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Constraints of Extisting Innovations in Technology Dissemination (ITD) Methods in India- A Critical Analysis

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Authors' contributions

This work was carried out in collaboration between both authors. Author NR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author NKK managed the analyses and literature searches of the study. Both authors read and approved the final manuscript.

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ABSTRACT

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. The present study was conducted in Kannur district of Kerala state, to identify the constraints of existing ITD methods implemented by different agricultural institutions in Kannur and find out the suggestions from farmers for improvement. Thirty farmers each from four selected Grama Panchayats (Ezhome, Kankol- Alapadamba, Kadannapalli- Panapuzha and Mayyil) of Kannur were identified using simple random sampling. A well-structured interview schedule was used for collecting data from the respondents. The data were tabulated and inferences were drawn after appropriate statistical analysis. The results shows 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 farmer's needs' (71.5) and 'Less training programs for farmers and extension personnel (69.77).

Keywords: ITD; personal interview; constraints; suggestions; strategies for improvement.

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1. INTRODUCTION

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. Innovations in Technology Dissemination (ITD) is part of the agricultural extension system which 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.

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) within DAC was set up in 1958, mainly for the dissemination of specific knowledge to farmers, supervision of countrywide extension training infrastructure and to implement national programs.

The major activities of agricultural extension at the district level are 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. 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. ICAR has established Agricultural Technology and Information Centres (ATICs) in some of the State Agricultural Universities (SAUs) and ICAR institutes mainly to serve 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, National Bank for Agriculture and Rural Development (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 [1].

Different private and voluntary sector initiatives involved in technology dissemination were input agencies, agri- business firms, farmer organisations, Non Governmental 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 dissemination of knowledge and information to rural population. Some of the Information and Communication Technology (ICT) tools include web portals, call centers, mobile applications, community radio, information kiosk, digital photography and audio & video conferencing.

The study, constraints of existing Innovations in Technology Dissemination (ITD) methods in India was carried out in Kannur district of Kerala state to identify and analyse the major constraints faced by different agricultural institutions in technology dissemination. According to Bhaskaran and Sushama [2] lack of infrastructural facilities, inadequate training programs for farmers, researchers and extension personnel, absence of technology evaluations and up gradation efforts, lack of functional linkages among the research, extension, input and farmer sub systems were some of the constraints in transfer of agricultural technologies in Kerala. Singh et al. [3] reported that poor connectivity, lack of awareness in farmers and incomprehensible technical information provided through helpline service 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 [4].

The findings of the study will be helpful to agricultural scientists and extension personnals 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 farmer's needs and goals.

2. METHODOLOGY

The study was conducted in Kannur district of Kerala with special reference to Kannur Krishi Vigyan Kendra (KVK). Kannur is one of the 14 districts along the west coast in the state of Kerala, which is bounded by Kasaragod District to the north, Kozhikode district to the south and Wayanad District to the southeast. As per 2011 census, the total population of the district is 25.23 lakhs. The district was purposively selected for the study because, Kannur KVK 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 (Lead Farmer centered Extension Advisory and Delivery Services) district along with Kollam, Wayanad and Palakkad. From the eleven block panchayats present in Kannur; Taliparamba, Kalliasseri, Payyanur and Irikkur blocks were selected based on the agro ecological zones of the district. From these four blocks, four Grama panchayats viz, Ezhome, Kankol - Alapadamba, Kadannapalli- Panapuzha, and Mayyil were selected after consulting each block panchayat office. A list of progressive farmers from each Grama Panchayat were collected and thirty farmers each were identified by simple random sampling, The total number of respondents were one hundred and twenty.ITD methods implemented by different agricultural institutions in Kannur district were identified after discussion with scientists and extension agents of KVK, ATMA, Department of Agriculture etc. Based on that, a well-structured interview schedule was prepared for collecting the data from the respondents.

2.1 Constraints of the Existing Technology Dissemination Methods

A list of constraints was identified after discussion with extension agents and farmers and Garrett's ranking technique was used to find out the most significant constraints which influence the respondents. 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.

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

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 [5].

3. RESULTS AND DISCUSSION

Constraints of the existing technology dissemination methods, its mean score calculated and ranks were listed in the Table 1.

From the Table 1, 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 did 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 for farmers, but the problem is most of the trainings were not much effective and it will leads to unavailability of proper technologies on time. It was observed from the 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. This result was similar to the study conducted by Afroz et al. [5] on working of digital green and found that unsuitable time of video projection is the most severe constraint with highest mean score

(75.25) followed by low IT literacy among farmers (65.60) and lack of videos related to market information (57.75). The result was also similar to the findings of Balakrishnan et al. [6] and Singh et al. [7].

3.1 Suggestions Given by the Respondents

The most important suggestions specified by the farmers were 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. 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 farmer's 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.

3.2 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 farmer's needs and goals.
- Provide interesting trainings and demonstrations especially for youth to attract them to agriculture.
- Incorporate farmer's own innovations and ideas in technology generation and dissemination and which will lead 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 activities of KVK.

Table 1. 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	Less training programmes for farmers and extension personnel	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

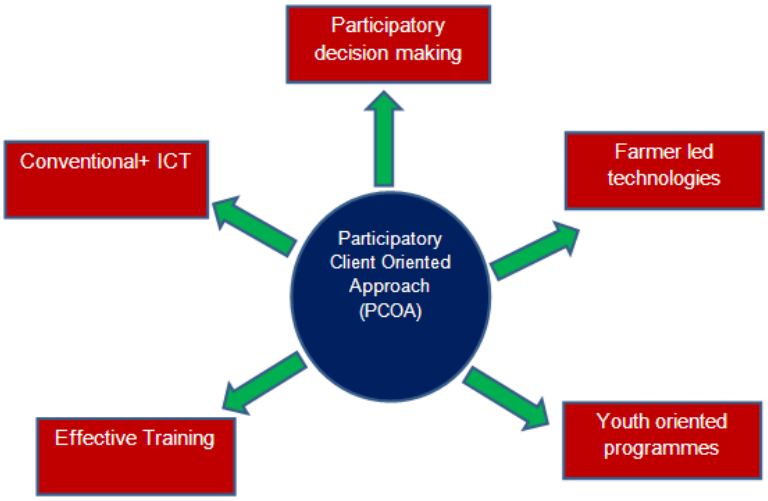

Fig. 1. Strategies for an ideal system for technology dissemination

4. CONCLUSION

Innovations are new ideas, practices, or products that are effectively brought into economic or social processes can involve technologies, organizations, institutions, or policies [8]. The role of agricultural information is more crucial in India where the economy is mostly dependent on agriculture. Innovations in Technology Dissemination methods play an important role in linking research system with farmers. Agricultural research system is developing variety of technologies but most of the farmers were not aware of these technologies. Lack of awareness about the latest ICT (Information and Communication Technology) methods for technology dissemination, ineffective training programmes, inadequate trainings for farmers and extension personnel, unavailability of technologies on time, irregularity in conducting farmer group meetings etc. were the important constraints of the existing ITD methods. The suggestions put forth by the farmers were, introduction of training centers at each panchayats, providing training programs to youth, providing training to farmers on ICT tools in technology dissemination and the like to improve the existing methods.

The study revealed that, to overcome the constraints, 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.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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