomposting improves the soil fertility, sustain the quality of soil than chemicals, increases plant nutritive value, that soil water conservation can be increased with the use of vermicomposting, that vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium, that vermicomposting enriches soil with microorganisms ,and that two tom of vermicomposting is required for one acre fertile land.
- When compared between the pre and post test interventions for of farm women knowledge index on seed treatment like -inhibit soil prone diseases, kills seed borne pathogens/insects, increase the life span of the seeds, enhancing the root formation of the pulse crops, gives uniform crop stand, even in adverse conditions (less/high moisture), and that seed preparing with cow milk, cow urine and cow bijaamruthum.
- Knowledge index on intercropping of farm women was found highly significant at 1 percent level between pre and post tests in helping in cultivating more than one crop in the same field, that gives additional yield income, increases nutritive value, controls weed, acts as an insurance against failure of crops in abnormal year, provides shade and support to the other crop and maintains the soil fertility as the nutrient uptake is from different layers of soil.
- Highly significant relationship was found at 1percent level when pre and post- test data of farm women was compared on knowledge index on drip irrigation that namely conserves water, where foliage remains dry which reduce the risk of disease, than lessen soil erosion, controls seed growth due to spot watering, where labour cost is less than other irrigation methods, that will not require land leveling and bundling and reduces energy costs.
- When compared pre and post knowledge index data on mulching, it was found to be highly significant at 1percent level among the farm women regarding mulching, knowing about mulching, that improve nutrient and retains water in the soil, regulates soil temperature, promotes activities of soil friendly microorganism, reduces and controls soil erosion and growth of weeds.

- When compared knowledge levels of farm women on super Napier, it was found to be significant at 1percent level regarding super Napier that it has high protein, carbohydrate, vitamins that is, grows faster upto10 feet in 59 days, and that it is best fodder crop for dairy cattle, which improves the quality of livestock's milk and that silage can be prepared with super Napier grass.
- Highly significant relationship was found at 1percent level between knowledge index levels of farm women between pre and post tests on hedge Lucerne that hedge Lucerne grass yielding for 5 to 6 years, yield up to 90 tons per acre, hedge Lucerne grass has high protein content, and best feed to livestock which is highly digestible and that is benefits in high rate of growth in cattle with increased yield in milk.

Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate Smart Agriculture

- When compared, pre-test and post-test economic empowerment, there was a highly significant relationship found with increased income, saved money, promoted investments, purchasing inputs of farming and reduced chemical fertilizers cost and knew about e-marketing due to knowledge and adoption of mobile messages by farm women.
- In family and social empowerment of farm women, both pre-test and post-test, it was found highly significant relationship at 1 percent level was perceived in developing institutional contact, linkage with departments, family recognizes the ability, team spirit, leadership quality, group consensus to solve problem, equipped with accessing modern knowledge with mobiles on par with other family members.
- When compared pre-test and post-test political empowerment, there was a highly significant relationship in social well-being activities, social organization, freedom of expression, conflict management and key person in the community for latest agriculture information through mobile messages which can be attributed to FWKGs involvement and support.
- When compared between pre-test and post-test for psychological empowerment evaluation of farm women on mobile messages, highly significant relationship

was found in empowering motivation, self-esteem, willing for risk taking ability, confidence and decision making ability among farm women through mobile messages.

- The pre and post-test results revealed that there was highly significant empowerment in Knowledge levels of the farm women after the mobile message intervention, at 1percent level. The use of vermicomposting as organic farming and knowledge on climate friendly and adoption practices of seed treatment, soil testing techniques, inter cropping practices, drip irrigation, mulching, IFS practices, growing hedge Lucerne and super Napier grass for livestock fodder has strengthened their knowledge and they became social mobilizers for their village.

Conclusion:

- From the study, it can be concluded that more than half percent of farm women belonged to the middle age group between 26-35 years with intermediate education and married. Farm women had medium family with 4-6 members.
- Majority of the farm women were having their own and dry lands for cultivation. Farm women also had 6-10 years of work experience with medium size family.
- Majority of information related to farming obtained by the farm women from television channels providing agriculture related programmes in appropriate timings for them.
- Frequency of contact with different extension personnel by farm women is limited when they got in touch with extension agents only for getting information on the availability of credit and during disease outbreaks.
- Attitude of farm women towards ICTs is positive expressed as necessary for their children and youth to get information regarding their academics and to build their career and also felt that ICTs helps in acquiring needed knowledge regarding farming/agriculture.
- Extent of use of ICT tools was low to medium. Use of any tool depended on awareness and knowledge on the tool. The low and medium extent of use of different ICT tools might be due to lack of awareness and knowledge on the ICT tools. The cost of the ICT tools might be the another reason of low to medium

extent of use as most of the farmers in the study area hold small farm size and have medium level of annual income.

- Pre knowledge on usage of mobile phones by Farm Women Knowledge Groups were either for trainings or for family members, and, their capacity to maintain the communication effectively was difficult, and SMS source was purely personal and they were not getting any messages from any other organizations.
- Post knowledge on usage of mobile phones by Farm Women Knowledge Groups improved the knowledge of farm women the effort of the investigator initiated efforts for providing the mobile trainings to the farm women.
- Among farm women knowledge groups, awareness and knowledge on climate change and climate smart agriculture through mobile phones and trainings were improved. Significant association was found at 0.01 per cent level.
- Pre and post empowerment of farm women regarding mobile messages for climate smart agriculture also improved and it was found to be significant at level of sufficiency.

Recommendations and Suggestions for future research

- Though farmwomen were aware of long-term changes in climatic factors (temperature and rainfall, for example), they are unable to identify these changes as climate change, requiring more capacity building.
- The government should implement such projects on a larger scale all over the country.
- To popularise climate smart agricultural technologies and messages government should implement integrated message apps developed by various government and private organizations and should link them to Agricultural Universities, KrishiVignanKendras and the government agriculture and allied departments for communication using the popular print and electronic media so that more and more people get aware of this knowledge and will be empowered to meet the climate based challenges.
- Farmers are also aware of risks generated by climate variability but they are unable to assess extreme climatic events and their knowledge levels need to be improved. Farmers are not taking concrete steps in dealing with perceived

climatic changes, although farmers are changing their agricultural and farming practices.

- Passive response towards adaptive strategies to climate change should be encouraged through extension services viz. campaigns and awareness programmes.
- Policy interventions to scale up adaptation on climate change in Indian agriculture sector should be given more priority.

Suggestions for future research

- The study was focused as experimental design in Ranga Reddy District of Telangana State. Hence, a full-length study can be initiated in different states of India, based on the different climatic conditions and changes and impact driven solutions in the field of gender and climate change adaptation.
- Studies on Climate change adaptation interventions can be targeted by being linked with type of climatic risks experienced by women farmers, their social profile and their needs based on the role they play in agriculture.
- Studies can be taken up related to prioritisation of hotspot regions specially in India as a first step for climate change and gender based specifically for adaptation, is a research gap and interventions through ICT and mobile phones can be explored.
- Adaptation interventions in the form of climate-smart agriculture (CSA) are being increasingly suggested as a means of reducing the impact of climate risks on farmers. Experimenting with Farm Women Knowledge Groups and Farmers Knowledge Groups can be taken up at massive levels involving government and non-government organisations.
- Collaborative research can be planned with National and International organisations working on climate change and Climate Smart Agriculture to promote climate friendly technologies to the women farmers and their families for adaptation for improving productivity or income.
- Research on development of farm women friendly ICTs, especially Smart Phone based interventions like WhatsApp messages, video, audio and text messages, innovative case studies and real time video documentation, success stories and

interviews related to coping strategies and resilience mechanisms , Tele and video conferencing etc. is the need of the hour.

- Research on transfer of simple, innovative Climate friendly adaptation technologies CSA practices and technologies which help farmers to improve their agricultural productivity, lower their field labor requirements, and provide diverse income options, while building their resilience towards future climate risks can be promoted through traditional mass media interventions viz. burrakatha, oggu katha, puppet shows, role plays and skits, Noting etc.
- Farmers are not taking concrete steps in dealing with perceived climatic changes, although farmers are changing their agricultural and farming practices. therefore, active response towards adaptive strategies to climate change should be encouraged through extension services viz. campaigns and awareness programmes.
- Studies related to Policy interventions to scale up adaptation on climate change in Indian agriculture sector should be given more priority.

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Appendix - I

Interview Schedule

General Information

1. Village :
2. Mandal /Block :
3. District :
4. Name of the respondent :
5. Mobile number :
6. Type of Mobile Phone :

Part – I: General profile of the respondent

7. Age in years :
 - a. 18-35 years
 - b. 36-50 years
 - c. Above 50 years
8. Educational qualification:
 - a. Illiterate
 - b. Primary school
 - c. Middle school
 - d. High school
 - e. Intermediate
 - f. Graduate and above
9. Marital Status:
 - a. Married
 - b. Unmarried
 - c. Widow
10. Size of the family:
 - a. Small family (less than 5 members)
 - b. Medium family (5-7 members)
 - c. Large family (7-9 members)
11. Type of family
 - a. Nuclear family
 - b. Joint family

12. Family occupation:

- a. Farming
- b. Farming and Service
- c. Farming and business
- d. Farming and Daily wage earner

13. Respondent's occupation:

- a. Farming
- b. Farming and Service
- c. Farming and business
- d. Farming and Daily wage earner

14. Annual income

- a. Low
- c. Medium
- d. High

Part – II: Information related to farming

15. Land holding

- a. Landless
- b. Marginal (less than 0.01 acres)
- c. Small (0.01-2.5 acres)
- d. Medium (above 2.5 – 7.0 acres)
- e. Large (above 7 acres)

16. Work experience in farming

- a. 0-10 years
- b. 10-20 years
- c. 20-30 years
- d. Above 30 years

17. Main crop in cultivation

- a. Cereals
- b. Pulses
- c. Flowers
- d. Vegetables
- e. Cotton

18. Source of information about farming

- a. Traditional knowledge
- b. News paper

- c. KVK
- d. Agricultural University
- e. Climate related agricultural Counseling
- f. AEO/ Agricultural Officer
- g. TV
- h. Radio
- i. Mobile phone
- j. family members
- k. Neighbor's

Part – III: Social Participation of farm women

19. How often did you participate in organizations

Organizations	Extent of participation		
	Regularly 3	Occasionally 2	Never 1
Self Help Group			
Anganwadi centre			
Mahilamandal			
Gram Panchayat			
Zilla panchayat			
Taluk panchayat			
Farmers organization			

20. How often did you contact with extension agents

Extension Agent	Frequency of contact with extension personnel		
	Regularly 3	Occasionally 2	Never 1
VLEW			
AEO			
Farmers Organisation			
Community Coordinator (SHG)			
Anganwadi Worker			
University Personnel			
NGO Personnel			
Bank Personnel			
Block Personnel (VAO & VRO)			

Part IV - Knowledge and utilization of ICTs by the farm women

21. Availability and accessibility to different ICTs hardware:

ICTs hardware	Availability		Accessibility		
	Yes 2	No 1	Complete 3	Partial 2	No access 1
Television					
Radio					
Mobile					
Computer					
CD/VDV					
Internet					
e- mail					

* **Complete access-** one can use and operate as and when they want

22. Awareness and use of different ICT tools and services

ICT tools and services	Aware		Use	
	Yes 2	No 1	Yes 2	No 1
a. Mobile without internet				
Calling				
SMS				
Memory stick				
b. Mobile with internet				
Calling				
SMS ing				
Memory stick/ Memory card				
Whats app				
Facebook				
Games/ movies/ songs				
Accessing different internet sites				
c. Computer /laptop without internet				
Office documents/presentations etc.				
Any other				
d. Computer/laptop with internet				
Office documents/presentations etc.				
Facebook, social media				
Accessing different internet sites				

23. Distribution of respondents by Level of ICT utilization

ICTs Tools	Level of Utilisation		
	Regularly 3	Occasionally 2	Rarely 1
Mobile			
Radio			
Television			
News paper			
Magazine			
Computer			
Internet			

24. Have you undergone any training related to ICT?

ICTs	Participation	
	Yes 2	No 1
Mobile phones		
Basics of Computer		
Use of Internet		

25. Frequency of use of ICT tools:

ICT tools	Frequency of usage			
	Always 4	Sometimes 3	Rarely 2	Never 1
Television				
Radio				
Mobile				
Computer				
CD/VDV				
Internet				
e- mail				

26. Purpose for using ICTs (Yes-2 and No-1)

ICT tools	Education	Health	Business	Agriculture	Social welfare	Entertainment
Television						
Radio						
Mobile						
Computer						
CD/VDV						
Internet						
e- mail						

27. Attitude towards ICTs:

Statements	SA 5	A 4	UD 3	D 2	SD 1
I feel updated whenever using ICTs to find any information					
Use of ICTs is a wastage of time					
ICTs helps the farmers in decision making					
Use of ICTs makes life more complicated					
ICTs improves the farmers output					
ICTs helps farmers to acquire needed knowledge					
Sever as a link between government and farmers					
ICTs motivate farmers to adopt new technology					
ICTs demonstrate improved technologies to farmers					
Use of ICTs creates isolation from the other population					
I feel proud to be able to access the internet at any time					
ICTs connect people with latest trends of technology					
Any other					

SA- Strongly Agree, A- Agree, UD- Un-decided, D-Disagree, SD- Strongly disagree

Part V - Knowledge and usage of mobile phone by farm women knowledge groups**28. Knowledge and usage of mobile phone**

Do you know how to use mobile phone?	Yes/No
Do you know how to charge your mobile phone?	Yes/No
Do you know how to receive your calls?	Yes/No
Do you know how to send SMS from your mobile phone?	Yes/No
Do you know how to open your received SMS?	Yes/No
Do you know how to save contact number in your mobile phone?	Yes/No
Do you know how to make and receive phone calls	Yes/No
Do you know how to use calculator, calendar, clock, alarm features etc.	Yes/No
Do you know how to use internet	Yes/No
Do you know how to use social media apps (WhatsApp, facebook etc)	Yes/No

29. Source of learning about mobile phone

Sources	Yes 2	No 1
Family members		
Friends and relatives		
By trying mobiles for knowing about apps		
By attending training programmes		

30. Frequency of receiving SMS from mobile phone

Source of SMS	Yes 2	No 1
Family Members		
Relatives		
KVKs		
Agricultural extension officer		
PJTSAU, University/Researcher		
School teacher		
Banks		

Part VI - Awareness of Farm Women Knowledge Groups (FWKGs) on Climate Change

31. Farm women's level of knowledge on the causes of climate change

Statement	Level of knowledge		
	Fully aware 3	Somewhat aware 2	Not aware 1
Deforestation			
Increase in number of vehicles			
Overpopulation			
Industries/ factories			
Use of pesticides			
Burning of fossils and farm waste			
Use of electrical appliances			
Pollution			
Global warming			
Natural disaster			
Rapid urbanization			

32. Farm women's level of knowledge on climate variable influencing production

Incidence	Degree of change in percentage (%)			
	Extreme 4	Moderate 3	Minor/Negligible 2	None 1
Drought				
Flood				
Increased temperature				
Change in growing season				

33. Farm women's adaptability for climate change

Adaptation strategies	Yes 2	No 1
Diversification of crop varieties		
Change in planting calendar		
Change in use of chemical pesticides and fertilizers		
Implementing soil conservation methods		
Adopting water harvesting techniques		
Change in agronomic practices i.e., mulching of soil		
Changing the traditional irrigation methods		
Switching from mono cropping to integrated farming systems		
Adoption of crop rotation		
Adoption of intercropping		
Use of soil health cards		
Preventing/reducing soil erosion		

Part VII -Awareness of Farm Women Knowledge Groups (FWKGs) on climate smart agriculture

34. Awareness on soil management

Items	I Know		I Don't Know	
Aware of soil health test				
Aware on usage of vermicomposting				
Aware of organic fertilizers				
Aware about legumes and green manure				
Aware on use of compost				
Aware about use of animal manure				
Aware of bio-fertilizer				

35. Awareness on crop management

Items	I Know		I Don't Know	
Aware of intercropping				
Aware of seed treatment				
Aware of crop rotation				
Aware of Planting drought resistant varieties of crops				
Aware of crop diversification				
Aware about change in cropping pattern and planting calendar				
Aware of mixed cropping				

36. Awareness on water management

Items	I Know		I Don't Know	
Aware about drip irrigation				
Aware of mulching				
Aware of water efficient crops varieties				
Aware about farm pond				
Aware of micro irrigation				
Aware of water harvesting				

37. Awareness on livestock management

Items	I Know		I Don't Know	
Aware about super napier is better fodder management				
Aware regarding lucerne hedge in better fodder management				
Aware about azolla is better fodder management				

38. Awareness on agro-diversification management

Items	I Know		I Don't Know	
Awareness regarding crop-tree systems (agro forestry systems)				
Awareness regarding reduced tillage				
Aware about crop-tree-livestock system				
Awareness regarding integrated farming system model				
Awareness regarding space between rows/plants				

Part VII -Knowledge index on adaptation strategies for climate smart agriculture

39. Knowledge index on soil health test

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know that soil test helps in identifying the fertility and nutrient levels of the land			
Do you know that the fertile lands should be tested at least once in three years			
Do you know soil test minimizes the other expenses like use of pesticides and other chemicals			
Do you know soil test balances acidic and alkalinity soil			
Do you know with soil test, the soil can be corrected by adding calcium and gypsum for the soil with increased acidic and alkaline conditions respectively			
Do you know vermicomposting need to be used maintain the quality of soil			

40. Knowledge index on vermicomposting

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know that use of vermicomposting improves the soil fertility			
Do you know vermicomposting sustain the quality of soil than chemicals			
Do you know vermicomposting increases plant nutritive value			
Do you know the soil water conservation can be increased with the use of vermicomposting			
Do you know vermicomposting have a composition of 1.6 nitrogen, 0.5 sodium and 0.8 potassium			
Do you know vermicomposting enriches soil with microorganisms			

41. Knowledge index on seed treatment

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know that seed treatment is required to inhibit soil borne diseases			
Do you know seed treatment kills seed borne pathogens/insects			
Do you know seed treatment increases the life span of the seeds			
Do you know seed treatment enhances the root formation of the pulse crops			
Do you know seed treatment can be prepared with cow milk			
Do you know seed treatment can be prepared with cow urine			

42. Knowledge index on intercropping

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know intercropping which helps in cultivating more than one crop in the same field			
Do you know intercropping gives additional yield income			
Do you know intercropping increase nutritive value			
Do you know intercropping controls weed			
Do you know intercropping acts as an insurance against failure of crops in abnormal year			
Do you know intercropping provide shade and support to the other crop			

43. Knowledge index on drip irrigation system

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know drip irrigation system conserves water			
Do you know in drip irrigation, foliage remains dry and reducing the risk of disease			
Do you know drip irrigation lessen soil erosion			
Do you know drip irrigation controls seed growth due to spot watering			
Do you know drip irrigation, labour cost is less than other irrigation methods			
Do you know drip irrigation will not require land leveling and bundling			

44. Knowledge index on mulching

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know what is mulching			
Do you know mulching improves nutrient and retains water in the soil			
Do you know mulching reduces and controls soil erosion			
Do you know mulching reduced the growth of weeds			
Do you know mulching regulates soil temperature			
Do you know mulching promotes activities of soil friendly microorganisms			

45. Knowledge index on Super Napier

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know what is super napier grass			
Do you know super napier grass has high protein, carbohydrate, vitamins			
Do you know super napier grass grows faster upto 10 feet in 59 days			
Do you know super napier grass is the best fodder crops for dairy cattle			
Do you know super napier grass improves the quality of livestock's milk			
Do you know silage can be prepared with super napier grass			

46. Knowledge index on Hedge Lucerne

Statements	Frequency		
	I know 3	Somewhat I know 2	I don't know 1
Do you know what is hedge lucerne grass			
Do you know hedge lucerne grass yields for 5 to 6 years			
Do you know hedge lucerne grass yield up to 90 tons per acre			
Do you know hedge lucerne grass has high protein content			
Do you know hedge lucerne grass is one of the best feed to livestock highly digestible			
Do you know it benefits in high rate of growth in cattle with increased yield in milk			

**Part IX- Empowerment of Farm Women Knowledge Groups (FWKGs) on Climate
Smart Agriculture**

47. Economic empowerment of farm women on mobile messages

Sl. No.	Economic empowerment components	Score											
		Before mobile message Intervention						After Mobile Message intervention					
		Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)	Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)
1.	Helps in Increased Income due to knowledge and adoption												
2.	Helps in Saving Money												
3.	Promotes Investments properly												
4.	Purchase of inputs of farming and reduce chemical fertilisers cost												
5.	Know e-marketing												

48. Family and social empowerment of farm women on mobile messages

Sl. No	Family and social empowerment components	Score											
		Before mobile message Intervention						After mobile message Intervention					
		Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)	Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)
1.	Helps in Developing institutional contact												
2.	Linkage with developing departments												
3	Family recognizes the ability												
4.	Team spirit												
5.	Leadership quality												
6.	Group consensus to solve problem												
7.	Equipped with accessing modern knowledge with mobile phone on par with other family members												

49. Political empowerment of farm women on mobile messages

Sl. No	Political empowerment components	Score											
		Before mobile message Intervention						After mobile message Intervention					
		Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)	Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)
1.	Participation in social well-being activities												
2.	Membership in the social organization												
3.	Freedom of expression												
4.	Conflict management												
5	Key person in the community for latest agriculture information												

50. Psychological empowerment of farm women on mobile messages

Sl. No.	Psychological empowerment components	Score											
		Before mobile message Intervention use						After mobile message Intervention					
		Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)	Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)
1.	Motivation in farming												
2.	Self esteem												
3.	Willing for Risk taking ability												
4.	Confidence												
5.	Decision making ability												

51. Knowledge empowerment on climate adaptive strategies

Sl. No.	Knowledge empowerment components	Score											
		Before mobile message Intervention						After mobile message Intervention use					
		Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)	Very Well (6)	Well (5)	Moderate (4)	Low (3)	Very low (2)	Not at all (1)
1.	Use of vermicompost as organic farming helping climate change												
2	Knowledge on climate friendly and adoption practices of Seed treatment												
3.	Knowledge on Climate resilient practices												
4	Knowledge on Crop rotation and inter cropping practices												
5.	Adoption of IWM practices Drip Irrigation, Mulching												
6.	Knowledge on IFS practices Growing Hedge Lucerne, Growing Super Napier grass												

APPENDIX-II

Farm women Knowledge Groups (FWKGs) registered mobile numbers

	Ramchandragudam				
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Shoba -(10th Class)	9666226834	1	Madavi -(Shashi)	9951594768
2	Sujatha- (Srinu)	9949602399	2	R.Lakshmi – (Inter)	9603680148
3	Swapna-(Inter)	9666115932	3	Mamtha – (Inter)	9966232626
4	Joythi -(10 th Class)	9848808253	4	Sujatha Baskhar– (Inter)	9951317464
5	Raklavath Shasli(Inter)	9705740325	5	Anganwadi Shobha-7 th Class	7095593042
6			6	Shivi (Sarpanch)	9951897233
			7	Sunitha – (Inter)	9010928098
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Fathima (10th)	8499891510	1	Manjula (Inter)	9640787513
2	Samina Begum (10th)	955004289	2	Gowsya (7th)	9866654786
3			3	Mallishvari (7th)	9640246274
4			4	Amaravathi(Dhgree)	9640028272
5			5	K.Pavani(Inter)	9705032092
6			6	Kammari Sunitha(8th)	9603830860
7			7	Amurutha (5th)	9849165942
			8	Bokka Manjula (10th)	9912723970
			9	Bokka Lakshmi (7th)	9849248779
			10	Rajya Lakshmi	9912714080
			11	Kummari Varalakmi (10th)	9949545903
			12	Rubina Begum(9th)	9912075872
			13	Banuri Prabhavathi	9959929648

			14	Kummari Sunitha	9346303391
	Kalwakol				
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Nikkath (Ill)	9959614747	1	Haritha (Inter)	9705066516
2	Laxmi (Ill)	8498011258	2	Radha (Inter)	9704774383
3	Vijaya Laxmi	8106953804	3	Vijaya Lakshimi-Chandriah	9640932772
4	Shanthi Priya (Dhgree)	8501803409	4	Divya(8th)	9542782974
5	Venkata Laxmi (6th)	9912892045	5	Santhosh (10th)	9951787450
6			6	Shanthi Priya – Shravani	9951289428
7			7	Manjula-Pg	9705799495
			8	Maimuda-Son (Ill)	7036041514
			9	Amrutha (Ill)	9948214155
			10	Gaddam Padmamma 6th)	9542184655
			11	Devamma -Maipal(Ill)	9908825756
	Dhubacherla				
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Shylaja (Ill)	9951338636	1	Sriveni-Prveenkumar	9010201024
2	Rani Pottagalla	9848084145	2	Indira-Yadaiah	9959380071
3	Naddi Laxmi-Raju	8466859772	3	Sugunamma-Sathaiah (Karoobar)	9581329854
4			4	Rani	9948034015
5			5	Erra Swarupa	9542009867
6			6	Pottagalla Pochamma-Jayaraj	9848735992
7			7	Radhika(Inter)	9010324977
			8	Shiva Lila –Rajababu	9912209726
			9	Rajababu(Cc)	9177303993
			10	Erra Rajitha	8465074738

			11	Pottagalla Rani –Ashok	7036757628
			12	Pottagalla Pochamma	8501907494
			13	Pottagalla Vasantha –Prashanth	9603070217
			14	Naddi Laxmi-Raju	8096809697
	Lilipur				
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Chinna Papulamma (10th)	8978330536	1	Jashintha (Dhegree)	9492056740
2	Chinnapalli Mariahmma	9704411449	2	Pedda Allimerri	9948899027
3	Allham Vijaya Rani	9542836016	3	Baghyarekha (10th)	9666175357
5	Fathima (Rapireddy)	9848544921	4	Sujatha - Fathima Reddy (10th)	9133116749
6	Yerava Vijaya Reddy	7659964943	5	Fathima Reddy	8008025056
7	Bal Reddy	9391221138	6	Sunitha(Ashok)	6300554462
8			7	Lalitha Meri-Balveshwari Reddy	9666362741
9			8	Marava Chinni Lilly Meri	9010955421
10			9	Showrillu	9666354002
11			10	Thamas Reddy	7893846539
			11	Meri	7729870488
	Pendyala				
S.No	Basic Phone		S.No	Smart Phone	
	Name	Mobile Number		Name	Mobile Number
1	Saritha	7286917895	1	Dasari Nagarani	9963136912
2	Savithri	9010518816	2	Nirmala -Inter	9542342629
3	Shivamma	8498942065	3	Niraja -10 th	9603453405
5	Manthri Parvathamma	9848649402	5	Yashoda -Shivaiah	9701803437
6	Kummari Shymala	9640055831	6	Manthri Parvathamma -Narsimulu	9542407091
7	Kummari Lavanya	9701993692	7	Jiatharam Savithri	9010518816
8			8	Jaitharam Sumathamma	7993928844

9			9	Shravani – Rajavardhan	9666302102
10			10	Manthri Sandhya	8096814074
11			10	Manthri Sandhya –Rajesh	9490677700
			12	Anwar Bee (Upa Sarpanch)	9951417511

APPENDIX-III

Intervention CSA adaptation practices through mobile phone applications - Text (SMS) Messages

Knowledge index on Climate Smart Agriculture - Benefits on Soil Health Test

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	భూమి యొక్క సారాన్ని పరీక్షించి తెలుసుకొనే పద్ధతిని భూసార పరీక్ష అంటారు. ఈ పరీక్షద్వారా భూమిలో మొక్కలకు కావాల్సిన పోషకాలు ఏ మేరలో అందుబాటులో ఉన్నాయో తెలుస్తుంది.			
2.	రైతులు తమ పొలంలో 2 నుండి 3 సంవత్సరాలకు ఒకసారి భూసార పరీక్ష చేయించుకుంటే ఖర్చు తగ్గి నేల సారవంతాన్ని కాపాడుకుంటూ అధిక దిగుబడి పొందవచ్చు			
3.	మట్టి పరీక్ష ద్వారా నేలలో అమ్ల లేదా క్షార లవణాలు ఏ స్థాయిలో ఉన్నది తెలుస్తుంది కావున ఆమ్లగుణం లేదా క్షారగుణం వున్నా నేలలను సరియైన తగిన మూలకాలతో బాగు చేసుకోవచ్చు			
4.	భూసార పరీక్ష వలన అమ్లగుణం ఉన్న నేలలను సున్నంతో, క్షారగుణం ఉన్న నేలలను జిప్సంతో బాగుచేసుకోవచ్చు.			
5.	మేలైన భూసారాని కిసేంద్రియ ఎరువులైన పెండ,కంపోస్ట్, వర్మికంపోస్టు లాంటి వాతావరణ అనుకూల ఎరువులను వాడి , భూమిలోని నాణ్యతను కాపాడుకుంటూ అధిక దిగుబడి పొందవచ్చు.ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture - Benefits on Varmicompost

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	వానపాములు సేంద్రీయ పదార్థాలను తిని విసర్జించే పదార్థమే వర్మీ కంపోస్టు. నేలసారాన్ని పెంచుకోడానికి రసాయనిక ఎరువుల కంటే వర్మీకంపోస్టు ఎరువు మేలైన పద్ధతి.			
2.	వర్మీకంపోస్టు ఎరువు వాడకంతో, నేల గుల్లబారి, భూసారం పెరిగి, మొక్కలకు అన్ని పోషకాలు అందటం వలన అధిక దిగుబడులు వస్తాయి.			
3.	వర్మీకంపోస్టు వాడకంతో, పంటకు పురుగులు, చీడపీడలను తట్టుకునే శక్తి పెరిగి, పంట భూమికి నీటి నిల్వ సామర్థ్యం పెరుగుతుంది.			
4.	వర్మీ కంపోస్టులో 1.6% నత్రజని, 0.5% భాస్వరం, 0.8% పొటాష్ ఉంటాయి.			
5.	వర్మీకంపోస్టులో సూక్ష్మపోషకాలతో పాటు మొక్క పెరుగుదలకు ఉపయోగపడే హార్మోనులు రోగనిరోధక శక్తిని పెంచే పోషకాలు అధికంగా లభిస్తాయి.			
6.	ఏ పంటకు అయినా ఎకరానికి 1 నుంచి 2 టన్నుల వర్మీ కంపోస్టు వేస్తే మేలు. ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture - Benefits on Seed Treatment (Vithanasudhi)

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	నేలలో ఉండే కీటకాలు, శిలీంధ్రాల నుంచి విత్తనాలను కాపాడుటకు వాటిని సరైన పద్ధతిలో శుద్ధి చేయడాన్ని విత్తనశుద్ధి అంటారు. నేల ద్వారా ఎటువంటి వ్యాధులు రాకుండా ఉండేందుకు విత్తనశుద్ధి తప్పనిసరిగ చేసుకోవాలి.			
2.	విత్తనశుద్ధి చేయడం ద్వారా విత్తనాల్లో ఉండే ఫంగస్, బాక్టీరియ, శిలీంధ్రాలు నశింప చేయబడి భూమిలోని, సూక్ష్మ క్రిములనుంచి, మొలకెత్తే విత్తనాలు, చిరుమొక్కలు కాపాడబడతాయి			
3.	విత్తనశుద్ధి చేయబడిన విత్తనం , నిల్వ సమయంలో కూడా పురుగు, తెగుళ్ల నుండి తట్టుకుంటుంది, అంతేకాకుండా విత్తనశుద్ధి వలన పప్పు జాతి పంటలలో , పంట ఆరోగ్యంగా పెరిగి వేర్లకు ఎక్కువ వేరు బుడిపెలు రావడానికి తోడ్పడుతుంది			
4.	సులువుగా ఈ విత్తనశుద్ధి ద్రావణాన్ని ఇంటివద్దే ఆవుపాలతో తయారు చేసుకోవచ్చు . 5 కిలోల విత్తనాలను ఒక లీటరు పాలకు పది లీటర్ల నీరు కలిపి 15 నిమిషాలు నానబెట్టి విత్తన శుద్ధి చేసుకోవచ్చు			
5.	బీజామృతంతో కూడా విత్తనశుద్ధి ద్రావణాన్ని తయారు చేసుకోవచ్చు. బీజామృతాన్ని ఆవు పేడ,పుట్ట మన్ను ,గోమూత్రం ,సున్నంను నీళ్లలో కలిపి తయారు చేసి, విత్తనాలను ఆ ద్రావణంలో 15 నిమిషాలునానబెట్టి విత్తన శుద్ధి చేసుకోవచ్చు . ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture – Benefits on Intercropping (Anthara panttalu)

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	అతివృష్టి, అనావృష్టి వంటి ప్రతికూల పరిస్థితుల్లోనూ ఎంతో కొంతయినా రైతుకు కనీస పెట్టుబడైనా చేతికి రావాలంటే అంతర పంటలు చేపట్టాలిందే. ఒకే విస్తీర్ణంలో ఒకే సీజన్లో ఒకేసారి ఒకటి కంటే ఎక్కువ పంటలు సాగు చేయడమే అంతర పంటల పద్ధతి			
2.	అంతర పంటల వలన ప్రధాన పైరు మొక్కల మధ్య స్థలం వృథా కాకుండా ఒక పంట నష్ట పోయినా ఇంకో పంట నుంచి రాబడి పొందవచ్చు దీని వలన పోషక పదార్థాల వినియోగ సామర్థ్యం పెరిగి కలుపు మొక్కలను రాకుండా నివారిస్తుంది			
3.	అంతర పంటల తో నేల కోతను అరికట్టి పంట నాణ్యతను పెంచవచ్చు . అంతర పంటలుగా పప్పు జాతి ,గడ్డి జాతి ధాన్యపు మొక్కలను పెంచడం వలన భూసారాన్ని పెంచవచ్చు			
4.	పత్తిలో పెసర, మినుము, కొర్రలు, సోయా చిక్కుడు వంటి పంటలను అంతర పంటలుగా వేస్తే, పత్తి పంటను ఆశించే రసం వీల్చే పురుగులను తినేందుకు ఉపయోగపడే అక్షింతల పురుగులు, సాలీళ్లు వృద్ధి చెందుతాయి.			
5.	ప్రధాన పంట నుంచి దిగుబడి తగ్గకుండా, దాంట్లో వేసిన అంతర పంట నుంచి అదనపు దిగుబడితో లాభం పొందేలా పంటలను, వాటి విత్తనాలను ఎంపిక చేసుకోవాలి. వర్షాభావం వల్ల ప్రధాన పంట దెబ్బతిన్నా, దాంట్లో వేసిన అంతర పంట వర్షాభావాన్ని తట్టుకునేదిగా ఉండాలి. ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture – Benefits on Drip Irrigation (Bindusedyam)

Sl no	Statement	Most relevant	Relevant	Not relevant
1.	మొక్కకు సరైన మోతాదులో అవసరమైన భాగంలో నీటిని అందించడానికి అత్యంత ఉత్తమమైన పద్ధతి డ్రిప్ లేదా బిందు సేద్యం. మొక్కకు కావాల్సిన నీటిని బొట్టు బొట్టుగా, వేరు దగ్గరలో డ్రిప్పర్ల ద్వారా నీటిని అందించి 30-50 శాతం వరకు నీటిని ఆదా చేయవచ్చు			
2.	పత్తి, మిరప, పండ్ల తోటలు, పూల తోటలు, కూరగాయల పంటలు మొదలగు అన్ని రకాల పంటల్లో బిందు సేద్యం పద్ధతి చాలా బాగా పనిచేస్తుంది			
3.	బిందు సేద్యం ద్వారా ఒక ఎకరానికి సరిపడే నీటితోనే దాదాపుగా 3 నుంచి 4 ఎకరాల వరకు సాగు చేసుకోవచ్చు. అంతేకాక నేలను చదును చేయడం, గట్టు కట్టడం, కాలువలు తవ్వడం వంటి పనులు ఉండవు నీరు కట్టడానికి, ఎరువులు వేయడానికి కూలీల అవసరం తక్కువగా ఉంటుంది			
4.	బిందుసేద్యంలో మొక్కలు, ఆకులపైన తేమ ఉండదు కనుక చీడపీడల ఉధృతి తక్కువగా ఉంటుంది అంతేకాక మొక్కల వరుసల మధ్య నీరు నిల్వ ఉండదు కావున కలుపు బెడద ఉండదు			
5.	మల్చింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture – Benefits on Mulching

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	పంట పొలంలో ప్లాస్టిక్ షీటును మొక్క చుట్టూ నేలపై కప్పడాన్ని మల్చింగ్ అంటారు. మొక్క చుట్టూ మల్చింగ్ షీటును పరిస్తే భూమిలోని తేమ ఆరిపోకుండా ఉంటుంది అంతేకాక 30-40 శాతం వరకు నీరు ఆదా అవుతుంది			
2.	మల్చింగ్ షీటు వల్ల వేర్లు ఆరోగ్యంగా, దృఢంగా పెరిగి, మట్టి కోత నివారించబడి భూసారం పరిరక్షించబడుతుంది అంతేకాక కలుపు మొక్కల బెడద 80 శాతం వరకూ తగ్గుతుంది			
3.	మల్చింగ్ షీట్ మొక్క చుట్టూ సూక్ష్మ వాతావరణ పరిస్థితులు కలుగజేస్తూ నేల ఉష్ణోగ్రతను నియంత్రిస్తుంది, భూమిలో ఎల్లప్పుడూ తేమ ఉండడం వల్ల నేల గుల్లాబారి, నీటి వ్యవస్థ బాగా వృద్ధి చెందుతోంది			
4.	పొరదర్శకమైన మల్చింగ్ షీట్లను పరచిన చేలల్లో సూర్యరశ్మి ధారాళంగా ప్రసరించి భూమిలో దాగి ఉండే క్రిమికీటకాలు, తెగుళ్ల వ్యాప్తికి కారణమైన సూక్ష్మజీవులు నశిస్తాయి			
5.	మల్చింగ్ షీట్లు పరవడానికి తొలుత కూలీలు అవసరమైనప్పటికీ ఆ తర్వాత కలుపుతీత, అంతరకృషి వంటి పనులకు కూలీలపై అయ్యే ఖర్చు ఆదా అవుతుంది. మల్చింగ్ తో పాటు డ్రిప్ పద్ధతిలో నీరు అందిస్తే ప్రయోజనాలు అత్యధికం ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Knowledge index on Climate Smart Agriculture – Benefits on Super Napier

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	బహువార్షికపు పశుగ్రాసామైన సూపర్ నేపియర్ గడ్డి పాడి పశువుల పోషణకు అత్యంత ప్రయోజనకారి. ఇది 15 నుంచి 20 అడుగుల వరకు పెరిగి సుమారు ఎకరాకు సంవత్సరానికి 200 టన్నుల దిగుబడినిస్తుంది.			
2.	సూపర్ నేపియర్ గడ్డి అధిక కార్బోహైడ్రేట్స్, ప్రోటీన్స్ మరియు విటమిన్లు కలిగి ,తీయని కాండంతో , ముళ్ళు పొలుసు లేకుండా ఆకులు మెత్తగా ఉండటం వల్ల పశువులు ఎంతో ఇష్టంగా తింటాయి.			
3.	సూపర్ నేపియర్ గడ్డి ఇవ్వడం వల్ల పశువులలో పాల దిగుబడి మరియు నాణ్యత పెరిగి పశువులు ఆరోగ్యంగా ఉంటూ పాలల్లో వెన్న శాతం పెరుగుతుంది			
4.	సూపర్ నేపియర్ విత్తు కోవడానికి వర్షకాలం అనువైనది. చలి కాలంలో కూడా బాగా పెరిగి , ఒకసారి విత్తుకుంటే సుమారు అయిదు ఏళ్ళ వరకు దిగుబడినిస్తుంది.			
5.	సూపర్ నేపియర్ గడ్డితో ఒకసారి పంట వేసుకుంటే దీని నుంచే తర్వాత పంటకు కటింగ్స్ ద్వారా విత్తనం తయారు చేసుకోవచ్చు .ఈ గడ్డితో సైలెజ్ (నిల్వ పశు గ్రాసం) ను కూడా తయారు చేసుకోవచ్చు ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

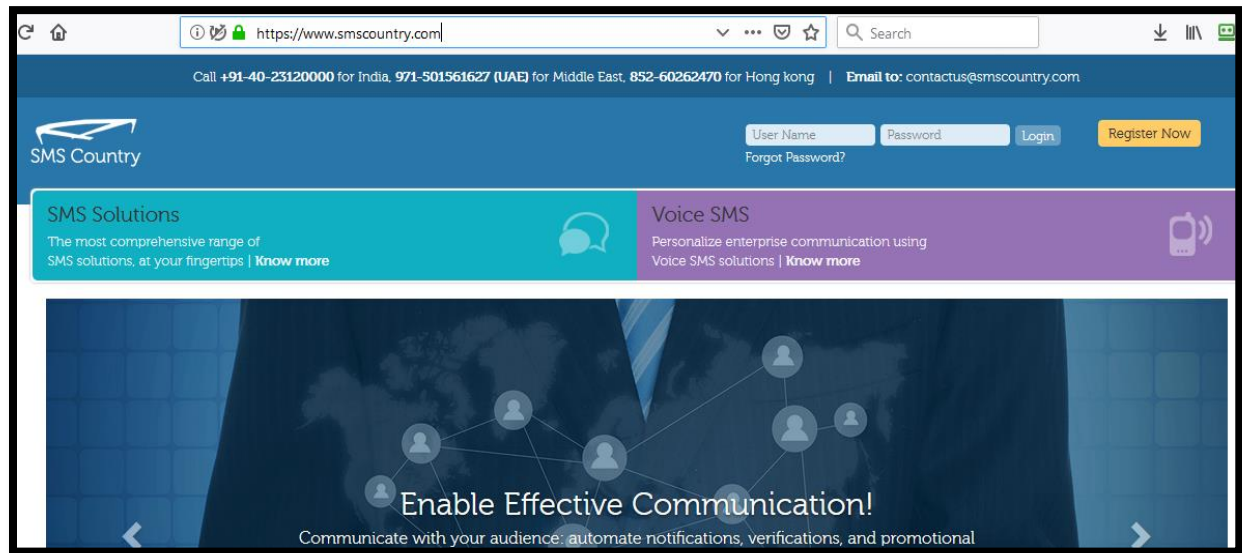
Knowledge index on Climate Smart Agriculture – Benefits on Hedge Lucerne

Sl no	Statements	Most relevant	Relevant	Not relevant
1.	హెడ్జ్ లూసర్న్ గడ్డిని దశరథ గడ్డి అని అంటారు. దక్షిణ భారత దేశంలో అత్యధిక పప్పు జాతి లెగ్యుమ్ పశుగ్రాసం యిచ్చే పంట. ఈ గడ్డి తేలిక పాటి నెలలల్లో, తక్కువ పెట్టుబడితో బాగా పెరిగి ఒక ఎకరం విత్తుకోవడానికి 2-3 కిలోల విత్తనం సరిపోతుంది.			
2.	హెడ్జ్ లూసర్న్ గడ్డి ఒక్కసారి విత్తిన తర్వాత సంవత్సరం పొడవునా ఎకరాకు 90 టన్నుల చొప్పున, 5-6 కోతలు ఇస్తూ 5-6 ఏళ్ళ వరకు పండుతుంది. దీనిని తోటలలో/ఉద్యాన వనాలలో అంతర పంటగా కూడా వేసుకోవచ్చు			
3.	హెడ్జ్ లూసర్న్ గడ్డి పశువులకు, కోళ్ళకు, మేకలకు, గొర్రెలకు మరియు కుందేళ్ళకు చాలా ఇష్టమైన గడ్డి			
4.	హెడ్జ్ లూసర్న్ గడ్డి గొర్రెలకు, మేకలకు రోజుకు 2 కిలోల వరకు వేసుకోవచ్చు. దీనిని పశువులకు ఇవ్వడం వల్ల ఎదుగుదల త్వరగా ఏర్పడి పాల ఉత్పత్తిని తొందరగా పొందవచ్చు.			
5.	హెడ్జ్ లూసర్న్ గడ్డిలో 20 శాతం అధిక మాంసకృత్తులు కలిగి ఉండి దీనిని ఇవ్వడం వల్ల పశువులలో పాల దిగుబడి మరియు నాణ్యత పెరుగుతుంది. ఈ మెళుకువలను తప్పక పాటిస్తారు కదా			

Appendix Part IV

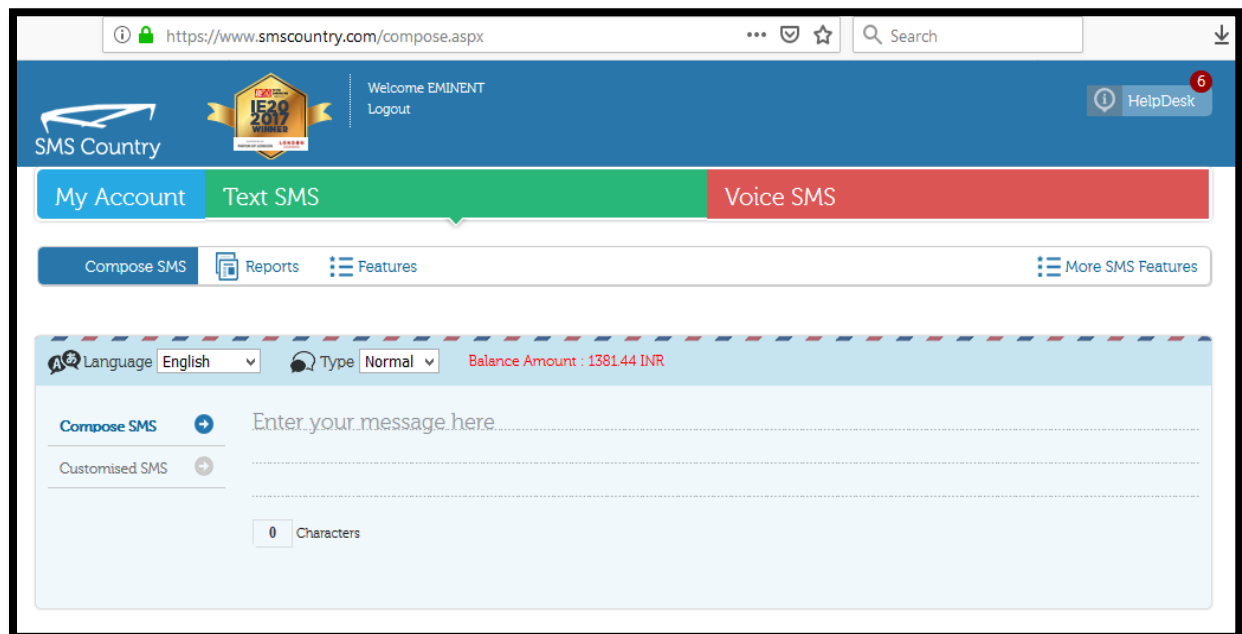
Processor on FWKGs for sending short messages and audio messages by using smscountry.com.

Step-1: Enter the site URL (<https://www.smscountry.com/> in any browser (Chrome, Firefox, IE, and Opera)

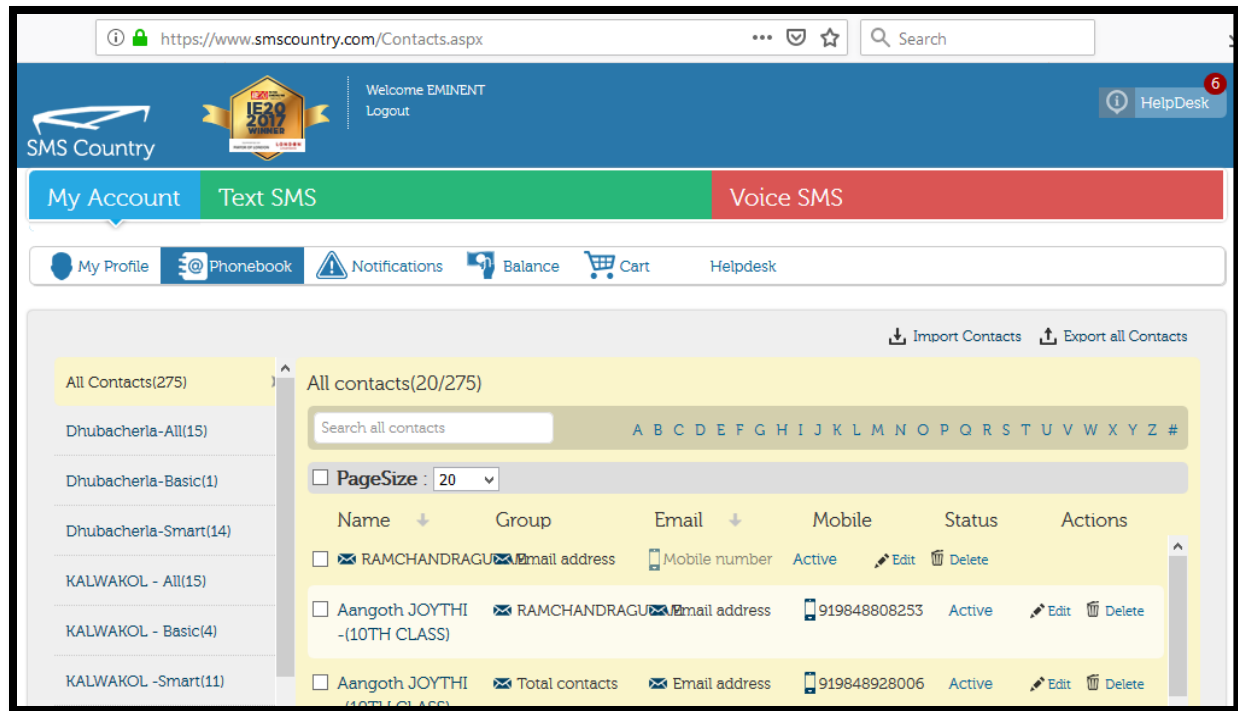


Step-2: Login with your correct username and Password

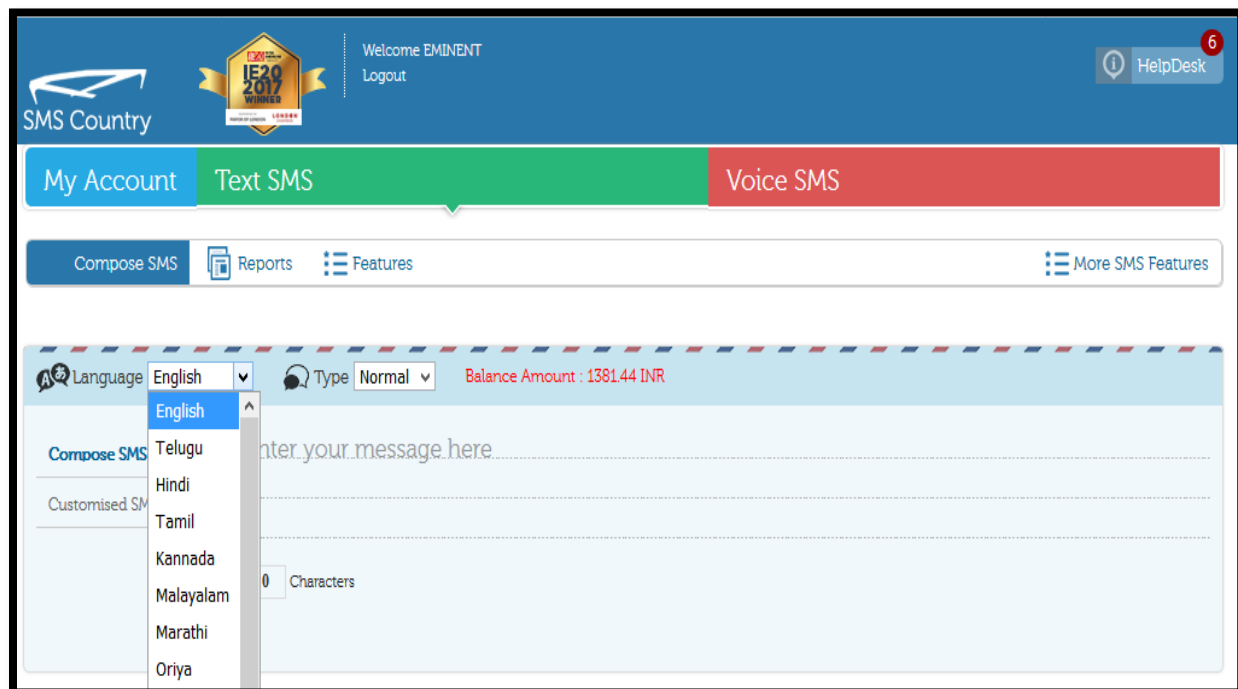
After Login below screen appears.



Step-3: Go to My Account and add your contacts in Phonebook.



Step-4: For sending Telugu text SMS, go to the tab Text SMS and select the language Telugu in drop down.



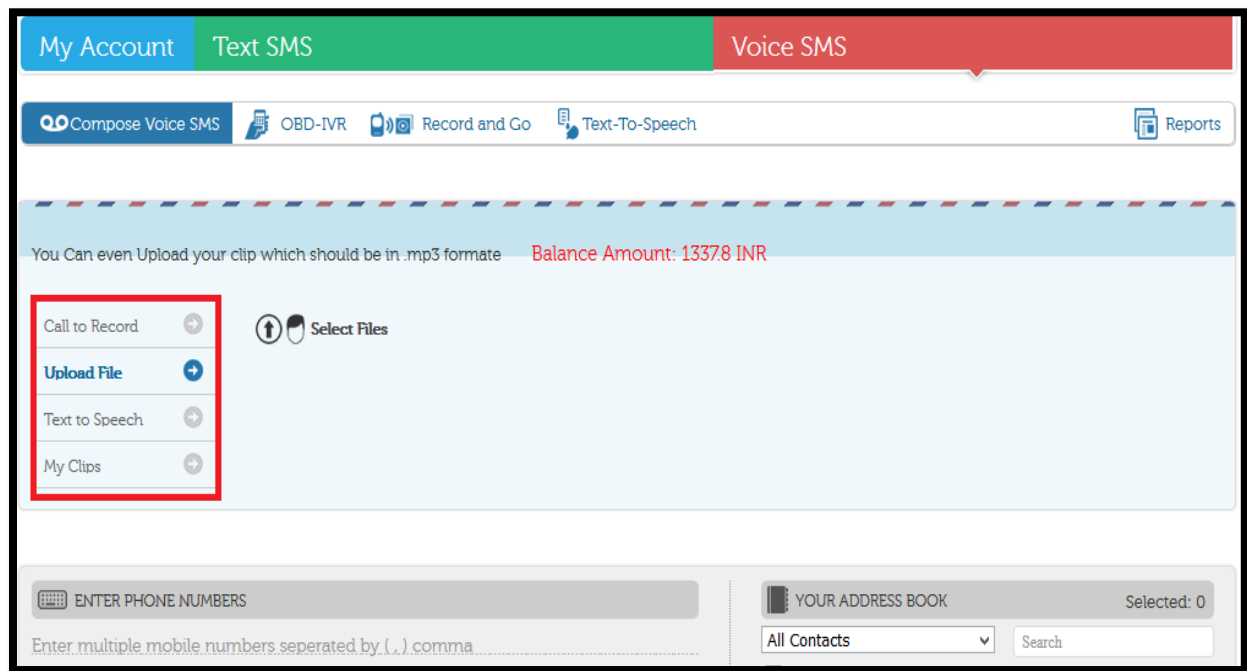
Step-5: After that paste your message and select the contact numbers or enter the phone numbers with country code.

The screenshot shows the SMS composition interface. At the top, there's a header with 'Language: Telugu', 'Type: Normal', and 'Balance Amount: 1381.44 INR'. Below this, there's a 'Compose SMS' button and a text area containing a message in Telugu: 'భూమి యొక్క సారాన్ని పరీక్షించి తెలుసుకోనే పద్ధతిని భూసార పరీక్ష అంటారు... ఈ పరీక్షద్వారా భూమిలో మొక్కలకు కావాల్సిన పోషకాలు ఏ మేరలో అందుబాటులో ఉన్నాయో తెలుస్తుంది'. Below the text area, it says '159 Characters' and a warning: 'WARNING : Message will be considered as 3 SMS's'. On the right, there's a 'YOUR ADDRESS BOOK' section with a list of contacts: Aangoth JOYTHI, Allham Vijaya Rani, AMARAVATHI(Dhgree), AMRUTHA (III), and AMURUTHA (5th), each with a phone number. There are checkboxes to select individual contacts or 'Select all'. At the bottom, there are buttons for 'Send Sms' and 'Schedule for Later'.

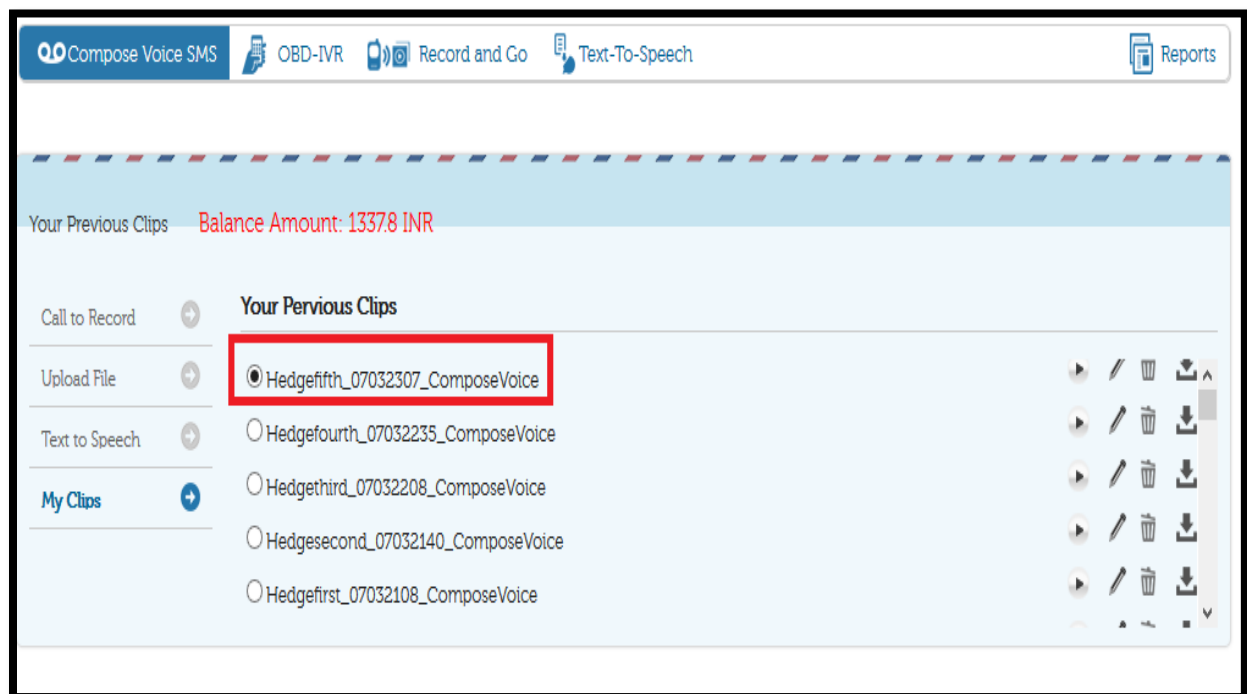
Step-6: Click “send sms” or “Schedule for Later” as shown below figure.

This screenshot shows the same SMS composition interface as the previous one, but with the 'Send Sms' button highlighted with a red rectangle. The interface includes a header with the URL 'https://www.smscountry.com/compose.aspx', a search bar, and a 'Cancel' button. The 'Compose SMS' section is on the left, and the 'YOUR ADDRESS BOOK' section is on the right, showing the same list of contacts. At the bottom, there's a 'Sender ID' dropdown set to 'smscntry', and the 'Send Sms' and 'Schedule for Later' buttons. The 'Send Sms' button is the one highlighted with a red rectangle.

Step-7: If required to send Voice SMS then go to the tab Voice SMS and click “upload file” for recorded Voice file or select “Call to Record” for record the new Voice SMS.



Step-8: After upload or record the file then select that required file for sending Voice SMS.



Step-9: Select the contact numbers in Your Address book or enter the contact numbers and click the Button “Send Now” or “Schedule for Later”

The screenshot displays a web interface for sending SMS. On the left, there is a section titled "ENTER PHONE NUMBERS" with a text input field labeled "Total contacts," and an "Upload Contacts" button. On the right, under "YOUR ADDRESS BOOK", there is a "Total contacts" dropdown, a search bar, and a list of contacts with checkboxes for selection. The contacts listed are: Aangoth JOYTHI -(10T... (919848928006), Allham Vijaya Rani (919542836016), AMARAVATHI(Dhgree) (919640028272), AMRUTHA (III) (919959716134), and AMURUTHA (5th) (919849165942). Below the list is a "Select Total Numbers in Group" section with a pagination control showing "1 2 3 4 5 >>". At the bottom, there are two buttons: "Send Now" and "Schedule for Later", which are highlighted with a red rectangle.

Step-10: For Reports click the tab “Reports” in Home Page

The screenshot shows the "SMS Country" home page. The top navigation bar includes the "SMS Country" logo, a "Welcome EMINENT" message with a "Logout" link, and a "HelpDesk" link. Below this is a main menu with three tabs: "My Account", "Text SMS", and "Voice SMS". The "Text SMS" tab is currently selected. Under the "Text SMS" tab, there are three sub-tabs: "Compose SMS", "Reports", and "Features". The "Reports" sub-tab is highlighted with a red rectangle. To the right of these sub-tabs is a link for "More SMS Features". Below the navigation bar, there is a section for composing SMS. It includes a "Language" dropdown set to "English", a "Type" dropdown set to "Normal", and a "Balance Amount : 1381.44 INR" display. The main area contains a "Compose SMS" button, a "Customised SMS" button, and a text input field labeled "Enter your message here". At the bottom, there is a character count showing "0 Characters".

Step-11: Select the “Today reports” or “Past days reports” and select the date range and press the button “Get Details”

The screenshot shows the 'Text SMS' section of a dashboard. Under 'SMS Reports', the 'Search by Date' section is highlighted with a red box. It contains radio buttons for 'Today reports' and 'Past days reports' (which is selected), and date pickers for 'From' (05/01/2019) and 'To' (05/31/2019). Other search filters include 'Search By Tool & Status' (Tool Used: All, Message Status: All) and 'Search by Mobile' (Enter Mobile Number). A 'Get Details' button is also highlighted with a red box.

Step-12: After that you will check your SMS reports, or if required then click “Download to Excel”

Get Details

Detailed Reports from 05/01/2019 to 05/31/2019 Total Messages Sent: 2461 Amount Used: INR 931.2600000000016

[Download To Excel](#)

Tool	To	Date (GMT +5.5)	Status	Amount	Sender Name	Message
Language Reminder	Dasari nagarani	5/31/2019 12:30:08 PM	Delivered	0.45 INR	16060	మల్పింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది. ఈ మెళకువలను తప్పక పాటిస్తారు కదా.
Language Reminder	AMRUTHA (ill)	5/31/2019 12:30:08 PM	Delivered	0.45 INR	16060	మల్పింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది. ఈ మెళకువలను తప్పక పాటిస్తారు కదా.
Language Reminder	NIKKATH (ill)	5/31/2019 12:30:08 PM	Expired	0.45 INR	16060	మల్పింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది. ఈ మెళకువలను తప్పక పాటిస్తారు కదా.
Language Reminder	INDIRA-YADIAIAH	5/31/2019 12:30:08 PM	Delivered	0.45 INR	16090	మల్పింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది. ఈ మెళకువలను తప్పక పాటిస్తారు కదా.
Language Reminder	Shivi (sarpanch)	5/31/2019 12:30:08 PM	Delivered	0.45 INR	16090	మల్పింగ్ విధానంలో బిందుసేద్యం అమలుచేస్తే చెట్టువద్ద గడ్డి ఇతర కలుపు మొక్కలు పెరిగే అవకాశం పోయి పంట ఆరోగ్యంగా పెరుగుతుంది. ఈ మెళకువలను తప్పక పాటిస్తారు కదా.

APPENDIX-V

SMS Delivery Status on Soil Health Test

		Soil Health Test		Soil Health Test		Soil Health Test		Soil Health Test		Soil Health Test	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
SUJATHA	9949602399	Delivered	Completed	Failed	Opted Out	Delivered	Completed	Delivered	Delivered	Delivered	Failed
SWAPNA	9666115932	Un Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
Aangoth JOYTHI	9848808253	Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed	Delivered	Delivered	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Delivered	Delivered	Completed
Rathlavath Suguna inter	9666304080	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Failed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Failed	Delivered	Completed	Delivered	Failed	Delivered	Completed
MAMTHA	9966232626	Un Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed	Delivered	Delivered	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Failed	Failed	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Failed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Expired	Completed	Expired	Completed	Expired	User Busy	Expired	Delivered	Delivered	Completed

Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
GOWSYA	9866654786	Delivered	Opted Out	Delivered	Completed	Delivered	Opted Out	Delivered	Delivered	Delivered	Opted Out
MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
k.PAVANI	9705032092	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
KAMMARI SUNITHA	9603830860	Delivered	Completed	Failed	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
BOKKA MANJULA	9912723970	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
BOKKA LAKSHMI	9849248779	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Delivered	Delivered	Opted Out
RAJYA LAKSHMI	9912714080	Un Delivered	Completed	Delivered	Opted Out	Delivered	Completed	Delivered	Delivered	Delivered	Opted Out
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
BANURI PRABHAVATHI	9959929648	Delivered	Completed	Delivered	Completed	Delivered	Opted Out	Delivered	Delivered	Delivered	Opted Out
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
LAXMI	8498011258	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
VIJAYA LAXMI	8106953804	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Delivered	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHIMI	9640932772	Delivered	Opted Out	Delivered	Un Delivered	Delivered	Failed	Delivered	Failed	Delivered	Completed
DIVYA	9542782974	Delivered	Completed	Failed	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
SHANTHI PRIYA	9951289428	Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed	Delivered	Completed	Delivered	Completed

MANJULA	9705799495	Delivered	Completed	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9948214155	Delivered	Opted Out	Delivered	Completed	Delivered	Opted Out	Delivered	Completed	Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI	9010201024	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RANI	9948034015	Delivered	Opted Out	Failed	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Completed
RADHIKA	9010324977	Un Delivered	Opted Out	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rajababu	9177303993	Delivered	Opted Out	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi	8096809697	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahmma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

Allham Vijaya Rani	9542836016	Delivered	Completed	Delivered	Completed	Delivered	Completed	Un Delivered	Completed	Delivered	Completed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Completed
Smart Phone											
Jashintha	9492056740	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pedda Allimerri	9948899027	Delivered	Opted Out	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sujatha	9133116749	Delivered	Opted Out	Delivered	Completed	Delivered	Failed	Delivered	Opted Out	Delivered	Completed
fathima reddy	8008025056	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9010955421	Delivered	Completed	Failed	Completed	Delivered	Completed	Delivered	Opted Out	Delivered	Failed
Showrillu	9666354002	Delivered	Completed	Delivered	Completed	Delivered	Completed	Opted Out	Opted Out	Delivered	Completed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Delivered	Opted Out	Delivered	Completed	Delivered	Opted Out	Delivered	Opted Out	Delivered	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kummari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Completed
Kummari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Un Delivered	Completed	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Opted Out

Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Un Delivered	Completed	Delivered	Completed	Delivered	Failed
Jaitharam Sumathi	7993928844	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shravani	9666302102	Delivered	Completed	Failed	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Vermicomposting

		Vermi composting		Vermi composting		Vermi composting		Vermi composting		Vermi composting		Vermi composting	
		1st Message		2nd Message		3rd Message		4th Message		5th Message		6th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone													
Name	Mobile Number												
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9949602399	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848808253	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	un Completed
Rathlavath Shanathi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
MAMTHA	9966232626	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
ANGANWAD I SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA													

Basic phone													
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GOWSYA	9866654786	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MALLISHVA RI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
AMARAVAT HI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
k.PAVANI	9705032092	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9603830860	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
BOKKA LAKSHMI	9849248779	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9912714080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVAT HI	9959929648	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL													
Basic phone													
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
LAXMI	8498011258	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAXMI	8106953804	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed

SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHIMI	9640932772	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
SHANTHI PRIYA	9951289428	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9948214155	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla													
Basic phone													
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
SRIVENI	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RANI	9948034015	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHIKA	9010324977	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

Rajababu	9177303993	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
Naddi laxmi	8096809697	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur													
Basic phone													
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
Jashintha	9492056740	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pedda Allimerri	9948899027	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Failed
Sujatha	9133116749	Un Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	un Completed
marava chinni lilly meri	9010955421	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Completed
Showrillu	9666354002	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala													
Basic phone													
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kummari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	un Completed
Kummari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone													
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Failed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	un Completed
Jaitharam Sumatham ma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Completed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Seed Treatment

		Seed Treatment		Seed Treatment		Seed Treatment		Seed Treatment		Seed Treatment	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9949602399	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848808253	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAMTHA	9966232626	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GOWSYA	9866654786	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
k.PAVANI	9705032092	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9603830860	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
BOKKA LAKSHMI	9849248779	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9912714080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVATHI	9959929648	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
LAXMI	8498011258	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAXMI	8106953804	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHIMI	9640932772	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
SHANTHI PRIYA	9951289428	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9948214155	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RANI	9948034015	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHIKA	9010324977	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rajababu	9177303993	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi	8096809697	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9492056740	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pedda Allimerri	9948899027	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

Sujatha	9133116749	Un Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9010955421	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Showrillu	9666354002	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Intercropping

		Intercropping		Intercropping		Intercropping		Intercropping		Intercropping	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA- (SRINU)	9010056548	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848928006	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
MAMTHA	9502741969	Delivered	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Failed	Delivered	Failed	Expired	Failed	Delivered	Failed	Delivered	Failed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GOWSYA	9177164009	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Expired	Completed	Expired	Completed
k.PAVANI	9505360145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9640061397	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Delivered	Completed	Un Delivered	Completed	Expired	Completed	Un Delivered	Completed	Un Delivered	Completed
BOKKA LAKSHMI	7730956407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9666148816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVATHI	9666012268	Delivered	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
LAXMI	8498011258	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAXMI	8106953804	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
VIJAYA LAKSHIMI	9951316689	Delivered	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	9391274751	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9959716134	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RANI	9948034015	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHIKA	9010324977	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rajababu	9177303993	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi	8096809697	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahmma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9618055932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

Pedda Allimerri	7659964943	Delivered	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
BaghyaRekha	9666175357	Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
Sujatha	9640776462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
Lalitha meri	9666362741	Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
marava chinni lilly meri	9542526076	Delivered	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Showrillu	8978368818	Delivered	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Drip Irrigation System

		Drip Irrigation System		Drip Irrigation System		Drip Irrigation System		Drip Irrigation System		Drip Irrigation System	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9010056548	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848928006	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAMTHA	9502741969	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

GOWSYA	9177164009	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
k.PAVANI	9505360145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9640061397	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
BOKKA LAKSHMI	7730956407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9666148816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVATHI	9666012268	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
LAXMI	8498011258	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
VIJAYA LAXMI	8106953804	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHIMI	9951316689	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	9391274751	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9959716134	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

GADDAM PADMA	9542184655	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RANI	9948034015	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHIKA	9010324977	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rajababu	9177303993	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi	8096809697	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahmma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9618055932	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed

Pedda Allimerri	7659964943	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out
BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sujatha	9640776462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9542526076	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Showrillu	8978368818	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumhari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Mulching

		Mulching		Mulching		Mulching		Mulching		Mulching	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9010056548	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848928006	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAMTHA	9502741969	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Failed	Delivered	Completed	Delivered	Completed	Delivered	Failed	Delivered	Failed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

GOWSYA	9177164009	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Failed	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed
k.PAVANI	9505360145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9640061397	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA LAKSHMI	7730956407	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RAJYA LAKSHMI	9666148816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVATHI	9666012268	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
LAXMI	8498011258	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
VIJAYA LAXMI	8106953804	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
SHANTHI PRIYA	8501803409	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
VIJAYA LAKSHIMI	9951316689	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	9391274751	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMRUTHA	9959716134	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

GADDAM PADMA	9542184655	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNA	9581329854	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
RANI	9948034015	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9542009867	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA Pavani	9848735992	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHIKA	9010324977	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rajababu	9177303993	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Pottagalla Rani	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pavani	8501907494	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi	8096809697	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9618055932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pedda Allimerri	7659964943	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sujatha	9640776462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9542526076	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Showrillu	8978368818	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Un Delivered	Failed	Un Delivered	Failed	Un Delivered	Failed	Un Delivered	Failed	Un Delivered	Failed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kummari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kummari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Super Napier

		Super Napier		Super Napier		Super Napier		Super Napier		Super Napier	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9010056548	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848928006	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Expired	Failed	Delivered	Failed	Expired	Failed	Expired	Failed	Expired	Failed
Rathlavath Suguna	9666304080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MADAVI	9951594768	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAMTHA	9502741969	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Failed	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

GOWSYA	9177164009	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
k.PAVANI	9505360145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9640061397	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Delivered	Completed	Un Delivered	Completed
BOKKA LAKSHMI	7730956407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9666148816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
BANURI PRABHAVATHI	9666012268	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
LAXMI	8498011258	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
VIJAYA LAXMI	8106953804	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHIMI	9951316689	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
SHANTHI PRIYA	9391274751	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

AMRUTHA	9959716134	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Un Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
DEVi	9908825756	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI-PRVEENKUMAR	9010201024	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
INDIRA-YADIAH	9959380071	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUGUNAMMA-SATHAIAH (KAROBAR)	9581329854	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
RANI	9848031194	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
ERRA SWARUPA	9848084145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA POCHAMMA- JAYARAJ	9848735992	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila -rajababu	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pottagalla Rani -Ashok	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pochamma	8501907494	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha -prashanth	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi-Raju	8466859772	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9618055932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pedda Allimerri	7659964943	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sujatha	9640776462	Delivered	Completed	Delivered	Un Delivered	Delivered	Completed	Delivered	Completed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9542526076	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Showrillu	8978368818	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed
marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

SMS Delivery Status on Hedge Lucerne

		Hedge Lucerne		Hedge Lucerne		Hedge Lucerne		Hedge Lucerne		Hedge Lucerne	
		1st Message		2nd Message		3rd Message		4th Message		5th Message	
		Text	Voice	Text	Voice	Text	Voice	Text	Voice	Text	Voice
Basic phone											
Name	Mobile Number										
Shoba	9666226834	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA	9010056548	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SWAPNA	9666115932	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Aangoth JOYTHI	9848928006	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out	Delivered	Opted Out
RAKLAVATH HASLI	9705740325	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Shanthi	6281505407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Rathlavath Suguna	9666304080	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
MADAVI	9951594768	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed
R.LAKSHMI	9603680148	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAMTHA	9502741969	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUJATHA BASKHAR	9951317464	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ANGANWADI SHOBHA	7095593042	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shivi (sarpanch)	9951897233	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SUNITHA	9010928098	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meghavath Rajitha	8186835681	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
THOLKATTA											
Basic phone											
FATHIMA	8499891510	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed	Expired	Completed
Smart Phone											
MANJULA	9640787513	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed

GOWSYA	9177164009	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
MALLISHVARI	9640246274	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMARAVATHI	9640028272	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
k.PAVANI	9505360145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KAMMARI SUNITHA	9640061397	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
AMURUTHA	9849165942	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BOKKA MANJULA	9912723970	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
BOKKA LAKSHMI	7730956407	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RAJYA LAKSHMI	9666148816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KUMMARI VARALAKMI	9949545903	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RUBINA BEGUM	9912075872	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
BANURI PRABHAVATHI	9666012268	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out
KUMMARI SUNITHA	9346303391	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
KALWAKOL											
Basic phone											
NIKKATH	9959614747	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
LAXMI	8498011258	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAXMI	8106953804	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	8501803409	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
HARITHA	9705066516	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RADHA	9704774383	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
VIJAYA LAKSHMI	9951316689	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
DIVYA	9542782974	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SANTHOSHA	9951787450	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
SHANTHI PRIYA	9391274751	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MANJULA	9705799495	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
MAIMUDA	7036041514	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed

AMRUTHA	9959716134	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
GADDAM PADMA	9542184655	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
DEVI	9908825756	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Dhubacherla											
Basic phone											
SHYLAJA	9951338636	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
SRIVENI-PRVEENKUMAR	9010201024	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed	Un Delivered	Completed
INDIRA-YADIAH	9959380071	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
SUGUNAMMA-SATHAIAH (KAROBAR)	9581329854	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
RANI	9848031194	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA SWARUPA	9848084145	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
POTTAGALLA POCHAMMA- JAYARAJ	9848735992	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Shiva lila -rajababu	9912209726	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
ERRA Rajitha	8465074738	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pottagalla Rani -Ashok	7036757628	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla pochamma	8501907494	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
pottagalla vasantha -prashanth	9603070217	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Naddi laxmi-Raju	8466859772	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lilipur											
Basic phone											
Chinna papulamma	8978330536	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
chinnapalli mariahma	9704411449	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Allham Vijaya Rani	9542836016	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Fathima	9848544921	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Jashintha	9618055932	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Pedda Allimerri	7659964943	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out	Opted Out

BaghyaRekha	9666175357	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sujatha	9640776462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
fathima reddy	8008025056	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Sunitha	6300554462	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Lalitha meri	9666362741	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
marava chinni lilly meri	9542526076	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Showrillu	8978368818	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed	Expired	Failed
Marry	7893846539	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Meri	7729870488	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Pendyala											
Basic phone											
saritha	7286917895	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed	Opted Out	Completed
Savithri	9010518816	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
manthri Parvathi	9848649402	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumari Shymala	9640055831	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Kumari lavanya	9701993692	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Smart Phone											
Dasari nagarani	9963136912	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Nirmala	9542342629	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Niraja	9603453405	Delivered	Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed	Delivered	Un Completed
Yashoda	9701803437	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
manthri parvathi	9542407091	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jiatharam Savithri	9010518816	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Jaitharam Sumathamma	7993928844	Delivered	Completed	Delivered	Failed	Delivered	Failed	Delivered	Failed	Delivered	Failed
Shravani	9666302102	Un Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Manthri Sandhya -	9490677700	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed
Anwar bee	9951417511	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed	Delivered	Completed