INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD): IN KANNUR DISTRICT

by

NAMITHA REGHUNATH
(2014 - 11 - 188)

THESIS
Submitted in partial fulfilment of the
requirements for the degree of

MASTER OF SCIENCE IN AGRICULTURE

Faculty of Agriculture

Kerala Agricultural University

DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE
VELLAYANI, THIRUVANANTHAPURAM-695 522
KERALA, INDIA

2016

DECLARATION

I, hereby declare that this thesis, entitled **"INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD): IN KANNUR DISTRICT"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society

Namitha

Vellayani, **Namitha Reghunath**

Date 18/08/16 (2014-11-188)

CERTIFICATE

Certified that this thesis entitled **"INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD): IN KANNUR DISTRICT"** is a record of research work done independently by Ms Namitha Reghunath under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her

Vellayani,
Date 18/8/16

Dr. N. KISHORE KUMAR
(M. Sc. (Ag), MBA, MA, Ph. D,
PGDHRM, PGJMC, PGDDM, Ad. SD)
(Major Advisor, Advisory Committee)
Professor (Agricultural Extension)
College of Agriculture, Vellayani

CERTIFICATE

We, the undersigned members of the advisory committee of Ms Namitha Reghunath, a candidate for the degree of **Master of Science in Agriculture** with major in Agricultural Extension, agree that this thesis entitled **"INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD): IN KANNUR DISTRICT"** may be submitted by Ms Namitha Reghunath in partial fulfillment of the requirement for the degree

Dr. N. Kishore Kumar
(Chairman, Advisory Committee)
Professor
Department of Agricultural Extension
College of Agriculture, Vellayani

18/8/16

Dr. V. B. Padmanabhan
(Member, Advisory Committee)
Professor and Head
Department of Agricultural Extension
College of Agriculture, Vellayani

18/8/2016

Dr. Vijayaraghava Kumar
(Member, Advisory Committee)
Professor and Head
Department of Agricultural statistics
College of Agriculture, Vellayani

Dr. Allan Thomas
(Member, Advisory Committee)
Assistant Professor (Sr scale)
Department of Agricultural Extension
College of Agriculture, Vellayani

EXTERNAL EXAMINER

Acknowledgement

*I bow my head before **God** the **Almighty** for the blessings, mercy and love showered on me for the completion of my work and for being the lamp and light in my path.*

*With great respect, I place on record my most sincere and heartfelt gratitude to my respected teacher and the Chairman of the Advisory committee **Dr N. Kishore Kumar**, Professor, Department of Agricultural Extension for the meticulous guidance, valuable suggestions personal attention and whole hearted support rendered in all possible ways during the entire period of my study and research work.*

*I humbly place my gratitude to **Dr. V B. Padmanabhan** Professor and Head, Department of Agricultural Extension and member of Advisory Committee for his inspiring professional guidance and timely help rendered to me for the completion of my work.*

*To the greatest degree, I am grateful to **Dr. Allan Thomas** Assistant Professor (Sr Scale), Department of Agricultural Extension, Member of the advisory committee, for his generous encouragement, inspiration and personal guidance in the pursuit of this work.*

*I owe my sincere gratitude to **Dr Vijayaraghava Kumar**, Professor and Head, Department of Agricultural Statistics as a member of the Advisory Committee for the valuable suggestions, critical evaluation, whole hearted effort in statistical analysis, interpretation of the results and advice rendered throughout the course work.*

*I wish to record my profound sense of gratitude and indebtness to **Dr R. Prakash** (Rtd) Professor, Department of Agricultural Extension for his unstinted support, valuable help, expert advice, constructive suggestions, timely support and co operation rendered throughout the course of my study*

*My heartful thanks and gratitude to **Dr A. Anil Kumar** (Prof.), **Dr B Seema** (Prof.) and **Dr G. S. Sreedaya** (Asst Professor) for their friendly approach, creative suggestions and encouragement provided to me during the course of my study and research work.*

A special thanks to ***Dr P Jayaraj, Ms. Shahanas*** *and all other staffs of Kannur KVK and other agricultural institutions in Kannur district for their support and suggestions for the documentation work.*

I also extend my acknowledgment to ***Smt. Aswathi*** *and to all non-teaching staffs of the Department of Agricultural Extension for the help rendered to me during the course work.*

I wish to place on record my gratitude to my seniors Akshay Aswathy Sachina Iby and Reeba for their assistance, moral support and help rendered to me at each and every stage of my work.

I wish to place my heartfelt thanks to my batchmates Dhanya, Anju, Suma Rose, Noobiya, Binsa Thasneem and my juniors Afna, Preethu, Dhanusha, Athira, Namitha, Mamatha, Vani, Uthara, Greeshma, Aparna and Dileep for their moral support, companionship and valuable help

Words fail to express my deep sense of gratitude to my ***Besties*** *and my heart bound friends for their help, moral support and encouragement*

Finally, I recall with love and gratitude, the constant encouragement and inspiration given to me by my parents, ***Achan*** *and* ***Amma****. I am ineffably thankful to my* ***Chechi*** *and* ***Chettan*** *for their ceaseless encouragement, sustained help, patience, and moral support given for making this endeavour a success*

Namitha Reghunath

CONTENTS

LIST OF TABLES

LIST OF TABLES CONTINUED

LIST OF FIGURES

LIST OF FIGURES CONTINUED

LIST OF PLATES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviations	Full form
%	Percentage
ATIC	Agricultural Technology Information Centre
ATMA	Agricultural Technology Management Agency
CDs	Compact Disk
CTCRI	Central Tuber Crops Research Institute
DAC	Department of Agriculture and Cooperation
DARE	Department of Agricultural Research and Education
DoE	Directorate of Extension
et al	And others
FEOs	Farmer Extension Organisations
FTD	Farmer led Technology Development
Govt	Government
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
ICT	Information and Communication Technology
IIIMK	Indian Institute of Information Technology Management - Kerala
INM	Integrated Nutrient Management
ITD	Innovations in Technology Dissemination
KAU	Kerala Agricultural University
KEEF	KVK led Expert Emeritus Faculty
KVK	Krishi Vigyan Kendra
LEADS	Lead Farmer centered Extension Advisory and Delivery Services
MoA	Ministry of Agriculture

LIST OF ABBREVIATIONS

Abbreviations	Full form
NABARD	National Bank for Agriculture and Rural Development
NATP	National Agriculture Technology Project
NGO's	Non Governmental Organisations
NIPHM	National Institute of Plant Health Management
SAMETI	State Agricultural Management & Extension Training Institute
SAU	State Agricultural University
SHGs	Self Help Groups
VFPCK	Vegetable and Fruit Promotion Council Keralam

INTRODUCTION

1. INTRODUCTION

Agriculture is the life blood of Indian population and it is one of the most important sectors of Indian economy About half of India's population is significantly dependent for their livelihoods on some form of farm activity – be it agriculture, horticulture, animal husbandry or fisheries But Indian agriculture now confronting several challenges due to the lack of technological back up among the farming community Majority of farmers in India are small and marginal farmers with less land area and lack of idea about latest technologies, so extension system has been introducing new policies and strategies to modify and improve the way of assessment refinement and dissemination of new technologies Agricultural extension or agricultural advisory services consist of different organizations that support people involved in agricultural production, facilitate their efforts to solve problems and attain information, skills, and technologies to improve their livelihoods (Birner *et al* , 2009)

Extension in many countries has come to cover a variety of activities in both the public and private sectors, yet the transfer of information continues to be the ultimate focus of all extension activities Agricultural extension has witnessed remarkable structural and functional changes to meet the global challenges in the agricultural sector during the last two and half decades in most of the nations The agricultural knowledge infrastructure is emerging in a big way with the emergence of pluralistic extension factors and innovations to satisfy the needs of farmers (Saravanan, 2008)

Earlier, agricultural extension was considered to be a monopoly of the public system but with the increasing demands for latest agricultural technology there is a growing recognition that public extension itself cannot meet the specific needs of farmers This leads to the emergence of pluralistic system, which is more broad based and include public, private and all other agencies which act as knowledge or information agents that helps to transfer mutually meaningful and equitable knowledge among agricultural researchers, trainers and primary

producers The public, private and Non Governmental Organisation (NGO) extension changing from individual to group approaches, that facilitates extension planning and implementation and it makes the system more farmer accountable, involvement of groups in decision making, value addition, access to credit and marketing which will leads to sustainability (Sulaiman, 2003)

In India, public extension system is supported and funded by the national government through its Ministry of Agriculture and allied ministries The Ministry of Agriculture (MoA) consists of Department of Agriculture and Cooperation (DAC) and the Department of Agricultural Research and Education (DARE) The Directorate of Extension (DoE) is working within DAC which was set up in 1958 mainly for the dissemination of latest agricultural technologies to farmers, supervision of countrywide extension training infrastructure and to implement different national programmes The major activities of agricultural extension at the district level include the assessment, refinement and demonstration of technologies through a network of Krishi Vigyan Kendras (KVKs), the Departments of Agriculture, Agricultural Technology Management Agency (ATMA) and Agricultural Technology Information Centres (ATIC) established under Indian Council of Agricultural Research (ICAR) institutes and State Agricultural Universities (SAUs) etc

The Krishi Vigyan Kendra (KVK), or farm science center, is a multidisciplinary educational institution with an aim of assessment, refinement and large scale adoption of technology or products Accordingly KVKs have been identified as an effective link between agricultural research and extension system in the country The KVK activities include on farm testing to identify the location specificity of agricultural technologies under various farming systems, front line demonstrations to establish the production potential of improved agricultural technologies on the farmer's fields and training to farmers and extension personnel to update their knowledge and skill

The concept of Innovations in Technology Dissemination (ITD) was initiated as a component of National Agriculture Technology Project (NATP) through which ATMA was introduced as a pilot project in 28 districts in seven states of India ATMA is an important platform for integrating extension programs across line departments, linking research and extension system in a district and ensure farmers participation in decision making (Swanson, 2008) ICAR has established ATICs in some of the SAUs and ICAR institutes and it act as a single window extension delivery system offering the institute's technology, advice and products Some of the other important public extension initiatives for technology dissemination were farmers field school, farm school, NABARD farmers club, innovative farmer meet etc Indian Agricultural Research Institute (IARI), has designed an innovative extension approach for effective delivery of IARI technologies through post offices aimed at utilizing the strength of the vast network of postal department in technology dissemination to distantly located farmers through village post masters as community based change agents (Burman *et al*,2015)

Different private and voluntary sector initiatives involved in technology dissemination were input agencies, agri- business firms, farmer organisations, NGOs, financial agencies, consultancy services etc Along with this, the public and private agencies utilized the widespread availability of Information and Communication Technologies (ICTs) for the transfer of latest agricultural technologies to rural population Some ICT tools include web portals, call centres, mobile applications, community radio, information kiosk, digital photography and audio and video conferencing

1 1 OBJECTIVE OF THE STUDY

The objective of the study is to document the Innovations in Technology Dissemination (ITD) methods implemented by different agricultural institutions in Kannur district with special reference to Kannur KVK and to find out the effectiveness and farmers perception towards these approaches Constraints of

the existing methods will be studied and effective ITD method for technology transfer will be suggested

1 2 SCOPE AND IMPORTANCE OF THE STUDY

The role of agricultural information is more crucial in India where the economy is mostly dependent on agriculture Agricultural research system is developing variety of technologies but most of the farmers were not aware of these technologies Innovations in Technology Dissemination methods play an important role in linking research system with farmers

The study Innovations in Technology Dissemination (ITD) in Kannur district was carried out to document and analyse the ITD methods implemented by Kannur KVK and other agricultural institutions in Kannur The findings of the study will be helpful to Agricultural Scientists and Extension Personnels to identify the effectiveness and constraints of the existing ITD methods in the district and based on that the authorities can suggest an ideal system which will be specific to farmers needs and goals The study will be useful to farmers to get an idea about latest ITD methods and ICT facilities implemented by different agricultural institutions in Kannur for technology dissemination

1 3 LIMITATIONS OF THE STUDY

The study has some limitations due to restricted time and resources and it was conducted by single investigator Utmost care has been taken to avoid the personnel bias because the study was completely based on the awareness, perception and opinion of the farmer respondents Since the study was conducted in Kannur district the generalization of awareness and perception of farmers on ITD methods to other areas may not be appropriate With the limitations, much effort was taken to make the study as more systematic as possible

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

A systematic review is a popular way of conducting research synthesis by integrating the evidence of an effect of a variable or intervention involving the findings from a defined set of relevant and usable primary sources such as published papers (Marks and Skyes, 2003)

Thinking about a research problem from multiple vectors is a key strategy for finding new solutions to a problem or gaining a new perspective Almost every field of study has at least one comprehensive database devoted to indexing its research literature (Robert, 2010)

A literature review is an in depth evaluation of previous research It is a summary of a particular area of research, allowing anybody reading the paper to establish why the investigator is pursuing this particular research program An overview of all available past studies related to the research topic is important for the formation of hypotheses A good literature review expands upon the reasons behind selecting a particular research question and gives ideas for the interpretations of the findings

This chapter is organized under the following headings

2 1 Concept of Innovations

2 2 Concept of Technology

2 3 Concept of Technology Dissemination

2 4 Variables and their review

2 5 Constraints faced by the respondents

2 1 CONCEPT OF INNOVATIONS

According to Lundvall (1992), innovation is a process by which a nation creates and transforms latest knowledge and technologies into useful products

services, and processes for national and worldwide products prompting both value creation for stakeholders and higher standard of living

Rogers (2003) defined innovation as an idea, practice or object that is perceived as new by an individual or other unit of adoption

Innovation is the implementation of something new or improved in products, processes, marketing or organizational methods It implies applying ideas, knowledge or practices that are new to a particular context with the purpose of creating positive change that will provide a way to meet needs tackle challenges or seize opportunities (OECD, 2005)

According to OECD classification (2005), there are four types of innovations namely product innovation, process innovation, marketing innovation and organizational innovation

Vedakumari (2005) explained that innovations in tele communications, semi-conductors, microprocessors, fibre optics and microelectronics are the engines of growth for the development of countries across the world These innovations are known as Information and Communication Technologies (ICTs)

According to World Bank (2006), innovation is the process by which individuals or organizations master and implement the design and production of goods and services that are new to them, irrespective of whether they are new to their rivals, their nation, or the world

Innovation is the application of technological, institutional and human resources and discoveries to productive processes, bringing about new practices, products, markets, institutions and organisations that are improved and efficiency-enhancing (Poole, 2006)

Innovations are new ideas, practices, or products that are effectively brought into economic or social processes can involve technologies, organizations, institutions, or policies (IFPRI, 2009)

Hall (2010) reported that innovation concentrates on understanding the ways in which the process of research is used rather than only on how research products are exchanged and adopted

2 2 CONCEPT OF TECHNOLOGY

Technology can be most broadly defined as the entities, both material and immaterial, made by the use of mental and physical effort in order to accomplish some value In agriculture, technology is a complex blend of materials, processes and knowledge (Venkatasubramanian *et al* , 2009) Technology is any systematic knowledge and action applicable to any recurrent activity It involves application of science and knowledge to practical use, which enable a person to live more comfortably

Different ITD methods implemented by Kannur KVK and other agricultural institutions in Kannur district is explained in appendix III

2 3 CONCEPT OF TECHNOLOGY DISSEMINATION

Farm information and technology dissemination to the farmers provide opportunities for their self-development, enhance existing knowledge, abilities and improve their capabilities (Burman *et al* , 2013)

In order to provide agricultural extension services through Information and Communication Technologies (ICTs), it is necessary to assess the information needs of the farmers so as to prepare and deliver specific messages or technologies as per the farmers' requirements (Saravanan, 2009)

Burman *et al* (2013) revealed that major sources of farm information were progressive farmers (53 3 per cent) and input dealers (41 6 per cent) Radio and television were likewise utilized by 31 6 per cent and 21 6 per cent farmers, respectively

Market related information was mostly accessed through input dealer (65per cent) followed by radio (60 per cent) and progressive farmers (50 per cent) (Burman *et al* , 2013)

Burman *et al* (2013) revealed that the information sources like radio, newspaper, extension literature, progressive farmers and Krishi Vigyan Kendra were perceived to be relatively more accurate compared to other sources such as friends, neighbours, input dealers, television and village level workers in technology dissemination

2 4 VARIABLES AND THEIR REVIEW

2.4.1 Perception of Farmers on ITD Methods

Taneja (1989) defined perception as the process of understanding sensation or attaching meaning based on experience to signs

Senthilkumar (2003) identified the respondent's perception about the information requirement through different cyber extension tools The result implies that majority of the respondents (80 per cent) were satisfied with the cyber extension tools that are used to transfer the latest agricultural information All the respondents get the technological information by means of web page and group mail and mobile phone followed by IMCD and computer conferencing

Perception is the subjective process of acquiring, interpreting, and organizing sensory information (Nelson, 2008)

Oladele (2011) explained that researches (60 per cent) had a more positive perception of the effect of ICT on information access than the extension agents (38 4 per cent) and farmers (25 11 per cent) The effect is represented as Researchers>Extension Agents >Farmers

Balakrishnan *et al* (2013) reported that 78 3 per cent of the e-learners had favourable perception, whereas 16 7 per cent had somewhat favourable perception and 5 0 per cent had a place with highly favourable group

Extension and research personnel utilized radio "almost always", and magazines, brochures and agricultural suppliers were used "often" and they perceived that the radio, television and agricultural suppliers are "very effective" sources of information (Mirani, 2013)

Dar *et al* (2014) reported that ATIC products of the Directorate of Extension Education SKUAST-K Shalimar were perceived to be most important followed by services and education

Perception indicate the user's view of a technology or method or initiative, which is formed based on his previous experiences (Sivakumar and Sulaiman, 2015)

2.4.2 Extent of Awareness of Farmers on ITD Methods

Rao and Reddy (2007) reported that Rythumitra programme created awareness about latest farm technologies to all (100 per cent) viewers and they also revealed that 77 5 per cent adopted the practices and rest of them (22 50 per cent) could not utilize the practices

Sharma *et al* (2008) opined that fifteen per cent had high level of awareness and 10 5 per cent had low level of awareness of communication sources and channels

Sobalaje and Adigun (2013) reported that 84 per cent of the yam farmers were aware of ICTs as a source of information for their farming activities, while only 16 per cent of the yam farmers were not aware of ICTs as a source of information

Pandya *et al* (2013) found that nearly three-fourth (74 per cent) of the respondents were found to have medium level of awareness and an equal (13 per cent) number of respondents had low and high level of awareness about Knowledge Resource Centre established by KVK

Chouhan and Kansal (2014) revealed that 100 per cent of the dairy farmers had awareness about radio and television programmes related with animal husbandry broadcast from different stations

2.4.3 Age

Daudu *et al* (2009) revealed that 73 33 per cent of the respondents were coming under the age group of 21 - 40 years This shows that most of the respondents were young, active and adventurous

Singh *et al* (2009) reported that majority (68 75 per cent) of the respondents where belong to 26-50 years age while 28 75 per cent are in old age group of above 51 years Only 2 50 per cent of the respondents are young, under 25 years

Majority (46 67 per cent) of the respondents belonged to the middle aged group followed by 38 67 per cent were within young age and 14 67 per cent were under old age (Dhakal and Chayal, 2010)

Shahzad *et al* (2011) reported that the respondents within the age group of 18-25 years had an opinion that their yield had increased by the use of agricultural information

Majority of the farmers (55 50 per cent) were categorized in the age group of 36- 55 years, 28 per cent were comes under 18-35 years age and 16 50 per cent of the respondents were in 56 and above years of age category (Singh et *al*, 2011)

Singh and Singh (2012) studied constraints perceived by farmers in communication behaviour revealed that majority of the farmers where within young age category, followed by middle and old age categories

2.4.4 Educational Status

Kamalakannan (2001) revealed that 37 5 per cent of the farmers had schooling up to middle level and stated that education had positive relationship with media utilization behavior

Kadian and Kumar (2006) in their study based on the educational qualification, found that maximum number of respondents (45 per cent) were studied upto high school level, followed by the respondents having education in the category of intermediate and above (28 34 per cent), 18 33 per cent of the respondents had educational level upto primary and 8 33 per cent of the respondents in the category of illiterates

Educational level of the respondents showed that about 39 16 per cent were educated upto middle school level, while 9 58 per cent possessed college level of education (Singh *et al* 2009)

Omotesho *et al* (2015) explained that sixty one per cent of the respondents possessed a minimum of primary school education and thirty nine per cent had no formal education

2.4.5 Occupation

Kamalakannan (2001) stated that majority of the respondents were having farming as their main occupation that shows positive relationship with farming and media utilization behavior

Anandaraja (2002) reported that two third of the respondents had farming as their sole occupation

Wime (2007) found that 83 per cent of the respondents had full time of farm work while 57 9 per cent had part time of farm work and 50 7 per cent were full time farmers

Michailidis and Anastasios, 2007 on adoption of internet in agriculture reported that thirty one per cent of the farmer respondents were engaged in dairy farming and 41 per cent had beef production as their main enterprise

Oomen (2007) revealed that more than 50 per cent of the respondents had subsidiary occupation along with agriculture

Kumar *et al* (2013) reported that 69 17 per cent of the respondents were having farming plus animal husbandry as their main occupation followed by 13 33 per cent of the farmers were agricultural labourers and 8 33 per cent having only farming as their main occupation

2.4.6 Farm Size

Shankaraiah and Swamy (2012) revealed that most (90 per cent) of the farmer respondents have more than five acres of land means most of them are large scale farmers

Rathod *et al* (2014) in the study related to livestock health care service delivery indicated that 76 67 per cent of the respondents were medium level farmers followed by small and large farmers

Rashid and Sheikh (2014) reported that marginal farmers own 2 22 acres of land and small farmers own 7 37 acres of land, and the medium and large farmers own 16 48 acres and 38 71 acres of lands respectively

Singh *et al* (2014) in studied 'Structural and functional mechanism of mobile based agro advisory services and socio-economic profile of the member farmers' reported that 30 per cent of the respondents were small farmers and 26 7 per cent were semi-medium farmers

Omotesho *et al* (2015) reported that about 13 per cent of the respondents had more than 4ha of farmland However, the modal class of 1 1-2 0 hectares reveals the small holder status of the farmers

2.4.7 Trainings

Rao (2000) studied on the communication techniques used by the Agricultural Assistants of Karnataka state Department of Agriculture in Dharwad district opined that most of the Agricultural Assistants received training on communication techniques and on subject matter areas

Parthasarathi and Govind (2002) found that the knowledge level of trained farmers on biological and physical methods of IPM, identification of pests and predators on economic threshold levels was much higher This shows that the training programme had positive effect on farmers and it influenced the farmers knowledge level

Priya (2003) reported that in the case of training nearly 95 per cent of farmers were in the high category

Binkadakatti (2008) in the study related to KVK brevealed that, majority of the trained respondents had correct overall information about improved practices of bio- fertilizers and bio-pesticides as compared to untrained respondents

2.4.8 Mass Media Exposure /ICT

Mass media play an important role in agricultural information dissemination and generally, are useful in reaching a wide audience at a very fast rate They are useful sources of agricultural information to farmers and as well constitute methods of notifying farmers of new developments and emergencies They could equally be important in stimulating farmer's interest in new ideas and practices (Ani *et al* , 1997)

Farm publications are found to be an effective means for dissemination of information, especially to introduce innovative technologies These are also useful tool for disseminating latest agricultural technologies among literate farmers (Singh, 2001)

Majority of the farmers depend on magazines, newspapers and pamphlets for getting the information regarding production technologies of sugarcane These were considered as the most appropriate sources for transfer of sugarcane production technologies (Abbas *et al* , 2003)

Khushk and Memon (2004) explained that production and distribution of printed material helps in preserving the technologies in the form of books, booklets, magazines, newspapers and brochures It provide a way to transfer new information and technologies among farmers

Radio plays a peculiar role in technology transfer compared to other mass medias (Ejembi *et al* , 2006, Prathap and Ponnusamy, 2006)

Shaffril *et al* (2009) reported that rural community seems reluctant to use internet and other advanced technologies to receive agriculture information

Mass media plays an important role in providing information to the rural community enabling them to take informed decision regarding their farming activities, especially in the rural areas of developing countries (Lwoga, 2010)

The potential of TV for dissemination of information should be utilized for the benefits of farmers (Nazari and Hassan, 2011)

Radio and Television were found to be more available and accessible to the farmers with 46 3 and 29 6 per cent respectively, followed by 11 1 per cent with telephone 7 4 per cent and 5 6 per cent of the farmers opined that internet and print media were found to be less available and accessible to the farmers (Ariyo *et al* , 2013)

Ariyo *et al* (2013) reported that 90 7 per cent of the respondents opined that mass media is very effective source in the dissemination of agricultural technologies while 9 3 per cent opined mass media is not much effective

2.4.9 Extension Agency Contact

Sridhar (2002) reported that 35 33 per cent of the farmers regularly contacted Agricultural Assistants (AAs), while 32 00 and 32 67 per cent of the respondents were occasionally and never contacted AAs respectively

Anandamanikandan (2003) found that majority of the respondents had high level of contact with extension agency

Reddy (2005) revealed that majority (68 00 per cent) of the respondents regularly contacted AAs followed by 60 00 per cent of them contacting AOs regularly 54 67 and 46 67 per cent of them regularly contacted NGO officials and Raita Samparka Kendras respectively

Daudu *et al* (2009) reported that 29 17 per cent of the respondents get their information from radio, 37 5 per cent of respondents from friends, 9 17 per cent from libraries, while most (40 83 per cent) of the farmers depend on extension agents for agricultural information

2.4.10 Extension Participation

Singh *et al* (2003) reported that majority of the respondents had low to medium level of extension participation

Anitha (2004) found that 17 5 per cent of respondents had high extension participation, 44 2 per cent had medium and 38 3 per cent had low extension participation

Majority (86 per cent) of the respondents were participated in more than one activity in adopted villages followed by 11 per cent were participated in one activity and 3 per cent of the respondents were not participated in any of the activity (Pandya *et al* 2013)

Manoj (2013) found that the participation of farmers in farmers field schools has helped them to improve their overall knowledge of crop production

practices like integrated nutrient management, seed management and water management

2 4.11 Social Participation

Social participation as participation of individual in various formal social institutions either as a member or as an office bearer (Sadamate, 1978)

Sasankan (2004) reported that majority of the respondents had medium level of social participation within and outside the social system

Majority (76 67 per cent) of the respondents had no concern with any social, economic and political organization and not taken any type of membership in these type of organizations while, 22 50 per cent reported their membership in only one organization and very little percentage (0 83 per cent) of the respondents take part in two or more organizations (Singh *et al* , 2009)

Narayanasamy *et al* (2010) found that majority (93 per cent) of the respondents reported to have participated in the grama sabha meetings especially to discuss the matters related to MGNREGS

Pandya *et al* (2013) studied awareness among farmers about Krishi Vigyan Kendra knowledge resource centre in Tapi district, revealed that majority (90 per cent) of the respondents were participated in social activities and 10 per cent of the respondents were not participated in social activities

2.4.12 Economic Motivation

Bhavya (2008) found that 60 per cent of respondents had medium level of economic motivation followed by 21 67 per cent with high level of economic motivation

Sangeetha (2009) reported that 58 18 per cent of the respondents had higher level of economic motivation followed by 30 91 per cent medium and 10 91 per cent low level of economic motivation

Singh *et al* (2009) stated that majority (93 33 per cent) has medium level while, 6 25 per cent possessed high and 0 42 per cent has low level of economic motivation

Shankaraiah and Swamy (2012) reported that 47 5 per cent of the farmers had medium level of economic motivation One of the reason might be that farmers are becoming more and more market oriented to get more profit

2.4.13 Decision Making Ability

Indigenous farmers in the resource-poor areas of Namibia are less involved in the decision-making process in most of the programs intended to benefit them (Kumba, 2003)

Farmers (40 per cent) belonged to middle age group and medium education level had medium decision making ability (Shankaraiah and Swamy, 2012) The positively significant relationship was found between decision making ability of chilli growers with the age, knowledge level and use of information sources (Mishra *et al*, 2014)

2.4.14 Innovation Proneness

Shankaraiah and Swamy (2012) found that farmers in the dry land area might be interested to try different innovations to increase their income, so they had medium innovative proneness (40 per cent),

Mandal and De (2013) reported that innovation proneness was positively and significantly correlated with communication competence of a farmer

2.4.15 Acceptance of Innovation

Acceptance of an innovation and its further use mainly depend on the availability of inputs, climate or weather parameters, prevailing development policies, supporting factors like market, institutions, credit availability and user or consumer preferences (Gowda *et al* 2014)

Mir *et al* (2015) reported that one of the most important reason for low production or productivity of cocoons in Kashmir valley is that around 92 per cent respondents were not either willing or half-hearted to accept innovation because of strong traditional beliefs and less exposure to various mass media

2.4.16 Participation Efficiency

The relationship between farm size and farmer's decision to participate in an agricultural project is estimated to be positive (Etwire *et al* 2013)

Oladejo *et al* (2011) reported that there is no significant relationship between access to credit and participation of farmers in an agricultural project

2.4.17 Group Interaction

Larson (1989) stated that each and every member of the team should have a belief that the interaction within the group is effective and follow a high degree of integrity which can solve their problem

Sreedaya (2000) reported that positive and significant relation exists between the variables cosmopoliteness and social participation with group interaction

Omotesho *et al* (2015) found that forty per cent of the respondents belonged to at least two farmer groups

2.4.18 Need Satisfaction

Muller (1997) found that training gives the members of the group more knowledge leading to achievement of group goals and hence increased need satisfaction

Sreedaya (2000) reported that people can tackle their problems more wisely and try to satisfy their needs only if they are more experienced and more success oriented

2 5 CONSTRAINTS FACED BY THE RESPONDENTS

Lack of infrastructural facilities, inadequate training programmes for farmers, researchers and extension personnels, absence of technology evaluations and up gradation efforts, lack of functional linkages among the research, extension and input and farmer sub systems were some of the constraints in transfer of agricultural technologies in Kerala (Bhaskaran and Sushama, 1994)

Mali *et al* (2003) states that lack of awareness of internet (26 25 per cent) and illiteracy about computer operation (22 5 per cent) were the major problems expressed by farmers

Singh *et al* (2008) reported that poor connectivity, lack of awareness in farmers and incomprehensible technical information provided through helpline services were perceived as the important constraints in the dissemination of co-line information to the farmers

The major constraints perceived by the scientists regarding linkages were lack of accurate policies, administrative problems between scientists and farmers, lack of transport or office facilities for extension work between scientists and extension workers, and poor transportation facilities for extension work between extension workers and farmers (Helen *et al*, 2010)

Kumar *et al* (2011) reported that lack of training on different farming systems pertaining to agriculture and allied departments, too many schemes and vacancies and less demonstrations on existing farming systems were the predominant constraints expressed by the extension functionaries involved in ATMA

Musa *et al* (2013) revealed that lack of skilled staff and technicians was the most important constraint ranked by fifty-three per cent of the respondents in the dissemination of technologies using ICT facilities

The important constraints in promotion of agriculture and allied fields faced by the farmers in getting technology information through ATMA, were

ecological constraints, marketing constraints, technical constraints and socio political constraints (Chouhan *et al* , 2013)

The most severe constraint in effective functioning of Digital Green was the timing in the projection of video as perceived by farmers (Afroz *et al* , 2014)

Singh and Singh (2014) reported that shortage of ATMA staff, non-cooperation from block level administration, lack of awareness about SREP among farmers and lack of marketing support were the most predominant constraints in implementation of SREP

METHODOLOGY

3. METHODOLOGY

Research methodology is an important technique to scientifically studying how research is done and to solve the research problems In it we study the different steps that are used by a researcher to identify his research problem along with the logic behind them (Kothari, 1985)

This chapter describes the methods and procedures that were used for the study to meet the objectives The methodology adopted in the study is presented under the following subheadings

3 1 Research Design
3 2 Locale of the study
3 3 Selection of the respondents
3 4 Data collection methods and tools
3 5 Operationalisation of variables and its measurements
3 5 1 Measurement of dependent variables
3 5 2 Measurement of independent variables
3 6 Constraints of the existing technology dissemination methods
3 7 Statistical tools used
3 8 Conceptual framework of the study

3 1 RESEARCH DESIGN

Research design is the plan, structure and strategy of investigation so as to obtain answer to research questions and to control variance (Kerlinger, 1978) It provides guidelines for data collection

Here Ex-post-facto research design was used for conducting the study Ex-post-facto research design is a category of research design in which investigation starts after the phenomenon occurred, without any intervention from the researcher The investigator draws inference regarding the

relationship between the dependent and independent variables and there was no scope for manipulation of any variable under study

3 2 LOCALE OF THE STUDY

3.2.1 Selection of the District

The study was conducted in Kannur district with special reference to Kannur KVK and it was purposively selected for the study because, Kannur KVK is implemented a variety of innovations for technology dissemination so it became the youngest ever to bag the national best KVK award among the 589 KVKs in the country in 2009, and Kannur district is selected as LEADS district along with Kollam, Wayanad and Palakkad

3.2.2 Selection of Panchayats

From the eleven block panchayats present in Kannur district, Taliparamba, Kalliasseri, Payyanur and Irikkur panchayats were selected based on the agro ecological zones of Kannur with the help of scientists from Kannur KVK From these four block panchayats four grama panchayats, Kadannappalli-Panapuzha panchayat from Taliparamba, Ezhome panchayat from Kalliasseri, Kankol- Alapadamba panchayat from Payyanur and Mayyil panchayat from Irikkur were selected after consulting with each block panchayat office based on the maximum agricultural area of the panchayaths

3 3 SELECTION OF THE RESPONDENTS

A list of progressive farmers from each grama panchayat were collected from respective Krishi Bhavans and thirty farmers each were selected by simple random sampling, so total number of respondents were 120

3 4 DATA COLLECTION METHODS AND TOOLS

Collecting data in a systematic and unbiased way is one of the essential requirements for quality research (Sivakumar and Sulaiman, 2015) Considering

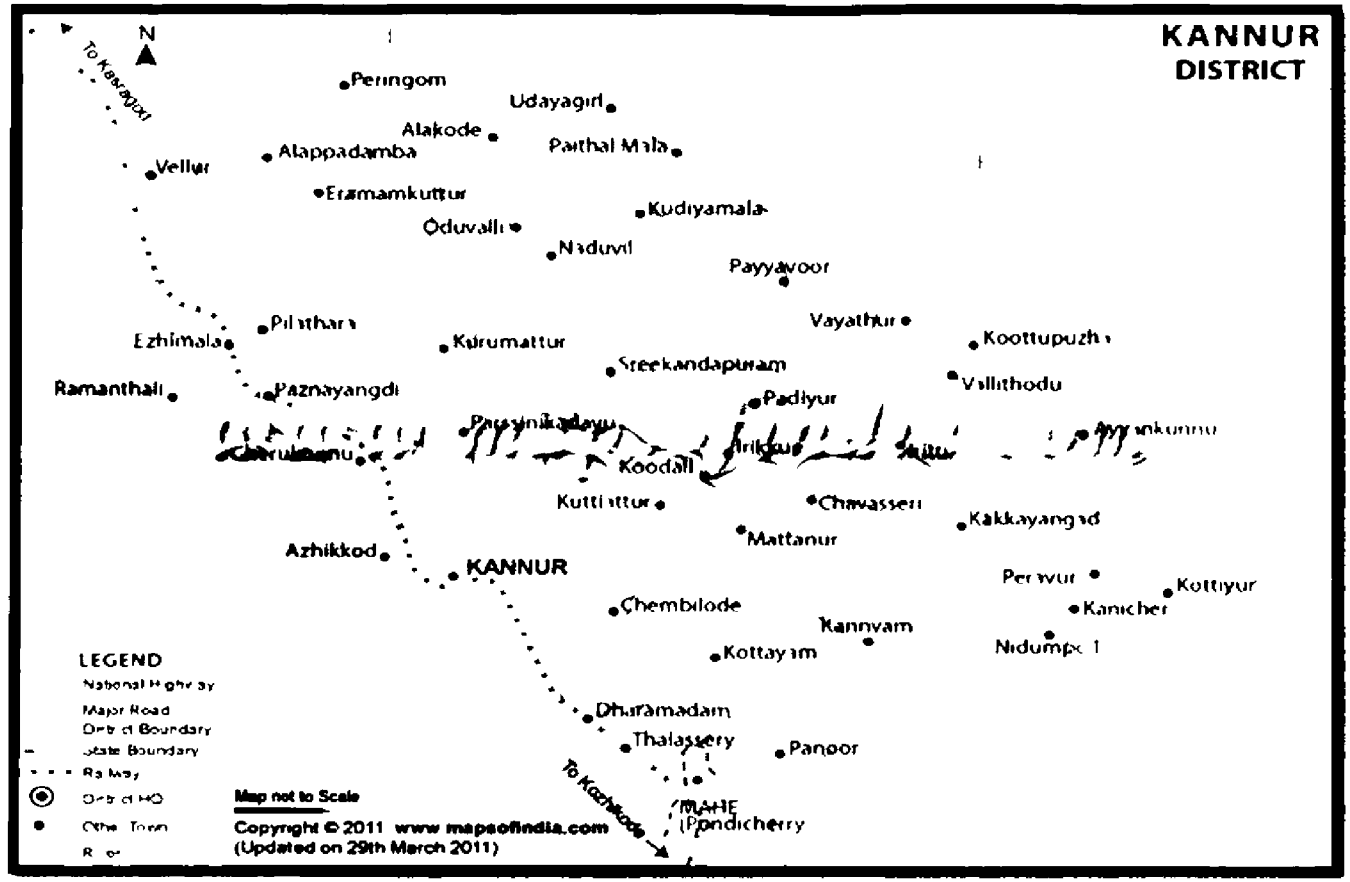


Fig 1 Map of the study area Kannur district

the scope and objectives of the study, an interview schedule was prepared after consultation with experts in the field of extension and other related fields A pilot study was conducted in non sample area and suitable modifications were made in the final interview schedule Then the final schedule was directly administered to the respondents and data regarding the profile characteristics, information needs, extension participation, awareness, perception, constraints and suggestions about ITD methods were collected

3 5 OPERATIONALISATION AND MEASUREMENT OF THE VARIABLES

3.5.1 Measurement of Dependent Variables

Perception of farmers on different ITD methods and extent of awareness of farmers on ITD methods are the two dependent variables selected based on the objectives of the study

3.5.1.1 Perception of Farmers on Different ITD Methods

Perception is the subjective process of acquiring, interpreting, and organizing sensory information (Nelson, 2008) Perception indicate the users view of a technology or method or initiative, which is formed based on his previous experiences (Sivakumar and Sulaiman, 2015) Perception in this case was operationalized as the farmer's opinion towards various innovations in technology dissemination implemented by different agricultural institutions in Kannur district

To measure the perception of farmers, scale developed by Preethi *et al* (2014) with some modification was used Scale consists of ten statements which was measured in a five point continuum namely, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree

Statements used for measuring the perception of farmers on ITD methods are given below

Sl. No.	Statements	SA	A	UD	DA	SDA
1	Innovations in Technology Dissemination(ITD) methods are more effective than conventional methods					
2	ITD helps farmers to access new technologies and products easily					
3	Social media play a crucial role in technology dissemination					
4	Group approach of ITD is more effective than individual approach					
5	Innovations using ICT is more effective for technology dissemination					
6	Participative decision making is ensured in the implementation of the ITD methods					
7	Farmers get an opportunity to take leadership in technology dissemination process					
8	Greater economic prosperity can be achieved through the ITD methods					
9	Participative skill training helps farmers to adopt new technologies and methods					
10	Farmers get an opportunity to introduce their own innovations to the farming community					

Scoring procedure for perception of farmers on ITD methods

Sl. No.	Category	Score
1	Strongly Agree	5
2	Agree	4
3	Undecided	3
4	Disagree	2
5	Strongly Disagree	1

Based on the scores the Perception Index (PI) of each statement was calculated using the formula

$$\text{Perception Index (PI)} = \frac{\text{Individual subject score}}{\text{Total score}} \times 100$$

3.5.1.2 Extent of Awareness of Farmers on ITD Methods

Awareness was operationalised as the level of extent to which the respondents were familiar with the Innovations in Technology Dissemination (ITD) methods implemented

Scale followed by Jayawardhana (2007) and Sasidharan (2015) with slight modification was used The scale consists of number of innovations implemented by Kannur KVK and other agricultural institutions in Kannur district The respondents were advised to mark the degree of awareness about the innovations in a two point scale **aware** and **not aware** with scores 1 and 0 respectively

3.5.2 Measurement of Independent Variables

A list of fifty three independent variables which are related to the study area were selected after detailed review of literature and discussion with subject matter specialists Then the variables were sent to 10 experts in the field of

agricultural extension and related fields They were asked to rate the variables on a five point continuum most relevant, more relevant, relevant, less relevant and least relevant

The final variables were selected based on the criterion of mean relevancy score, which was obtained by summing up the weightages obtained and dividing it by the number of judges responded Those variables got score more than the mean score were selected for the study

3.5.2.1 Age

Age was operationally defined as the number of years completed by the respondent at the time of investigation This was measured as the total number of years completed by the farmer at the time of interview, and it was classified based on Census report (2011) Distribution of respondents based on age is given below

Sl. No.	Age category	Years	Score
1	Young	Less than 35	1
2	Middle aged	35-55	2
3	Aged	Greater than 55	3

3.5.2.2 Educational Status

Educational status was operationally defined as the extent of formal education achieved by the respondent It was measured using the scoring pattern developed by Trivedi (1963) followed by Sobha (2013) The scoring procedure for educational status is represented below

Sl. No.	Category	Score
1	Illiterate	1
2	Can read and write	2
3	Primary school	3

Sl. No.	Category	Score
4	Middle school	4
5	High school	5
6	College	6
7	Professional degree	7

3.5.2.3 Occupation

It was operationally defined as main vocation and other additional vocations that the respondents were possessing at the time of interview

Scale developed by Anandaraja (2002) with slight modification was used for the study The scoring procedure is represented below

Sl. No.	Category	Score
1	Farming as a sole profession	4
2	Farming+ Agri labour	3
3	Farming+ business	2
4	Farming+ service	1

3.5.2.4 Farm Size

It had been referred as the total extent of land under cultivation by an individual farmer at the time of enquiry The respondents were classified into four categories and scores were allotted to them as per the scoring procedure developed by Sreedaya (2000) and followed by Sobha (2013) The scoring procedure is represented in the following table

Sl. No.	Area in acres	Score
1	< 0 5	1
2	0 51- 1	2
3	1 01- 2	3
4	> 2	4

3.5.2.5 Number of Trainings

It was operationalised as the number of trainings undergone by the respondent, which was conducted by different agricultural institutions in Kannur district

Procedure used by Ponmani (1993) followed by Peter (2014) was used The possible score ranges from zero to three Scoring procedure for number of trainings attended by the respondents is given below

Sl. No.	Trainings undergone	Score
1	No training	0
2	One training	1
3	Two trainings	2
4	Three or more trainings	3

3.5.2.6 Mass Media Exposure / ICT

Mass media exposure was defined as the degree to which the respondents were exposed to various mass media or ICT channels It was measured using the scale developed by Lakshmi (2000) and followed by Peter (2014) The scores for frequency of use of the sources for seeking information were ranging from 2 to 0 for regularly, occasionally and never in the order of sequence Scoring procedure is represented below

Sl. No.	Items	Regularly (2)	Occasionally (1)	Never(0)
1	Television			
2	Radio			
3	Newspaper			
4	Internet			
5	Magazine			
6	Bulletin			

Sl. No.	Items	Regularly (2)	Occasionally (1)	Never(0)
7	Information Kiosk			
8	Mobiles			

3.5.2.7 Extension Agency Contact

It was operationalized as the degree to which an individual have contact with research and extension agency for the purpose of obtaining information and advices The scoring procedures used by Manoj (2000) with slight modification were followed in the study The range of measuring the extension agency contact was 10-30 Scoring procedure of extension agency contact is represented below

Sl. No.	Category	Regularly (3)	Occasionally (2)	Rarely (1)
1	Agricultural scientist			
2	Agricultural officer			
3	Agriculture assistant			
4	Private extension agencies			
5	Block Technology Manager			
6	Assistant director of agriculture			
7	SMS of KVK			
8	NGOs			
9	Bank officials			

3.5.2.8 Extension Participation

It was operationally defined as the extent of involvement of farmer in different extension activities Procedure used by Jaiswal *et al* (1971) followed by Sobha (2013) with slight modification was used The score ranges from zero to eighteen

Sl. No.	Extension activity	Attended whenever conducted(2)	Sometimes(1)	Never attended(0)
1	Campaign			
2	Seminar			
3	Fair/melas			
4	Exhibition			
5	Exposure visits			
6	Study tours			
7	Group discussion			
8	Demonstrations			

3.5.2.9 Social Participation

Refers to the degree of involvement of respondents in formal and informal social organizations either as a member or as an office bearer, which also includes the extent of participation in organizational activities It was measured using the scale developed by Kamarudeen (1981) followed by Meera (2001) with slight modifications, having two dimensions, membership in organization and participation in organizational activities

For membership in organization	Scores
No membership in organization	0
Membership in organization	1
Office bearer in organization	2

Frequency of participation	Scores
Never attending any of the meetings	0
Sometimes attending meeting/ activities	1
Regularly attending meetings	2

3.5.2.10 Economic Motivation

It was operationally defined as the extent to which a farmer is oriented towards achievement of the maximum economic ends Scale developed by Supe (1969) followed by Fayas (2003) with some modification was used Scale consists of 6 statements, fifth and sixth were negative Each statement was provided with five point continuum, Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree with scores 5,4,3,2 and 1 for positive statements and 1,2,3,4 and 5 for negative statements The score range was from 6-30

3.5.2.11 Decision Making Ability

It was operationalized as the ability of the respondents to select the most efficient means from among the available alternatives without depending on others Scale prepared by Parimaladevi (2004) with slight modification was used Scale consists of 5 statements (three positive and two negative) on a four point continuum Strongly Agree, Agree, Disagree, and Strongly Disagree The score ranges from 5 to 20

A score of 4, 3, 2 and 1 for positive statements, and score reversed for negative statements The scores of all statements were added to get the decision making ability score of each respondent

3.5.2.12 Innovation Proneness

It refers to the keenness of the respondent in accepting new ideas and seeking changes in farming techniques and to introduce such changes into their

farm operations when practical and feasible Scale used by Gurubalan (2007) with some modification is used It consists of 5 statements Responses were obtained on a five point continuum ranging from Strongly Agree to Strongly Disagree with scores 4, 3, 2, 1, 0 respectively Scoring procedure was reversed for negative statements The score ranges from 0 to 20

3.5.2.13 Acceptance of Innovation

It was operationalized as the degree to which the farmers were ready to accept the innovation from any of the reliable source An arbitrary scale was developed by the researcher for the study Scale consists of ten statements measured on a five point continuum Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree The score ranges from 10 to 50 and the scoring procedure is as follows

Nature of statement	**SA**	**A**	**UD**	**DA**	**SDA**
Positive statement	5	4	3	2	1
Negative statement	1	2	3	4	5

3.5.2.14 Participation Efficiency

It refers to the propensity of the members to actively associate in planning, execution, monitoring, and evaluation of activities related to farmers groups Scale used by Surendran (2000) with slight modification was used for the study

Scale consists of eight statements Each statement was provided with three point continuum, and the scoring was done as,

Always	2
Sometimes	1
Never	0

The score range was from 0 to 16

3.5.2.15 Group Interaction

It was operationally defined as the tendency of members to get in touch with other members of the group and freely mix with them without any formality or inhibition It was measured using arbitrary index based on Bales interaction process analysis scoring sheet originally used by Bales (1950) The index consists of nine statements of which seven were positive and two were negative The response categories for each item were given in a five point continuum and the scoring was done as,

Responses	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

The scores obtained for each statement were summed up to arrive at the individual's total score The score ranges from 9 to 45

3.5.2.16 Need Satisfaction

It was operationalized as achieving individual member's need and requirements by group within a stipulated time An arbitrary index developed by Jayalekshmi (2001) with slight modification was used The index consisted of eight statements out of which seven are positive and one is negative The respondents were asked to cite their responses on a five point continuum as follows

The scores obtained for each statement were summed up to arrive at the individual's score for need satisfaction The score ranges from 9 to 45

Responses	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

3 6 CONSTRAINTS OF THE EXISTING TECHNOLOGY DISSEMINATION METHODS

To find out the most significant constraints which influence the respondent, Garrett's ranking technique was used As per this method, the respondents were asked to give rank for all constraints and the outcome of such ranking was converted into scores with the help of the following formula

$$\text{Percentage position} = \frac{100\,(R_{ij} - 0.5)}{N_{ij}}$$

Where R_{ij} = Rank given for the i^{th} variable by j^{th} respondents and N_{ij} = Number of variable ranked by j^{th} respondents With the help of Garrett's table, the estimated percent position is then converted into scores Then for each constraint the scores of each individual are added and then total values and mean values of scores were calculated The constraint having highest mean value is considered to be the most severe constraints (Afroz *et al* , 2014)

3 7 STATISTICAL TOOLS USED IN THE STUDY

The collected data were scored, tabulated and analysed using appropriate parametric and non parametric tools The statistical methods used were described below

3.7.1 Mean

The respondents were grouped into categories with reference to the means of the independent variables After grouping the respondents into categories, their percentages were worked out

3.7.2 Percentage Analysis

Percentage analysis was done to make classification of the respondents wherever necessary For calculating percentages the frequency of the particular cell was multiplied by 100 and divided by total number of respondents

3.7.3 Quartiles

Quartile deviation was used to categorize the respondents based on the first quartile Q_1 and third quartile Q_3 For a normally distributed data, the first quartile is equal to the data at the 25^{th} percentile of the data and the third quartile is equal to the data at the 75^{th} percentile of the data The observations obtained below first quartile Q_1 are taken to be low category, observations obtained below first quartile Q_1 are taken to be low category, observations from first quartile Q_1 to third quartile Q_3 as medium category and above third quartile Q_3 for higher category for categorizing the respondents

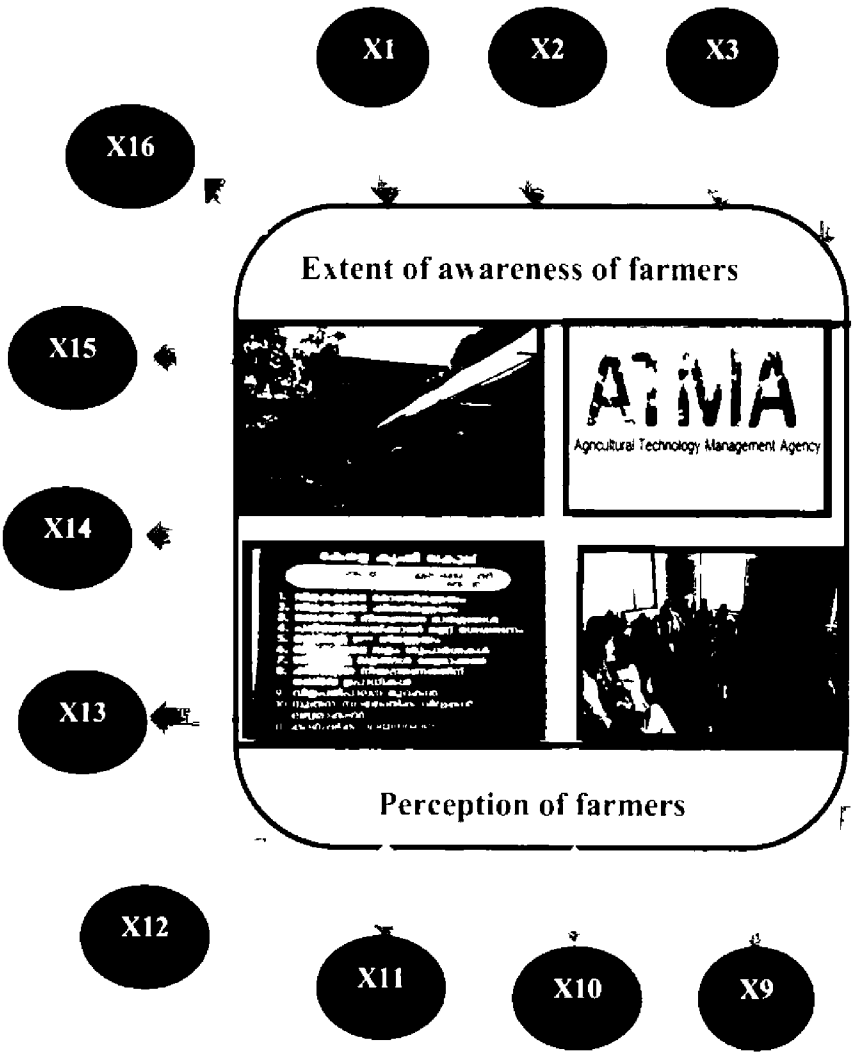
3.7.4 Correlation Analysis

Simple correlation analysis was done to explain the relationship between two variables The correlation coefficient was worked out to measure the degree of relationship between the dependent variables and independent variables

3 8 CONCEPTUAL FRAMEWORK OF THE STUDY

A conceptual model of the study has been framed based on the objectives set forth for the study, the concepts theoretically designed from the review of literature and factors influencing the extent of awareness and perception of farmers on ITD methods The frame work explains the relationship between

the independent variables and the dependent variables namely extent of awareness and perception of farmers on ITD methods implemented by KVK and other agricultural institutions in Kannur district The conceptual frame work is given in Fig 2



X1	Age	X7	Extension agency contact	X13	Acceptance of innovation
X2	Educational status	X8	Extension participation	X14	Participation efficiency
X3	Occupation	X9	Social participation	X15	Group interaction
X4	Farm size	X10	Economic motivation	X16	Need satisfaction
X5	No of trainings	X11	Decision making ability		
X6	Mass media exposure	X12	Innovation proneness		

Fig 2 Conceptual framework of the study

RESULTS AND DISCUSSIONS

4. RESULTS AND DISCUSSIONS

The main body of research report is 'Results and Discussions' whose purpose is to provide sufficient information so as to arrive at valid conclusion and recommendations Discussion helps to interpret the results in proper perspective and to relate them with other relevant studies, including the hypothesis supported or non-supported

The findings of the present study are presented in this chapter The inferences are drawn based on the objectives set forth The chapter is organized under the following subheadings

4 1 Profile characteristics of the respondents

4 2 Extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods

4 3 Perception of farmers on Innovations in Technology Dissemination (ITD) methods

4 4 Effectiveness of Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK

4 5 Effectiveness of Innovations in Technology Dissemination (ITD) methods implemented by other agricultural institutions in Kannur district

4 6 Correlation between extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK and other agricultural institutions with independent variables

4 6 1 Correlation between extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK with the independent variables

4 6 2 Correlation between extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods implemented by other agricultural institutions with the independent variables

4 7 Test for dependence or independence

4 8 Correlation between perception of farmers on Innovations in Technology Dissemination (ITD) methods with independent variables

4 9 Constraints of the existing technology dissemination methods as perceived by farmers

4 10 Suggestions given by the respondents

4 11 Strategies for an ideal system for technology dissemination.

4 1 PROFILE CHARACTERISTICS OF THE RESPONDENTS

A clear understanding about the socio- economic characteristics of the respondents helps the investigator to interpret the data in the right direction The profile characteristics of the respondents are discussed below

4.1.1 Age

Age was operationally defined as the number of years completed by the respondent at the time of investigation The respondents were classified into three categories, viz, young, middle and old age category Distribution of respondents according to their age is presented in Table 1

Table 1 Distribution of respondents according to their age (n = 120)

Sl. No.	Age Category (years)	Frequency	Percentage
1	Young Age(<35)	3	2 51
2	Middle Age (35-55)	40	33 33
3	Old Age (>55)	77	64 16

From table 1, it was observed that more than half of the respondents (64 16 per cent) belonged to old age category followed middle age category (33 33 per cent) and less than five per cent were in young age group

It showed that majority of the respondents were belonged to old age and middle age groups and participation of youth in agriculture is very low because they were not at all interested to take agriculture as their profession and our society looks agriculture as a profession with less social status The findings were in line with the earlier studies of Hanjabam (2013) and Anupama (2014) This is represented in figure 3

4.1.2 Educational Status

Educational status was operationally defined as the extent of formal education achieved by the respondent Categorization of farmers according to their educational status is furnished in table 2

Table 2 Distribution of the respondents based on educational status (n=120)

Sl. No.	Category	Frequency	Percentage
1	Illiterate	0	0
2	Can read and write	0	0
3	Primary school	6	5
4	Middle school	25	20 84
5	High School	52	43 33
6	College	36	30
7	Professional degree	1	0 83

Majority of the respondents were educated up to High school level (43 33 per cent) followed by collegiate level (30 per cent) Middle school (20 84 per cent), primary school (5 per cent), professional degree (0 83 per cent), and none of the respondents were observed under illiterate and can read and write category (Fig 4)

Fig 3 Distribution of respondents based on age

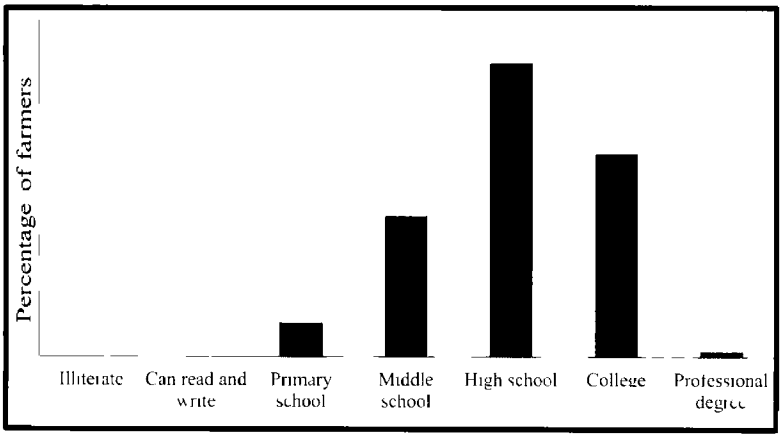


Fig 4 Distribution of respondents based on educational status

The result reflects that most of the farmers are highly educated because of the education system prevailing and higher literacy rate of the state One of other reason for this finding was that one fourth of the progressive farmer respondents in the study area were retired government employees Similar result has been obtained by several researchers *viz*, Jayawardhana (2007) and Anupama (2014)

4.1.3 Occupation

It was operationally defined as main vocation and other additional vocations that the respondents were possessing at the time of interview Distribution of respondents based on occupation is furnished in table 3

Majority of the farmers (56 66 per cent) had farming as a sole occupation and 30 per cent of the farmers are doing other services with farming activities 7 51 per cent of the farmers working as businessmen and 5 83 per cent of the respondents are agricultural labourers (Fig 5)

Table 3 Distribution of respondents based on occupation (n=120)

Sl. No.	Category	Frequency	Percentage
1	Farming as a sole profession	68	56 66
2	Farming + Agrl labour	7	5 83
3	Farming+ business	9	7 51
4	Farming+ Service	36	30

It was clear from table 3 that the retired government employees were more attracted towards agriculture than agricultural labourers and businessmen The result was in contradicts with the findings of Hassan (2008) who states that there was a gradual decrease in the percentage of respondents in taking farming as a sole occupation to farming with after retirement or in service

4.1.4 Farm Size (in acres)

It had been referred as the total extent of land under cultivation by an individual farmer at the time of enquiry Categorization of respondents based on farm size is given in table 4

Table 4 Distribution of respondents based on farm size (n=120)

Sl. No.	Category (acres)	Frequency	Percentage
1	< 0 5	16	13 33
2	0 51 – 1	34	28 33
3	1 01 - 2	41	34 17
4	> 2	29	24 17

Table 4 revealed that 34 17 per cent of farmers possessed 1 01-2 acres of land and 28 33 per cent of farmers had an area between 0 5 to 1 acres 24 17 per cent of farmers possessed more than 2 acres and 13 33 per cent had only less than 0 5 acres of land This is represented in figure 6

It was evident that majority of the farmers had 0 5- 2 or more than 2 acres of land and some farmers take land as leased for doing agricultural activities

4.1.5 Number of Trainings

It was operationalized as the number of trainings undergone by the respondent, which was conducted by different agricultural institutions in Kannur district Categorization of respondents based on trainings attended are represented in table 5

Table 5 Distribution of respondents based on trainings (n=120)

Sl. No.	Category	Frequency	Percentage
1	No training	16	13 33
2	One training	3	2 5
3	Two trainings	11	9 16
4	Three or more trainings	90	75

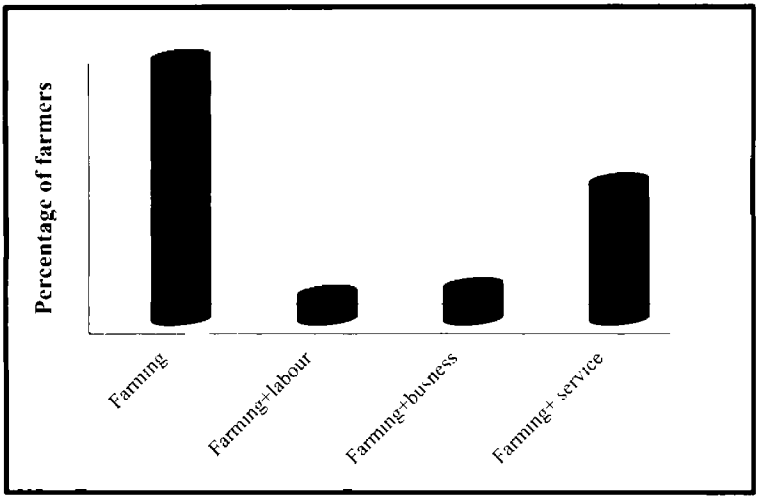


Fig 5 Distribution of respondents based on occupation

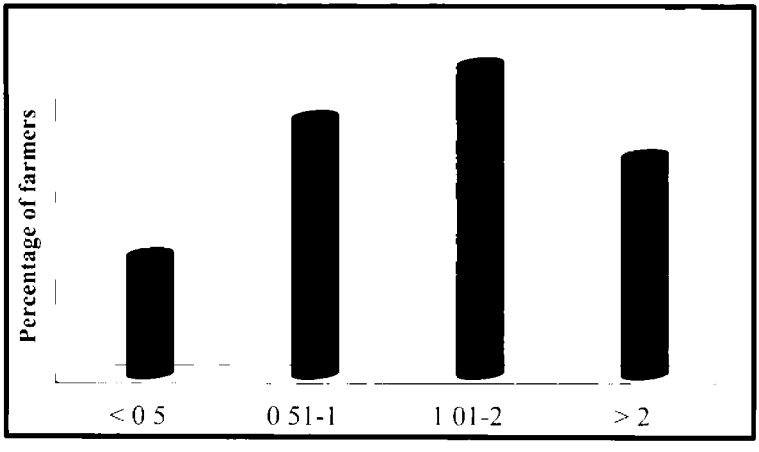


Fig 6 Distribution of respondents based on farm size

Analysis of table 5 proved that 75 per cent of the respondents had attended three or more trainings and 9 16 per cent and 2 5 per cent of the farmers were attended two trainings and one training respectively 13 33 per cent of the farmers never attended any training programmes (Fig 7) This is because most of the farmers were attended training programmes and classes conducted by Krishibhavans and panchayats and majority of the farmers were not aware of the training programmes conducted by other agricultural institutions in Kannur district

4.1.6 Mass Media Exposure

Mass media exposure was defined as the degree to which the respondents were exposed to various mass media or ICT channels The respondents were asked to mention the regularity in exposure to various mass media channels in a three point continuum, regularly, occasionally, and never Distribution of respondents based on exposure to various mass media and ICT tools were shown in table 6

It could be evident from table 6 that majority of the respondents (85 83 per cent) were exposed to TV programmes regularly and remaining 14 17 per cent with occasionally Most of them were interested in agriculture related TV programmes like Kissan Krishideepam, Krishidarshan etc

Equal distribution of respondents (33 33 per cent) were observed in the case of hearing radio regularly, occasionally and never Mayyil panchayat had highest number of farmers listening agricultural programmes in radio regularly followed by Ezhome 100 per cent of the respondents in each panchayat utilizing the newspaper regularly to get the information related to agriculture

Majority of the farmers (83 33 per cent) were never exposed to internet and ICT facilities, and they were not aware about the latest agricultural websites, portals, expert systems etc Many of the respondents did not have any idea about how to use computer and internet facilities In Ezhome panchayat 16 67 per cent

Table 6 Categorisation of respondents based on mass media exposure, per cent (n= 120)

Mass medias	Ezhome			Kankol			Kadannappalli			Mayyil			Total		
	R	O	N	R	O	N	R	O	N	R	O	N	R	O	N
TV	86 67	13 33	0	96 67	3 33	0	80	20	0	80	20	0	**85.83**	14 17	0
Radio	40	33 33	26 67	26 67	30	43 33	13 33	40	46 67	53 33	30	16 66	33 33	33 33	33 33
Newspaper	100	0	0	100	0	0	100	0	0	100	0	0	**100**	0	0
Internet	16 67	3 33	80	0	3 33	96 66	10	13 33	76 66	3 33	16 67	80	7 5	9 17	**83.33**
Magazine	100	0	0	66 67	23 33	10	76 67	16 67	6.67	86 67	6 67	6 67	**82.5**	11 67	5 83
Bulletin	6 67	90	3 33	10	63 33	26 67	6 67	60	33 33	3 33	76 67	20	6 67	72 5	20 83
Information kiosk	0	0	100	0	0	100	0	0	100	0	0	100	0	0	**100**
mobile	96 67	0	3 33	90	0	10	90	6 67	3 33	93 33	0	6 67	**92.5**	1 67	5 83

R- Regularly O – Occasionally N- Never

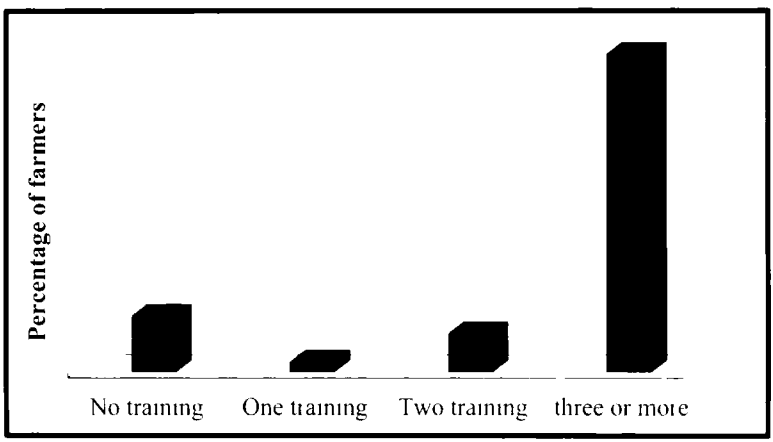


Fig 7 Distribution of respondents based on number of trainings

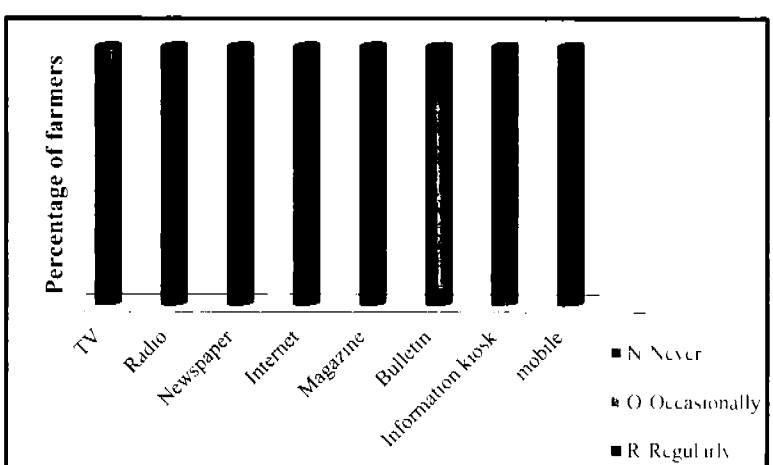


Fig 8 Distribution of respondents based on mass media exposure

of the total 30 respondents were utilizing the internet facilities regularly, but in other panchayats exposure of farmers to internet facilities were very poor

82 5 per cent of the total respondents depend on agricultural magazines like *Karshakasree* and *Kerala Kaı shakan* etc. regularly to get latest agricultural information Most of them have annual or lifetime membership on these magazines and journals It was observed that about 72 5 per cent of farmers rely on bulletin occasionally to seek information but 100 per cent of the farmers never depend on information kiosk for information related to agriculture This may be due to lack of awareness of farmers on modern ICT facilities and its use In the case of mobile phones majority of them (92 5 per cent) were utilizing mobiles regularly to exchange information but they were not aware about the new mobile apps to get latest information on agriculture This is represented in figure 8

4.1.7 Extension Agency Contact

It was operationalized as the degree to which an individual had contact with research and extension agency for the purpose of obtaining information and advices The scoring procedure used by Manoj (2000) was used with slight modifications Respondents were categorized based on the contact with extension agents and was shown in table 7

It was clear from table 7 that most of the farmers have regular contact with agricultural officers (75 83 per cent), agricultural assistants (76 67per cent) and bank officials (64 17 per cent) So it helps the farmers to gain information on pest and disease management, new schemes of department of agriculture, credits in agriculture and allied fields etc But more than half of the respondents do not have any contact with Agricultural Scientists, Block Technology Manager (BTM) and SMS of KVK Similarly, majority of them had no contact with Assistant Director of Agriculture (77 5 per cent), private extension agencies (95 per cent) and NGOs (94 16 per cent) When comparing the four panchayats based on extension agency contact, it was observed that farmers of Ezhome panchayat had good contact with all the agricultural agencies because in Ezhome, research works

Table 7 Categorisation of respondents based on extension agency contact, per cent (n = 120)

Extension agencies	Ezhome			Kankol			Kadannappali			Mayyil			Total		
	R	O	N	R	O	N	R	O	N	R	O	N	R	O	N
Ag Scientist	**43.33**	40	16 67	6 67	36 67	56 67	10	36 67	53 33	23 33	23 33	53 33	20 83	34 17	45
Ag Officer	**100**	0	0	60	40	0	73 33	23 33	3 33	70	30	0	**75.83**	23 33	0 83
Ag Assistant	**100**	0	0	63 33	36 67	0	73 33	23 33	3 33	70	30	0	**76.67**	22 5	0 83
Private agencies	3 33	3 33	93 33	0	0	100	0	6 67	93 33	3 33	3 33	93 33	1 67	3.33	95
BTM	40	53 33	6 67	0	13 33	86 67	20	36 67	43 33	23 33	13 33	63 33	20 83	29 16	50
Assistant director	6 67	33 33	60	3 33	13 33	83 33	0	10	90	6 67	16 67	76 67	4 17	18 33	77 5
SMS of KVK	23 33	43 33	33 33	0	23 33	76 67	6 67	53 33	40	23 33	26 67	50	13 33	36 67	50
NGOs	3 33	6 67	90	3 33	0	96 67	3 33	0	96 67	3 33	3 33	93 33	3 33	2 5	94 16
Bank officials	**76.67**	23 33	0	53 33	46 67	0	60	40	0	66 67	33 33	0	**64.17**	35 83	0

R- Regularly O – Occasionally N- Never

related to *Kaipad* rice is going on and the contribution of *Kaipad* farmers society in the work is well known This is represented in figure 9

Now varieties of innovations are introduced by public, private sectors and NGOs to disseminate latest agricultural technologies to farmers field But the benefit from this private and NGO sectors were not reached to farmers properly and most of the farmers were not at all heard about these ventures

4.1.8 Extension Participation

It was operationally defined as the extent of involvement of farmer in different extension activities Participation of farmers in various extension activities are categorized and furnished in table 8

A glance of the table 8 revealed that more than half of the respondents were occasionally involved in campaigns (53 33 per cent), seminars (56 67 per cent), Fair/ melas (56 67 per cent) exhibitions (55 per cent) and exposure visits (45 83 per cent) Majority of the farmers never attended extension activities like study tours (48 33 per cent), group discussions (46 67 per cent) and demonstrations (54 17 per cent) (Fig 10)

More than half of the respondents in Ezhome panchayat regularly participating in the agricultural seminars (53 33 per cent), agri fairs (53 33 per cent) and exhibitions (50 per cent) and in other panchayats (Kadannappalli, Kankol and Mayyil) it shows an occasional participation Compared to these extension activities, participation of farmers in exposure visits, study tours, group discussions and demonstrations were very less and there should be an initiation from Department of Agriculture, Krishi Vigyan Kendra, ATMA and other extension agencies to organize various farmer participatory approaches to deliver latest agricultural technologies

Table 8 Categorisation of respondents based on extension participation, per cent (n= 120)

Categories	Ezhome			Kankol			Kadannappali			Mayyil			Total		
	R	O	N	R	O	N	R	O	N	R	O	N	R	O	N
Campaign	13 33	70	16 67	13 33	36 67	50	6 67	53 33	40	13 33	53 33	33 33	11 67	**53.33**	35
Seminar	**53.33**	46 67	0	33 33	53 33	13 33	33 33	56 67	10	20	70	10	35	**56.67**	8 33
Fair/ melas	**53.33**	46 67	0	33 33	53 33	13 33	33 33	53 33	13 33	20	73 33	6 67	35	**56.67**	8 33
Exhibition	**50**	50	0	30	56 67	13 33	23 33	60	16 67	20	53 33	26 67	30 83	**55**	14 17
Exposure visits	13 33	46 67	40	3 33	36 67	60	0	60	40	16 67	40	43 33	8 33	45 83	45 83
Study tour	16 67	60	23 33	6 67	33 33	60	0	53 33	46 67	10	26 67	63 33	8 33	43 33	48 33
Group discussion	20	63 33	16 67	6 67	33 33	60	0	43 33	56 67	10	36 67	53 33	9 17	44 17	46.67
Demonstrations	16 67	50	33 33	3 33	33 33	63 33	0	33 33	66 67	10	36 67	53 33	7 5	38 33	54 17

R- Regularly O – Occasionally N- Never

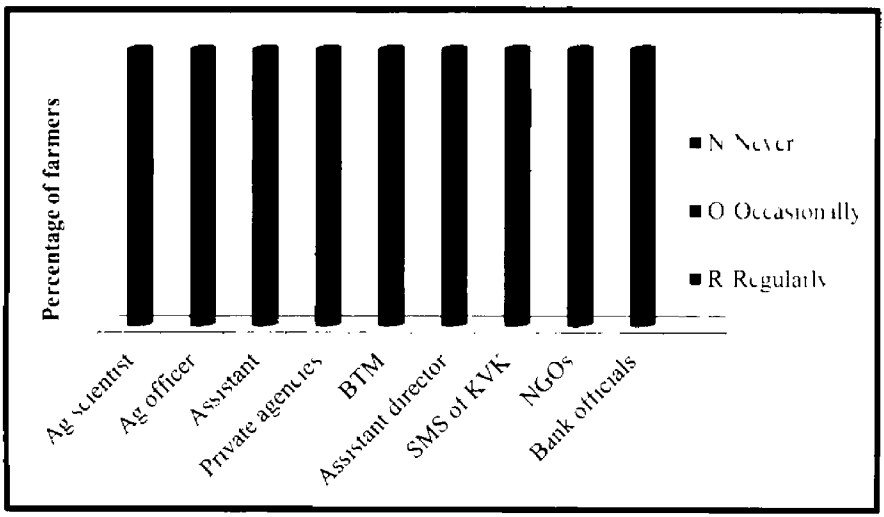


Fig 9 Distribution of respondents based on extension agency contact

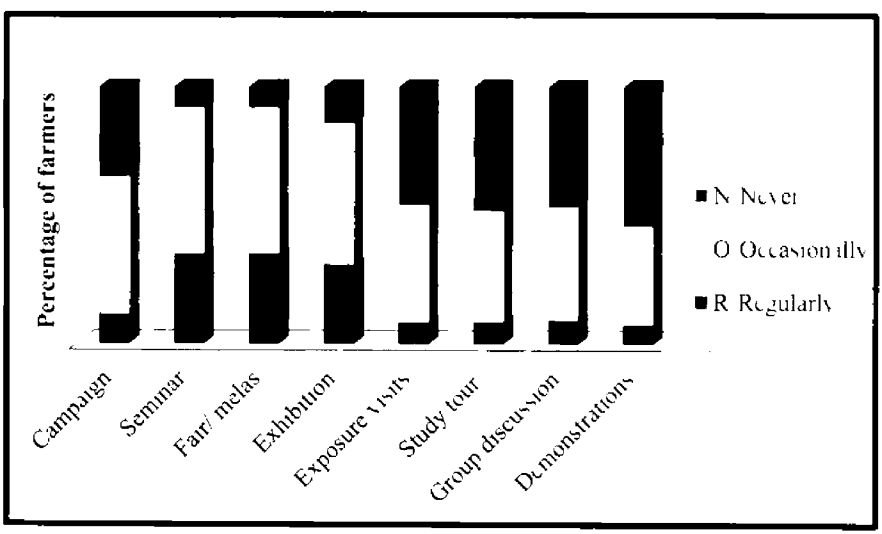


Figure 10 Distribution of respondents based on extension participation

4.1.9 Social Participation

It refers to the degree of involvement of respondents in formal and informal social organizations either as a member or as an office bearer, which also includes the extent of participation in organizational activities

From table 9, it was observed that majority of the farmers (57 5 per cent) had membership in any of the farmer organization and 36 67 per cent of the farmers were office bearers in the organization 5 83 per cent of farmers never had any membership in different farmer organisations In the case of frequency of participation, 72 5 per cent of the farmers were regularly attending the group meetings and 5 83 per cent were never attended the meetings 21 67 Per cent of the respondents attend the meetings based on their convenience This is represented in figure 11.

Table 9 Distribution of respondents based on social participation (n=120)

Sl .No.	Membership in organization			Frequency of participation		
	Category	F	%	Category	F	%
1	No membership in organization	7	5 83	Never attending the meetings	7	5 83
2	Membership in organisation	69	57 5	Sometimes attending meetings	26	21 67
3	Office bearer in organisation	44	36 67	Regularly attending meetings	87	72 5

It shows the picture from the table 9 that most of the farmer respondents were actively involving in the organizational activities Office bearers of different farmer groups are contributing their skills to coordinate the members and it will leads to better participation

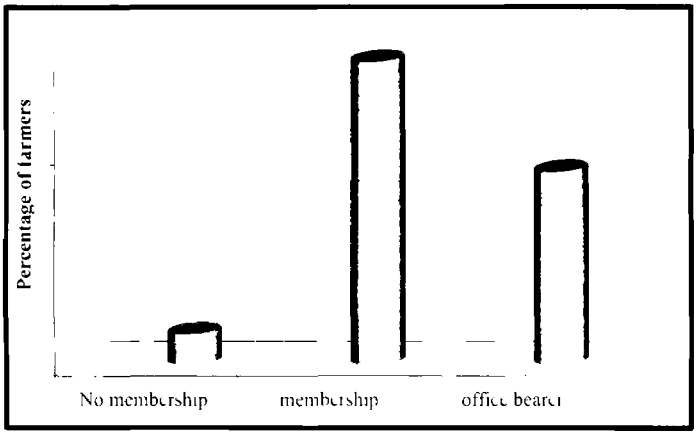


Fig 11 a Distribution of respondents based on membership in organisation

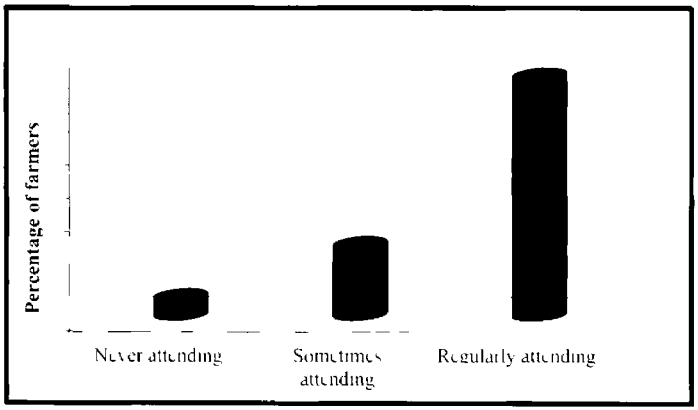


Fig 11 b Distribution of respondents based on frequency of participation

Fig 11 Distribution of respondents based on social participation

4.1.10 Economic Motivation

It was operationally defined as the extent to which a farmer is oriented towards achievement of the maximum economic ends Distribution of respondents based on economic motivation is given in the following table

Table 10 Distribution of respondents based on economic motivation (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low (<Q_1)	12	10
2	Medium (Between Q1 and Q3)	102	85
3	High (> Q3)	6	5
	Q_1= 15 Q_3= 18	Range = 12 - 20	

From table 10, it was observed that majority (85 per cent) of the respondents had medium level of economic motivation 10 per cent of the farmers had low and 5 per cent of the farmers had high level of economic motivation This is represented in figure 12 The findings were in line with the earlier study of Fayas (2003)

Table 10 showed that the farmer work towards high returns and activities of farmer organisations should be encouraged to maximum to get more income Field and agriculture is actually a passion for most of the farmers other than making profit, but the farmer children were not interested in these field

4.1.11 Decision Making Ability

It was operationalized as the ability of the respondents to select the most efficient means from among the available alternatives without depending on others Categorization of respondents based on decision making ability is given in the following table

Table 11 Distribution of respondents based on decision making ability (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low (<Q_1)	26	21 67
2	Medium (Between Q1 and Q3)	83	69 17
3	High (> Q3)	11	9 17
	Q_1= 15 Q_3= 17 Range = 10 - 18		

A glance of table 11 reveals that 69 17 per cent of the farmers had medium decision making ability followed by 21 67 per cent with low and 9 17 per cent with high decision making ability related to the group activities Most of the farmers are taking agriculture related decisions after consulting with agricultural officers and assistants and they had a good contact with the Krishibhavans So it helps the farmers to analyse the pros and cons of the existing situation and leads to take firm decisions But in some areas agriculture officers and assistants were not much active so the farmers take decisions by consulting with other progressive farmers of that area or take decisions by themselves (Fig 13)

4.1.12 Innovation Proneness

It refers to the keenness of the respondent in accepting new ideas and seeking changes in farming techniques and to introduce such changes into their farm operations when practical and feasible Scale used by Gurubalan (2007) with some modification was used for the study Categorization of respondents based on the innovation proneness is presented in the following table

Table 12 Distribution of respondents based on Innovation proneness (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low (<Q_1)	26	21 67
2	Medium (Between Q1 and Q3)	79	65 83
3	High (> Q3)	15	12 5
	Q_1= 11 Q_3= 15 Range = 5 - 20		

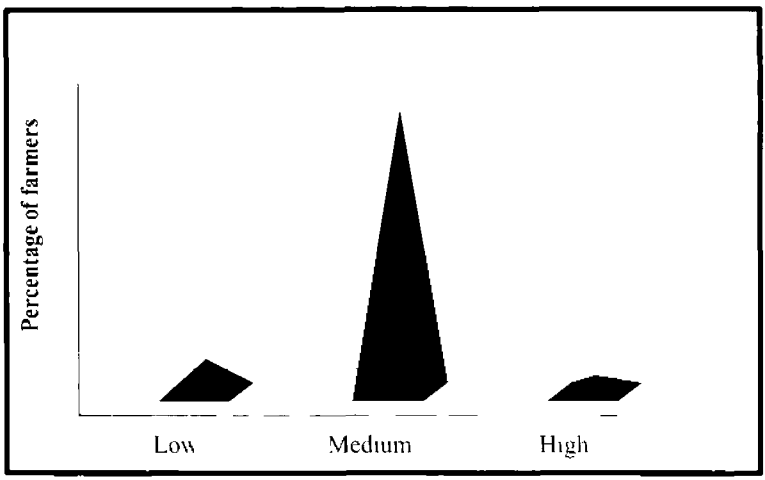


Fig 12 Distribution of respondents based on economic motivation

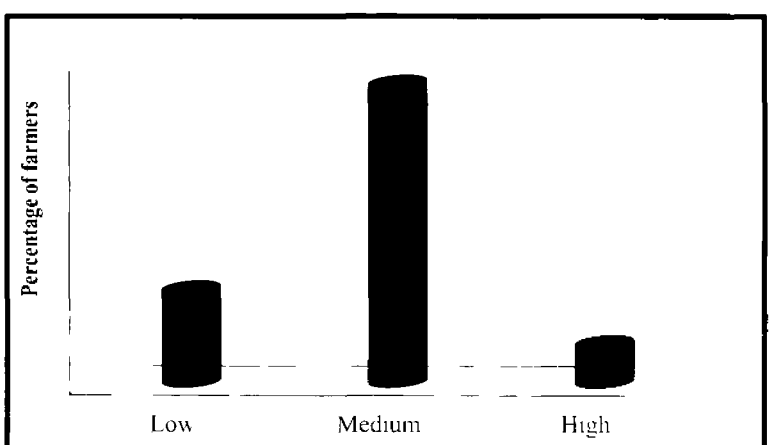


Fig 13 Distribution of respondents based on decision making ability

From table 12 it was observed that majority of the farmers (65 83 per cent) had medium level of innovation proneness and 21 67 per cent with low and 12 5 per cent with high innovation proneness respectively This is shown in figure 14 This might be because of people mostly have urge to work with new things and achieve better results by accepting the new ideas The reason for medium innovation proneness may due to lack of proper idea about the new technology dissemination methods and its activities 21 67 per cent of the farmers opted the traditional way of doing things than go for newer methods, so they accept any idea only after consulting with other progressive farmers The result obtained is in line with the study of Shankaraiah and Swamy (2012)

4.1.13 Acceptance of Innovation

It was operationalized as the degree to which the farmers were ready to accept the innovation from any of the reliable source Scale consists of ten statements measured on a five point continuum Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree

Table 13 Distribution of respondents based on acceptance of innovation (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low ($<Q_1$)	30	25
2	Medium (Between Q1 and Q3)	65	54 17
3	High (> Q3)	25	20 83
	Q_1= 33 75 Q_3= 37 Range = 26 42		

From table 13 it was clear that more than half of the farmers (54 17 per cent) were accepting the innovation in medium level and 25 per cent with low and 20 83 per cent with high acceptance The farmers are reluctant to participate in new technology dissemination methods because many of the innovations are not much specific to their need and locality and innovation implemented were not enough to

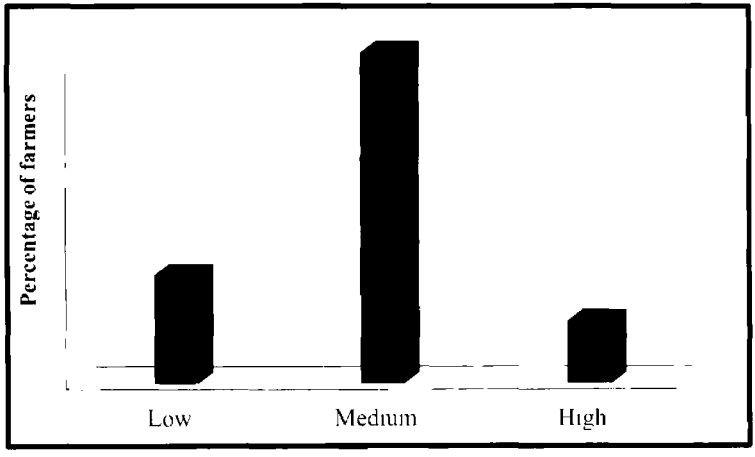


Fig 14 Distribution of respondents based on innovation proneness

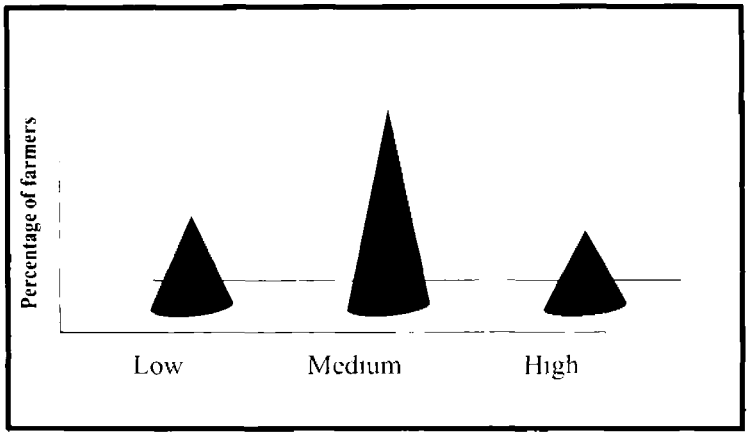


Fig 15 Distribution of respondents based on acceptance of innovation

achieve their overall goal So farmers were not at all satisfied with some of the innovations implemented by various agricultural institutions in Kannur district and the acceptance of these innovations were comparatively low or medium (Fig 15)

4.1.14 Participation Efficiency

It refers to the propensity of the members to actively associate in planning, execution, monitoring, and evaluation of activities related to farmers groups Scale used by Surendran (2000) with slight modification was used for the study Respondents were classified into three groups low, medium and high based on quartiles Q_1 and Q_3 Categorization of respondents based on participation efficiency is presented in the table below

Table 14 Distribution of respondents based on participation efficiency (n=120)

Sl. No	Category	Frequency	Percentage
1	Low ($<Q_1$)	29	24 17
2	Medium (Between Q1 and Q3)	68	56 67
3	High (> Q3)	23	19 17
	Q_1= 11 Q_3= 15 Range = 0 16		

It was observed from table that 56 67 per cent of the farmers had medium efficiency in participating the group activities and 24 17 per cent with low and 19 17 per cent with high participation efficiency respectively The study area have number of farmers groups like LEADS, *Padasekhara samithies* (rice farmers group), Kera cluster (Coconut farmers group), Kaipad farmers society, *Swasraya Karshaka Sangams, Nallabhoomi* (Organic farmers group), Vegetable cluster etc and NABARD farmers clubs were also there under Krishi Vigyan Kendra Pannyur

Kaipad farmers society is working in Ezhome panchayat where *Kaipad* area is mostly seen and the activities of the group is going well compared to other farmers groups

Padasekhara samithies and Kera cluster are present in all the four selected panchayats under Krishibhavans, but the farmers participation in these group activities is somewhat less in some areas of these panchayats This might be due to the lack of coordination between the group members and lack of timely group meetings Some members of the group were less active, so they did not take the responsibilities and they attend the meetings only for getting subsidies and other funds In Mayyil and some parts of ezhome panchayat *padasekhara samithies* are working very well because the office bearers of the groups in these mentioned areas were very active

Nallabhoomi is an organic farmers group working in Payyanur area They were conducting markets in weekends for the sale of their own organic fruits and vegetables and also organizing various classes, group discussions and demonstrations related to organic farming

4 .1.15 Group Interaction

It was operationally defined as the tendency of members to get in touch with other members of the group and freely mix with them without any formality or inhibition It is measured using arbitrary index based on Bales interaction process analysis scoring sheet originally used by Bales (1950) Distribution of farmers based on interaction with group members were categorized into three groups based on quartiles The result is shown in table15

It was inferred from the table that majority of the farmers (67 5 per cent) had medium level of group interaction followed by low (25 per cent) and high level (7 5 per cent) of mteraction among farmers within the groups It was evident that

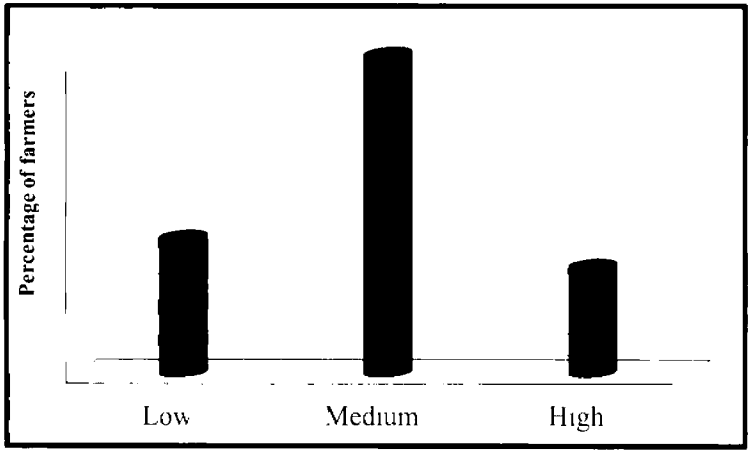


Fig 16 Distribution of respondents based on participation efficiency

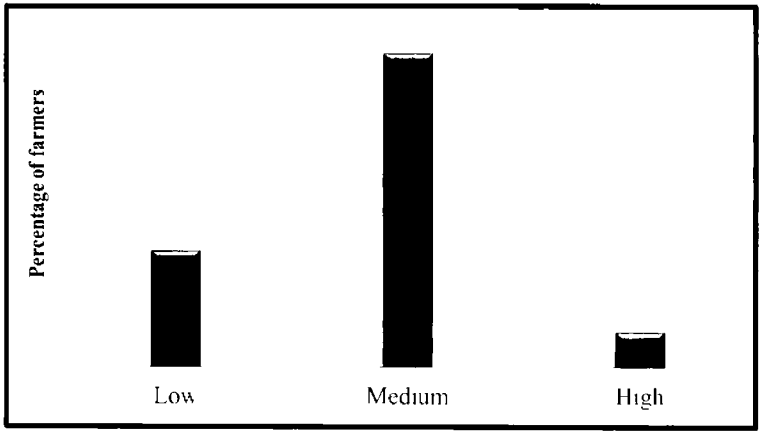


Fig 17 Distribution of respondents based on group interaction

most of the farmers having membership in any of the farmers groups but their participation and interaction with other group members were in medium level

Table 15 Distribution of respondents based on group interaction (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low (<Q_1)	30	25
2	Medium (Between Q1 and Q3)	81	67 5
3	High (> Q3)	9	7 5
	Q_1= 33 75 Q_3= 36 Range = 9- 43		

This might be due to the reason that the members of some groups were not much friendly towards each other and not agrees with the opinion of other members and also they were not fully satisfied with the final decisions of the group The group leaders should take initiative to conduct regular group meetings, ensure all members participation and contribution of each and every member's opinion in final decision that will lead to better interaction among the group members

4.1.16 Need Satisfaction

It was operationalized as achieving individual member's need and requirements by group within a stipulated time The respondents were distributed in to three categories based on need satisfaction and it was shown in the following table

Table 16 Distribution of respondents based on need satisfaction (n=120)

Sl. No.	Category	Frequency	Percentage
1	Low (<Q_1)	25	20 83
2	Medium (Between Q1 and Q3)	83	69 17
3	High (> Q3)	12	10
	Q_1= 29 Q_3= 31 25 Range = 8 - 35		

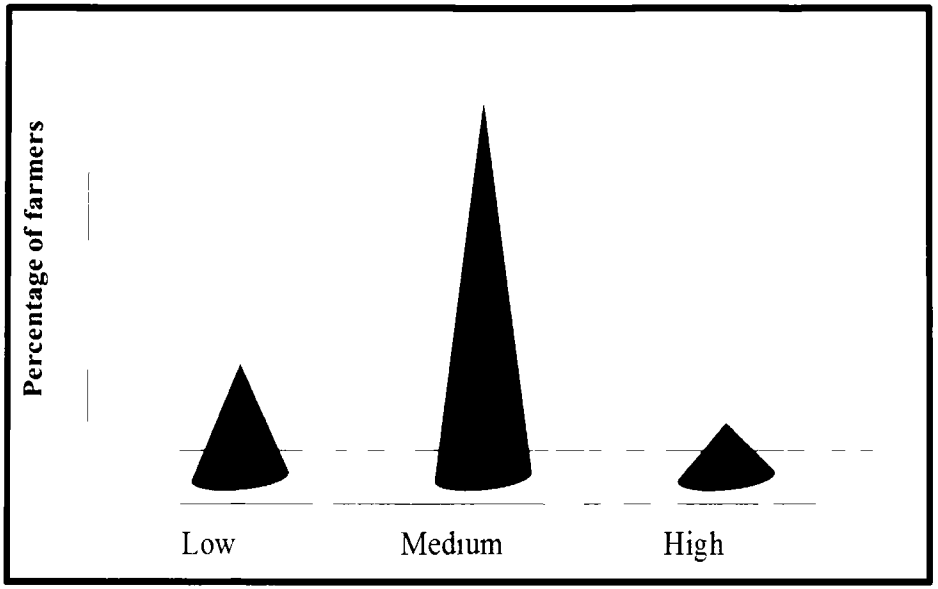


Fig 18 Distribution of respondents based on need satisfaction

It was clear from the table that majority of the respondents (69 17 per cent) had medium level of need satisfaction followed by low level (20 83 per cent) Only 10 per cent of the farmers are fully satisfied with the group activities and existing Innovations in Technology Dissemination (ITD) methods that helps them to attain their needs This is because the individual needs were not in line with the group needs and group activities were not sufficient to meet the individual needs and goals This is shown in figure 18

4 2 EXTENT OF AWARENESS OF FARMERS ON INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS

Awareness which is of a cognitive behavior was operationalized as the level of extent to which the respondents were familiar with the Innovations in Technology Dissemination methods implemented Scale followed by Jayawardhana (2007) with slight modification was used The scale consists of a list of Innovations in Technology Dissemination (ITD) methods and the respondents were advised to mark the degree of awareness about the innovations in a two point continuum aware and not aware

4.2.1 Extent of Awareness of Farmers on Innovations in Technology Dissemination (ITD) Methods Implemented by Kannur KVK

From table 17, it could be inferred that nearly half of the respondents were aware of the ITD methods like farmers science museum (48 33 per cent), KVK mall (41 67 per cent) and brochures and publications released by KVK (54 17 per cent) It may be seen that 22 5 per cent and 26 67 per cent of the farmers were aware about release of video and multimedia CDs and agro- biopharmacy respectively

The respondent's awareness about ITD methods like farmers science congress and training programmes for farm entrepreneurs were 10 83 per cent and 15 per cent respectively

Table 17 Extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK, per cent (n= 120)

Sl. No.	ITD METHODS	Ezhome		Kankol		Kadannappalli		Mayyil		Total	
		A	NA	A	NA	A	NA	A	NA	A	NA
1	Compact Area Group Approach	0	100	3 33	96 67	0	100	16.67	83 3	5	95
2	Farmers science congress	10	90	6 67	93 33	10	90	16 67	83 33	10 83	89 17
3	Farmers science museum	**46.67**	53 33	26 67	73 33	53 3	36 67	**66.67**	33 33	**48.33**	51 67
4	NABARD- KVK farmers club	3 33	96 67	3 33	96 67	0	100	10	90	4 17	95 83
5	Training programmes for farm entrepreneurs	10	90	10	90	26 67	73 33	13 33	86 67	15	85
6	KVK mall	**43.33**	56 67	16 67	83 33	43 33	53 33	**63.33**	36 67	**41.67**	58 33
7	SBI KVK loan window	6 67	93 33	0	100	0	100	16 67	83.33	5 83	94 17

A- Aware NA- Not Aware

Table 17 continued

Sl. No.	ITD methods	Ezhome		Kankol		Kadannappali		Mayyil		Total	
		A	NA	A	NA	A	NA	A	NA	A	NA
8	Formation of mussel farmers club	0	100	0	100	0	100	10	90	2 5	97 5
9	Participatory production of planting materials and vegetable seeds	6 67	93 33	0	100	3 33	96 67	10	90	5	95
10	Formation of farmer producer organisations	6 67	93 33	0	100	30	70	6 67	93 33	10 83	89 17
11	Release of video and multimedia CDs related to various practices	30	70	0	100	13 33	86 67	46 67	53 33	22 5	77 5
12	Agro biopharmacy	46 67	53 33	0	100	10	90	**50**	50	26 67	73 33
13	Farmers filed school	16 67	83 33	0	100	0	100	20	80	9 17	90 83
14	Brochures and publications	**66.67**	33 33	23 33	76 67	53 33	43 33	**73.33**	26 67	**54.17**	45 83

A- Aware NA- Not Aware

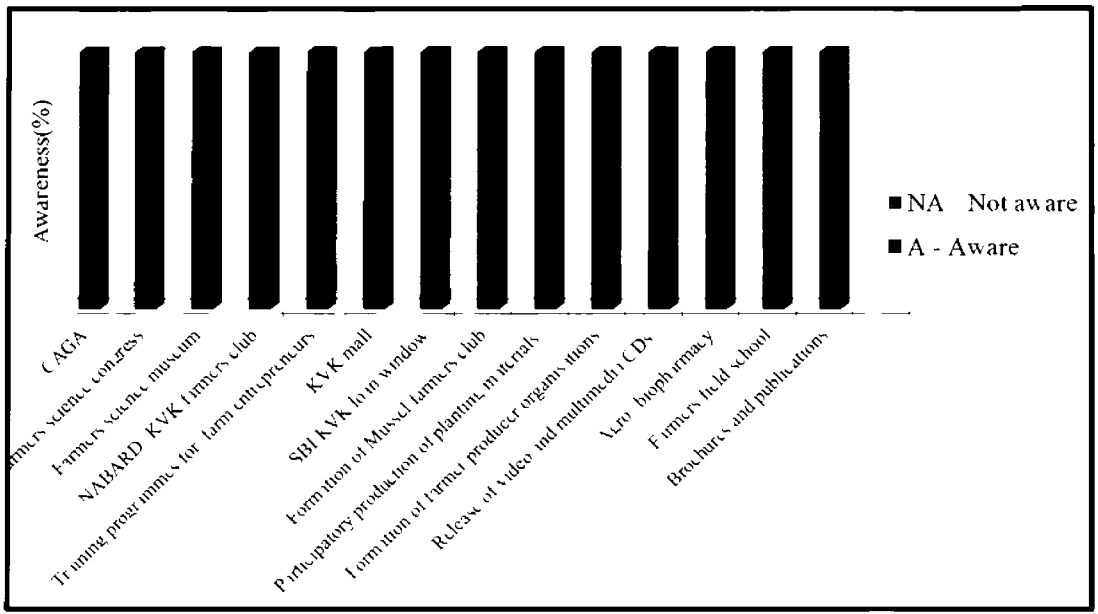


Fig 19 Extent of awareness of farmers on ITD methods implemented by KVK

More than 90 per cent of the respondents were not aware the methods like Compact Area Group Approach (CAGA), farmers science congress, NABARD-KVK farmers club, SBI- KVK loan window, formation of mussel farmers club, participatory production of planting materials and vegetable seeds, formation of farmer producer organisations and farmers field school

Compared to Ezhome, Kankol- Alapadamba, and Kadannappalli-Panapuzha panchayat more than half of the respondents in Mayyil panchayat were aware of the ITD methods like farmers science congress (66 67 per cent) and KVK mall (63 33 per cent)

It can be observed from the table that 66 67 per cent of the farmers from Ezhome panchayat and 73 33 per cent of the farmers from Mayyil panchayat were aware of the brochures and publications released by Kannur KVK

It was also evident from the table 17 that nearly 50 per cent of the farmers of Ezhome and Mayyil panchayat were aware of the agro biopharmacy

Majority of the farmers from Kankol- Alapadamba panchayat were had least awareness on all the ITD methods implemented by Kannur KVK

4.2.2 Extent of Awareness of Farmers on Innovations in Technology Dissemination (ITD) Methods Implemented by Other Agricultural Institutions in Kannur District

From table 18 it could be inferred that majority of the farmers were aware of the ITD methods like training programmes by ATMA (68 33 per cent), ATMA newsletter (58 33 per cent), LEADS activities (53 33 per cent) and trainings and workshops by Department of Agriculture (66 67 per cent)

Compared to farmers of Kankol and Kadannappalli panchayat majority of the farmers in Ezhome (77 59 per cent) and Mayyil panchayat (96 67 per cent) were aware of the training programmes conducted by ATMA, and most of the farmers in Ezhome panchayat (86 67 per cent) were aware the activities of LEADS

Table 18 Extent of Awareness of farmers on Innovations in Technology Dissemination (ITD) methods implemented by other agricultural institutions in Kannur district, per cent (n= 120)

Sl. No.	ITD methods	Ezhome		Kankol		Kadannappalli		Ezhome		Total	
		A	NA	A	NA	A	NA	A	NA	A	NA
1	Training progammes by ATMA in Kannur	**77.59**	10	16 67	83 33	70	30	**96.67**	3 33	**68.33**	31 67
2	ATMA newsletter	66 67	33 33	10	90	63 33	36 67	**93.33**	6 67	58 33	41 67
3	ATMA PLUS activities	43 33	56 67	0	100	23 33	76 67	23 33	76 67	22 5	77 5
4	Farmer field schools	46 67	53 33	0	100	30	70	36 67	63 33	28 33	71 67
5	Technology meet	10	90	0	100	3 33	96 67	3 33	96 67	4 17	95 83
6	Farmer extension organisation	13 33	86 67	0	100	0	100	3 33	96 67	4 17	95 83
7	Farmer led technology development	6 67	93 33	0	100	0	100	6 67	93 33	3 33	96 67

A- Aware NA- Not Aware

Table 18 continued

Sl. No.	ITD methods	Ezhome		Kankol		Kadannappalli		Mayyil		Total	
		A	NA	A	NA	A	NA	A	NA	A	NA
8	Trainings & workshops by Dept of Agriculture	**93.33**	6 67	20	80	**86.67**	13 33	66 67	23 33	**66.67**	30 83
9	LEADS activities	**86.67**	13 33	36 67	63 33	33 33	66 67	56 67	43 33	53 33	46 67
10	Crop health management scheme	3 33	96 67	0	100	**90**	10	3 33	96 67	2 5	97 5
11	Farmers clubs formed with the help of Syndicate Bank	3 33	96 67	0	100	0	100	0	100	0 83	99 17
12	Innovations by NGOs	6 67	93 33	0	100	0	100	3 33	96 67	2 5	97 5
13	Farmers clubs formed by TSSS	0	100	0	100	0	100	0	100	0	100
14	Agro service centres	**16.67**	83 33	0	100	0	100	0	100	4 17	95 83
15	Farmers clubs by other banks	3 33	96 67	0	100	0	100	0	100	0 83	99 17
16	Seed farm Payyanur area	0	100	**100**	0	0	100	0	100	25	75

A- Aware NA- Not Aware

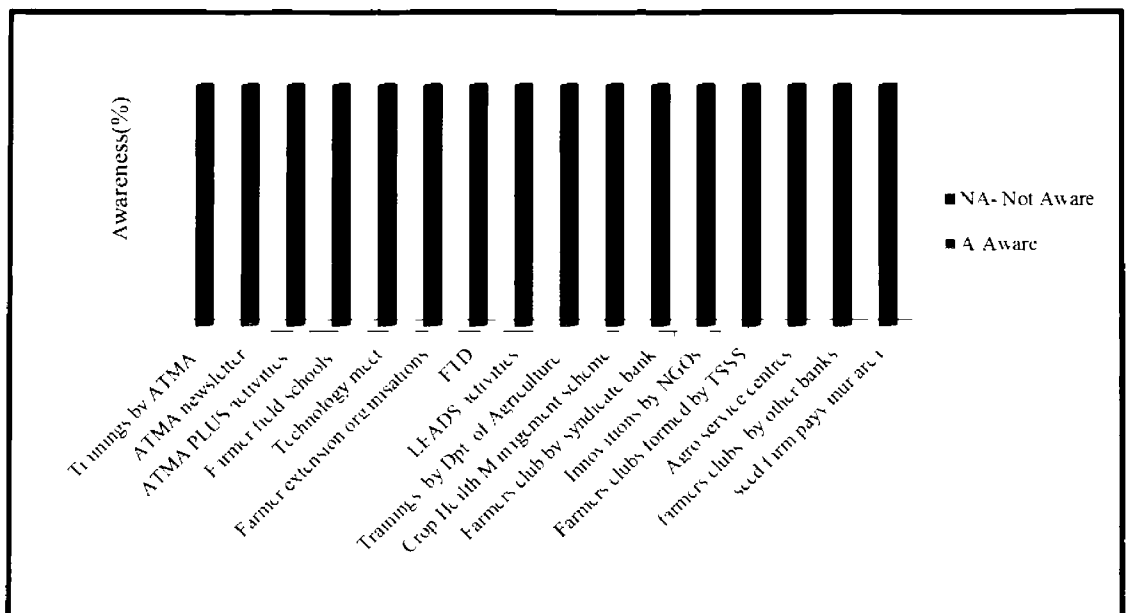


Fig 20 Extent of awareness of farmers on ITD methods implemented by other agricultural institutions in Kannur district

From table 18 it was evident that majority of the farmers in Ezhome (93 33 per cent) and Kadannappalli (86 67 per cent) panchayat were aware of the trainings and workshops by the Department of Agriculture

It was also observed from the table that 90 per cent of the respondents in Kadannappalli Panchayat were aware of the crop health management scheme implemented by the Department of Agriculture, because in Kadannappalli Krishibhavan one plant health clinic is there, and it is working very well So most of the farmers in this area were approaching the clinic to solve the problems related to pest and disease management

Compared to all the three panchayats selected 16 67 per cent of the respondents in Ezhome panchayat were aware of the agro service centres

Hundred per cent of the respondents in Kankol- Alapadamba panchayat were aware of the seed farm, because most of the farmers in Kankol- Alapadamba panchayat were depend on the seed farm to get inputs like seeds, planting materials, fertilizers, pesticides etc

From table it was clear that all the respondents in Kankol- Alapadamba panchayat were not aware of the ATMA PLUS activities, Innovations by NGOs and farmers clubs formed by different banks In the case of ATMA PLUS activities 28 33 per cent of the farmers were aware of the farmers field schools for pest and disease management and most of the respondents were not aware of the technology meet, farmer led technology development and farmer extension organisations

It can be concluded that majority of the farmers lack awareness about the innovations by NGOs and farmers clubs formed by different banks

4 3 PERCEPTION OF FARMERS ON INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS

Perception was operationalized as the farmer's opinion towards various innovations in technology dissemination implemented by different agricultural institutions in Kannur district Scale consists of ten statements which was

measured in a five point continuum namely, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree After data collection the respondents were categorized in to three groups low, medium and high based on mean and standard deviation

Table 19 Distribution of respondents based on Perception of farmers on ITD methods (n=120)

Sl. No	Category	Frequency	Percentage
1	Low	33	27 5
2	Medium	75	62 5
3	High	12	10
	Mean = 35 86 SD= 4 67		

It was clear from the table that majority of the farmers reported medium level of perception (62 5 per cent) followed by low level (27 5 per cent) Only 10 per cent of the respondents were having high perception on ITD methods implemented by different agricultural institutions in Kannur district This is represented in figure 21

More than half of the respondents were strongly agreed with the perception statements such as 'Innovations in Technology Dissemination (ITD) methods are more effective than conventional methods', 'ITD helps farmers to access new technologies and products easily', 'Group approach of ITD is more effective than individual approach' and 'Participative skill training helps farmers to adopt new technologies and methods'

Based on perception, perception index for each statement was worked out using the following formula, and Perception Index was given in the table 20

$$\text{Perception Index (PI)} = \frac{\text{Individual subject score}}{\text{Total score}} \times 100$$

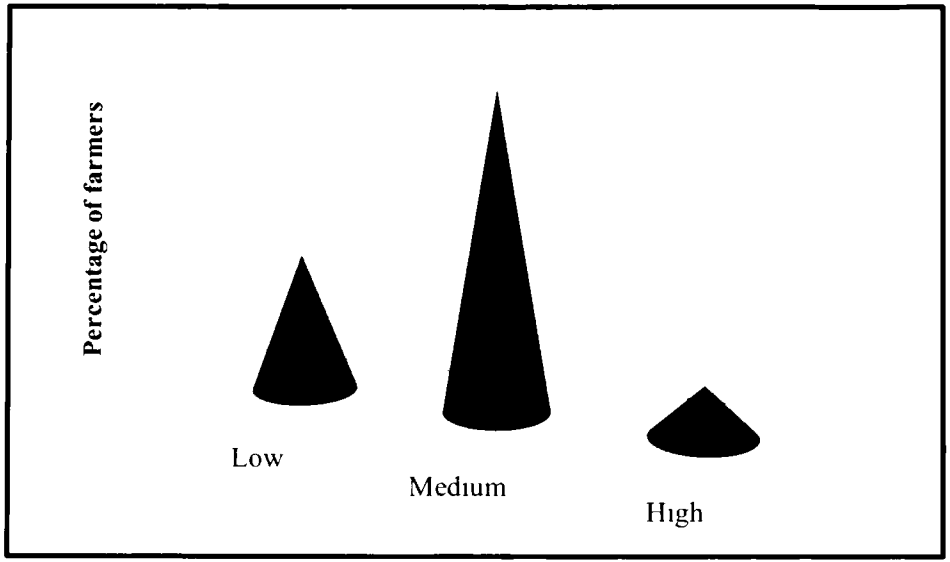


Fig 21 Distribution of farmers based on perception of farmers on ITD methods

Table 20 Perception Index

Sl. No.	STATEMENTS	PI
1	Innovations in Technology Dissemination(ITD) methods are more effective than conventional methods	81 16
2	ITD helps farmers to access new technologies and products easily	81
3	Group approach of ITD is more effective than individual approach	80 5
4	Participative skill training helps farmers to adopt new technologies and methods	76 17
5	Innovations using ICT is more effective for technology dissemination	75 5
6	Participative decision making is ensured in the implementation of the ITD methods	75
7	Greater economic prosperity can be achieved through the ITD methods	74 6
8	Social media play a crucial role in technology dissemination	70 33
9	Farmers get an opportunity to take leadership in technology dissemination process	68 17
10	Farmers get an opportunity to introduce their own innovations to the farming community	61 17

From table it was inferred that perception statements such as 'Innovations in Technology Dissemination (ITD) methods are more effective than conventional methods', 'ITD helps farmers to access new technologies and products easily', and 'Group approach of ITD is more effective than individual approach' were having high perception index with 81 16, 81 and 80 5 respectively

It was clear from the table that statements like 'farmers get an opportunity to take leadership in technology dissemination process,' 'farmers get an

opportunity to introduce their own innovations to the farming community' were having low perception index The perception index score obtained ranges from 350 to 500

4 4 EFFECTIVENESS OF INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS IMPLEMENTED BY KANNUR KVK

Effectiveness of ITD methods as perceived by farmers was worked out, based on the farmer's response towards ITD methods implemented by the KVK Effectiveness of ITD methods implemented by Kannur KVK was given in table 21

From the table it was observed that 28 33 per cent of the farmers were expressed as farmers science museum is most effective than all other ITD methods implemented by Kannur KVK and 24 17 per cent of the farmers were opined as KVK mall is the most effective method

23 33 per cent of the farmers were perceived as 'training programmes for farm entrepreneurs' is the more effective method

21 67 per cent of the respondents were opined as brochures and publications released by KVK is having high effectiveness than other methods

Table 21 Effectiveness of Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK.

Sl. No.	ITD methods	Frequency	Percentage
1	Farmers science museum	34	28 33
2	KVK mall	29	24 17
3	Training programmes for farm entrepreneurs	28	23 33
4	Brochures and publications	26	21 67
5	Agro- biopharmacy	20	16 67

Table 21 continued

Sl. No.	ITD methods	Frequency	Percentage
6	Release of video and multimedia CDs related to various practices	17	14 17
7	Farmers science congress	13	10 33
8	Participatory production of planting materials and vegetable seeds	6	5 00
9	Farmers field school	5	4 17
10	NABARD KVK farmers club	3	2 50

4 5 EFFECTIVENESS OF INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS IMPLEMENTED BY OTHER AGRICULTURAL INSTITUTIONS IN KANNUR DISTRICT

Effectiveness of ITD methods as perceived by farmers was worked out, based on the farmer's response towards ITD methods implemented by different agricultural institutions in Kannur Effectiveness of ITD methods implemented was given in table 22

From table 22 it was clear that majority of the farmers (37 5 per cent) were perceived as ATMA activities are more effective followed by LEADS (31 67 per cent), crop health management scheme (20 83 per cent) and ATMA PLUS activities (20 per cent) in Kannur district

Table 22 Effectiveness of Innovations in Technology Dissemination (ITD) methods implemented by other agricultural institutions in Kannur district

Sl. No.	ITD methods	Frequency	Percentage
1	ATMA	45	37 5
2	LEADS activities	38	31 67
3	Crop Health Management scheme	25	20 83
4	ATMA PLUS activities in Kannur district	24	20 00
5	Trainings and workshops by Department of Agriculture	20	16 67
6	Seed farm Payyannur area	22	18 33
7	Agro service centers	20	16 67
8	Farmers clubs implemented by other banks	6	5 00

Innovations by NGOs and farmers clubs formed by different banks were perceived as least effective Innovations in Technology Dissemination (ITD) methods implemented by different agricultural institutions in Kannur district

4 6 CORRELATION BETWEEN EXTENT OF AWARENESS OF FARMERS ON INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS IMPLEMENTED BY KANNUR KVK AND OTHER AGRICULTURAL INSTITUTIONS WITH INDEPENDENT VARIABLES

Correlation analysis was done to assess the relationship of characteristics of respondents with the extent of awareness of farmers on Innovations in Technology Dissemination (ITD) methods and perception of farmers on ITD methods The correlation coefficients were worked out and the significance was tested by comparing with the table values

4.6.1 Correlation between Independent Variables and Extent of Awareness of Farmers on ITD Methods Implemented by Kannur KVK

Correlation analysis of extent of awareness of farmers on ITD methods implemented by Kannur KVK with independent variables was done and it is shown in the following table 23

Extent of awareness of farmers on ITD methods implemented by Kannur KVK is positively correlated with mass media exposure, extension agency contact, extension participation, innovation proneness and acceptance of innovation at 1 per cent significance level and number of trainings, social participation, economic motivation, participation efficiency, group interaction and need satisfaction at 5 per cent significance level

From table 23 it can be inferred that increase in the exposure to various mass media leads to increase in awareness of ITD methods implemented by Kannur KVK As extension agency contact of farmers increases, extension participation, economic motivation, innovation proneness and acceptance of innovation were also increase which increases the extent of awareness of farmers on ITD methods implemented by KVK

It was observed from the table that when the group variables like social participation, participation efficiency, group interaction and need satisfaction increases, extent of awareness of farmers on ITD methods also increase because when the farmers interact with other progressive farmers and extension personals, they will be more aware of different ITD methods implemented by KVK This is represented in figure 22

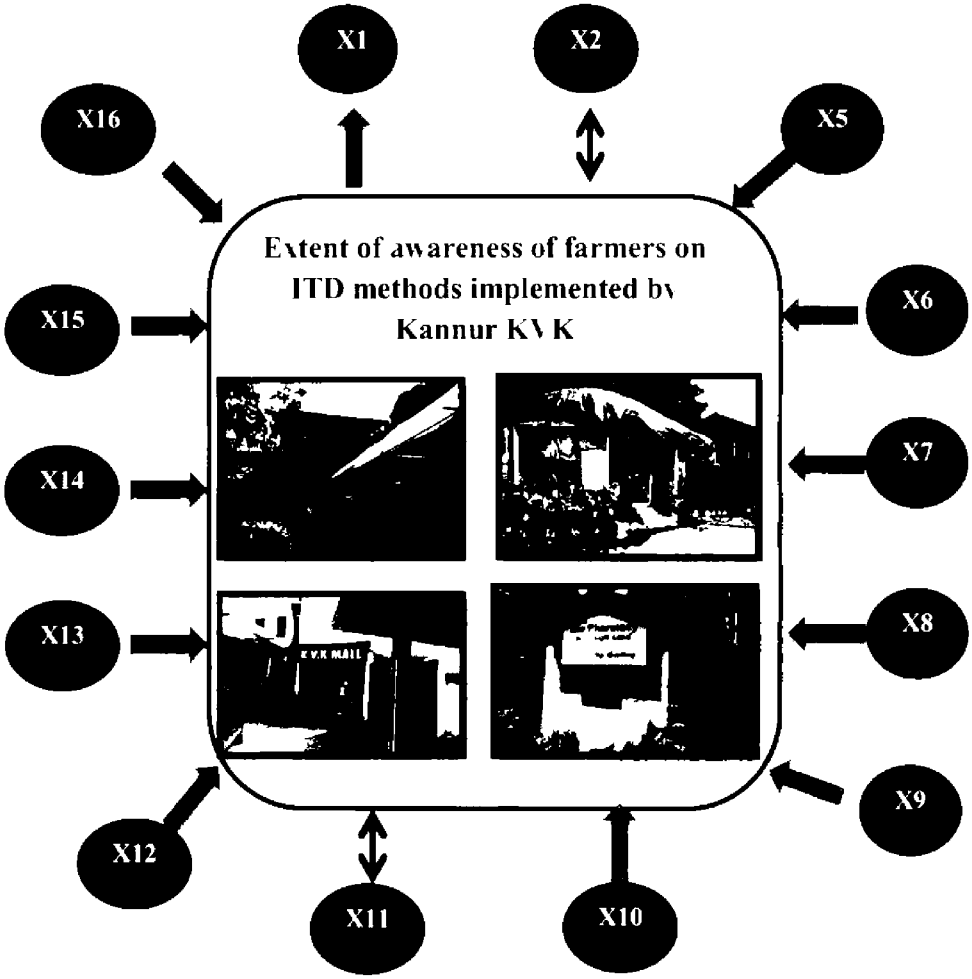
Table 23 Correlation between independent variables and extent of awareness of farmers on ITD methods implemented by Kannur KVK

Sl. No.	Independent variables	Correlation coefficient 'r' value
1	Age	-0 325*
2	No of Trainings	0 223*
3	Mass media exposure	0 370**
4	Extension agency contact	0 577**
5	Extension participation	0 433**
6	Social participation	0 195*
7	Decision making ability	0 018 NS
8	Economic motivation	0 230*
9	Innovation proneness	0 418**
10	Acceptance of innovation	0 243**
11	Participation efficiency	0 200*
12	Group interaction	0 183*
13	Need satisfaction	0 187*

"*" Significant at 5per cent level, "**" Significant at 1per cent level, Not significant "NS"

4.6.2 Correlation between Independent Variables and Extent of Awareness of Farmers on ITD Methods Implemented by Other Agricultural Institutions in Kannur District.

Relationship between extent of awareness of farmers on ITD methods implemented by different agricultural institutions in Kannur district with the independent variables was analysed using correlation and correlation coefficient was worked out The result is shown in table 24



X1	Age	X9	Social participation	X15	Group interaction
X2	- Educational status	X10	Economic motivation	X16	Need satisfaction
X5	No of Trainings	X11	Decision making ability		
X6	Mass media exposure	X12	Innovation proneness		
X7	Extension agency contact	X13	Acceptance of innovation		
X8	Extension participation	X14	Participation efficiency		

Positive significant **Negative significant** **Non significant**

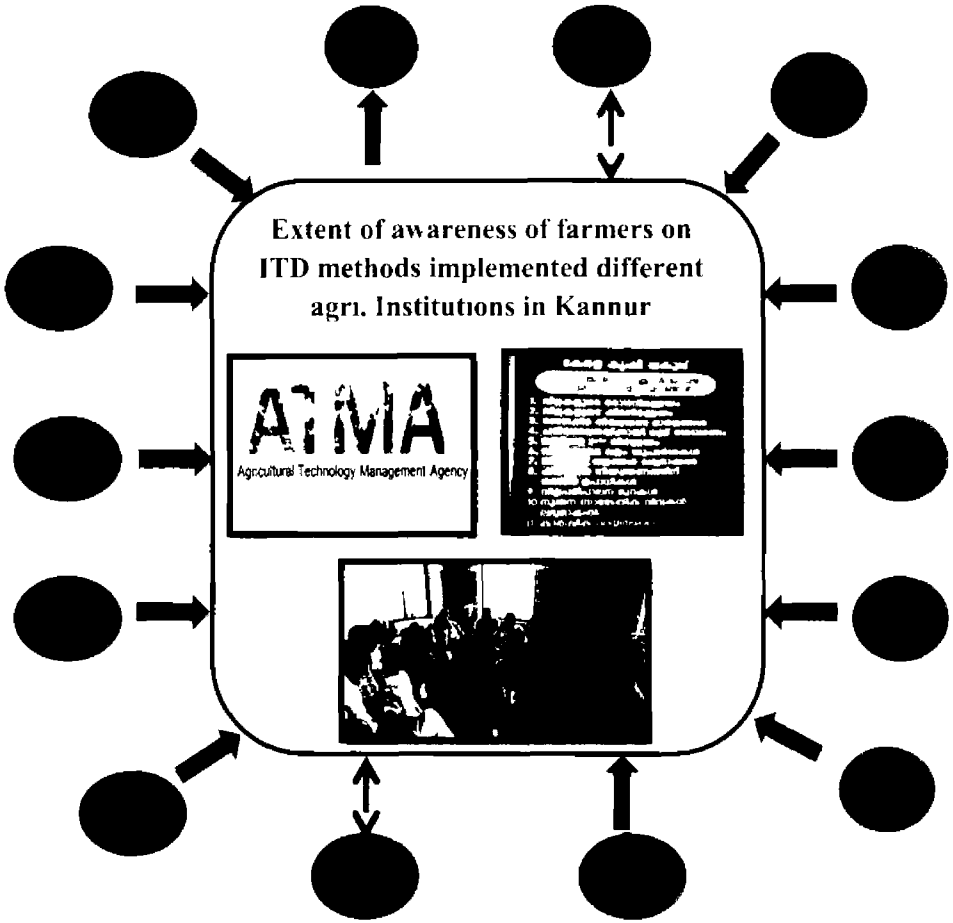
Fig 22 Empirical relationship between extent of awareness of farmers on ITD methods implemented by Kannur KVK and independent variables

Table 24 Correlation between independent variables and extent of awareness of farmers on ITD methods implemented by other agricultural institutions in Kannur district

Sl. No.	Independent variables	Correlation coefficient 'r' value
1	Age	-0 264**
2	No of trainings	0 290**
3	Mass media exposure	0 428**
4	Extension agency contact	0 664**
5	Extension participation	0 515**
6	Social participation	0 288**
7	Decision making ability	0 125 NS
8	Economic motivation	0 332**
9	Innovation proneness	0 382**
10	Acceptance of innovation	0 312**
11	Participation efficiency	0 241**
12	Group interaction	0 241**
13	Need satisfaction	0 181*

"*" Significant at 5 per cent level, "**" Significant at 1 per cent level, "NS" Not significant

From table 24 it can be observed that extent of awareness of farmers on ITD methods implemented by different agricultural institutions is positively correlated with number of trainings attended, mass media exposure, extension agency contact, extension participation, social participation, economic motivation, innovation proneness, acceptance of innovation, participation efficiency and group interaction at 1 per cent level and need satisfaction at 5 per cent level (Fig 23) When the farmers attend different training programmes, extension activities



X1	Age	X9	Social participation	X15	Group interaction
X2	Educational status	X10	Economic motivation	X16	Need satisfaction
X5	No of Trainings	X11	Decision making ability		
X6	Mass media exposure	X12	Innovation proneness		
X7	Extension agency contact	X13	Acceptance of innovation		
X8	Extension participation	X14	Participation efficiency		

Positive significant **Negative Significant** **Non significant**

Fig 23 Empirical relationship between extent of awareness of farmers on ITD methods implemented by different agri Institutions and independent variables

and group activities they will get an idea on various new practices and methods and it will leads to increase in awareness of farmers on ITD methods implemented by different agricultural institutions in Kannur district

4 7 TEST FOR DEPENDENCE OR INDEPENDENCE

Chi square analysis was done to find out the relationship between the extent of awareness of farmers on ITD methods implemented by different agricultural institutions in Kannur district and educational status From the analysis it was found that the calculated χ^2 values ($\chi_1^2 = 0\ 68$, $\chi_2^2 = 0\ 79$) for extent of awareness of farmers on ITD methods implemented by Kannur KVK (χ_1^2) and other agricultural institutions in Kannur district (χ_2^2) with educational status were less than the table value (5 991) So it can be inferred that there is no dependence among extent of awareness of farmers on ITD methods and educational status

4 8 CORRELATION BETWEEN PERCEPTION OF FARMERS ON ITD METHODS WITH THE INDEPENDENT VARIABLES

Perception of farmers on ITD methods is positively correlated to education, number of trainings attended, mass media exposure, extension agency contact, extension participation, social participation, decision making ability, economic motivation, innovation proneness, acceptance of innovation, participation efficiency, group interaction and need satisfaction at 1 per cent level

Table 25 Correlation between perception of farmers on ITD methods with the independent variables

Sl. No.	Independent variables	Correlation coefficient 'r' value
1	Age	-0 231*
2	Educational status	0 288**
3	No of Trainings	0 427**
4	Mass media exposure	0 520**
5	Extension agency contact	0 687**

Table 25 continued

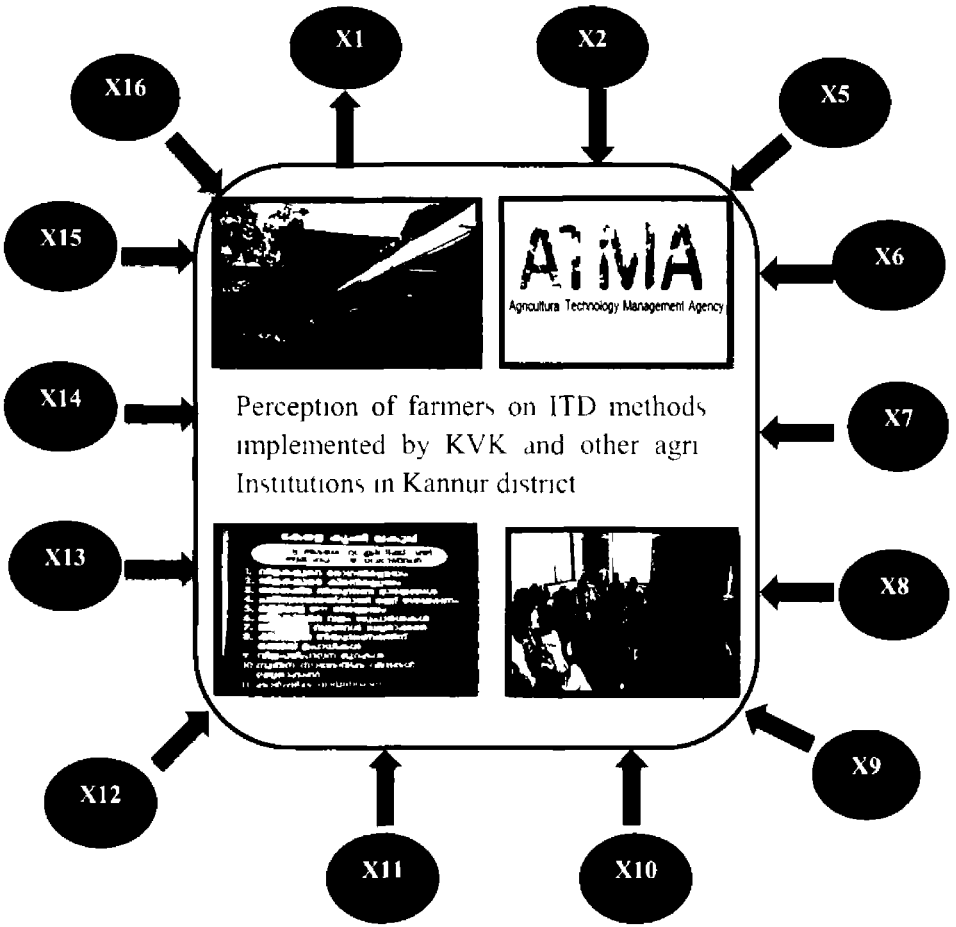
Sl. No.	Independent variables	Correlation coefficient 'r' value
6	Extension participation	0 614**
7	Social participation	0 443**
8	Decision making ability	0 335**
9	Economic motivation	0 454**
10	Innovation proneness	0 696**
11	Acceptance of innovation	0 688**
12	Participation efficiency	0 421**
13	Group interaction	0 449**
14	Need satisfaction	0 386**

"*" Significant at 5per cent level, "**" Significant at 1per cent level, "NS" Not significant

From table 25 it can be observed that exposure to various mass media and contact with different extension agencies increases the extension participation and that increases the innovation proneness and acceptance of innovation which in turn increases the perception of farmers on ITD methods When the participation of farmers in group activities and interaction among the group members increases, perception of farmers on ITD methods also increases This is represented in figure 24

4 9 CONSTRAINTS OF THE EXISTING TECHNOLOGY DISSEMINATION METHODS AS PERCEIVED BY FARMERS

Garrett's ranking technique was used to find out the most significant constraints which influence the respondents As per this method, respondents have been asked to assign the rank for all constraints and the outcome of such ranking has been converted into score value with the help of the following formula



X1	Age	X9	Social participation	X15	Group interaction
X2	Educational status	X10	Economic motivation	X16	Need satisfaction
X5	No of Trainings	X11	Decision making ability		
X6	Mass media exposure	X12	Innovation proneness		
X7	Extension agency contact	X13	Acceptance of innovation		
X8	Extension participation	X14	Participation efficiency		

↓ Positive significant ↑ Negative significant ↕ Non significant

Fig 24 Empirical relationship between perception of farmers on ITD methods and independent variables

$$\text{Percentage position} = \frac{100\,(R_{ij} - 0.5)}{N_{ij}}$$

Where R_{ij} = Rank given for the i^{th} variable by j^{th} respondents and N_{ij} = Number of variable ranked by j^{th} respondents With the help of Garrett's table, the per cent position estimated is converted into scores Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated The factors having highest mean value is considered to be the most severe constraints

Constraints of the existing technology dissemination methods, its mean score and rank were listed in table 26

From table 26, it can be inferred that 'lack of awareness about the latest ICT methods for technology dissemination' is having highest mean score (72 17) and it is considered as the most severe constraint by the farmers followed by 'trainings are not effective to meet farmers needs' (71 5), 'training programmes for farmers and extension personnel are less in numbers' (69 77), 'unavailability of technologies on time'(64 54),'irregularity in conducting farmer group meetings' (57 85) etc

Majority of the farmers were not have an idea about the latest ICT based methods for agricultural technology dissemination, because they never exposed to ICT based training programmes and classes Department of agriculture, ATMA, KVK, and other agricultural institutions were conducting different training programmes to farmers, but the problem is most of the trainings were not much effective and it will leads to unavailability of proper technologies on time

Table 26 Constraints of the existing technology dissemination methods as perceived by farmers

Sl. No.	Constraints	Mean Score	Rank
1	Lack of awareness about the latest ICT methods for technology dissemination	72 17	1
2	Trainings are not effective to meet farmers needs	71 5	2
3	Training programmes for farmers and extension personnel are less in numbers	69 77	3
4	Unavailability of technologies on time	64 54	4
5	Irregularity in conducting farmer group meetings	57 85	5
6	Farmers were not aware about the conducting of training programmes	55 18	6
7	Irregularity in conducting Pre MTA &MTA	48 93	7
8	Less participation of farmers on group meetings & trainings	48 55	8
9	Less contact with other farmers and extension personnel	43 7	9
10	No time to attend the meetings	40 72	10
11	Highly technical advices of research/extension workers	40 53	11
12	Less suitability of innovations in the locality	40 13	12
13	Less support from family	34 24	13
14	Lack of knowledge of contact farmers	31 98	14
15	Negative mentality in accepting new things	30 52	15

It was observed from table that 'highly technical advices of research/extension workers', 'less suitability of innovations in the locality', 'less support from family' 'lack of knowledge of contact farmers' ,'negative mentality in accepting new things' were the least important constraints as perceived by the respondents

4 10 SUGGESTIONS GIVEN BY THE RESPONDENTS

The most important suggestions specified by the farmers were training programmes conducted by different agricultural institutions should be effective to meet farmer's needs and all the technology dissemination programmes should reach at the lower level Other suggestions given by the farmers for the improvement of technology dissemination methods include,

- Start training centres at each panchayats
- It is necessary to provide training programmes and classes to farmers on ICT tools in agricultural technology dissemination.
- Ensure farmers participation in decision making process
- Ensure participation of farmers in farmers group meetings
- Provide special training programmes to youth
- Select appropriate technology dissemination method based on the socio economic characteristics of the farmers
- Include different policies and strategies related to agriculture in the technology dissemination

4 11 STRATEGIES FOR AN IDEAL SYSTEM FOR TECHNOLOGY DISSEMINATION

To improve or modify the existing technology dissemination methods, there should be introduction of an ideal system called Participatory Client Oriented Approach (PCOA) that include participatory decision making, inclusion of farmer led technologies, youth oriented programmes, effective trainings etc

- Ensure farmers participation in the decision making related to agriculture, which will help to initiate farmer oriented technology dissemination system
- Organise different training programmes on variety of topics and it must be effective to meet farmers needs and goals
- Provide interesting trainings and demonstrations especially for youth to attract them to agriculture
- Incorporate farmers own innovations and ideas in the technology generation and dissemination and that will leads to the formation of a specific ITD system
- Ensure the combination of conventional technology dissemination methods and latest ICT based methods
- ICAR should initiate the implementation of one more KVK in each district of Kerala to cover most of the farmers in the district So farmers can completely involve in the different activities of KVK.

The representation of the ideal system for technology dissemination is shown in figure 25

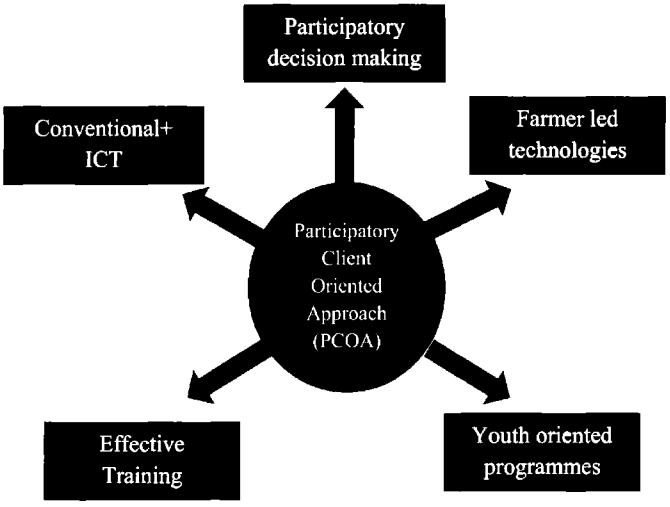


Fig. 25. Strategies for an ideal system for technology dissemination

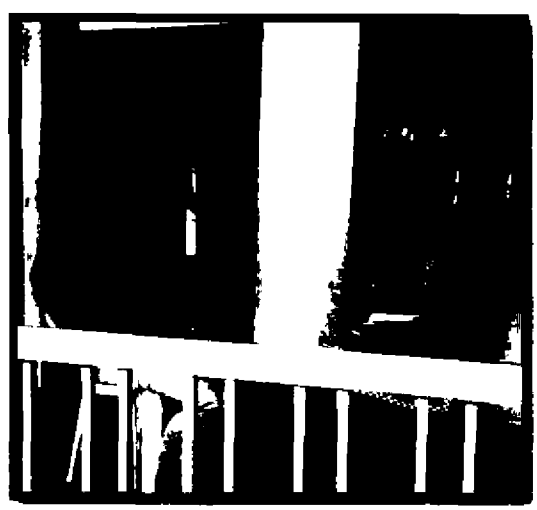


Plate 1 Interaction with Farmers

SUMMARY

5. SUMMARY

Majority of farmers in India are small and marginal farmers with less land hold and poor in idea about new technologies So extension system has been introducing new policies and reforms to modify and improve the way of, assessment refinement and dissemination of new technologies The concept of Innovations in Technology Dissemination (ITD) was initiated as a component of National Agriculture Technology Project (NATP) and it is primarily concerned with transmitting information and knowledge of important agricultural technology from research to farmer ITD holds key to rapid development and transformation of rural society and it is greatly influenced by the linkage between the research subsystem, extension subsystem and client subsystem Now, the pluralistic system was emerged, that involve different public, private and NGOs in technology dissemination process Pluralistic system is more broad based and served as knowledge or information agents that initiate and facilitate mutually meaningful and equitable knowledge based transactions among agricultural researchers, trainers and primary producers KVKs play a big role in technology transfer by developing different ITD methods, demonstrating proven technologies, conducting On Farm Trials (OFTs) and providing different training programmes to farmers

The present study entitled "Innovations in Technology Dissemination (ITD) in Kannur district" attempts to document and analyse the various ITD methods implemented by different agricultural institutions in Kannur district with special reference to Kannur KVK It also aimed to study the constraints of the existing ITD methods and it helps to suggest specific strategies for future

The study was conducted in Kannur district and it was purposively selected because, Kannur KVK was implemented a variety of innovations for technology dissemination which include Compact Area Group Approach (CAGA), farmers science museum, farmers science congress, NABARD- KVK farmers club, agro- biopharmacy, mussel farmers club, KVK mall, creative extension activities etc and Kannur district is selected as LEAD district along

with Kollam, Wayanad and Palakkad Taliparamba, Kalliasseri, Payyanur and Irikkur panchayats were selected from the eleven block panchayats present in Kannur ,based on the agro ecological zones of the district From these four block panchayats four grama panchayats, Kadannappalli-Panapuzha Panchayat from Taliparamba, Ezhome Panchayat from Kalliasseri, Kankol- Alapadamba Panchayat from Payyanur and Mayyil Panchayat from Irikkur were selected after consulting with each block panchayat office A list of progressive farmers were collected from respective Krishibhavans and thirty respondents each from four panchayats were selected by simple random sampling

Ex post facto research was used for the study Extent of awareness of farmers on ITD methods and perception of farmers on ITD methods were the two dependent variables and sixteen independent variables were selected after judges rating A well-structured interview schedule was used for collecting the data from the respondents The data were tabulated and inferences were drawn after appropriate statistical analysis

5 1 SALIENT FINDING OF THE STUDY

1 Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK include Compact Area Group Approach (CAGA), farmers science museum, farmers science congress, NABARD- KVK farmers club, agro- biopharmacy, mussel farmers club, KVK mall and creative extension activities

2 ATMA (Agricultural Technology Management Agency), LEADS (Lead farmer centered Extension Advisory and Delivery Services), ATMA PLUS, training programmes by Department of Agriculture, crop health management scheme, Innovations by Non Governmental Organisations (NGOs), farmers clubs formed by different banks were the ITD methods implemented by other agricultural institutions in Kannur district

3 More than half of the respondents (64 16 per cent) belonged to old age category followed by middle age category (33 33 per cent) and less than five percent were in young age group

4 Majority of the respondents were educated up to High school level (43 33 per cent) followed by collegiate level (30per cent) Middle school (20 83 per cent) and none of the respondents were observed under illiterate and can read and write category

5 Majority of the farmers (56 66 per cent) are having farming as a sole occupation and 30 per cent of the farmers are doing other services with farming activities 7 5 per cent of the farmers working as businessmen and 5 83 percent of the farmers are agricultural labourers

6 Most of the respondents (75 per cent) had attended three or more than three training programmes and 13 33 per cent of the farmers never attended any training programmes

7 In the case of mass media exposure, majority of the respondents (85 83 per cent) were watching TV regularly, and equal distribution of respondents (33 33 per cent) in the case of hearing radio regularly, occasionally and never 100 per cent of the respondents in each panchayat reading the newspaper regularly to get the information related to agriculture

8 Majority of the farmers (83 33 per cent) were never exposed to internet and ICT facilities, and they were not aware about the latest agricultural websites, portals, expert systems etc

9 Most of the farmers have regular contact with agricultural officers (75 83 per cent), agricultural assistants (76 67 per cent) and bank officials (64 17 per cent) But more than half of the respondents does not have any contact with agricultural scientists, Block Technology Manager (BTM) and SMS of KVK Similarly, majority of them had no contact with Assistant Director of Agriculture (77 5 per cent), Private extension agencies (95per cent) and NGOs (94 16per cent)

10 In the case of extension participation, majority of the farmers are occasionally involved in campaigns (53 33 per cent), seminars

(56 67 per cent), Fair/ melas (56 67 per cent) exhibitions (55 per cent) and exposure visits (45 83 per cent) and most of the farmers never attended extension activities like study tours (48 33 per cent), group discussions (46 67 per cent) and demonstrations (54 17 per cent)

11 Majority of the farmers (57 5 per cent) had membership in any of the farmer organization and 36 67 per cent of the farmers were office bearers in the organization About 5 83 per cent of farmers do not have any membership in farmer organisations

12 Majority (85 per cent) of the respondents had medium level of economic motivation 10 percent of the farmers had low and 5 per cent of the farmers had high level of economic motivation

13 69 17 percent of the farmers had medium decision making ability followed by 21 67per cent with low and 9 17 per cent with high decision making ability related to the group activities

14 Majority of the farmers (65 83 per cent) had medium level of innovation proneness and 21 67 per cent with low and 12 5 per cent with high innovation proneness respectively

15 More than half of the farmers (54 17 per cent) were accepting the innovation in medium level and 25 per cent with low and 20 83 per cent with high acceptance

16 More than half of the respondents (56 67 per cent) had medium efficiency in participating the group activities and 24 17 per cent with low and 19 17 per cent with high participation efficiency respectively

17 Majority of the farmers (67 5 per cent) had medium level of group interaction followed by low (25 per cent) and high level (7 5 per cent) of interaction among farmers within the groups

18 Majority of the respondents (69 15 per cent) had medium level of need satisfaction followed by low level (20 83 per cent) Only 10 percent of the farmers are fully satisfied with the group activities and existing Innovations in Technology Dissemination methods that helps them to attain their needs

19 Nearly half of the respondents were aware of the ITD methods like farmers science museum (48 33 per cent), KVK mall (41 67 per cent) and brochures and publications released by KVK (54 17 per cent) It may be seen that 22 5 per cent and 26 67 per cent of the farmers were aware about release of video and multimedia CDs and agro- biopharmacy respectively

20 More than 90 per cent of the respondents were not aware the methods like Compact Area Group Approach (CAGA), farmers science congress, NABARD-KVK farmers club, SBI- KVK loan window, formation of mussel farmers club, participatory production of planting materials and vegetable seeds, formation of farmer producer organisations and farmers field school

21 Majority of the farmers were aware of the ITD methods like training programmes by ATMA (68 33 per cent), ATMA newsletter (58 33 per cent), LEADS activities (53 33 per cent) and trainings and workshops by Department of Agriculture (66 67 per cent)

22 Majority of the farmers lack awareness about the innovations by NGOs and farmers clubs formed by different banks

23 Majority of the farmers reported medium level of perception (62 5 per cent) followed by low level (27 5 per cent) Only 10per cent of the respondents were having high perception on ITD methods implemented by different agricultural institutions in Kannur district

24 28 33 percent of the farmers were expressed as farmers science museum is most effective than all other ITD methods implemented by Kannur KVK and 24 17 percent of the farmers were opined as KVK mall is the most effective method

25 Majority of the farmers (37 5 per cent) were perceived as ATMA activities are more effective followed by LEADS (31 67 per cent), crop health management scheme (20 83 per cent) and ATMA PLUS activities (20 per cent) in Kannur district

26 Extent of awareness of farmers on ITD methods implemented by Kannur KVK is positively correlated with, educational status, mass media exposure, extension agency contact, extension participation, economic motivation,

innovation proneness and acceptance of innovation at 1per cent significance level and social participation, participation efficiency, group interaction and need satisfaction at 5per cent significance level

27 Extent of awareness of farmers on ITD methods implemented by different agricultural institutions is positively correlated with trainings attended, mass media exposure, extension agency contact, extension participation, social participation, economic motivation, innovation proneness, acceptance of innovation, participation efficiency and group interaction at 1per cent level and educational status and need satisfaction at 5per cent level

28 Perception of farmers on ITD methods is positively correlated to education, Trainings attended, mass media exposure, extension agency contact, extension participation, social participation, decision making ability, economic motivation, innovation proneness, acceptance of innovation, participation efficiency, group interaction and need satisfaction at 1per cent level

29 Lack of awareness about the latest ICT methods for technology dissemination' is having highest mean score (72 17) and it is considered as the most severe constraint by the farmers followed by 'trainings are not effective to meet farmers needs' (71 5), 'training programmes for farmers and extension personnel are less in numbers' (69 77), 'unavailability of technologies on time' (64 54), 'irregularity in conducting farmer group meetings' (57 85) etc

5 2 SUGGESTIONS GIVEN BY THE RESPONDENTS

- Training progrmmes conducted by different agricultural institutions should be effective to meet farmer's needs and all the technology dissemination programmes should reach at the lower level
- Start training centres at each panchayats
- It is necessary to provide training programmes and classes to farmers on ICT tools in agricultural technology dissemination
- Ensure farmers participation in decision making process

- Ensure participation of farmers in farmers group meetings
- Provide special training programmes to youth.
- Select appropriate Technology dissemination method based on the socio economic characteristics of the farmers
- Include different policies and strategies related to agriculture in the technology dissemination

5 3 STRATEGIES FOR AN IDEAL SYSTEM FOR TECHNOLOGY DISSEMINATION

- Ensure farmers participation in the decision making related to agriculture, which will help to initiate farmer oriented technology dissemination system
- Organise different training programmes on variety of topics and it must be effective to meet farmers needs and goals
- Provide interesting trainings and demonstrations especially for youth to attract them to agriculture
- Incorporate farmers own innovations and ideas in the technology generation and dissemination and that will leads to the formation of a specific ITD system
- Ensure the combination of conventional technology dissemination methods and latest ICT based methods
- ICAR should initiate the implementation of one more KVK in each district of Kerala to cover most of the farmers in the district So farmers can completely involve in the different activities of KVK

REFERENCES

6. REFERENCES

Abbas, M , Sheikh, A D , Muhammad, S , and Ashfaq, M 2003 Role of print media in the dissemination of recommended sugarcane production technologies among farmers in the central Punjab- Pakistan *Int J Agri Biol* 5 26–29

Afroz, S , Singh, R , Burman, R R , Sangeetha, V , and Prasad, R 2014 An Innovative Participatory Video for Agricultural Information Dissemination A case of Digital Green *J Community Mobilization Sustain Dev* 9(1) 75-79

Anandamanikandan, M D 2003 Content analysis and Audience Research on farm and home programmes of Doordarshan Kendra, Pondichery M Sc (Ag) thesis, Tamil Nadu Agricultural University, Coimbatore, 120p

Anandaraja, N 2002 Developing farmer friendly interactive multimedia compact disc and testing its effectiveness in transfer of farm technology Ph D thesis, Tamil Nadu Agricultural University, Coimbatore, 112p

Ani, A O , Undiandeye, U C , and Anogie, D A 1997 The role of mass media in agricultural information in Nigeria *Educational forum* 3(1) 80-85

Anitha, B 2004 A study on entrepreneurial behaviour and market participation of farm women in Bangalore rural district of Karnataka M Sc (Ag) thesis, University of Agricultural Sciences, Bangalore, 112p

Anupama, S 2014 Content development for an agricultural expert system on organic vegetable cultivation M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 134p

Ariyo, O C , Ariyo, M O , Okelola, O E , Aasa, O S , Awotide, O G , Aaron, A J , and Oni, O B 2013 Assessment of the role of mass media in the dissemination of agricultural technologies among farmers in Kaduna north local government area of Kaduna state, Nigeria *J Biol Agric Health* 3(6) 1-28

Balakrishnan, R , Wason, M , Padaria, R N , Singh, P , and Varghese, E 2013 Attitude and perception of farmers towards e-learning *Indian J Ext Educ* 49(3&4) 50-53

Bales, R F 1950 *Interaction Process Analysis A Method for the Study of Small Groups* Mass Addison- Wesley, Cambridge 33p

Bhaskaran, C and Sushama, N P 1994 Privatisation of agricultural extension perspectives and prospects In Hansra, B S , Suraj, P T , Ananth, P N , and Gowda, M C (eds), *Agricultural Extension Systems Issues and Approaches* Concept publishing company, New Delhi, pp 37-43

Bhavya, B 2008 Cause- consequence analysis of indebtedness among farmers in Pulpally panchayats of Wayanad district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 62p

Binkadakatti, J S 2008 Impact of KrishiVigyan Kendra Trainings (KVK) on use of Bio-Fertilizers and Bio-Pesticides by Tur farmers in Gulbarga District M Sc (Ag) thesis, University of Agriculture Sciences, Dharwad, 145p

Birner, R , Davis, K , Pender, J , Nkonya, E , Anandayasekeram, P , Ekboir, J , Mbabu, A , Spielman, D J , Horna, D , Benin, S , and Cohen, M 2009 Best practice to best fit A framework for analyzing pluralistic agricultural advisory services world wide *J Agric Educ Ext* 15(4) 341–355

Burman, R R , Dubey, S K , Sharma, J P , Vijayaragavan, K , Sangeetha, V , and Singh, I 2013 Information dynamics for designing cyber extension model for agricultural development *J Community Mobilization Sustain Dev* 8(2) 182-185

Burman, R R , Sarkar, S , Lenin, V , Dubey, S K , and Sharma, J P 2015 *Post Masters as Community Based Extension Agents* 6p [on-line] Available http //www aesa-gfras net/goodpractice aspx?id=42&title=Postmasters% 20as%20 Community-Based% 20Extension%20Agents pdf [20 Jan 2016]

Census report 2011 Government of India

Chouhan, M and Kansal, S K 2014 Awareness level and extent of utilization of different mass media sources by dairy farmers of Punjab *Indian Res J Ext Edu* 14(3) 134-136

Chouhan, N , Henry, C , and Solanki, D K 2013 Constraints faced by the farmers in getting agriculture technology information under ATMA in western region of Rajasthan *Indian J Ext Educ* 49(3&4) 102-106

Dar, M A , Safeer, A , Jasvinder, K , Ram, D , Shafiqul, I Tentray, A M 2014 Agricultural Technology Information Centre (ATIC) Farmers perception *Indian Soc Ext Educ* 50(2) 77-79

Daudu, S , Chado, S S , and Igbashal, A A 2009 Agricultural information sources utilized by farmers in Benue state, Nigeria *PAT* 5(1) 39-48

Dhakal, B L and Chayal, K 2010 Farmer's experience with ICTs on transfer of technology in changing agri- rural environment *Indian Res J Ext Educ* 10(3) 22-24

Ejembi, E P , Omoregbee, F E , and Ejembi, S A 2006 Farmers' assessment of the training and visit extension system in central Nigeria evidence from Barkin Ladi, Plateau state *J Soc Sci* 12(3) 207-212

Etwire, P M , Dogbe, W , Wiredu, A N , Martey, E , Etwire, E , Owusu, R K , and Wahaga, E 2013 Factors influencing farmer's participation in agricultural projects the case of the agricultural value chain mentorship project in the northern region of Ghana *J Econ Sustain Dev* 4(10) 35-39

Fayas, M 2003 Viability of self-help groups in vegetable and fruit promotion council Keralam – a multidimensional analysis M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 111p

Gowda, M J C , Dixit, S , Burman, R R and Ananth, P N 2014 *Extension Research and Technology Development*

Gurubalan, M 2007 Entrepreneurial Behaviour of coconut oil- based unit owners M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 89p

Hall, A J 2010 Institutional developments in Indian agricultural R&D systems The emerging patterns of public and private sector activity *J Sci Technol Dev* 16(3) 51-56

Hanjabam, S 2013 Analysis of constraints and strategies for scaling up of precision farming in Kerala M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 127p

Hassan, S N 2008 Effective Agricultural Information Delivery System- An action Research among farmers Ph D thesis, Kerala Agricultural University, Thrissur, 160p

Helen, K S , Singh, P , and Vijayaragvan, K 2010 Constraints of linkages among university research-extension and farmers in India and Ethiopia A critical analysis *Indian J Ext Educ* 46(3 & 4) 85-89

IFPRI (International Food Policy Research Institute) 2009 *Knowledge and Innovation for Agricultural Development* [On-line] Available http //www ifpri org/pubs/bp /bp0011 asp [28 Dec 2015]

Jaiswal, N K , Singh, N N , and Singh, B N 1971 A study of interactional association of selected factors with innovativeness in farming *Indian J Extn Edu* 7 110-116

Jayalekshmi, G 2001 Empowerment of rural women through self help groups- an action research Ph D thesis, Kerala Agricultural University, Thrissur, 144p

Jayawardhana, J K J P 2007 Organic agricultural practices in coconut based homesteads in Thiruvananthapuram district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 99p

Kadian, S K and Kumar, G S 2006 Effectiveness of a video compact disc (VCD) on diary calf management practices *IJES* 1(1) 57-62

Kamalakannan, T 2001 Content analysis of selected mass media in dissemination of farm technology – an analysis M Sc (Ag) thesis, Tamil Nadu Agricultural University, Coimbatore, 142p

Kamarudeen, M. 1981 A study on the impact of national demonstration on paddy cultivation in Thrissur district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 60p

Kerlinger, F N 1978 *Foundations of Behavioural Research* Surjeet Publication, New Delhi, 741p

Khushk, A M and Memon, A 2004 *Impact of Devolution on Farm Extension System* P III Daily Dawn November 1–7, 2004

Kothari, C R 1985 *Research Methodology Methods and Techniques* New Age International Private Limited, New Delhi, 150p

Kumar, S , Pal, S , and Mittal, R 2011 Role of R and D in managing agricultural crisis In Barah, B C and Smitha Siroshi (eds), *Agrarian Distress in India - Problems and Remedies* Concept Publishing Company Pvt Ltd , New Delhi

Kumar, V , Prajapati, R S , Ghintala, A , and Singh, K 2013 Source and Channels of Agriculture Information used by the Beneficiary Farmers of NAIP-III *Gujarat J Ext Educ* 24 35-38

Kumba, F F 2003 Farmer participation in agricultural research and extension service in Namibia *J Int Agric Ext Educ* 10(3) 47-55

Lakshmi, S 2000 Techno- Socio- Economic Consequences of National Watershed Development Project for Rained Areas in Thiruvananthapuram District M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 132p

Larson, E C 1989 Team work what must go right- what must go wrong, evidence from developing countries *World Dev* 26 1-23

Lundvall 1992 *National Systems of Innovation Towards a theory of Innovation and Interactive Learning* Printer Publications, London, 123p

Lwoga, E T 2010 Bridging the agricultural knowledge and information divide The case of selected telecenter and rural radio in Tanzania *EJISDC* 43 1-14

Mali, M E , Lohar, B E , Shinde, S B , and Sawant, G K 2003 Information technology as a new scenario in extension for information needs of farmers [abstract] In *Abstracts, national seminar on responding to changes and challenges New roles of Agricultural Extension*, 7-9 February, 2003, Nagpur College of Agriculture, Nagpur, 56p

Mandal, B K and De, D 2013 Factors effecting communication competency of farmers in Banka district of Bihar *Indian J Ext Educ* 49(3&4) 46-49

Manoj, A 2013 Impact of farmers' field schools on farmer's knowledge, productivity and environment Ph D thesis, Indian Agricultural Research Institute, New Delhi, 150p

Manoj, S 2000 Techno-socio-economic assessment of farmers' practices in rice cultivation in Thiruvananthapuram district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 102p

Marks, D F and Sykes, C M 2003 Synthesising evidence Systema c reviews, meta-analyses and preference analyses In *Research Methods for Clinical and Health Psychology* Sage Publications Inc , London, 250p

Meera, M J 2001 Performance of Samata self help groups in the empowerment of rural women in Ulloor panchayat M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 100p

Michailidis, and Anastasios 2007 Adoption of internet in agriculture *J Ext System* 1 1-13

Mirani, Z 2013 Perception of farmers and extension and research personnel regarding use and effectiveness of sources of agricultural information in sindh province of Pakistan *J Community Informatics* 9(1) 1-5

Mir, M A , Baqual, M F , Kamili, A S , Mir, S A , Saleem, S , and Verma, G R 2015 Impact of mass media exposure and innovation proneness on cocoon production *J Exp Biol Agric Sci* 3(5) 58-63

Mishra, S , Sigh, S R K , Singh, D K , Chouhan, S , and Kumari, N 2014 Decision making ability of chilli growers of Chhindwara district of Madhya Pradesh *Indian J Ext Educ* 50(1&2) 53-55

Muller, S 1997 An analysis of the characteristics of women's groups and theirrole in rural development, M Sc (Ag) thesis, Kerala Agricultural University Thrissur, 110p

Narayanaswamy, N , Boraian, M P , Manivel, S , Saji, M P , Sebastian, P , Dhavamani, R , Lalan, A , Geethanjali , and Pandian, M 2010 A study on the performance of NREGS in Kerala, Available http //www crd kerala gov in/2010/sept/consolidation pdf 175p

Nazari, M R and Hassan, M S B H 2011 The role of television in the enhancement of farmers' agricultural knowledge *Afric J Agric Res* 6(4) 931-936

Nelson, T L 2008 *Perception Question In Encyclopaedia of Survey Research Methods* Sage Publications, USA, pp 580-581

OECD (Organization for Economic Cooperation and Development) 2005 *Oslo Manual Guidelines for Collecting and Interpreting Innovation Data* (3rd Ed) European Communities, France, 164p

Oladele, O I 2011 Effect of information and communication technology on agricultural information access among researchers, extension agents and farmers in South Western Nigeria *J Agric Food Inf* pp 167-176

Oladejo, J A , Olawuyi, S O , and Anjorin, T D 2011 Analysis of Women Participation in Agricultural Production in Egbedore Local Government Area of Osun State, Nigeria *Int J Agric Econ Rural Dev* 4(1) 1-11

Omotesho, K F , Ogunlade, I , and Ayinde, O E 2015 Analysis of Farmers' Perception of the Accountability of Agricultural Extension Services in Oyo State, Nigeria *Sarhad J Agric* 31(2) 94 100

Oommen, M V 2007 Mode of presentation and viewers preference of Agricultural programmes through various Channels of Television, M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 96p

Pandya, C D , Soni, A N , and Chauhan, N M 2013 Awareness among farmers about Krishi Vigyan Kendra - knowledge resource centre in Tapi district *Gujarat J Ext Educ* 24 114-119

Parimaladevi, S 2004 Effectiveness of agriclinics and agribusiness training programme In Kerala M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 120p

Parthasarathi and Govind, S 2002 Knowledge of trained and untrained farmers on IPM practices *J Ext Educ* 13 3293-3297

Peter, P 2014 Farmer- To- Farmer Extension in Kerala Agriculture A critical analysis of LEADS (Lead farmer centred Extension Advisory and Delivery

Sevice) Project in Kollam District M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 99p

Prathap, D P and Ponnusamy, K A 2006 Mass media and symbolic adoption behavior of rural women *Stud Media Inf Literacy Educ* 6(4) 1-6

Preethi, M S , Nataraju , and Lakshminarayan M T 2014 Development of a scale to measure perception of farm youth towards agriculture *Int J Extn Edu* 10 165-167

Priya, R D 2003 Micro credit and technology utilization in vegetable production by self help groups in Thiruvananthapuram district, M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 72p

Ponmani, M 1993 Rural women participation in the trainings offered by government and voluntary agencies M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 50p

Poole, N 2006 Innovation challenges, constraints and opportunities for the rural poor International Fund for Agricultural Development, UK, 63p

Rao, M 2000 A study on the communication techniques used by the agricultural assistants of KSDA in Dharwad district M Sc (Ag) thesis, University of Agricultural Sciences, Dharwad, 135p

Rao, P P and Reddy, G P 2007 Effectiveness of Rythumitra- An innovative farm telecast programme in Andhra Pradesh In Vasanthakumari, Philip Theodore and Nataraja (eds) *New Dimensions and Approaches in Extension Pluralism for Rural Development* Agro bios India, Jodhpur, India

Rathod, P K , Nikam, T R , Landge, S , and Hatey, A 2014 Farmers perception towards livestock health care service delivery by dairy cooperatives- study of Western Maharashtra *Karnataka J Agric Sci* 27(1) 95- 96

Reddy, N 2005 A study on knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district of Karnataka state M Sc (Ag) thesis, University of Agricultural Sciences, Raichur, Karnataka, 113p

Robert, F 2010 *The Oxford Handbook of Interdisciplinarity* Oxford University press, Newyork, 320p

Rogers, E M 2003 *Diffusion of Innovations* Free press, New York, 127p

Sadamate, V V 1978 *Globalisation of Indian Agriculture thoughts on Revamping Agricultural extension - Symposium* pp. 56 62

Sangeetha, S 2009 Study on factors influencing the adoption of precision farming technologies in tomato cultivation M Sc (Ag) thesis, Tamil Nadu Agricultural University, Coimbatore, 78p

Saravanan, R 2008 *Agricultural Extension-World Wide Innovations* New India Publishing Agency, New Delhi, 417p

Saravanan, R 2009 ICTs for Agricultural Extension in India Policy Implications for Developing Countries *Indian J Ext Educ* 27(3) 28-33

Sasankan, V R 2004 Production system typology and technology utilization pattern in cassava cultivation in Thiruvananthapuram district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 97p

Sasidharan, A 2015 Adoption of organic farming technologies in banana and vegetable crops in Kasargod district M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 121p

Senthilkumar, M 2003 Field testing of cyber extension techniques for transfer of farm technology- a feasibility study Ph D thesis, TNAU, Coimbatore 110p

Shaffril, H A M, Hassan, M S, and Samah, B A 2009 Level of agro-based website surfing among Malaysian agricultural entreprenuers A Case of Malaysia *J Agric Social Sci* 5 55-60

Shahzad, M, Islam, F, Umber, S, Khan, I A, Abdal A, and Raza, M A 2011 Role of agricultural publications in disseminating agricultural information among farming community of district Faisalabad *Pak J Agri Sci* 48(3) 221-224

Shankaraiah, N and Swamy, B K N 2012 Attitude of farmers and scientists towards dissemination of technologies through Mobile Message Service (MMS) *Trop Agric Res* 24(1) 31-41

Sharma, F L, Sharma, V P, and Manhas, J S 2008 Dairy farmer's awareness of communication sources and channels in Jammu and Kashmir *Indian J Soc Res* 49(2) 127-133

Singh, A K 2001 *Agricultural Extension Impact and Assessment* Agrobios, Jodhpur, 350p

Singh, A K, Singh, L, and Riyajuddeen 2008 Role of help line services in technology dissemination *Indian Res J Ext Educ* 8(1) 51-54

Singh, D K, Gautam, U S, Pandey, S, and Singh, M 2009 Training need of farmers related crop production in Madhya Pradesh *Indian J Ext Educ* 45(3 & 4) 51-55

Singh, B, Padaria, R N, Singh, M, Mishra, M, and Chaturvedi, V K 2011 Information needs of farmers regarding improved agricultural technologies *Indian J Ext Educ* 47(3 & 4) 40-44

Singh, J, Chahal, V P, and Vidyulatha 2003 Media use profile of farmers in Haryana, *Indian J Ext Educ* 39(3&4) 47-52

Singh, M and Singh, R K 2012 Constraints perceived by farmers in communication behaviour *Indian J Ext Educ* 48(1 & 2) 52-55

Singh, M , Burman, R R , Sharma, J P , Sangeetha, V , and Iquebal, M A 2014 Structural and functional mechanism of mobile based agro advisory services socio- economic profile of the member farmers *J Community Mobilisation Sustain Dev* 9(2) 192-199

Singh, D S and Singh, P 2014 Effectiveness of training programmes under agricultural technology management agency in Bihar *Indian Res J Ext Educ* 14(1) 93-95

Sivakumar, P S and Sulaiman, V R 2015 Extension research in India current status and future strategies [online] Available http //www g-fras org/en/forum/2-all-topics/829 extension-research-in-india-current-status-future-strategies html[12 Dec 2015]

Sobalaje, A J and Adigun, G O 2013 Use of Information and Communication Technologies (ICTs) by yam farmers in Boluwaduro local government area of Osun state, Nigeria *Libr Philos Practice,* 12(3) 18

Sobha, S 2013 Farm telecast in Kerala- a critical appraisal M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 114 p

Sreedaya, G S 2000 Performance Analysis of the self Help Groups in Vegetable Production in Thiruvananthapuram District M Sc (Ag) thesis, Kerala Agricultural University, Thrissur, 150p

Sridhar, K 2002 An evaluative study on watershed programme in Pavagadataluk of Tumkur district in Karnataka M Sc (Ag) thesis, Umversity of Agricultural Sciences, Karnataka, 130p

Sulaiman, R V 2003 *Agricultural Extension Involvement of Private Sector* Occasional paper 29, Department of Economic Analysis and Research,

National Bank for Agriculture and Rural Development (NABARD), Mumbai

Supe, S V 1969 Factors related to different degrees of rationality in decision making among farmers Ph D thesis, IARI, New Delhi, 159p

Surendran, G 2000 Participatory group approach for sustainable development of agriculture in Kerala Ph D thesis, Kerala Agricultural University, Thrissur, 282p

Swanson, B E 2008 *Global review of good agricultural extension and advisory service practices* Food and Agricultural Organisation, Rome Available http //www fao org/nr/ext/extn_en html [21 Jan 2016]

Taneja, R P 1989 *Dictionary of Education* Anmol publications, Ansari road, New Delhi

Trivedi, G 1963 Measurement and analysis of socio-economic status of rural families- Kanghawala block Ph D thesis IARI, New Delhi

Vedakumari 2005 Information and communication technology (ICT) for rural development *J Rural Dev* 2(3) 399-408

Venkatasubramanian, V, Sajeev, M V, and Singha, A K 2009 *Concepts, Approaches and Methodologies for Technology Application and Transfer - A Resource Book for KVKs* Indian Council of Agricultural Research, New Delhi, 651p

Wime, P 2007 Analysis of adoption and use of Information and communication technologies among Irish farm families *J Extn System* (1) 14-28

World Bank 2006 *Enhancing Agricultural Innovation How to Go Beyond the Strengthening of Research Systems*, Washington, DC 147p

INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD): IN KANNUR DISTRICT

by

NAMITHA REGHUNATH

(2014-11-188)

Abstract of the thesis submitted in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN AGRICULTURE

Faculty of Agriculture

Kerala Agricultural University

DEPARTMENT OF AGRICULTURAL EXTENSION

COLLEGE OF AGRICULTURE

VELLAYANI, THIRUVANANTHAPURAM-695 522

KERALA, INDIA

2016

ABSTRACT

The present study entitled "Innovations in Technology Dissemination (ITD) in Kannur district" was carried out with the objectives, to document the Innovations in Technology Dissemination (ITD) methods implemented by different agricultural institutions in Kannur district with special reference to Kannur KVK, to find out the effectiveness and farmers perception towards these approaches, to study the constraints and suggest effective ITD method for technology transfer

Thirty farmers each from four selected grama panchayats of Kannur district were identified using simple random sampling and a total of one hundred and twenty respondents were included in the study A well-structured interview schedule was used for collecting the data from the respondents Two dependent variables and sixteen independent variables were studied and analysed with the help of different statistical tools

The findings indicate that Compact Area Group Approach (CAGA), farmers science museum, farmers science congress, NABARD- KVK farmers club, agro-biopharmacy, mussel farmers club, KVK mall, creative extension activities etc were the important Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK ATMA (Agricultural Technology Management Agency), LEADS (Lead farmer centered Extension Advisory and Delivery Services), ATMA PLUS, training programmes by Department of Agriculture, crop health management scheme, Innovations by Non Governmental Organisations (NGOs), farmers clubs formed by different banks were the ITD methods implemented by other agricultural institutions in Kannur district On analysis of data, it was found that majority of the farmers (64 16%) belonged to old age group and had regular contact with Agricultural Officers(75 83%), Assistants(76 67%) and Bank Officials (64 17%) Most of the respondents had medium level of economic motivation (85%), decision making ability (69 17%),

innovation proneness (65 83%), acceptance of innovation (54 17%), participation efficiency (56 67%), group interaction (67 5%) and need satisfaction (69 17%)

Majority of the farmers (62 5%) had medium level of perception on ITD methods however, most of the respondents were not aware of the different ITD methods implemented by Kannur KVK and other agricultural institutions in Kannur district

Perception and extent of awareness of farmers on ITD methods were positively and significantly correlated with mass media exposure, extension agency contact, extension participation, social participation, innovation proneness, acceptance of innovation, participation efficiency, group interaction and need satisfaction

Lack of awareness about the latest ICT (Information and Communication Technology) methods for technology dissemination, ineffective training programmes, inadequate trainings for farmers and extension personnels, unavailability of technologies on time, irregularity in conducting farmers group meetings etc were the important constraints of the existing ITD methods The suggestions put forth by the farmers were, starting of training centres at each panchayats, providing training programmes to youth, providing trainings on ICT tools in technology dissemination and the like to improve the existing methods

The study revealed that, to increase the awareness and farmer's perception on ITD methods, there should be an integrated approach with inclusion of farmer led technologies in the dissemination process, technology transfer through participation of farmer groups and development of an ideal system combining conventional and latest ICT based methods for technology dissemination

സംഗ്രഹം

കണ്ണൂർ ജില്ലയിലെ പ്രധാന വിജ്ഞാനവ്യാപന കേന്ദ്രങ്ങളായ കണ്ണൂർ കൃഷി വിജ്ഞാനകേന്ദ്രം അതുപോലെ വിജ്ഞാനവ്യാപനവുമായി ബന്ധപ്പെട്ട മറ്റു കാർഷികകേന്ദ്രങ്ങൾ എന്നിവയുടെ നേതൃത്വത്തിലുള്ള വിജ്ഞാനവ്യാപനത്തിലെ പുതുമകൾ കണ്ടെത്താനും, അവയെക്കുറിച്ചുള്ള കർഷകരുടെ അറിവും അവബോധവും പ്രശ്നങ്ങളും തിരിച്ചറിയാനുമായി 'വിജ്ഞാനവ്യാപനത്തിലെ പുതുമകൾ കണ്ണൂർ ജില്ലയിൽ' എന്ന വിഷയത്തിൽ ഒരു പഠനം നടത്തുകയുണ്ടായി

തിരഞ്ഞെടുത്ത നാലു പഞ്ചായത്തുകളിൽ നിന്നും 30 കർഷകർ വീതം 120 കർഷകരെ ഉൾപ്പെടുത്തിക്കൊണ്ടുള്ള പഠനത്തിൽ വിവരശേഖരണത്തിനായി ചോദ്യാവലി തയ്യാറാക്കി

കണ്ണൂർ കൃഷി വിജ്ഞാനകേന്ദ്രം രൂപം കൊടുത്ത നൂതന വിജ്ഞാനവ്യാപന മാർഗ്ഗങ്ങൾ കർഷകർക്കായുള്ള മ്യൂസിയം, കർഷക സയൻസ് കോൺഗ്രസ്സ്, നബാർഡ് കൃഷി വിജ്ഞാനകേന്ദ്രം ക്ലബ്ബ്, കൃഷി വിജ്ഞാനകേന്ദ്രം മാൾ മുതലായവയാണ് ഇവയോടൊപ്പം ആത്മ, ലീഡ്സ്, ആത്മ പ്ലസ്, കൃഷി വകുപ്പ് മുഖേനയുള്ള ക്ലാസുകൾ, സസ്യ ആരോഗ്യ ക്ലിനിക്ക്, കൃഷി സംബന്ധമായ സർക്കാരിതര സ്ഥാപനങ്ങൾ എന്നിവയും കണ്ണൂർ ജില്ലയിൽ വിജ്ഞാനവ്യാപനത്തിന് പുതിയ സാധ്യതകൾ നല്കുന്നു മിക്ക കർഷകരും പ്രായമേറിയവരാണെങ്കിലും കൃഷി ഓഫിസർ, കൃഷി അസിസ്റ്റന്റ്, ബാങ്ക് ജീവനക്കാർ എന്നിവരുമായി നല്ല ബന്ധം പുലർത്തുന്നവരും ഒരു പരിധി വരെ നൂതന സാങ്കേതിക വിദ്യകൾ സ്വീകരിക്കുന്നവരും, വിവിധ കർഷക കൂട്ടായ്മകളിൽ പങ്കെടുക്കുകയും, ആശയങ്ങൾ പങ്കുവെക്കുകയും ചെയ്യുന്നവരുമാണ്

ഒട്ടു മിക്ക കർഷകർക്കും നൂതന വിജ്ഞാനവ്യാപന മാർഗ്ഗങ്ങൾ സ്വീകരിക്കുന്നതിനോട് അനുഭാവമുണ്ടെങ്കിലും മിക്കവരും ഇതിൽ അജ്ഞരാണ് വിജ്ഞാനവ്യാപനത്തിലെ പുതു മാർഗ്ഗങ്ങളെക്കുറിച്ചുള്ള അറിവും അവയോടുള്ള മനോഭാവവും പൂർണ്ണമായും ബന്ധപ്പെട്ടിരിക്കുന്നത്, വിജ്ഞാനവ്യാപന കേന്ദ്രങ്ങളുമായുള്ള ബന്ധം, വിവിധ കർഷക കൂട്ടായ്മകളിൽ പങ്കുചേരൽ, നൂതന വിദ്യകളുടെ ഉപയോഗപ്പെടുൽ, ആവശ്യങ്ങളുടെ സാക്ഷാത്കാരം എന്നിവയെ ആശ്രയിച്ചാണ്

വിവര വിജ്ഞാപന സാങ്കേതിക വിദ്യകളെക്കുറിച്ചുള്ള അറിവില്ലായ്മ വ്യത്യസ്തമാർന്നതും ഉപയോഗപ്രദവുമായ ക്ലാസുകളുടെ ലഭ്യതക്കുറവ്, കർഷക കൂട്ടായ്മകളുടെ യോഗം ചേരലിലുള്ള അനാസ്ഥ മുതലായവയാണ് വിജ്ഞാനവ്യാപനമാർഗ്ഗങ്ങൾ നേരിടുന്ന പ്രധാന പ്രശ്നങ്ങൾ

കർഷകർക്കിടയിൽ നൂതന വിജ്ഞാനവ്യാപന ആശയങ്ങളോടുള്ള ആഭിമുഖ്യവും അറിവും വർദ്ധിപ്പിക്കുന്നതിനായി പഞ്ചായത്ത് അടിസ്ഥാനത്തിൽ അവശ്യ ക്ലാസുകൾ നല്കുകയും, കൃഷി സംബന്ധമായ തീരുമാനങ്ങളിൽ കർഷകപങ്കാളിത്തം ഉറപ്പുവരുത്തുകയും, യുവാക്കൾക്ക് പ്രത്യേക കാർഷിക സെമിനാറുകൾ സംഘടിപ്പിക്കുകയും, വിജ്ഞാനവ്യാപന മേഖലയിൽ നൂതന സാങ്കേതിക വിദ്യകളുടെ പങ്കിനെക്കുറിച്ച് കർഷകരെ ബോധവാന്മാരക്കുകയും ചെയ്യേണ്ടത് തീർത്തും അനിവാര്യമാണ്

APPENDICES

APPENDIX I

KERALA AGRICULTURAL UNIVERSITY
DEPARTMENT OF AGRICULTURAL EXTENSION
COLLEGE OF AGRICULTURE VELLAYANI

Prof. (Dr.) N. Kishore Kumar Date 18-08-2015

Chairman of Advisory Committee

Sir

Sub MSc Research work – Independent variables selection

Ms Namitha Reghunath, MSc Scholar of this department is taking up research titled, "Innovations in Technology Dissemination (ITD) in Kannur district" The objective of the study is to

- To document the Innovations in Technology Dissemination (ITD) methods implemented by different agricultural institutions in Kannur district with special reference to Kannur KVK
- To find out the effectiveness and farmers perception towards these approaches
- To study the constraints of the existing methods
- To suggest effective ITD method for technology transfer

The main items of observation to be made in the study include

1 Documentation of ITD methods implemented by Kannur KVK

2 Perception of farmers on different ITD methods

3 Extent of awareness of farmers on the ITD methods

4 Technology Assessment and Refinement (TAR) process implemented

5 Perceived constraints of the existing approaches

6 To Suggest the effective Technology Assessment and Refinement approaches for technology dissemination

In this connection, I request you to go through the enclosed schedule and give your rating for each criterion as "Most relevant", "More relevant", "Relevant" "Less relevant" and "Least Relevant" considering the relevancy of each criterion

Considering your expertise and knowledge in the field and professional expertise you have been selected as a judge to rate the relevancy of the variables I request you to kindly spare some of your valuable time for examining the questionnaire critically Kindly return the list duly filled at the earliest

Thanking you

Yours faithfully

(Dr N Kishore Kumar)

Innovations in Technology Dissemination (ITD): in Kannur district.

List of Independent variables

Please rate the following independent variables by putting a (✓) in the appropriate column based on the relevancy of each variable which would help in the study The independent variables are given in bold cases and their respective meaning is explained for easy understanding of intended meaning

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
1	**Age** (Number of calendar years completed by the respondent at the time of investigation)					
2	**Sex** (refers to the male and female respondents)					
3	**Educational status** (Defined as the extent of formal education achieved by the respondent)					
4	**Occupation** (The main vocation and other additional vocations that the respondents were possessing at the time of interview)					
5	**Annual income** (refers to the total earning of all the members of the family of the respondent for one year)					
6	**Productivity-** It refers to the output per unit area cultivated					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
7	**Farming Experience** (number of completed years of experience of the respondents in farming)					
8	**Area under cultivation(** Measured as the extent of area under cultivation in cents)					
9	**Trainings** (defined as the number of trainings undergone by the respondent in various agricultural activities by different agricultural institutions in Kannur district)					
10	**Mass media exposure** (refers to the degree to which the respondents were exposed to various mass media channels)					
11	**Innovativeness** (degree to which the respondent was relatively earlier in adopting new ideas)					
12	**Information seeking behavior** (measures the extent to which the respondent is seeking information from different communication sources)					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
13	**Cosmopoliteness** (It refers to the tendency of the farmers to be in contact with outside village on the belief that all the needs of an individual cannot be satisfied within his/her own village)					
14	**Contact with officials** (degree to which the farmers are having contact with officers for obtaining information regarding various agricultural practices)					
15	**Extension Participation** (refers to as the extent of involvement of farmer in different extension activities)					
16	**Assessment of Information needs of the farmers** (Information needs of the farmers is operationalized as the desire of the farmers to obtain or locate information to satisfy his conscious or unconscious need)					
17	**Attitude of the farmers** (Attitude is an organized predisposition to think, feel,					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
	perceive and behave towards a cognitive object)					
18	**Information dissemination** (It is operationalized as the sharing of messages by the respondent among his fellow members or groups and also the most used means of information dissemination or followed pattern of information dissemination for communication the information support provided by the agricultural institutions)					
19	**Risk orientation** (refers to the degree to which the farmer is oriented towards encountering risks and uncertainty in adopting new ideas in farming)					
20	**Economic motivation** (refers to the extent to which a farmer is oriented towards achievement of the maximum economic ends)					
21	**Scientific orientation** (degree to which a farmer was oriented with use of scientific methods in farming)					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
22	**Social participation** (refers to the degree of involvement of respondents in formal and informal social organizations either as a member or as an office bearer, which also includes the extent of participation in organizational activities)					
23	**Exposure to ICT** (Information Communication and Technology) was operationally defined as the extent to which the respondent was exposed to internet and Information Communication and Technology (ICT) for developing his / her knowledge and skills for the benefit of his/her profession)					
24	**Self confidence** (defined as the extent of feeling about one's own powers, abilities and resourcefulness to perform any activity which the farmer desires to undertake)					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
25	**Market perception** (the capacity of the respondent to identify the market trend to sell the produce for greater returns)					
26	**Accessibility** (It refers to the ability to access the innovations)					
27	**Information source utilization** (Use of various sources of information by the respondent to get information on new innovations in technology dissemination					
28	**Timeliness** (operationalized as information provided when it is needed)					
29	**Flexibility** (degree to which the innovation is characterized by a ready capability to adopt to new alternative or changing requirements or conditions					
30	**Social acceptability** (degree to which an innovation is considered useful, practical and feasible by majority of the members of the social system					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
31	**Simplicity** (degree to which the innovation is simple to be adopted by the farmers					
32	**Desirability** (Degree to which the innovation is desired and perceived as worth)					
33	**Relevance of innovation** (Any information disseminated should be related to the information needs of a specific recipient for a situation)					
34	**Usefulness** (the information disseminated should be easy to use by the farmers)					
35	**Credibility** (can be defined as the quality of being believable or trustworthy)					
36	**Information feedback** (the oftenness of receipt of opinion, feeling, doubts, ideas and thoughts from the fellow farmers as a result of information given by them related to agriculture)					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
37	**Voluntariness of use** (Degree to which use of the innovation is perceived as being voluntary, or of free will)					
38	**Progressiveness** (Extent to which one is relatively early in venturing or putting the innovation into practice)					
39	**Knowledge Requirement** (It meant the need of knowledge on improved practices and other information as realised by the respondent)					
40	**Effectiveness** (It is defined as obtaining the right information to promote decision making to achieve the objectives)					
41	**Leadership** (Ability of a person to influence to people to cooperate in achieving a goal)					
42	**Level of aspiration** (It is operationally defined as the future level of achievement in his job, which he is expecting, based on the knowledge about the level					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
	of past performance					
43	**Management orientation** (Degree to which a farmer is oriented towards scientific management comparing of planning, production and marketing function of his farm experience					
44	**Participation in decision making** (Degree to which members of a social system are involved in the decision making process or the farmer's participation in the meetings held in the nodal agencies for decision making process)					
45	**Knowledge gain** (Knowledge gain was the quantity of information gained by the respondent by interacting with the innovations)					
46	**Innovation proneness** (refers to the keenness of the respondent in accepting new ideas and seeking changes in farming techniques					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
47	**Inter personnel communication behaviour** (Defined as the behavior of communication between two or more individuals)					
48	**Trial and satisfaction** (tried once and get satisfaction)					
49	**Attitude towards group approach** (refers to the degree of favorableness or unfavourableness of the farmers towards group approach)					
50	**Group cooperation** (it is operationally defined as the tendency of group members to associate and work with other members of the group in striving towards the achievement of goals)					
51	**Group interaction** (refers to tendency of members to get in touch with other members of the group and freely mix with them without any formality or inhibition)					

Table continued

Sl No	VARIABLES	Most R	More R	R	Less R	Least R
52	**Need satisfaction** (defined as achieving individual member's need and requirements by group within a stipulated time)					
53	**Participation efficiency** (refers to the propensity of the members to actively associate in planning, execution, monitoring and evaluation of activities related to farmers groups)					
	Other variables , if any **Please specify and explain**					

Signature

Name

Designation

APPENDIX II

KERALA AGRICULTURE UNIVERSITY

College of Agriculture, Vellayani, Thiruvananthapuram

Department of Agricultural Extension

Innovations in Technology Dissemination (ITD). in Kannur district

INTERVIEW SCHEDULE

Respondent No

1 Name

2 Village Block

3 Address

4 Contact No

5 Age . (completed number of years)

6 Farm size (in cents)

7 Major crops cultivated

8 Education

Sl. No	Category	Tick
1	Illiterate	
2	Can read and write	

Sl. No.	Category	Tick
3	Primary school	
4	Middle school	
5	High school	
6	College	
7	Professional degree	

9 Occupation

Sl. No.	Category	Tick
1	Farming as a sole profession	
2	Farming+ Agri Labour	
3	Farming+ business	
4	Farming+ service	

10 Trainings

Sl. No	Trainings undergone	Tick
1	No training	
2	One training	
3	Two trainings	
4	Three or more trainings	

11 Mass media exposure

Sl. No.	Items	Regularly	Occasionally	Never
1	Television			
2	Radio			
3	Newspaper			
4	Internet			
5	Magazine			
6	Bulletin			
7	Information Kiosk			
8	Mobiles			

12 Extension agency contact

Sl. No.	Category	Regularly	Occasionally	Rarely
1	Agricultural scientist			
2	Agricultural officer			
3	Agriculture assistant			
4	Private extension agencies			
5	Block Technology Manager			
6	Assistant director of agriculture			

Sl. No.	Category	Regularly	Occasionally	Rarely
7	SMS of KVK			
8	NGOs			
9	Bank officials			

13 Extension participation

Sl. No	Extension activity	Attended whenever conducted	Sometimes	Never attended
1	Campaign			
2	Seminar			
3	Fair/melas			
4	Exhibition			
5	Exposure visits			
6	Study tours			
7	Group discussion			
8	Demonstrations			

14 Social Participation

1.	For membership in organization	Tick
	No membership in organization	
	Membership in organization	
	Office bearer in organization	

2	**Frequency of participation**	**Tick**
	Never attending any of the meetings Sometimes attending meeting/ activities Regularly attending meetings	

15 Decision making ability

Indicate your extent of agreement or disagreement with the following statements

SA- Strongly Agree, A- Agree , DA- Disagree , SDA- Strongly Disagree

Sl. No.	**Statements**	**SA**	**A**	**DA**	**SDA**
1	I analyse problems by considering the pros and cons and take decisions				
2	I will not take a decision without consulting others				
3	In general I prolong my decisions				
4	Once I take a decision, I will stick on to it				
5	I need lot of time to take a decision				
6	I can take firm decision and initiate action when there are more alternative				

16 Economic motivation

Indicate your extent of agreement or disagreement with the following statements

SA- Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree

Sl. No.	Statements	SA	A	UD	DA	SDA
1	A farmer should work towards larger yields and economic returns					
2	The most successful farmer is the one who makes the most profit					
3	A farmer should try any new farming idea which may earn him more income					
4	A farmer should grow cash crops to increased monetary profit in comparison to growing of food crops for home consumption					
5	It is difficult for the farmers children to make a good start unless he provides them with economic assistance					
6	A farmer must earn his living, but the most important thing in life cannot be defined in economic terms					

17 Innovation proneness

Sl. No.	Statements	SA	A	UD	DA	SDA
1	You would feel restless unless, you tryout an innovative method which you have come across					
2	You are cautious about trying new practices					

Sl. No.	Statements	SA	A	UD	DA	SDA
3	You like to keep up to date information about the subjects of your interest					
4	You would prefer to wait for others to tryout new practices first					
5	You opt for the traditional way of doing things than go in for newer methods					

18 Acceptance of innovation

Indicate your extent of agreement or disagreement with the following statements

SA- Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree

Sl. No.	Statements	SA	A	UD	DA	SDA
1	You satisfied with the ease of use of innovation					
2	The innovation accepted is specific to your need					
3	Innovation is specific to your locality					
4	You always ready to implement the innovation in the field					
5	Innovation is helpful in improving the socio economic status					
6	Innovation is accepted based on the credibility of the implemented institution					
7	Communication with others will be enhanced by accepting the innovation					

Sl. No.	Statements	SA	A	UD	DA	SDA
8	Acceptance will help to improve the personal skills of an individual					
9	Innovation is helpful in achieving better income and increase the standard of living					
10	Innovation is helpful in achieving the overall goal					

19 Participation efficiency

A- Always, ST – Sometimes , N- Never

Sl. No.	Statements	A	ST	N
1	Do you attend the group meetings			
2	Do you guide and influence the group members in taking decision			
3	Do you think that you can change the attitude of others in the group			
4	Members are free to express their opinions during group meetings			
5	Are you actively involved in achieving the objectives of the group			
6	Are you ready to accept the responsibility entrusted to you by the group			
7	Watching the progress of implementation of group activities in relation to objectives/goals			
8	Assessing the suitability of technology/ skills and demand for new technology			

20 Group interaction

Indicate your extent of agreement or disagreement with the following statements

SA Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree

Sl. No.	Statements	SA	A	UD	DA	SDA
1	The members of my group are friendly towards each other					
2	Agrees with each other					
3	Gives suggestions freely					
4	Gives opinion freely					
5	Asks for information freely					
6	Asks for opinion freely					
7	Asks for suggestions freely					
8	Disagree with each other					
9	Seems unfriendly					

21 Need satisfaction

Indicate your extent of agreement or disagreement with the following statements

SA- Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree

Sl. No.	Statements	SA	A	UD	DA	SDA
1	I get a security feeling while working in this group					
2	The working of this group provides means for my livelihood					

Sl. No.	Statements	SA	A	UD	DA	SDA
3.	I feel satisfaction in working in the group					
4	My need for love and affection is being fulfilled by members performance					
5	I feel that my social status is improved being a member of the group					
6	I feel proud to work in this group					
7	I feel satisfied with the attainment of my needs by group activity					
8	I wish to quit from this group as my needs are not achieved by group activities					

22 Awareness of farmers about different Innovations in Technology Dissemination in Kannur district

- Innovations by Kannur KVK

Sl. No.	Innovations	A	NA
1	Compact Area Group Approach (CAGA)		
2	Farmers science congress		
3	Farmers science museum		
4	NABARD- KVK farmers club		
5	Training programmes for farm entrepreneurs		
6	KVK mall		
7	SBI KVK loan window		
8	Formation of Mussel farmers club		
9	Participatory production of planting materials and vegetable seeds		

Sl. No.	Innovations	A	NA
10	formation of farmer producer organisations		
11	Release of video and multimedia CDs related to various practices		
12	Agro- biopharmacy		
13	Farmers field school		
14	Brochures and publications		

23 Innovations by other institutions

Sl. No.	Innovations	A	NA
1	Training progammes by ATMA in Kannur		
	ATMA newsletter		
2	ATMA PLUS activities in Kannur district		
3	Farmer field schools to promote integrated pest and disease management		
4	Technology meet		
5	Farmer extension organisations		
6	Farmer led technology development (FTD)		
7	LEADS activities		
8	Traimngs and workshops by Department of Agriculture		
9	Crop Health Management scheme		
10	Farmers clubs formed with the help of syndicate bank		
11	Innovations by NGOs		

Sl. No.	Innovations	A	NA
12	Farmers clubs formed by Tellissery Social Service Society		
13	Training programmes conducted by TSSS		
14	Agro service centre		
15	Seed farm Payyanur area		

24 Perception of farmers on ITD methods

Indicate your extent of agreement or disagreement with the following statements

SA- Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree

Sl. No.	Statements	SA	A	UD	DA	SDA
1	Innovations in Technology Dissemination(ITD) methods are more effective than conventional methods					
2	ITD helps farmers to access new technologies and products easily					
3	Social media play a crucial role in technology dissemination					
4	Group approach of ITD is more effective than individual approach					
5	Innovations using ICT is more effective for technology dissemination					
6	Participative decision making is ensured in the implementation of the ITD methods					

Sl. No.	Statements	SA	A	UD	DA	SDA
7	Farmers get an opportunity to take leadership in technology dissemination process					
8	Greater economic prosperity can be achieved through the ITD methods					
9	Participative skill training helps farmers to adopt new technologies and methods					
10	Farmers get an opportunity to introduce their own innovations to the farming community					

20 Constraints

Rank the constraints of the existing methods

Sl. No.	Constraints	Rank
1	Irregularity in conducting farmer group meetings	
2	Training programmes for farmers and extension personnel are less in numbers	
3	Unavailability of technologies on time	
4	Less contact with other farmers and extension personnels	
5	Lack of awareness about the latest ICT methods for technology dissemination	
6	Irregularity in conducting Pre MTA &MTA	
7	Negative mentality in accepting new things	
8	Highly technical advices of research/extension workers	

Sl. No.	Constraints	Rank
9	Less suitability of innovations in the locality	
10	Lack of knowledge of contact farmers	
11	Less support from family	
12	Less participation of farmers on group meetings& trainings	
13	Trainings are not effective to meet farmers needs	
14	Farmers were not aware about the conducting of training programmes	
15	No time to attend the meetings	

APPENDIX III

1 INNOVATIONS IN TECHNOLOGY DISSEMINATION (ITD) METHODS IMPLEMENTED BY KANNUR KVK

Krishi Vigyan Kendra Kannur became functional as a constituent KVK of Kerala Agricultural University in 2004 in the premises of Pepper Research Station (PRS) at Panniyur fully financed by ICAR Kannur KVK introduced a variety of innovations and in 2009 just as it completed five years it became the youngest ever to bag the national best KVK award among the 589 KVKs in the country Area of operation of the KVK is the whole Kannur district and focuses on the major problems and felt needs of the farming community of the area Different ITD methods implemented by Kannur KVK are explained as follows

1.1 Compact Area Group Approach (CAGA)

It was an innovative extension approach to mobilise group action for the control of pest and diseases of endemic nature in which individual adoption may not be effective Compact Area Group Approach was used for coconut mite control in Vellavu area of Pariyaram panchayat, and found to be very effective It was the first ever OFT (On Farm Trial) in agricultural extension in the country

1.2 Farmers Science Congress

The Kendra made history by pioneering the first farmer's science congress (FSC '08) in which NABARD and Syndicate bank were the key sponsors It act as a platform for farmer scientists to present their inventions and innovations before a cross section of scientists, extension functionaries and other farmers with possible answers to many agronomic questions The farmers were the key players of the two day historic event and they displayed about 84 innovations like different machines (coconut climbing machine, panel guard knife, cow tail wagging fending device etc)

new irrigation methods, new varieties, pest and disease control methods etc The congress covered presentations by farmers in agricultural engineering, plant breeding, agronomy, agro processing, plant protection etc

1.3 Dar M J Joseph Farmers Science Museum

Dar M J Joseph Farmers Science Museum is the world's first farmer's science museum in the name of a farmer scientist which is located near to KVK building to popularize the farmer's innovations and giving recognition to the farmer scientists inorder to encourage rural inventions for the benefit of farming

1.4 Federation of NABARD-KVK Farmer's Clubs

Kannur KVK with the help of NABARD has started eighty farmer's clubs as a federation with a chief manager heading all unit level managers The chief manger is assisted by four directors (all farmers) and each director has nine associate directors

1.5 KVK Mall

Kannur KVK initiated KVK mall which is a fully air conditioned mall with all the look of a modern shop that displays and sells branded value added products prepared by the food processing unit of KVK

1.6 SBI KVK Loan Window

An SBI - KVK partnership programme serve as a single window for availing the important components for setting up an enterprise like training, credit and subsidy

1.7 Agro-Biopharmacy

The Kendra has set up a biopharmacy in its premises at Pannıyur to promote orgamcs in agriculture It intended to provide all the inputs such as organic pesticides, organic fertilizers, bio control agents etc ranging from tobacco decotion to trichoderma required for organic farming under one roof

1.8 Formation of Mussel Farmers Club

KVK has initiated a front line demonstration project on green shell mussel farming in the district In the first phase of the project, a farming unit has been set up in the Mahe river estuary at Olavil in Chokli panchayat A 20 member KVK mussel club comprising local youth has been formed and trained by the KVK in mussel farming The project envisages dissemination of the farming techniques among the resource poor women as also the unemployed, under employed and employed youths Several tonnes of mussel seeds which will otherwise be lost owing to non-exploitation can be utilized for farming

1.9 Farmers Field School

KVK organized farmers field schools on integrated pest and disease management in vegetables, soil and water conservation, organic farming in vegetables etc

1.10 Training Programmes for Farm Entrepreneurs

KVK Kannur provides training programmes to farmers on various topics like mushroom and spawn production, food processing, repair of agro machines, coconut technician training, rabbit rearing, goat rearing, training to combat tanjore wilt, virgin coconut oil production, medicinal plant cultivation, cashew apple processing, nursery management, micro sprinkler irrigation, trichoderma production, banana fibre extraction and handicrafts, composting techniques, mechanization in rice, milk processing, production of tissue culture plants, paper bag making, Integrated Nutrient Management (INM) in rice, gardeners raining etc

1.11 Participatory Production of Planting Materials and Vegetable Seeds

KVK initiated production of planting materials in pepper and vegetable seeds with the help of farmer's participation Production started in 20 demonstration plots

of five Panchayats including Cheruthazham, Kurumathur, Chengalai, Sreekandapuram and Naduvil

1.12 Plant Health Clinic

Services such as micro nutrient analysis, diagnosis of pests and diseases and soil health based problems are extended by the clinic

1.13 Creative Extension Programmes

Kendra introduced a tele- cine -drama called "Thengukalude Nilavili" to disseminate awareness about the control of coconut mite through group action

They released video CDs based on the topics organic manures, handicrafts from banana fibre, irrigation methods in coconut, scientific goat production, mushroom cultivation, quail rearing, banana processed products, stem bleeding in coconut, mite control in coconut etc Vayalkkili (popular agricultural folk songs), Thenkili (songs on animal husbandry) and Koon paatukal (mushroom songs) are the important audio CDs released by the Kendra

1.14 Brochures and Publications

14.1 Booklets

Panniyur kurumulakinangal

Vazhanaarilninnum kai akoushalavasthukkal

Koonki ishikkoru kaipusthakam

Mannuyala samrakshanam krishiyidangalil

Farmer participatory evaluation of Upland rice varieties for intercropping etc

14.2 Leaflets

Mandarıbaadhayum nıyanthranamaargangalum

Management of arecanut yellow leaf dısease

Thengıle chenneerolıppu

Nelkrıshıyıl vıthıdalum kalanıyanthranavum yanthravalkaranathıloode

Seethakala Pachakkarıkal etc

1.15 Ongoing On Farm Trials (OFT) and Front Line Demonstrations (FLD) in the Year 2015-16

1.15.1 On Farm Trials (OFT)

- Management of bacterial wılt ın tomato
- Management of pseudo stem weevıl ın banana
- Varıetal evaluatıon of black pepper

1.15.2 Front Line Demonstrations (FLD)

- Management of Tanjore wılt of coconut by ıntegrated approach
- Ayar (Sec and mıcro nutrıent mıxture) applıcatıon ın banana to enhance productıvıty
- Soıl test based nutrıent management for paddy
- Compact pre fab goat shed
- Productıon, brandıng and marketıng of bıo ınputs through bıo pharmacy by SHG
- Productıon, brandıng and marketıng of banana halwa through SHG
- Integrated approach for management of red palm weevıl

Compact Area Group Approach

Farmers Science Museum

KVK mall

Agro biophamacy

Plate 2 Innovations in Technology Dissemination (ITD) methods implemented by Kannur KVK

2 ITD METHODS IMPLEMENTED BY OTHER AGRICULTURAL INSTITUTIONS IN KANNUR DISTRICT

Department of Agriculture, Government of Kerala has implemented a number of programmes in Kannur district for transferring latest agricultural technologies to the farmer's field LEADS, ATMA, ATMA PLUS, NGOs etc were able to bring a drastic change in the technology dissemination culture

2.1 Training Programmes by ATMA

ATMA is a central government initiative to Support to State Extension Programmes for Extension Reforms (SSEPER) scheme, which was implemented int the district level

2.2 LEADS

In order to revitalize the present system of extension, a concept of frontier extension system revolved around lead farmer-satellite farmer concept on an Agro-Ecological Zone basis within a district The lead farmers are an important agent in the chain of transfer of technology in agriculture Kannur district was selected as the LEADS district along with Kollam, Palakkad and Wayanad The district is divided into two Agro Ecological Zones (AEZ) and each Agro Ecological Zone (AEZ) is divided into Agro Ecological Units (AEU) Visit schedule as well as technology advice for every month is prepared on agro ecological unit-wise The project is being implemented in 81 panchayats of Kannur and 243 lead farmers and 243 satellite farmer groups have been formed at the rate of three groups per panchayat, each group comprising of 10 selected farmers, for effective technology dissemination Regular field visit will be done by field assistants and one field assistant will cover two Krishi Bhavans There should not be any change in the field visit schedule finalized for a month The Agricultural officer and Agricultural Assistant will conduct at least one visit each per month to the field of lead farmer

2.3 ATMA PLUS Activities

ATMA plus is a new initiative by Department of Agriculture to support ATMA activities It is a combination of ATMA and LEADS to strengthen the ATMA cafeteria activities Main objective of ATMA PLUS is to promote innovations in extension at Panchayat level

2.3.1 Components of ATMA PLUS

- **Farmers Field School**

Farmer Field School is an attractive model in the dissemination of new technology ensuring farmer participation In the existing ATMA cafeteria a minimum of three farm schools per block are provided Ten more schools per district will be initiated giving emphasis on popularization of integrated pest and disease management system

- **Technology Meet**

One technology meet per district which includes small scale technology demonstrations, exhibitions and field demonstrations are provided in the ATMA PLUS activities

- **ATMA Newsletter**

A number of farm and farmer oriented activities covering major development departments are undertaken in ATMA In order to pass on up to date details of such activities to the stakeholders involved, release of ATMA newsletter will be done in each district on a bimonthly basis

- **Farmer Extension Organization(FEO)**

Farmer Extension Organisations are to be organized at block level for promoting extension activities on pilot basis In order to form the organization ten

conveners from 10 groups from the panchayat will be selected as members of the FEO The ten groups should be the best groups with lead farmers in the block The conveners of the ten groups could be made as members of the FEO

- **Farmer led Technology Development (FTD)**

FTD is mainly for the promotion of farmer research and innovations A Farmer Research Committee (FRC) with eight members will be constituted under the chairmanship of PAO with PD, ATMA, representative from the allied departments, three award winning farmers, KVK representative, one award winning Assistant Director of Agriculture and another award winning Agricultural Officer

2.4 Department of Agriculture

2. 4.1 Trainings and Workshops by Department of Agriculture

Department of Agriculture provides a variety of trainings and workshops to Agricultural Officers, Agricultural Assistants and progressive farmers on various topics with the help of SAMETI, ATMA etc

2.4.2 Crop Health Management Scheme

Crop Health Management scheme helps to develop an effective pest surveillance based crop advisory system to help the farmers to adopt timely and advance plant protection measures

2.4.2.1 Plant Health Clinics

Plant health clinics were started in 28 selected blocks of Kerala and in Kannur, 7 blocks and 14 Krishi Bhavans were selected for pest surveillance Mobile clinics were also working to provide timely advice to farmers on pest and disease management

2.5 Farmers Clubs Formed with the Help of Syndicate Bank

2.6 Innovations by NGOs

Tellissery Social Service Society (TSSS), KAIROS, social organization for rural development, Nocer India were the important NGOs for the dissemination of latest agricultural technologies to farmers in Kannur district TSSS having its main office at Tellissery providmg number of training programmes to farmers on the topics, production of biofertilizers and biochemicals , soil and water conservation, organic farming, organic certification, mushroom cultivation, bee keeping, value addition, animal rearing etc They have 18 farmers groups with 266 farmers