CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

Agricultural information system is the communication tool for effective transfer of agricultural information from the generation source to its dissemination point. Farming is an intensive process which requires constant seeking of information. Farmers require different types of information regarding financial, climatic, technical, crop related information to effectively manage their cultivation. These type of information are usually provided by both public and private institutions. But, due to the problems faced in accessing these information, its accuracy and availability in the right time, farmers often face several challenges (Just & Zilberman, n.d.). Here arises the role of government in providing reliable information to improve the efficiency of farming activities and sustaining agricultural and economic stability of the region, thereby achieving the development of rural community. It is understood that rural farmers are in most cases looking for getting informal information from fellow farmers or agricultural extension workers. Hence, through functioning of an efficient agricultural information system, it will be possible to provide them reliable information in the right time. Thus, through this study, the investigator has tried to find out use of Agricultural Information System by farmers in Kerala to achieve development of rural community.

This chapter has included the following aspects for the convenience for the formulation of research methodology.
3.1 Need for the Study

In the present scenario, agricultural productivity of Kerala is not adequate for meeting the daily food requirements and the state is facing series crisis on agriculture sector (Government of Kerala, n.d.). Hence, Kerala is depending on neighboring states for its food and vegetable needs. For increasing the production of food grains and vegetables in Kerala, farmers should have adequate knowledge on use of modern agricultural technologies, fertilizers and high quality of crops. Even though information on these aspects are available in multiple forms and languages regionally and all over the world, these are not accessed by the rural farmers. Hence, it is essential to sort out the reasons for inadequate agricultural production and food insecurity existing in Kerala. Creating awareness and periodic assessment of the rural farmers’ utilization on agricultural information will help to fulfill basic needs for the development of the rural community and nation. In this connection, this study will be significant to assess the use and search of agricultural information by the farmers in Kerala State, India.

3.2 Statement of the problem

In India, agricultural sector faces many challenges such as impact of crop diseases and pest infestations, climatic variations, changes in food practices and nutritional needs, soil salinity, heat, cold, drought, flood, pressure due to increase in population, competition in world trade that lead to reduced crop productivity. It is witnessed from the study conducted among the farmers of Kerala by Raman Nair (2006) identified that the farmers were reluctant to use specialised libraries due to complex approaches, where more information resources available but were not hesitate to use the village libraries and also stated that farmers were the real category
of users constituting 1% whereas the second category users such as students and scientists constituted 99%. To overcome such challenges, it is necessary to make qualitative improvements in agriculture which involves improved crop production technology. Hence, farmers are in need of information on agricultural related activities such as farm inputs, marketing and modern technologies and practices to increase productivity for attaining a better livelihood. Also, there should be adequate mechanism to transfer new technologies to farmers in an effective manner. Central as well as State Governments and other agencies related to agriculture are also in need of information to effectively plan the dissemination of information to farmers in an improved manner (Chatterjee & Dasgupta, 2016).

Since research and development activities are being carried out in the area of agriculture in the nation and world-wide, there is adequate information available in various resources on modern technologies and practices in agriculture. In the current situation, access to these information has become easier than earlier times due to the advancement of Information Technology. But, rural farmers in their attempt to access these agricultural technologies and information from the resources available are faced with several problems. The present study was hence designed to find out the use of agricultural information by rural farmers for improved crop production leading to their better livelihood (Obidike, 2011).

3.2.1 Use of Agricultural Information System by Farmers in Kerala state: Developing a Prototype Model for Rural Community

3.2.1.1 Definition of key terms

Use
• Use means "to do something with an object, machine, person, method etc. for achieving a work, to perform a process etc." (Merriam -webster learners dictionary, 2016).

• Take, hold, or deploy (something) as a means of accomplishing or achieving something; employ ((English Oxford living dictionaries, 2016).

Agriculture

• It is the science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products (English Oxford Living Dictionaries, 2016)

Information System (IS)

• A computer hardware and software system designed to accept, store, manipulate, and analyze data and to report results, usually on a regular, ongoing basis. An IS usually consists of a data input subsystem, a data storage and retrieval subsystem, a data analysis and manipulation subsystem, and a reporting subsystem. Widely used in scientific research, business management, medicine and health, resource management, and other fields that require statistical reporting, information systems can be broadly classified as spatial or non-spatial, depending on whether the data refers to a system of spatial coordinates (Reitz, 2016)

Farmer

• A person who owns or manages a farm(English Oxford living dictionaries, 2016).

• Someone who owns or takes care of a farm (Cambridge dictionary, 2016.)

Kerala State
• Kerala is the southernmost State of India.

Prototype Model

• Prototype model is “an original or first model of something from which other forms are copied or developed” (Merriam-webster dictionary, 2016)

Rural

• Sparsely populated area outside of the limits of a city or town or a designated commercial, industrial or residential center. Rural areas are characterized by farms, vegetation, and open spaces (Business dictionary, 2016).

Community

• Community is “a group of people with a common characteristic or interest living together within a larger society (Merriam-webster dictionary, 2016).

3.3 Objectives of the study

Following are the objectives framed for the present study

• To find out the Information needs of the rural community in the surveyed area

• To find out the sources of agricultural information to the farmers in Kerala state

• To ascertain the challenges of accessing agricultural information among the farmers in Kerala state

• To find out the Information use of the rural community in the surveyed area
• To find out the Information search habits of the rural community in the surveyed area

• To ascertain level of awareness of agricultural information among farmers in the study area

• To determine the role of information and communication technologies in information transfer to the rural farmers in Kerala State

• To identify the role of information centres and libraries in providing agriculture related information to rural farmers in Kerala State

3.4 **Hypotheses of the study**

In order to test the above mentioned objectives, the following null hypotheses were formulated and tested. The tested results are given in the major findings.

1. **H0**: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income of the farmers and their agricultural information needs

2. **H0**: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income of the farmers and their use of agricultural information

3. **H0**: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income of the farmers and their information search habits

4. **H0**: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income of the farmers and their level of awareness of agricultural information

5. **H0**: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income of the
farmers and role of information and communication technologies in information transfer to rural farmers in Kerala State.

6. No: There is no significant difference between the basic variables such as gender, age, religion, educational qualifications, annual income and role of information centres and libraries in providing agriculture related information to rural farmers in Kerala State.

3.5 Research Methodology

This research belongs to descriptive study. For conducting the study, survey method has been adopted by the researcher for collecting the data from rural farmers.

3.5.1 Research design

For evaluating the use of agricultural information system by rural farmers in Kerala State, an assessment regarding the use and seeking behavior of agricultural information and awareness of the existing agricultural information system has been conducted. A well-structured questionnaire has been designed by the investigator for collecting the data.

The samples were collected from fifteen villages under five districts of Kerala. Samples were selected through convenient sampling method. 100 samples from each district were selected. Hence, total samples selected from five districts were 500.

Table 3.5.1 Village-wise distribution of samples

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>District</th>
<th>Village</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Idukki (East)</td>
<td>Parathode</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pambadumpara</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Karunapuram</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Kollam</td>
<td>Sooranad</td>
<td>100</td>
</tr>
<tr>
<td>Districts</td>
<td>Villages</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>(West)</td>
<td>Perinad</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>East Kallada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Palakkad (North)</td>
<td>Elavencheri</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kizhakkencherry</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vadakkencherry</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Thiruvananthapuram (South)</td>
<td>Pallichal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Venganoor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kalliyoor</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Kottayam (Central)</td>
<td>Manimala</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onamthuruth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meenadom</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 Districts</strong></td>
<td><strong>15 Villages</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

### 3.6 Research population

Research population for the study included farmers residing in the rural areas of the five selected districts of Kerala State. Kerala State has been selected for the study because of its agrarian location. The cash crops such as coconut, rubber, tea, coffee, pepper, cardamom, areca nut, ginger, nutmeg, cinnamon and food crops such as paddy, pulses, tapioca etc. are grown from the total of 21,11,471 hectares land area sown in Kerala. Paddy is the major food crop of the State. Regardless of these realities, the production of paddy is found to be declining over the years. Even though the State could claim 50% self-sufficiency in paddy cultivation during 1974-75, its cultivated area and production declined alarmingly in the later years, resulting in
depending on other States for meeting its requirement of rice (Kerala Agriculture and Irrigation, n.d.).

Most of the rural people in Kerala depend on agriculture for their livelihood. As per Census 2011, total number of cultivators in Kerala was 740403. Hence, the sample selected is .067 percentage of the total population of cultivators in Kerala (Prokerala, n.d.). Majority of them are literate, having at least basic education. Hence, it is necessary to find out whether these farmers are using agricultural information and technologies developed in the area of agriculture. In order to conduct the research in the light of their information access facilities, the study has been taken in Kerala State having 14 districts. Since the researcher was having only limited time, the State has been divided into five zones to get equal representation from all corner of the State. Hence, the State has been divided into five regions based on its directions as east, west, north, south and central and selected one district from each region. Again from each district, three villages have been selected. In this study, in order to divide the State into regions (districts) and again for dividing the State into villages, random sampling i.e. multi-stage sampling have been used and for selecting the farmers from each village, convenient sampling is being used.

3.7 Pilot study

The investigator visited two villages of Kottayam District and distributed the questionnaire to 65 farmers for ensuring the validity of the final questionnaire. Based on the response drawn from the farmers, some of the questions which were useful have been incorporated and few of them have been deleted.
3.7.1 Areas selected for the study

The districts chosen were Idukki from the east region, Kollam from west region, Palakkad from north region, Thiruvananthapuram from south region and Kottayam from central region. Under each district, three villages in the coastal areas have been selected for conducting the study. The districts selected for the study are marked in the map of Kerala given below (Spiderkerala, n.d.).

(Source: http://www.spiderkerala.com/kerala/maps)

Figure 3.7.1 Kerala’s map showing the areas selected for conducting the study

3.7.1.1 Idukki district

Idukki district is situated in the eastern zone of Kerala. The agro-climatic conditions of Idukki are suitable for the cultivation of plantation crops like coffee, rubber, coconut, cardamom, pepper etc. Majority of the farmers belong to small and marginal farming group. The district is unique for natural beauty and has tea-gardens and cardamom plantation in the hilly areas. The district is famous for spices like pepper and cardamom. Other crops grown here include rubber, coffee and coconut.
The villages selected in Idukki district were Parathode, Pambadumpara and Karunapuram (National Informatics Centre, n.d.-a).

3.7.1.2 Kollam district

Kollam district lies in the south-west coast of Kerala. On its north is Alappuzha district and north-east Pathanamthitta district, east Thiruvananthapuram district, east Thiruvananthapuram district, west Arabian Sea and south Thiruvananthapuram district. Two rivers namely Ithikkara and Kallada rivers and Sasthamkottalake and several fresh-water lakes flows through the district. It is a prominent hub for the marine products’ industry of Kerala with Neendakara port. The important crops here are paddy, tapioca, coconut, rubber, pepper, banana, mango and cashew. More than 95% farmers here belong to small and marginal group. In Kollam district, the selected villages were Sooranad, Perinad and East Kallada (National Informatics Centre, n.d.-b).

3.7.1.3 Palakkad district

Palakkad district is located in the northern zone of Kerala. Agriculture is the main occupation in the district. Major crops cultivated here are coconut, rubber, pulses, arecanut, tapioca, ginger, groundnut, sugarcane, cotton etc. But, prominent crops of this region are coconut and paddy. Palakkad is known as the “Granary of Kerala”. Around 80% of the population are either owners of farms or farm labourers. The land area under cultivation in the district is 218336 hectares which is 49% of the total area. Elavencheri, Kizhakkancherry and Vadakkencherry were the villages selected in Palakkad district (National Informatics Centre, n.d.-c).
3.7.1.4 Thiruvananthapuram district

Thiruvananthapuram is the southernmost district of Kerala and the State capital. The district is bounded in the east by Thirunelveli district, Tamil Nadu, south by Kanyakumari District, Tamil Nadu, west by Arabian sea and north by Kollam district. The district has three major rivers, several fresh-water lakes and more than 300 ponds. Eastern part of the district is covered with forests, northern region has rubber cultivation and remaining areas have mixed dry land crops such as coconut, plantain and tapioca etc. In some places, there are rice cultivation also. In Thiruvananthapuram, Pallichal, Kalliyyoor and Venganurwere were the villages selected (Government of Kerala, n.d.-b).

3.7.1.5 Kottayam district

Kottayam is situated in central Kerala. It is bounded by Western Ghats in the east and on the west by VembanadLake and paddy fields of Kuttanad. Due to its many unique features such as beautiful backwaters, luxurious paddy fields, highlands, hills and hillocks, large scale rubber plantations and places with related legends and total literacy of people, Kottayam is known as “the land of letters, legends, latex and lakes”. Major share of India’s natural rubber is cultivated in Kottayam. Kottayam has a great honour of being the “Aksharanagari” meaning, “city of letters” considering its contribution to print media and literature. Apart from rubber, other crops cultivated here are tapioca, coconut, pepper, vegetables etc. Villages selected in Kottayam district were Manimala, Onamthuruth and Meenadom (National Informatics Centre, n.d.-b).
3.8 Methods of data collection

The data used for this study comprises both primary and secondary sources. Primary data were collected using questionnaires from farmer respondents and discussions with experts in the field. Secondary data were collected from published documents such as journal articles, books both print and online, digital information portals and internet related to agricultural information.

3.8.1 Tools for data collection

The main tool chosen for data collection was questionnaire. The questionnaire is comprised of two parts, first part involved questions to evaluate the socio-demographic information of the respondents and second part contained questions and statements to evaluate the farmers’ information needs, information use and seeking behavior, awareness on agricultural information, role of Information and Communication Technology in the transfer of agricultural information and the role of information centres and libraries in providing agricultural related information. Likert’s scale was used in the schedule to assess the respondents’ perceptions about different parameters.

The investigator has reviewed related studies in the topic of research since 1985. Based on the information collected from published articles, questionnaire has been developed. The finalized questionnaire has been attached. (During data collection, questionnaires were distributed to the respondents in local language, (Malayalam). The data were collected from November 2015 to April 2016 at the residence of the respondents as per their convenience. Data collected were checked, encoded and entered in the excel sheet.
3.9 Data analysis

Analysis of data has been carried out to test the formulated hypothesis using SPSS (Software Package for Social Sciences). Simple Percentage, Mean, Standard Deviation, Weighted Average Method (WAM), T-TEST and Analysis of Variance (ANOVA) and Chi-square were used for analyzing the data. T-TEST, ANOVA tests and Chi-square tests were used for testing the null hypotheses. Socio-demographic information of the respondents and problems faced in accessing agricultural information, order of preference in accessing agricultural information, awareness level of various agricultural information systems, role of agricultural information in increasing productivity were used as parameters for data analysis.

T-Tests results were tested with 0.05 significant level either for accepting or rejecting the null hypothesis for the independent variable “Gender” with the above dependent variables.

ANOVA results were tested with 0.05 significant level either for accepting or rejecting the null hypothesis for independent variable such as age, educational qualification, annual income and type of agricultural work with the above dependent variables.

CHI-SQUARE test results were tested with 0.05 significant level either for accepting or rejecting the null hypothesis for independent variables such as community and religion with the above dependent variables.

3.10 Limitations of the study

- Due to limitation of time, the study has been restricted to five districts of Kerala namely Thiruvananthapuram, Kollam, Kottayam, Idukki and Palakkad.
• The sample size was limited to 100 respondents from each district.

• Necessary care has been taken to make sure that the above limitations do not affect the rationality of the findings evolved.

3.11 Further study

In spite of all the limitations, the investigator trust that the findings and conclusion of the study will be useful for creating a prototype model for the development of rural community in Kerala and future research in the related area. Future studies can be undertaken with more number of respondents and districts at State level and even can be extended at national level.

3.12 Chapters of the study

The present study is organized into five chapters as detailed below.

Chapter 1: Introduction: This chapter deals with importance of information systems in agriculture, development of agriculture in India, agriculture at State level, global and national level advancement, use of agricultural information by rural farmers, flow of agricultural information and need for developing a prototype model for rural community.

Chapter 2: Review of related literature: In this chapter, past studies conducted in the research topic have been collected and learnt to find out the gap between modern technology and end-users for conducting factual research.

Chapter 3: Research Methodology: This chapter deals with need of the study, objectives and tentative hypothesis of the study, methodology adopted, sampling, method of data collection, data analysis, limitations of the study, further study and organization of chapters.
Chapter 4: Data analysis and interpretation: This chapter deals with quantitative results of the respondents represented in tables with interpretations.

Chapter 5: Findings, recommendations and conclusion: This chapter deals with findings based on the analysis of the data and recommendations with conclusion.
References


Raman Nair, R. (2006). Agricultural Information Service for the farmers and the public:


