PERFORMANCE OF AGRO SERVICE CENTRES OF DEPARTMENT OF AGRICULTURE-KERALA: A MULTIDIMENSIONAL ANALYSIS

by

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THESIS

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DECLARATION

I, hereby declare that this thesis entitled **"PERFORMANCE OF AGRO SERVICE CENTRES OF DEPARTMENT OF AGRICULTURE-KERALA: A MULTIDIMENSIONAL ANALYSIS"** 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.

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LIST OF ABBREVIATIONS

Abbreviations	Full form
%	Percentage
AMSC	Agro Machinery Service Centre
ANOVA	Analysis of Variance
ARS	Agricultural Research Station
ASC	Agro Service Centre
DAATTC	District Agricultural Advisory and Transfer of Technology Centre
et. al	Co-workers
FTC	Farmers Training Centre
FPO	Farmer Producer Organization
FYM	Farm Yard Manure
IT	Information and Technology
ITI	Industrial Training Institute
KCC	Kisan Call Centre
KVK	Krishi Vigyan Kendra
LEADS	Lead Farmer Centred Extension Advisory Services
MANAGE	National Institute of Agricultural Extension Management
No.	Number
PEI	Performance Effectiveness Index
RARS	Regional Agricultural Research Station
RATTC	Regional Agriculture Technology Training Centre
RSK	Raithu Samparka Kendra
SDA	State Department of Agriculture
SHG	Self Help group
SSLC	Secondary School Leaving Certificate
SHM	State Horticulture Mission
VHSE	Vocational Higher Secondary School

Introduction

INTRODUCTION

"If the farmer is poor, then so is the whole country" a famous polish proverb insinuates the importance of keeping our farmers prosperous, especially in a country like India where agriculture plays an indispensable role in the economy. Being an agrarian country, more than fifty per cent of India's population finds their way of living through agriculture and allied activities. Indian agriculture is designated by agro-ecological diversities in the cropping system, soil, rainfall and temperature and also India ranks among the top in the production of major food grains, pulses and vegetables. Our farming sector is currently facing the problems of low productivity, fragmented holdings, climate vagaries, fluctuating market prices, poor access to high-quality inputs and services and poor market access for the produce and the like. As per the statistics of 2017-18, an average of 10 farmers commits suicide every day in India (NCRB, 2019) due to low agricultural productivity and backward status of our agriculture. This is attributed to the inability of farmers to purchase good quality seeds and other inputs in small quantity due to their higher prices. Also, they are not capable to buy equipment and machinery for farming activities. Demand for farming inputs and agro advisory services is increasing at a faster pace. Even though the policies and programmes for the welfare of farmers are many, few reach their targets. Time-bound high-quality agro services are essential for the growth of agriculture in our country. Agro Service Centres satisfy the needs of small and marginal farmers by addressing their problems and needs in farming, through which empowering the farmers by securing them from economic loss in farming to some extent. This, in turn, contributes to the growth of Indian economy.

Agro service centres (ASCs) are the "one-stop-shops" offering timely services and inputs to the desired extent at reasonable rates in time in order to improve the economic viability of farming and standard of living of the farming community (Sidhu and Vatta, 2012). Moreover, they are the extension agencies providing

integrated services and supply of agro-inputs in rural areas according to local needs and also provide advice to farmers regarding the efficient utilization of available resources and create employment opportunities to rural youth (Vitthaldas, 2016).

The scheme " Agro Service Centre" for enhancing the service delivery of Kerala State Department of Agriculture was sanctioned for implementation in the state vide Government Order GO(Rt)No.1548/12/AD dated 30-07-2012 (GoK, 2012).

Agro Service Centres and service delivery project was launched in 2012-13 by the Department of Agriculture and Farmers welfare on a pilot basis in selected blocks and registered as a separate firm under Charitable Societies Act, 1955. In Kerala, Agro Service Centres are the service delivery systems established by the Department of Agriculture associated with co-operative societies, public limited companies, NGOs and the like. These centres are designed to purvey the needs of farmers in the areas like hiring of machinery with operator, repairing, providing inputs, transfer of technology at field level, weather advisory services, soil testing support and other technology-based services (GoK, 2016).

The goals of Agro Service Centres are much more holistic and plays a facilitatory role. In modern times, more emphasis has been given on commercial cultivation of crops for which they require massive investment and technical information which is not readily available in the existing extension service networks. Farmers need advisory services to resolve these issues. In this context, this study was undertaken with the following objectives.

1. To assess the performance effectiveness of Agro Service Centres in the dissemination of information and technology and measure the performance effectiveness of Agro Service Centres on farmer's income.
2. To study the attitude of farmers towards Agro Service Centres and elicit the problems encountered by Agro Service Centres in providing services to farmers.

1.1.SCOPE AND IMPORTANCE OF THE STUDY

Even though Kerala is blessed with all natural resources, agriculture sector exhibits an abrupt decline. This is mainly due to the deficit of farm laborers and inadequate remuneration of farmer's products. Also, the farmers are suffering from different kinds of losses in their farming due to unavailability of clinical and diagnostic services from experts. In order to make agriculture profitable in Kerala, a concerted effort is to be promoted in the field of farm mechanization, delivery of technical knowledge, availability of quality inputs and planting materials through a single-window approach. The success of agriculture depends on the availability of the right quantity of inputs and services at the right place in right time. Agro Service Centres facilitate the farmers to achieve these and thereby help to bridge the gap between farmers and the agriculture domain experts by providing need-based, diversified information and services to farmers. An effective appraisal of the performance of Agro Service Centres is imperative to determine the success and impact of these centres in the concerned areas of service delivery.

It is therefore hoped that this study will help in revising the modus operandi of Agro Service Centres and thereby act as an impetus for the establishment of more Agro Service Centres and productive functioning of the existing Agro Service Centres. The study will be of immense practical relevance not only to Department of Agriculture but also to all agencies involved in agricultural advisory services. The result of the study will be useful to the planners, policymakers and implementing officers to make emendations in the implementation of the scheme, as it is providing an idea about the constraints faced while running the centres and will also help in formulating solutions for the problems identified. The findings of the study will be therefore useful to the Department of Agriculture, training organizers of MANAGE and other stakeholders of advisory services and thus for the development of agriculture in the state.

1.2. LIMITATIONS OF THE STUDY

This study was conducted within a short span of time with the available resources. Wide coverage was not possible as the study was taken as a part of the requirement of M Sc. (Ag) programme. The area of investigation was restricted to three districts of Kerala representing the three zones. The working conditions in each area were quite different and therefore, the generalization of the study will not generate accurate results. The study was carried out among a small sample, chance for personal bias will be more and hence a detailed analysis may not be possible as it requires time. Also, there is a possibility of giving inaccurate information by the extension personnel regarding the services delivered in Agro Service Centre in order to convince that they are efficient in doing their work as an extension agent.

1.3.PRESENTATION OF THE STUDY

The report of the study has been presented under five chapters. The first chapter outlines the introduction part which comprises the service delivery aspects of ASCs, scope, importance and limitations of the study. The second chapter deals with review of literature which covers major related studies. The third chapter is the methodology of the study which illustrates the process of investigation and analysis. Fourth chapter covers the detailed narration of results and discussions of the study. The final chapter enclose the summary of the study and suggestions for future research. The references, appendices and abstract of the thesis are given in the end.

Review of Literature

REVIEW OF LITERATURE

Review of literature covers the theoretical orientation of the study. Generally, a literature review is the decisive scrutinisation of an already published body of knowledge related to the concepts and findings of the research. Review of literature is the first step in an explorative study which help the researcher to formulate a hypothesis and decide the things that need to be done (Ray and Mondal, 2011). This chapter illustrates the theoretical perspective adopted for the study, and literatures reviewed are presented under the following headings.

2.1. Concept of Agro Service Centre and agro advisory services

2.2. Concept of performance effectiveness

2.3. Performance effectiveness of agricultural information and services delivery systems

2.4. Attitude of respondents

2.5. Relationship between performance and attitude

2.6. Profile characters of respondents

2.7. Constraints faced by the respondents

2.8. Suggestions to improve the performance effectiveness of agricultural information and services delivery systems

2.1. CONCEPT OF AGRO SERVICE CENTRE AND AGRO ADVISORY SERVICES

Anderson (2007) opined that apart from providing information to improve the agricultural production and productivity, agricultural advisory services should concentrate on promoting sustainable production techniques and is also expected to satisfy the requirements of farmers in the marketing of their product.

Agro Service Centre is an agency which is delivering various agricultural services and inputs to farmers based on their farming requirement at a single point (GoK, 2011).

Agro service centres (ASCs) are the "one-stop-shops" offering timely services and inputs to the desired extent at reasonable rates in time in order to improve economic viability of farming and standard of living of the farming community (Sidhu and Vatta, 2012).

Nnadi *et al.* (2013) opined that agricultural extension services play an important role in improving the livelihood of farmers in terms of providing cost-effective, appropriate and affordable services to farmers, transfer of latest farming technologies and help in diversification and specification of farming.

Agro service centres are the extension agencies providing integrated services and supply of agro inputs in rural areas according to local needs and also provide advise to farmers regarding the efficient utilization of available resources and create employment opportunities to rural youth. (Vitthaldas, 2016).

Rural agricultural service centre is a hub which is operated by a trained agricultural expert and it will help the rural farmers to get needed information on agriculture and allied sectors at their doorsteps in time at remunerable price (Kumar *et al.*, 2017).

Farmers service centre is a one-stop-shop offering quality agricultural inputs and services to farmers (CNFA, 2018).

2.2.CONCEPT OF PERFORMANCE EFFECTIVENESS

Vijayaragavan and Singh (1997) pointed out that performance is a process of appraising employee in carrying given responsibilities and task in order to develop their potential.

Talbot (1999) stated that performance measures the gap between organizational activities and the outcomes that the organization wants to accomplish

According to Bella (2006), performance effectiveness of the teacher is the degree to which a teacher creatively does right things to achieve the intended and desired results through optimum utilization of resources in teaching, research and extension education.

Khalil *et al.* (2008) opined that a better performance can be achieved through proper agricultural extension strategies and policies. He analyzed performance in terms of five dimensions *viz* quality and quantity of work, attendance of employees at work, dependability, feedback of extension activities and satisfaction of clients.

Verbeeten (2008) reported that clear and measurable goals were positively associated with quantitative performance parameters such as efficiency and production goals, as well as quality performance parameters including employee morale, accuracy and innovation.

Chinchu (2011) conceptualized the performance effectiveness of State Horticultural Mission-Kerala in terms of beneficiary satisfaction, achievement of physical targets and financial targets and stakeholder participation.

Mukherjee (2011) conceptualized the effectiveness of an extension system as its ability to meet the needs of farmers by providing inputs, information, services and

relevant technology for better adoption of technologies and ultimately leading to satisfaction of farmers.

June and Mahmood (2011) opined that the employee's job performance is a critical factor in deciding the performance of an organization. Profoundly performing employees can help the organization to achieve its strategic goals, thus maintaining the competitive spirit of the organization.

Sayooj (2012) conceptualized the performance as the effectiveness of the activities of VFPCK, which can be contrary to the mandate and objectives of the organization

Peter (2014) states that reliability, timeliness, accuracy and completeness of the information are some of the important factors that affect the effectiveness of monthly technical advice by LEADS.

According to Anirban and Aniruddha (2015), performance effectiveness is the precision and efficiency of an extension organization in delivering the latest technologies and information to a farming population and meeting predetermined goals.

Mukherjee and Maity (2015) described the effectiveness of an organization as how well it performs its activities to attain the predetermined objectives.

2.3. PERFORMANCE EFFECTIVENESS OF AGRICULTURAL INFORMATION AND SERVICES DELIVERY SYSTEMS

Dakhore *et al.* (2008) observed that farmers using agro advisory services received 18 and 12 per cent higher net return in tobacco and potato cultivation respectively compared to non-users in middle Gujarat agro-climatic zone.

Chittem (2010) in a study conducted on the performance of Eruvaka Kendras in Andra Pradesh found that 55 per cent of farmers categorized the Eruvaka Kendras

into average performance category followed by poor performance category (23.75%) and good performance category (21.25%).

Issa *et al.* (2011) found that the perception of farmers on the effectiveness of agricultural extension services delivery channels was significantly and positively related to income and farming experience of the farmers.

Mukherjee (2011) in his study on Tata Kisan Sansar revealed that the performance effectiveness of services provided by Tata Kisan Sansar was medium for majority (54%) of the farmers and it was highly effective for 46 per cent of the farmers.

Sayooj (2012) reported that a high performance index was found in the service support of VFPCK including marketing facility, credit accessibility, input supply and technical support to farmers.

Avinash (2013) in his study on the functioning of Raitha Samparka Kendra (RSK) found that the perception of farmers regarding the performance of RSK was positively and significantly correlated with their annual income.

Mustapha *et al.* (2016) in a study conducted among the onion farmers in Nigeria reported that 43.80 per cent of farmers perceived the performance of extension services as high followed by 35.9 per cent perceived as medium performance.

Koshy (2016) reported that 69 per cent of farmers who received the services of Kisan Call Centre (KCC) opined the efficiency of KCC services was medium and therefore the centre needs to render most useful service to farmers for a better performance

Chandran (2018) reported that in Kerala, services of Agro Machinery Service Centre (AMSC) helps the farmers to cope with the shortage of agricultural labourers and thereby it facilitates the timely management of farm with a reduction in cost of cultivation.

Ravikishore (2018) in his study on performance effectiveness of State Department of Agriculture (SDA) reported that in Kerala, 45 per cent of the respondents

perceived that the performance effectiveness index of Department of Agriculture was medium followed by high and low performance effectiveness index as perceived by 28 per cent and 27 per cent of respondents respectively.

2.4. ATTITUDE OF RESPONDENTS

2.4.1. Attitude of farmers

Purushottam (2000) observed from his study on the attitude of farmers towards watershed development programmes that most of the farmers had a favourable attitude towards the activities related to watershed development programmes

Chittem (2010) found that only 21.25 per cent of farmers had favourable attitude towards the functioning of Eruvaka Kendras.

Ganiger (2012) revealed that 69.45 per cent of farmers had favourable attitude towards agro advisory services provided by input dealers followed by 31.25 per cent with less favourable attitude.

Peter (2014) revealed that implementation of farmer centered extension advisory services has increased the farmers access to agricultural services directly and regularly from the extension agents and hence the farmers were having a favourable attitude towards the agro advisory services delivery system of LEADS.

Sobanbhai (2014) in a study conducted among the beneficiary farmers of Kisan Call Centre (KCC) in Gujarat found that most of the farmers (57%) had medium favourable attitude towards the services of KCC followed by almost equal per cent of farmers with favourable (22%) and unfavourable (21%) attitude.

Koshy (2016) reported the majority of the farmers had a moderately favourable attitude towards the services of KCC followed by twenty-six per cent of the farmers with favourable attitude and fifteen per cent of the farmers with less favourable attitude towards KCC

Wadkar *et al.* (2016) assessed that the service providers need to focus more on the efficacy and utility of services in order to develop a favourable attitude in dairy farmers towards e-Agri services.

Kushwaha (2018) confronted that 70.84 per cent of farmers had favourable attitude towards the private agricultural extension services and the remaining 29.16 per cent of farmers had least favourable attitude.

2.4.2. Attitude of extension personnel

Kumar (1997) in his study on the effectiveness of officers in the state department of agriculture recognised that attitude of officers was positively and significantly correlated with information efficiency.

Chaudhary (2006) conducted a study among the Agricultural Supervisors and found that 75 per cent of Agricultural Supervisors were having a medium favourable attitude towards the extension activities of Rajasthan State Department of Agriculture followed by 17 per cent and 8 per cent of supervisors who had least and most favourable attitude respectively.

Chittem (2010) observed that 70 per cent of Agricultural Officers were having neutral attitude followed by unfavourable (17.50%), favourable (12.50%) attitude towards the functioning of Eruvaka Kendras.

Peter (2014) revealed that 77% of extension personnel had a favourable attitude towards farmer centred extension advisory and delivery services.

Arifullah *et al.* (2014) in their study on the attitude of extension workers towards activities of agricultural extension department discovered that 43.14 per cent of the extension agents had moderate favourable attitude

Bortamuly (2015) in his study on the performance of extension personnel in Assam revealed that easy working guidelines of ATMA and provision of opportunities by ATMA for professional carrier upscaling led to the favourable (66.07%) and highly favourable (16.96%) attitude of the extension personnel.

Walke and Bhange (2017) revealed that majority of the agricultural officers (71.32%) were having favourable and highly favourable attitude towards their job followed by 27.21 per cent of officers with less favourable attitude.

Ravikishore (2018) reported that 55 per cent of extension agents had medium favourable attitude towards the technology disseminating system of Department of Agriculture, Kerala followed by 25 per cent and 20 per cent of extension agents with less favourable and high favourable attitude.

2.5. RELATIONSHIP BETWEEN PERFORMANCE AND ATTITUDE

Depaolo and Mclaren (2006) examined the relationship between attitude and performance of students in business calculus and found that attitude of students plays a vital role in the performance of business calculus

Bireswari (2013) conducted an empirical study among IT employees in Bangalore and found that organizational performance affects employee attitude towards the organization.

Awan and Islam (2015) reported that a strong and positive correlation exists between attitude and performance of employees and the factors affecting includes supervisors conduct, co-workers behaviour, pay, monetary rewards, promotion, workload and working environment.

2.6.PROFILE CHARACTERISTICS OF THE RESPONDENTS

2.6.1. Profile characteristics of farmers

2.6.1.1.Age

Chittem (2010) found that majority of the respondents belonged to middle age group (56.25%) followed by old (26.25%) and young age (17.50%) groups.

Mukherjee (2011) identified that 56 per cent of beneficiaries of agricultural information and service centres called Tata Kisan Sansar were young farmers.

Sayooj (2012) found that majority (64.58%) of SHG farmers belonged to middle age group followed by 29.16 per cent of farmers with age above 55 years and only 6.25 per cent of farmers were in age group less than 35 years.

Neethi (2013) in her study among the beneficiaries of District Agricultural Advisory and Transfer of Technology Centre (DAATT Centre) observed that 40.00% of the beneficiaries of DAATT Centre services belonged to the middle age group followed by 33.33% in old age group and 26.67% in the young age group.

Nnadi *et al.* (2013) observed that most of the beneficiaries of agricultural extension services (62.5%) belong to the middle age category with a mean age of 48.5 years.

Peter (2014) found that participation of youth in farming was very less compared to old age and middle age categories.

Sobanbhai (2014) found in his study that more than fifty per cent (55%) of the farmers were in middle age group, whereas 26 per cent and19 per cent of them were in young and old age category respectively.

Mwangi and Kariuki (2015) in their study among small holder farmers revealed that there exist a negative relationship between age and perception of technologies.

Mustapha *et al.* (2016) found that in Bomo state of Nigeria, most of the onion farmers (50%) receiving agricultural extension services were in the age group of 20 to 30 years followed by 28.10% in the range of 31 to 40, 12.50% in the range of 41 to 50 and 9.40% in the range of 51 to 60 years.

Kapondera and Namusanya (2017) observed that youth dominate in the usage of telecentre facilities in Kasungu district of Malawi.

Paul (2017) observed that most of the farmers from Palakkad (51.11%) and Kollam (48.89%) districts who received the services of LEADS belonged to aged

category followed by 46.67 per cent of farmers from both these districts belonged to middle aged category.

Ajith (2018) reported based on the findings of his study that nearly fifty per cent (50.83%) of farmers belonged to old age group followed by 45 per cent and 4.16 per cent farmers who belonged to middle and young age group respectively.

Kushwaha (2018) in a study conducted among the farmers who prefer to use private agricultural extension services found that 40 per cent of farmers who utilized private agricultural extension services were middle aged followed by 32.5 per cent farmers who were elderly and 27.5 per cent of farmers who were youngsters.

2.6.1.2.Education

Chittem (2010) opined that in the past most of the youngsters entered farming leaving education but later the situation has changed.

Chinchu (2011) in his study on performance of Kerala State Horticultural Mission (SHM) identified that most of the farmers (42%) had secondary education followed by 31 per cent farmers with primary education and none of the farmers was illiterate.

Neethi (2013) opined that 39.17% of the beneficiaries of agricultural advisory services of DAATT centres were having primary and middle school level of education followed by illiterate (33.33%), high school (10%), intermediate (5%) and only 4.17 % of the beneficiaries with college level education

Peter (2014) reported that 65 per cent of the farmers had high school education followed by 32 % of the farmers with college level education

Namitha (2017) revealed that 44 per cent of the farmers had high school education followed by 29 per cent with primary school education.

Paul (2017) recognized that most of the farmers who received the services of LEADS had a middle school or high school level education and none of the LEAD farmers was illiterate.

Ajith (2018) found that 55 per cent of the respondent farmers had education up to high school or higher secondary followed by 30.83 per cent with a degree or above qualification.

Ravikishore (2018) revealed that in Kerala, most of the farmers had high school level and higher secondary level of education and only a few farmers were illiterate.

2.6.1.3. Size of land holding

Chittem (2010) discovered that the size of landholding had a positive and significant correlation with the attitude of farmers towards the functioning of Eruvaka Kendra.

Chinchu (2011) found in his study that the average landholding size of beneficiary farmers were 1.2 acre and most of the farmers (55%) had a land area ranging from 1 to 2 acre.

Mukherjee (2011) affirmed that more than fifty per cent (52%) of beneficiary farmers of Tata Kisan Sansar belonged to small farmer group followed by 36 per cent farmers in semi-medium and 12 per cent of farmers in marginal group.

Ganiger (2012) revealed that 39.16 per cent of respondents were marginal farmers followed by 18.33 per cent small farmers and 17.49 per cent medium farmers.

Sayooj (2012) reported that of majority (52.08%) of the farmer's area of cultivation was more than 2 acre and that of 40.62 per cent of farmers had an area of cultivation between 1-2 acre.

Nnadi *et al.* (2013) revealed that 79.5% of farmers who are utilizing the extension services had the land area ranging from 2 to 4 ha, 12.8% of farmers had a land area above 4 ha and 7.7 % had the land area below 2 hectare.

Sobanbhai (2014) reported that small holder farmers were major beneficiaries of KCC services than other categories of farmers based on their land holding size

Shah and Shroff (2017) observed that the average size of land holding of beneficiary farmers who receive extension services of agri-clinic and agribusiness

centres in Maharashtra is 0.68 hectare for marginal farmers, 1.53 hectares for small and 2.93 hecatres for medium farmers.

2.6.1.4. Crops grown

Sayooj (2012) identified, banana, bittergourd, amorphophallus and cow pea as the major crops grown by most of the VFPCK farmers.

The area, production and productivity of major crops including paddy, coconut, banana, tapioca and vegetables were found to be enhanced after the interventions of Agro Service Centres in Kerala (GoK, 2016)

Food crops like paddy and banana, cash crops like coconut, areca nut, pepper, rubber, cardamom, tea, coffee, ginger, nutmeg, cinnamon are the major crops cultivated in Kerala (GoI, 2019)

2.6.1.5. Farming experience

Chittem (2010) observed that 57.50 per cent of farmers had medium experience in farming followed by 23.75 per cent with high and 18.75 per cent with low experience.

Chinchu (2011) assessed the farming experience of respondent farmers and it was found that 64 per cent of them were having more than ten years of experience in farming.

Mukherjee (2011) found that 46 per cent of farmers had 20 to 30 years of farming experience followed by 42 per cent of farmers with less than 20 years of experience in farming.

Fereshteh (2012) reported that wheat farmers receiving agricultural advisory services possessed an average of 17 years of experience in farming.

Sayooj (2012) revealed that 77.08 per cent of VFPCK farmers had more than 10 years of experience in farming

Neethi (2013) revealed that 48.33 per cent of the beneficiaries of DAATT centre services were having medium farming experience followed by 28.33 per cent with high and 23.33 per cent with less experience in farming.

Namitha (2017) in her study among the vegetable growers of Thiruvanathapuram district reported that nearly fifty per cent (51%) of the farmers had 10 to 25 years of experience in farming followed by 29 per cent with more than 25 years of farming experience.

Paul (2017) found that majority of the farmers from Kollam (82.22%) and Palakkad (75.56%) possessed experience of more than 25 years in farming and rest of the farmers had experience between 11 to 25 years.

2.6.1.6. Annual farm income

Chinchu (2011) found that most of the farmers (47%) who received the services of SHM-Kerala earn an income of 50001 to 100000 rupees followed by 39 per cent farmers who earn income between 25000 to 50000 rupees from farming.

Sayooj (2012) revealed that 84.40 per cent VFPCK farmers were having income of more than one lakh.

Avinash (2013) commented that a high-income farmer can afford all the services and technologies from any agricultural extension agencies such as RSK and therefore they have a higher perception towards the functioning of RSK.

Kapondera and Namusanya (2017) found that farmers with low-income levels use the services of telecentres more efficiently.

Namitha (2017) reported that almost 47 per cent of the farmers were earning an annual income of more than one lakh and only 21 per cent of the farmers were earning an income below fifty thousand.

Ajith (2018) reported that 39.16 per cent of member farmers who received the services from FPOs earn an annual income in the range of Rs.60,000 to Rs.2,00,000 followed by 31.66 per cent of farmers who obtain an income of more than two lakh.

Raj (2018) found that 58.75% of the farmers were getting annual income of rupees in the range of 50000 to 100000 from farming alone.

2.6.1.7. Resource utilization

Fan *et al.* (2011) opined that resource utilization efficiency should be enhanced to improve productivity and thereby ensuring food security.

Sundaran (2016) reported that majority of the respondents moderately utilized the available resources.

2.6.1.8. Change proneness

Vasantha (1996) found that 58.34% of respondents had a medium level of change proneness followed by 28.83% who had a low level of change-proneness and 15.83% had a high level of change proneness

Reddy (2002) reported that the majority (57.44%) of the respondents had medium change proneness followed by high and low change proneness with 21.28% of each.

Neethi (2013) revealed that 49.17% of the beneficiaries of DAATT Centre services had medium change proneness followed by low (26.67%) and high (24.17%) change proneness respectively.

2.6.1.9. Decision making ability

Chaudhary (2006) observed that the decision making ability of 72 per cent of the respondents was moderate followed by low and high decision making ability by 18 per cent and 10 per cent of respondents respectively.

According to Paul (2017), medium decision making ability of majority of farmers was due to their over dependency on fellow farmers for taking decisions.

Raj (2018) reported that for majority of farmers the decision making ability was medium, whereas the percentage of farmers were equal in the low and high category of decision making ability.

2.6.1.10. Information source utilization

Chinchu (2011) reported that Krishi Bhavan and other fellow farmers were the most utilized information sources by majority of the farmers and newspaper, television and internet were found to be the least utilized information sources.

Neethi (2013) reported that almost seventy per cent of the farmers were having moderate information source utilization behaviour and 17 per cent and 12 per cent of farmers were utilizing the available information sources with high and low efficiency respectively.

According to Koshy (2016), most preferred and used information source of the KCC farmers was found to be the television followed by newspaper and mobile phones and it was found that their information utilization was found to be medium (71%), high(17%) and low(12%), in that order

Paul (2017) reported that most frequently utilized information sources by majority of the beneficiary farmers of LEADS were Krishi Bhavan, newspaper and television.

Kushwaha (2018) realized that 41.67 per cent of the farmers belonged to medium category of information source utilization followed by 30 per cent in high category and 28.33 per cent of farmers in low category of information source utilization.

2.6.1.11. Risk orientation

Mauceri *et al.* (2005) stated that younger farmers do have less risk-averse behaviour and are ready to try new technologies.

Mukherjee (2011) revealed that beneficiaries of agricultural extension service were better in dealing with risk and uncertainties and hence they had higher risk orientation.

Satyanarayana (2014) expressed his opinion that the innovativeness might be the reason for the high risk orientation of majority of the respondent.

Sobanbhai (2014) found that majority of respondent farmers (60.5%) of KCC services had medium level of risk orientation followed by 23.5 per cent and 16 per cent farmers who had high and low orientation towards risk.

Deekshit (2015) reported that 66.66 per cent of respondents were having medium level of risk orientation.

Namitha (2017) observed the risk orientation of the farmers and it was found that 57 per cent of them had medium level of risk orientation followed by 24 per cent and 19 per cent of them with high and low risk orientation respectively.

Kushwaha (2018) defined risk orientation as the courage of farmers in facing the problems that arise in farming and he reported that 38.33 per cent of farmers had medium risk orientation followed by 31.67 per cent and 30 per cent of farmers who had high and low risk orientation.

2.6.1.12.Extension agency contact

Chittem (2010) reported that 52.50 per cent of the farmers had medium extension agency contact followed by 28.75 per cent had high contact and 18.75 per cent had low extension agency contact.

Mukherjee (2011) examined the extension agency contact of both beneficiary and non-beneficiary farmers of a private agro service centre named Tata Kisan Sansar and it was found that beneficiary farmers had more contact with extension agencies than non-beneficiary farmers.

Ganiger (2012) in his study found that most of the respondents (73%) were having medium to high contact with extension agencies.

Avinash (2013) reported that 69.16 per cent of farmers had regular contact with Agricultural Officers and Assistant Agricultural Officers and almost twenty per cent of the farmers had occasional contact with these officers.

Neethi (2013) found that more than half of the respondents (65%) had medium level of extension agency contact followed by 18 per cent with low level of extension agency contact and 17 per cent with high level of extension agency contact.

Peter (2014) reported that contact of farmers with extension agents and the utilization of services provided by them has increased after the implementation and functioning of LEADS.

Sobanbhai (2014) opined that extension contact influence the attitude of respondents towards the services of KCC

Namitha (2017) found that most of the respondents had regular contact with extension agents of Krishi Bhavan and VFPCK.

Paul (2017) opined that the frequent visit of farmers to Krishi Bhavan reduce their contact with other extension agencies and this might be the reason for the occasional contact of them with other extension agencies.

Ajith (2018) observed that for most of the respondents (44.16%), extension agency contact was low and for 30.83 per cent of respondents extension agency contact was found to be high.

2.6.2. Profile characteristics of Extension personnel

2.6.2.1.Age

Chaudhary (2006) noticed the age distribution of majority of agricultural supervisors (98%) was in between 30 to 50 years.

Chittem (2010) commented that middle aged extension agents were more productive and their role performance in Eruvaka Kendra was found to be high because of their enthusiasm and energy than elders.

Ali (2013) found that middle aged extension personnel were greater in number than old and young extension personnel.

Bhaurao (2014) revealed that majority of the extension agents in agro service centres were from middle age category (63.33%), followed by 19.16% from old age and 17.51% from young age categories and the average age of the extension agents was found to be 48.10 years.

Peter (2014) found that the majority of the extension workers involved in the service delivery mechanism of LEADS belonged to young and middle age categories.

Bortamuly (2015) revealed that more than sixty per cent (61.61%) of the respondents belonged to the middle aged category, followed by 20.54 per cent in old aged and 17.85 per cent in young aged category and the mean age of the agricultural extension personnel was found to be 42.89 years.

Koshy (2016) observed that more than fifty per cent of farmers receiving the agricultural information support services of Kisan Call Centres belongs to middle age group followed by high age group and then low age group.

Deepika (2017) revealed that 68.3 per cent of veterinary extension personnel were youngsters followed by 24.2 per cent belonged to middle age group and only 7.5 per cent of officers belonged to old age group.

Ravikishore (2018) found that sixty two per cent of the extension agents from Kerala State Department of Agriculture were middle aged and only 17.5 per cent were young extension agents.

2.6.2.2. Education

Chittem (2010) reported that 55 per cent of officers was found to be hold a degree in agricultural sciences followed by 42.5 per cent of officers with post-graduation in agricultural science.

Sayooj (2012) found that majority of assistant managers (68.95%) working in VFPCK were from the stream of agriculture only.

Ali (2013) revealed that thirty per cent each of extension personnel were having graduation, post graduation and doctoral degree in agricultural science.

Bhaurao (2014) found that most of the extension workers in agro service centres were non-agricultural graduates.

Peter (2014) found that all extension workers associated with LEADS in Kollam. district of Kerala have college level education.

Bortamuly (2015) reported that most of the extension agents in the revitalized extension system in Assam were graduates and postgraduates in agriculture.

2.6.2.3. Experience in extension work

Chaudhary (2006) opined that rich experience (more than 20 years) of majority of the agricultural supervisors (65%) helped them in convincing farmers about the benefits of new technologies and thereby enable effective delivery of departmental programmes.

Ali (2013) conducted a study on "The impact of transformational leadership and innovative behaviour on job performance of extension personnel" in which he found that most of the respondents had medium service experience in extension service.

Bhaurao (2014) observed that majority of the extension agents (73.33%) had medium level (9 to 16 years) experience in extension work and only 16.67% of the respondents had more than 17 years of experience.

Bortamuly (2015) disclosed that majority (73.21%) of extension agents were having service experience of 7 to 17 years followed by 15.18% with more than 17 years of experience and he also found that many of the young officers had less service experience

Deepika (2017) from his study inferred that more than sixty per cent (63.33%) women veterinary officers had less experience in extension work and average experience of respondents was found to be 9.7 years.

Ravikishore (2018) observed that fifty six per cent of extension agents were having moderate experience in Kerala State Department of Agriculture and almost equal number of extension agents belonged to high (25%) and low category (24%) of experience.

2.6.2.4. Training received

Chittem (2010) commented that different types of in-service.training programmes are needed to improve the professional competency of the extension officers.

Ganiger (2012) reported that the various training programmes provided for the input dealers of Agro Service Centres, in the areas of crop production techniques, integrated nutrient and pest management, has tremendously improved the techniques and strategies adopted by the input dealers for water conservation, documentation, diagnostic skills, post-harvest management, agribusiness management and the like.

Ali (2013) suggested that extension personnel should adopt specialized training programs to perform a variety of tasks, contribute agricultural development and productivity by enhancing and updating their skills.

Bhaurao (2014) found that majority of extension agents (61.67%) have not received any kind of training programmes

Peter (2014a) reported that the majority of the officers and field assistants received more training compared to beneficiary farmers of LEADS.

Peter (2014b) found that the number of training attended had a positive and significant impact on the attitude of both farmers and extension personnel towards LEADS.

Bortamuly (2015) opined that Agricultural Officers with less service experience must be exposed to adequate training opportunities to acquire further expertise.

Ravikishore (2018) reported that in Kerala, the State Department of Agriculture considers training as the basic requirement of extension agents to practice all the principles and functions of agricultural extension services. He also opined that training on handling of recently developed technologies and methods should be

provided to extension agents who are there to provide services to the farming community

2.6.2.5. Extension service orientation

Ganiger (2012) observed that nearly fifty per cent (50.84%) of respondents had high extension service orientation followed by 25.83 per cent with medium extension service orientation and 23.33 per cent of respondents were having low extension service orientation.

2.6.2.6. Work commitment

Kumar (1985) found that most of the Assistant Agricultural Officers (44%) had only moderate commitment when working in an organization under Training and Visit system.

Kumar (1997) found that majority of the officers (68%) had a high work commitment followed by rest of the officers with very high (20%) and low (12%) work commitment.

Chaudhary (2006) found that majority of the Agricultural Supervisors (61%) had medium job commitment followed by 23 per cent and 16 per cent of supervisors who had high and low level commitment in their job.

Sundaran (2016) reported that majority of the respondents were having medium level commitment in their work.

Ravikishore (2018) found that organizational commitment of extension personnel was positively and significantly correlated with their attitude towards the technology dissemination of SDA.

2.6.2.7. Problem solving ability

Tivaieyari *et al.* (2010) assessed the different competencies influencing the job performance of extension workers and found that problem-solving competence of extension worker did not affect their job performance in Good Agricultural Practices (GAP).

Ali (2013) conceptualized problem solving ability as the capacity to make sensible decisions and initiates distinct plans to provide solutions for both individual and organizational problems.

2.6.2.8.Leadership ability

Shankar (2004) in his study on the efficiency of extension and clientele system disclosed that more than sixty per cent (65%) of the extension personnel had medium leadership ability followed by 25 per cent with low leadership ability.

Moore and Rudd (2004) stated that human skill, technical skill, conceptual skill, industry knowledge skill, emotional intelligence and communication skill are the six necessary leadership skills for an extension agent.

Chaudhary (2006) reported that 65 per cent of the respondents had medium leadership ability and the remaining 35 per cent of respondents had less leadership ability.

Khalil *et al.* (2008) assessed competency variables associated with extension worker's leadership and it includes planning, implementation and evaluation of extension program, extension methods and communication, leadership development and human development learning and they found that these competencies lead to the confidence of extension worker as a leader

Tivaieyari *et al.* (2010) opined that leadership development is important in determining the competency of extension worker.

2.7. CONSTRAINTS FACED BY THE RESPONDENTS

2.7.1. Constraints faced by farmers

Chittem (2010) observed that lack of technical staff and lack of subsidies for high cost new technologies were the two major constraints faced by the farmers.

Ganiger (2012) identified that the major obstacles faced by the farmers were communication gap of agencies in delivering agro advisory services, lack of diagnostic skills and inadequate professional qualification of extension agents.

Neethi (2013) identified that the major problems faced by the farmers in the utilization of agricultural advisory services were lack of adequate extension personnel, insufficient financial support, lack of proper storage facilities and lack of access to location-specific technologies for the farmers.

According to Paul (2017), the major constraints experienced by the farmers were lack of coordination among the agencies providing similar services and lack of usefulness of farmer oriented activities such as demonstrations and field visits.

2.7.2. Constraints faced by extension personnel

Chittem (2010) revealed that lack of enough extension personnel and heavy work load of existing extension personnel were the two major reasons leading to the average performance of Eruvaka Kendras.

Mukherjee (2011) identified the prominent problems faced by the extension workers in the functioning of Tata Kisan Sansar as lack of co cooperation from other extension organization and problem of job security.

Neethi (2013) reported the major problems as perceived by the extension agents in the delivery of agricultural services were limited finance for the functioning of the centre, inadequate technical staff and poor linkages with the farmers who require the services.

Bhaurao (2014) identified major problems in running the agro service centres as, inadequate finance, inadequate supply of seeds at right time, lack of technical knowledge in handling of farm machinery and inadequate storage facilities.

Deepika (2017) enlisted the constraints faced by majority of the officers and it included inadequate technical knowledge, lack of trained workers, lack of time due to increased documentation work and lack of skill based training on advanced technologies.

Paul (2017) identified the major constraints encountered by the officials in the implementation of LEADS and it includes lack of support from the farmer groups and lack of effective participation from the member farmers in attending group meetings.

Ravikishore (2018) recognised the important constraints faced by the extension agents of agricultural department in managing technology dissemination methods and they were lack of training to employees, inaccurate information on technology delivery methods and lack of awareness on new approaches of technology dissemination.

2.8. SUGGESTIONS TO IMPROVE THE PERFORMANCE EFFECTIVENESS OF AGRICULTURAL INFORMATION AND SERVICES DELIVERY SYSTEMS

Chittem (2010) suggested that performance of Eruvaka Kendras can be improved appointing qualified, experienced and interested candidates in the reported vacancies.

Neethi (2013) suggested to hire adequate staff in the vacant posts and also to provide separate fund for the effective functioning of the agricultural advisory and transfer of technology centres in Andra Pradesh.

According to Singh *et al.* (2013), adequate funding and proper linkage between different agencies are needed to improve the efficiency of agricultural technology disseminating system.

Paul (2017) suggested in her study to conduct frequent field visit to farmer's field by expert teams to enhance the performance effectiveness of extension agencies and to increase the cultivation and productivity of farmers.

Methodology

METHODOLOGY

Research methodology is a systematic way to accomplish the research objectives efficiently. It reflects the methods and approaches followed while conducting the research and also paves the way for a satisfactory result for the researcher. The methodology followed for the research are outlined under the following heads

3.1. Research design
3.2. Locale of the study
3.3. Selection of respondents
3.4. Operationalisation and measurement of variables
3.5. Region wise comparison of Agro Service Centres
3.6. Constraints faced by the respondents and their suggestions
3.7. Data collection tools and methods
3.8. Statistical tools used

3.1. RESEARCH DESIGN

A research design is the whole process of planning and carrying out the investigation by enabling the researcher to foresee the constraints and such other aspects during the conduct of the research and the design is often designated by its flexibility, relevancy, and efficiency (Daivadeenam and Somani, 2013).

The design of research involves all the important activities of research right from the identification of the problem up to reporting of the research problem and help to gain familiarity with the phenomena or to attain new insights into it, often in order to formulate a specific research problem. In the present study, where the main intention is assessing the performance effectiveness of Agro Service Centres in the dissemination of information and technology and to measure the performance

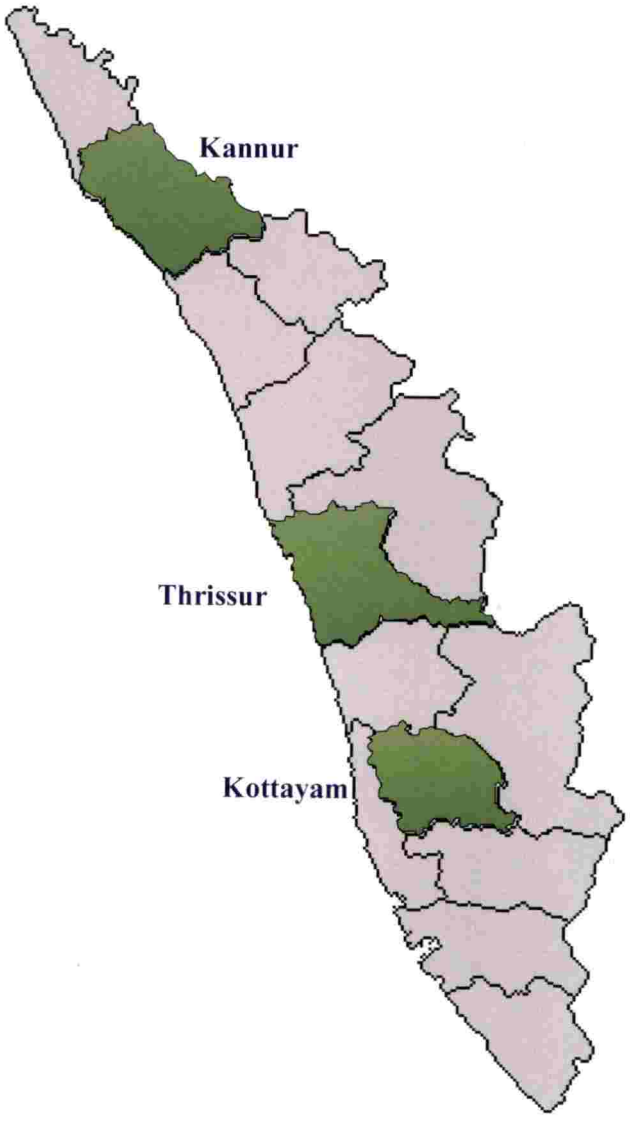

Figure 1: Location of the study

effectiveness of Agro Service Centres on farmer's income, Ex-post-facto research design was employed.

3.2. LOCALE OF THE STUDY

The present study was conducted in three districts of Kerala *viz;* Kottayam from the southern region, Thrissur from the central region and Kannur from the northern region which were having maximum number of Agro Service Centres. From the 77 Agro Service Centres established across the state until 2016-17, 6, 10 and 10 Agro Service Centres that were established in Kottayam, Thrissur and Kannur districts respectively were selected for the study.

3.3. SELECTION OF RESPONDENTS

The respondent groups of the study comprises of extension personnel from Agro Service Centres and farmers. Number of farmers from the districts were determined in proportion to total number of Agro Service Centres in each district. A total of 120 farmers with a sample size of 30, 45 and 45 farmers were randomly selected from Kottayam, Thrissur and Kannur districts respectively. Apart from farmers, a sample of 60 extension personnel associated with Agro Service Centres from all the three districts of study were selected.

3.4. OPERATIONALISATION AND MEASUREMENT OF VARIABLES

Variables and measurement techniques

Sl. no	Variable	Measurement technique
A.	**Dependent variables**	
1.	Performance effectiveness as perceived by farmers	Index was developed
2.	Attitude of beneficiaries towards ASC	Arbitrary scale
3.	Attitude of extension	Arbitrary scale

	personnel towards the service delivery system of ASC	
B.	**Independent variables for farmers**	
1.	Age	Chronological age of respondent
2.	Education	Procedure developed by Singh(1993)
3.	Size of land holding	Gross area under cultivation in hectares
4.	Crops grown	Measured by directly asking the respondent the types of crops grown
5.	Annual farm income	Total annual income of the respondent from farming and allied sectors
6.	Farming experience	The total farming experience in farm
7.	Resource utilization	Arbitrary scale
8.	Change proneness	Schedule developed by Neethi (2013)
9.	Decision making ability	Scale developed by Parimaladevi (2004) and used by Raj (2018)
10.	Information source utilization	Procedure followed by Paul(2017)with slight modification
11.	Risk orientation	Scale followed by Rubeena (2015)
12.	Extension agency contact	The regularity of contact by farmer with the extension officials of different agencies
C.	**Independent variables for extension personnel**	
1.	Age	Chronological age of respondent
2.	Education	Measured by directly asking the respondent
3.	Occupational position	Measured by directly asking the occupational position of the respondent in the Agro Service Centre
4.	Experience in extension work	Number of completed years of service of the extension personnel
5.	Training received	Total number of training received by the extension personnel at the time of interview

6.	Extension service orientation	Arbitrary scale
7.	Work commitment	Procedure developed by the Sundaran (2016) with slight modification
8.	Problem solving ability	Procedure developed by Sundaran (2016).
9.	Leadership ability	Schedule used by Suthan (2003)

3.4.1. Measurement of dependent variables

*3.4.1.1. **Performance effectiveness as perceived by farmers***

Performance effectiveness is operationally defined as the ability of Agro Service Centres to achieve the predetermined goals and objectives in appropriate time and right quality.

Performance effectiveness was measured on the basis of three components namely performance effectiveness of ASC in dissemination of information and technology, Performance of ASC in service delivery and performance effectiveness of ASC on farmer's income as perceived by farmer beneficiaries of ASCs. Performance Effectiveness Index (PEI) was calculated for each component namely performance effectiveness of ASC in dissemination of information and technology, Performance of ASC in service delivery and performance effectiveness of ASC on farmer's income and mean of these indices were computed to obtain the performance effectiveness index as perceived by farmers.

3.4.1.1.1. Components of Performance Effectiveness as perceived by farmers

a. Performance effectiveness of ASC in information and technology dissemination (X_1):

Defined as the performance of Agro Service Centre in the dissemination of information and technology for the welfare of farming community and it was measured in terms of Performance Effectiveness Index i.e. PEI (X_1). The

respondents were asked to give their opinion about the performance effectiveness of ASCs in information and technology dissemination on a three point continuum as good, average and below average with the scoring 3, 2, and 1 respectively.

Sl. no	Statements	Good (3)	Average (2)	Below average (1)
1	Reliability of information and technology disseminated through ASC			
2	Dissemination of latest information and technologies in farming			
3	Timely dissemination of information and technology			
4	Adequacy in information and technology dissemination			
5	Use of farmer friendly approaches in dissemination of information			

b. Performance of ASC in service delivery (X_2):

Defined as the adequacy of different services of ASC to meet the requirements of farmers and it was measured in terms of Performance Effectiveness Index i.e. PEI (X_2). The services available in the ASCs were enlisted and zero score was assigned to those services in which the respondent have not yet received from the centre. The beneficiary farmers of ASCs were asked to give their response regarding the adequacy of different available services in ASCs on a three point continuum as adequate, moderate and not adequate with the scoring 3, 2 and 1 respectively.

Sl no	Statements	Yes	No	If yes,											
				Need-based			Timely			High quality			Adequate quantity		
				A	M	NA	A	M	NA	A	M	NA	A	M	NA
1	Machinery														

	services														
2	Supply of planting materials														
3	Supply of bio farming inputs														
4	Consultancy services														
5	Soil testing support														
6	Farmers training programmes														

(Adequate-A, Moderate- M, Not adequate- NA)

c. Performance effectiveness of ASC on farmer's income (X_3):

Defined as the perceived impact of the services of ASC in farming and in farmer's income. The beneficiary farmers were asked to give their response regarding the perceived changes in their farming after utilizing the information and services from ASCs on a three point continuum as 'increase', 'no change' and 'decrease' with the scoring 3, 2 and 1 respectively.

Sl.no	Statements	Increase (3)	No change (2)	Decrease (1)
1	Area under cultivation			
2	Diversity of crops/ enterprise			
3	Income from farming			

Performance Effectiveness Index of each component i.e. PEI (X_1), PEI (X_2) and PEI (X_3) were measured using the formula.

$$\text{PEI } (X_n) = 100 - \left(\frac{Xnmax - Xni}{Range}\right) \times 100$$

Where n = 1, 2, 3

X_{nmax} is the maximum obtained value of X_n

X_{ni} is the observed value of X_n

Range is the difference between maximum obtained value and minimum obtained value of X_n.

Performance effectiveness index (PEI) of ASCs as perceived by farmers was calculated as the mean of the indices of the three components of PEI and it was calculated using the formula

Performance Effectiveness Index as perceived by the farmer (PEI) =

$$\frac{PEI\ (X1) + PEI(X2) + PEI\ (X3)}{3}$$

The value of Performance Effectiveness Index (PEI) ranges from 0 to 100. Based on the range of PEI as perceived by the farmers, Agro Service Centres were classified into three categories namely low, medium and high.

3.4.1.1.2. Contribution of each component to total PEI

Contribution of each component to the overall Performance Effectiveness Index was estimated as the mean of the percentage contribution of each component to the total Performance Effectiveness Index of studied ASCs.

3.4.1.2. Attitude of beneficiaries towards ASC

Attitude of beneficiaries towards ASC is operationally defined as the degree of positive and negative mental disposition of respondent towards the service delivery system of Agro Service Centre.

An arbitrary scale was used for the study with ten statements reflecting the attitude of farmer beneficiaries towards ASC. The scale consist of ten statements with six positive and four negative statements. The respondents were asked to give their agreement (or) disagreement on a five point continuum as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with the scoring 5, 4, 3, 2 and 1 respectively in the case of positive statements and vice-versa in the case of negative statements. The score ranges from 10 to 50. The farmer beneficiaries were classified into three categories namely low, medium and high based on the obtained data score range. (Appendix II)

3.4.1.3. Attitude of extension personnel towards the service delivery system of ASC

Attitude of extension personnel is operationally defined as the degree of positive and negative mental disposition of respondent towards the service delivery system of agro service centre.

An arbitrary scale was developed for the study with eleven statements reflecting the attitude of extension agents towards the service delivery system of ASC. The scale consist of 11 statements with six positive statements and five negative statements. The respondents were asked to give their agreement (or) disagreement on a five point continuum as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with the scoring 5, 4, 3, 2 and 1 respectively in the case of positive statements and vice-versa in the case of negative statements. The possible minimum and maximum scores were 11 and 55 respectively. The extension personnel of Agro Service Centres were grouped into three categories of attitude specifically low, medium and high based on the obtained data score range. (Appendix III)

3.4.2. Measurement of Independent variables

3.4.2.1. Independent variables for farmers

3.4.2.1.1. *Age:* Refers to number of calendar years completed by the respondent at the time of interview.

The respondents were classified into three categories of age namely young (below 35), middle aged (35 to 55) and old (above 55) based on the census report (2011) of Government of India.

3.4.2.1.2. *Education:* Refers to academic qualification attained by the respondent at the time of enquiry. Education was measured with the help of scoring procedure developed by Singh (1993).

The farmers were classified into six categories based on their educational qualifications namely illiterate, read and write, primary school, high school, higher secondary and college level. (Appendix II)

3.4.2.1.3. *Size of land holding:* Refers to gross area under cultivation in an year in hectares. This variable was measured by directly asking the respondents.

Categorization was done based on the agricultural census report 2010-11 of Government of India (2015), where farmers were classified into marginal, small, semi medium, medium and large farmer groups based on their land holding size.

3.4.2.1.4. *Crops grown:* Refers to the major crops grown by the beneficiary farmer of Agro Service Centre. This was identified by directly asking the respondent and the important crops grown by majority of the farmers were enlisted, documented, frequency and percentage analysis was carried out.

3.4.2.1.5. *Annual farm income:* Refers to total earning of the respondent from farming and allied sectors for one year. This was measured by directly asking the respondents and based on range and average of annual farm income categorization was done.

3.4.2.1.6. *Farming experience:* Refers to number of years of experience in farming and related activities, a farmer possessed at the time of enquiry. This variable was measured by directly asking the respondents and based on range farmers were classified into four farming experience categories namely up to 10 years, 10 to 20 years, 20 to 30 years and above 30 years.

3.4.2.1.7. *Resource utilization:* Operationally defined as the ability of farmer to utilize the available on farm and off farm resources and services at its fullest potential.

An arbitrary scale was developed for the study. The scale consist of ten statements and the respondents were asked to give their responses in a three point continuum ranging from 'agree', ' partially agree' and 'disagree' with scores 3, 2 and 1 respectively. The score ranges from 10 to 30. The farmers were grouped into three categories of resource utilization namely low, medium and high based on the range of obtained data score. (Appendix II)

3.4.2.1.8. *Change proneness:* Operationally defined as the degree to which an individual is prone to change by the influence of external factors. This was measured by using the schedule developed by Neethi (2013). A set of nine statements with four positive and five negative were prepared to elicit the responses on change proneness.

The respondents were asked to give their agreement (or) disagreement on a three point continuum as agree (3), undecided (2) and disagree (1) with respective scores accorded for positive statements and the same were reversed for negative statements. The possible maximum and minimum scores were 27 and 9 respectively. The respondents were grouped into three categories of change proneness namely low, medium and high based on the range of obtained data score. (Appendix II)

3.4.2.1.9. Decision making ability: Operationally defined as the ability of the farmer to take decision on crop production from the available alternatives. It was measured using a scale developed by Parimaladevi (2004), used by Raj (2018).

The scale comprised of 6 statements of which three were positive and three were negative statements. It was measured on a five point continuum, strongly agree, agree, undecided, disagree and strongly disagree. Score of 5, 4, 3, 2 and 1 were given for positive statements, and scoring was reversed for negative statements. The total score ranges from 6 to 30. The respondents were grouped into three levels of decision making ability namely low, medium and high based on the range of obtained data score. (Appendix II)

3.4.2.1.10. Information source utilization: Defined as the use of various information sources by the respondent in order to acquire information on crop production and management. It was measured by using the procedure followed by Paul (2017) with slight modification in the sources. The six information sources considered were Krishi Bhavan, Agro Service Centre, television, radio, newspaper and internet. Frequency of use of each information sources was measured as regularly, occasionally and never

with scores 3, 2 and 1 respectively. Based on the response of farmers, the total score was calculated. The score ranges from 6 to 18 and the respondents were grouped into three categories of information source utilization namely low, medium and high based on the range of obtained data score. (Appendix II)

3.4.2.1.11. Risk orientation: Operationally defined as the willingness of farmer to take risk in adopting recommended practices given by the extension system. It was measured by using the scale followed by Rubeena (2015).

This scale consist of six statements with one negative statement. The sum of scores of each statement was the score for risk orientation of the respondent. The respondents were asked to give their agreement (or) disagreement on a five point continuum as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with the scoring 5, 4, 3, 2 and 1 respectively in the case of positive statements and vice-versa in the case of negative statements. The possible minimum and maximum scores were 6 and 36 respectively. The farmers were grouped into three categories of risk orientation namely low, medium and high based on the range of obtained data score. (Appendix II)

3.4.2.1.12. Extension agency contact: Operationally defined as the extent to which a farmer contact extension personnel of Agro Service Centre, Krishi Bhavan and other agencies to get information and services on farming related aspects.

The measurement of this variable was done based on the regularity of contact with extension officials of different agencies and frequency and percentage analysis was carried out for assessing the contact of farmers with each agency. The farmers were grouped into three categories namely

regular, occasional and never based on their contact with each extension agency. (Appendix II)

3.4.2.2. Independent variables for extension personnel

3.4.2.2.1. Age: Refers to number of calendar years completed by the respondent at the time of interview.

The respondents were classified into three categories of age namely young (below 35), middle aged (35 to 55) and old (above 55) based on the census report (2011) of Government of India.

3.4.2.2.2. Education: Refers to academic qualification attained by the respondent at the time of enquiry.

Educational qualifications of extension personnel were identified and documented by directly asking them. Degree or diploma in agriculture and allied subjects, VHSE, KGTA (a six-month diploma course in agriculture), ITI and SSLC were the major identified educational qualifications of extension agents of ASCs. Frequency and percentage analysis of the enlisted educational qualifications of extension personnel was carried out. (Appendix III)

3.4.2.2.3. Occupational position: Operationally defined as the occupational position of the respondent in the Agro Service Centre and it was recognised through the personal interview with the respondent. Agricultural facilitators and service providers are the two types of extension personnel directly associated with the functioning of ASCs.

3.4.2.2.4. *Experience in extension work:* Operationally defined as the number of completed years of service the extension personnel had in agricultural service delivery system in the Kerala State Department of Agriculture and Farmers welfare. This variable was measured by directly asking the respondents and based on the range of experience extension agents were classified into four experience categories of extension work namely up to 5 years, 6 to 15 years, 16 to 30 years and above 30 years.

3.4.2.2.5. *Training received:* Operationally defined as the training received by the respondent on operation of farm machinery or for the enhancement of any particular skill related to farming.

All extension agents were appointed in ASCs only after they have been trained in any of the areas like operation of farm machines and other equipment, field operations, nursery management, plant protection activities, and other skill up gradation training. The maximum number of training received by the extension agents were three. The extension agents of Agro Service Centre were asked to indicate the number of training programme they received after joining in ASC and based on which extension agents were classified into three categories.

3.4.2.2.6. *Extension service orientation:* Operationally defined as the degree to which extension personnel of Agro Service Centre are oriented to provide extension and agro advisory services.

An arbitrary scale was developed for the study. The scale with eleven statements were used to measure the extension service orientation of respondents and it was measured on three point continuum i.e. 'agree', 'undecided', 'disagree' with the scores of 3, 2, 1 respectively. The

individual score was obtained by summing up all the scores of various statements and the possible minimum and maximum scores were 11 and 33. The extension personnel of ASCs were grouped into three categories of extension service orientation namely low, medium and high based on the range of obtained data score. (Appendix III).

3.4.2.2.7. Work commitment: Extent of dedication and responsibility of the respondent while delivering the agricultural information and services. Procedure developed by the Sundaran (2016) with slight modification was used for the measurement of work commitment.

The procedure which consisted of 7 statements were given to give their responses in a five point continuum ranging 'strongly agree', 'agree', 'undecided', 'disagree', and 'strongly disagree' with scores 5, 4, 3, 2, and 1 respectively. The possible minimum and maximum scores were 7 and 35.The score of the respondents for work commitment was obtained by summing up the score obtained for each statement. The respondents were grouped into three categories of work commitment namely low, medium and high based on the range of obtained data score. (Appendix III)

3.4.2.2.8. Problem solving ability: Defined as the ability of extension personnel to identify and solve problems faced by the farmers, who are beneficiaries of Agro Service Centre.

It was measured by using the procedure developed by Sundaran (2016). It consist of eight statements of which five were positive and three were negative statements. The respondents were asked to give their responses in a five point continuum ranging from strongly agree, agree, undecided, disagree and strongly disagree with scores 5, 4, 3, 2 and 1 respectively and vice-versa for negative statements. By summing up the score obtained for each statement the score of the respondents was

obtained. The score ranges from 8-40. The extension personnel of Agro Service Centres were grouped into three levels of problem solving ability namely low, medium and high based on the range of obtained data score. (Appendix III)

3.4.2.2.9. Leadership ability: Degree to which an individual is oriented towards his own capabilities of influencing others and developing strategies for the effective delivery of agro advisory services.

Leadership ability was measured by using the schedule used by Suthan (2003). The respondents were asked to indicate their ability to lead others on a five point continuum as 'always', 'often', 'sometimes', 'seldom' and 'never' with the scoring 5, 4, 3, 2 and 1 respectively. The score ranges from 5 to 25. The respondents were grouped into three levels of leadership ability namely low, medium and high based on the range of obtained data score. (Appendix III)

3.5. REGION WISE COMPARISON OF AGRO SERVICE CENTRES

Region wise comparison of the performance of Agro Service Centres in the three districts were made by comparing the availability of different farming related services in each ASCs and also by comparing the utilization of different information and technology disseminating system by each ASCs for the effective transmission of agricultural information and services to the farmers

3.5.1. Region wise comparison of services provided in ASC:

The services delivered by the Agro Service Centres in the three districts to the farmers in order to enhance the production and productivity were identified for comparing the performance of ASCs. The total number and percentage of services provided by ASCs in each district were calculated based on the availability of

services at 10 ASCs from Thrissur, 10 ASCs from Kannur and 6 ASCs from Kottayam district. Region wise comparison was made based on the variation in number and percentage of services provided by ASCs in the three districts.

3.5.2. Region wise comparison of Information and technology disseminating system by ASC:

Different systems which are being used by each ASCs for delivering agricultural information and technologies to the farmers were identified to compare the performance of ASCs in the three districts in terms of information and technology disseminating system. The total number and percentage of information and technology disseminating system by ASCs in each district were calculated based on the utilization of different information and technology disseminating systems at 10 ASCs from Thrissur, 10 ASCs from Kannur and 6 ASCs from Kottayam district. Region wise comparison was done based on the disparity observed in number and percentage of different information and technology disseminating methods adopted by ASCs in the three districts.

3.6. CONSTRAINTS FACED BY THE RESPONDENTS

3.6.1. Constraint Analysis of farmers

Constraint analysis of farmers was done based on their responses to the enlisted constraints. The major constraints which affect the performance of Agro Service Centres were documented after conducting the pilot study. A total of nine constraints were identified based on the discussion with subject matter experts and other officials. The identified constraints were enlisted for getting response from farmers. The beneficiary farmers were asked to rank the constraints and based on which weighted mean score was estimated to recognise the most relevant constraints. (Appendix II)

3.6.2. Constraint Analysis of extension agents

After pilot study and discussion with officials, a total of nine major constraints faced by the extension personnel of ASCs in providing services to farmers were identified. Constraint analysis of extension agents was done based on their responses and constraints were ranked based on weighted mean score. (Appendix III)

3.7. DATA COLLECTION TOOLS AND METHODS

Data collection was done through personal interviews with the respondents. The interview schedule was pre-tested in a pilot study conducted in a non-sample area and suitable changes were made based on the information collected. On the basis of these corrections, the final interview schedule was prepared. The respondents were surveyed separately in their mother tongue. The final interview schedule is enclosed. (Appendix II and III)

3.8. STATISTICAL TOOLS USED

3.8.1. Mean

The respondents were sorted into categories based on the mean values of both dependent and independent variables. After grouping the respondents into categories, percentage analysis was done

3.8.2. Weighted mean

It is similar to Arithmetic mean and commonly used in descriptive statistics. Here weighted mean was calculated to rank the constraints faced by the respondents.

3.8.3. Frequency and Percentage analysis

The frequency and percentage were used to find out the number of respondents in each category and also to find out the distribution of respondents across the classes in order to make a proper assessment of the data.

3.8.4. Correlation analysis

Correlation analysis was performed to find the relationship between the dependent and independent variables of the study.

3.8.5. Kruskal- Wallis test

The Kruskal- Wallis test by ranks is a non-parametric method for testing whether there is any significant difference between the samples of equal size or different size and it can be used to compare P independent samples. It is also known as the non-parametric equivalent of one-way ANOVA. In the present study, Kruskal-Wallis test was used to compare the attitude of beneficiaries of ASC in the three regions of Kerala and also to compare the performance effectiveness index as perceived by the farmers in the three regions.

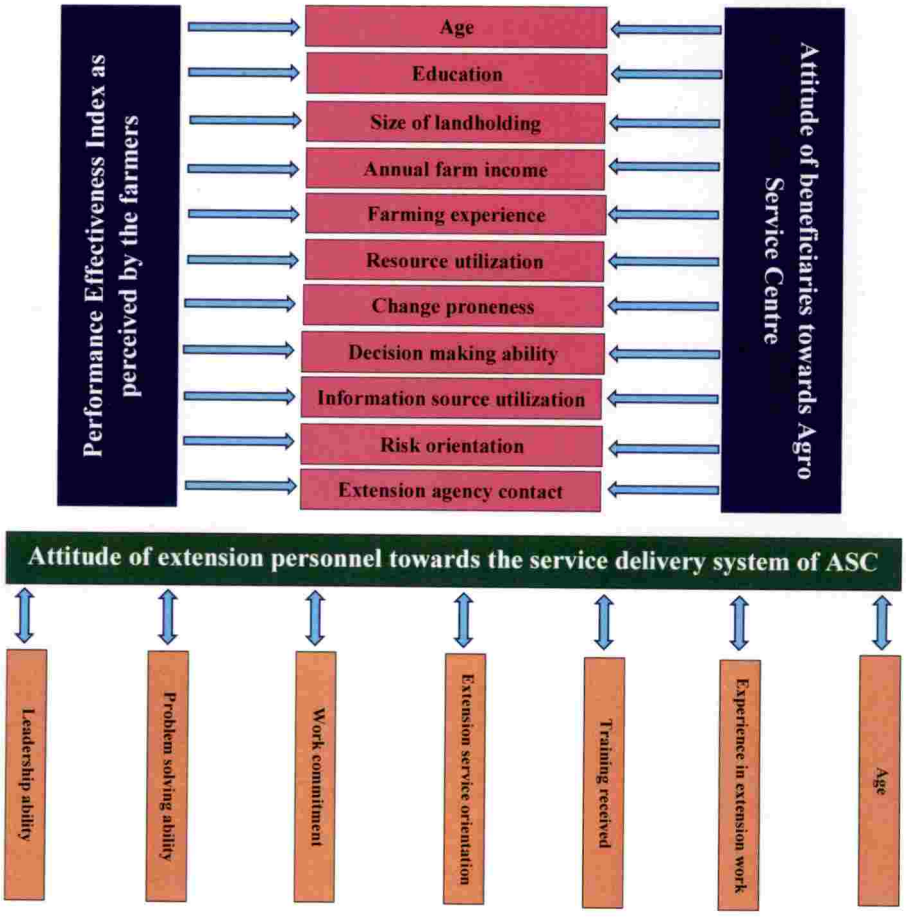

Figure 2: Conceptual framework of the study

Results & Discussion

RESULTS AND DISCUSSION

This chapter deals with the result and discussions based on the statistical interpretation of the data obtained after conducting the survey. The data gathered were interpreted and categorized with suitable statistical methods given below. The result and discussions are presented in the following headings.

4.1. Description of function and Activities of ASCs

4.2. Performance of ASCs as perceived by beneficiaries

4.3. Region wise comparison of ASCs

4.4. Attitude of beneficiaries towards ASCs

4.5. Attitude of Extension personnel towards the service delivery system of ASCs

4.6. Distribution of respondents based on their profile characteristics.

4.7. Relationship of performance effectiveness index as perceived by farmers with their attitude towards ASCs.

4.8. Relationship of Performance Effectiveness Index of ASCs and attitude of beneficiaries towards ASC with profile characteristics of farmers.

4.9. Relationship of attitude of extension personnel towards the service delivery system of ASC with their profile characteristics.

4.10. Constraints faced by the respondents

4.11. Suggestions to improve the performance of ASCs

4.1. DESCRIPTION OF FUNCTION AND ACTIVITIES OF ASCs

Agro Service Centres (ASCs) - Kerala

Agro Service Centre (ASC) is an agency which is delivering different farming inputs and services to farmers based on their requirement at a single point. Department of Agriculture and Farmers welfare started Agro Service Centre and service delivery project from 2012-13, mainly to attract youth to agriculture, provide employment for unemployed youth in agriculture sector and also to make agriculture economical (GoK, 2011). Model Agro Service Centres are established in association with Agricultural Research Station and Kerala Agricultural University, Mannuthy. About 77 Agro Service Centres has been established throughout the state by 2016-17, out of which 14 Agro Service Centres (one in each district) are established as Model Agro Service Centres. The training and hand holdings to these 14 centres are provided by Kerala Agricultural University. A total amount of 32 lakhs was provided to each Agro Service Centre. Agro Service Centres are established mainly for the management of the labour shortage problem faced in the agriculture sector of Kerala by agro machinery operation services, delivering technical as well as operational support services at field level, building the capacity of the youth in the professional management of agricultural related services and for improving the farm clinical and diagnostic services (GoK, 2016).

The activities of ASCs are guided by an appointed agricultural facilitator. The facilitator should be either a retired officer from the Department of Agriculture or persons having educational qualification like B Sc. Agriculture, Diploma in agriculture. There are a number of service delivery executives like VHSC certificate holders, ITIs and others to provide services to farmers. Repair and service unit of the Agro Service Centre is managed by professionals having ITI qualification. Diagnostic and clinical services are managed by VHSE holders. The day to day activities of ASCs are monitored by the members of management committee and its control and

sovereignty is vested with the high power committee. Government also conducts training programmes for the facilitator and for service delivery executives to enhance their knowledge and skill in agriculture. Training programmes for service providers of ASCs are conducted by Department of Agriculture in association with District Agricultural Engineering Department, Farmer Training Centres (FTCs), Agricultural Research Station (ARS), RATTC etc.

Facilities available at Agro Service Centre include bio pharmacy, soil testing lab, seedling nursery, composting unit and farm machineries. Major activities of ASCs include implementation of various schemes of Krishi Bhavans, seedlings production and distribution, preparation of kitchen gardens and school vegetable gardens, fallow land cultivation and land preparation. Rain shelter, cool chamber and wick irrigation unit to the needy farmers are being made by the trained service providers.

Ten Agro Service Centres were established in Thrissur district till 2016-17. Among these, three ASCs including one model ASC, were established during the year 2012-13. Only one ASC was established during 2014-15. During the years 2015-16 and 2016-17, four and two ASCs were established respectively. Also, the district has the headquarters of Kerala Agricultural University and many other agriculture-related research institutes. Therefore it is easy for both farmers and extension personnel of Agro Service Centres to maintain contact with these research and extension institutes especially with ARS, Mannuthy for regular updation. All these agricultural support systems and facilities in Thrissur provide very good working conditions for ASCs and thereby improving their performance effectiveness in farming sector. Apart from other activities, Agro Service Centres in Thrissur district concentrate on kole land cultivation of paddy and plant protection activities of nutmeg and coconut.

Ten Agro Service Centres were established in Kannur district till 2016-17. Among these, three ASCs including one model ASC, were established during the year 2012-13. During the years 2014-15, 2015-16 and 2016-17, four, one and two ASCs

were established respectively. The ASCs from Kannur district receive support and guidance from agriculture research and extension institutes like Krishi Vigyan Kendra, District Agricultural Farm and RARS Pilicode. The Agro Service Centres from Kannur district mainly focus on fallow land cultivation, paddy cultivation and seedling supply of plantation crops and pepper.

Six ASCs were established in Kottayam district till 2016-17. Among these, two ASCs including one model ASC were established in the year 2012-13. During the years 2014-15, 2015-16 and 2016-17 one, one and two ASCs were established respectively. The ASCs in Kottayam district receives support from Krishi Vigyan Kendra, Rubber Research Institute of India and Rubber Board and hence, their activities mainly involve the cultivation aspects of rubber and other cash crops.

4.2. PERFORMANCE EFFECTIVEESS OF AGRO SERVICE CENTRES (ASCs) AS PERCEIVED BY BENEFICIARIES

Performance effectiveness of ASCs were determined in terms of Performance Effectiveness Index (PEI) as perceived by the farmer beneficiaries. Performance effectiveness is operationally defined as the ability of Agro Service Centres to achieve the predetermined goals and objectives in appropriate time and right quality. Performance effectiveness was measured on the basis of three indicators namely performance effectiveness of ASC in dissemination of information and technology, Performance of ASC in service delivery and performance effectiveness of ASC on farmer's income. Performance Effectiveness Index (PEI) was calculated on the basis of maximum and minimum score obtained for each component and the ASCs were classified into three categories based on the range of PEI as perceived by the farmers.

Table 1. Categorization of ASCs based on performance effectiveness as perceived by the farmers

	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (<33)	9	20	8	17.78	9	30	26	21.66
Medium (33- 66)	16	35.55	15	33.34	15	50	46	38.34
High (>66)	20	44.45	22	48.88	6	20	48	40
Mean	58.27		58.65		48.15		55.88	
Total	45		45		30		120	

Expected score range = 0 to 100, Data score range = 6.09 to 96.24

Considering the overall Performance Effectiveness Index of ASCs in Kerala, it was found that 40 per cent of the farmers scored the ASCs into high category of performance followed by 38.34 per cent of the farmers scored the ASCs into medium category of performance. Nearly twenty per cent (21.66%) of beneficiaries opined that the performance of ASC was low. In the case of region wise ASCs, 48.88 per cent of the farmers from Kannur and 44.45 per cent of farmers from Thrissur district scored the ASCs to high PEI category. More than thirty per cent (35.55%) of the farmers from Thrissur and 33.34 per cent of farmers from Kannur scored the ASCs to medium category. But in the case of Kottayam district, fifty per cent of farmers scored the ASCs to medium category. Only 20 per cent beneficiaries from Kottayam had the opinion that the performance of Agro Service Centre was high. Almost 20 per cent and 17.78 per cent of farmer beneficiaries from Thrissur and Kannur grouped ASCs into low performance category. Unlike the two districts Thrissur and Kannur, nearly 30 per cent of farmers from Kottayam grouped ASCs into low category of performance.

Therefore, it is clear from the above table that Agro Service Centers from the northern and central region of Kerala were rendering better agricultural information

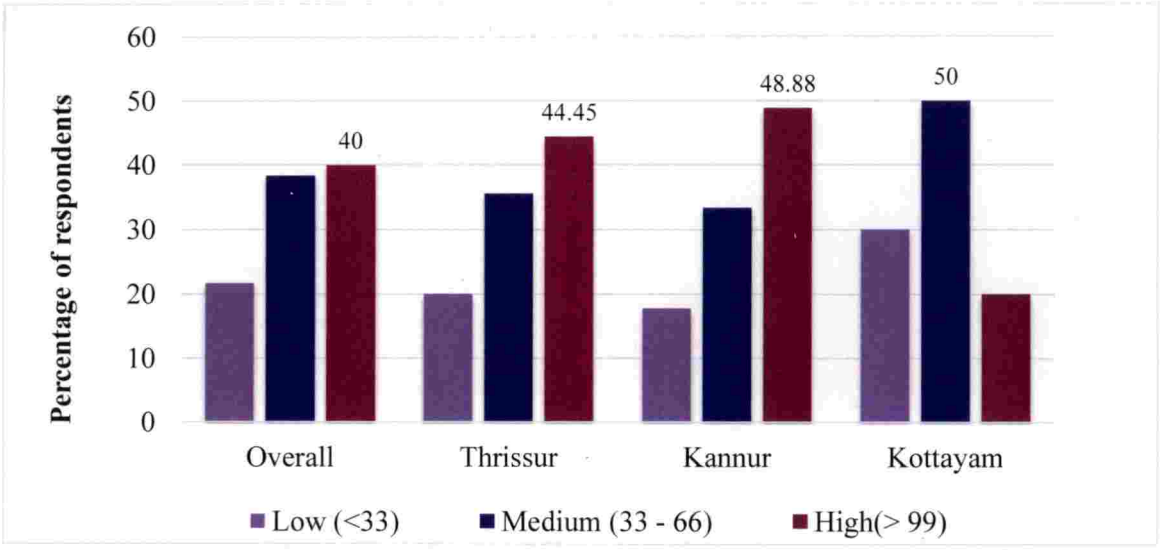

Figure 3: Categorization of ASCs based on performance effectiveness as perceived by the farmers (PEI)

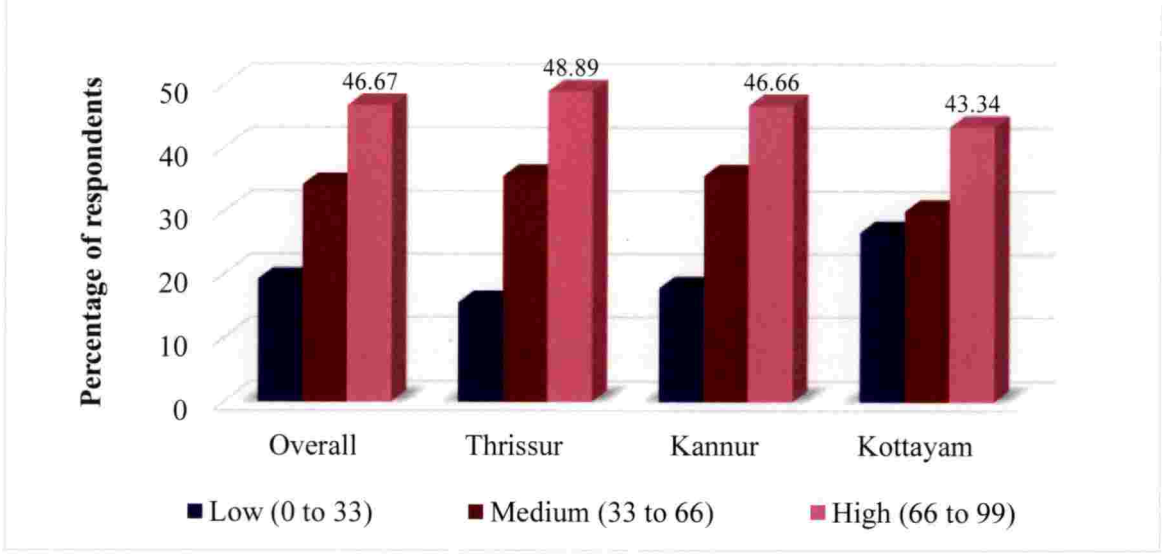

Figure 4: Categorization of ASCs based on the performance effectiveness of ASCs in the dissemination of information and technology – PEI (X1)

and services to farmers than the Agro Service Centres from southern Kerala. Fifty per cent of ASCs in Kottayam district has started its proper functioning recently and most of the centres fail to provide different expected agro services to farmers due to their inadequate experience in the concerned areas of service delivery. Moreover, the perception of farmers about the performance effectiveness of ASCs was low due to the lack of awareness among the farmers regarding the agricultural information and service delivery system of ASCs. This may be the reason for low PEI of ASCs in Kottayam district.

4.2.1. Performance effectiveness of Agro Service Centres in the dissemination of information and technology (X_1)

Performance of Agro Service Centre in the dissemination of information and technology for the welfare of farming community was determined by calculating PEI in terms of performance of ASCs in information and technology dissemination. PEI was calculated on the basis of maximum and minimum score obtained and the ASCs were classified into three categories based on range of PEI (X_1) i.e. Low, Medium and High.

Table 2: Categorization of ASCs based on its performance effectiveness in information and technology dissemination

	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (<33)	7	15.55	8	17.78	8	26.66	23	19.17
Medium (33- 66)	16	35.56	16	35.56	9	30	41	34.16
High (>66)	22	48.89	21	46.66	13	43.34	56	46.67
Mean	60.83		62.78		55.83		60.31	
Total	45		45		30		120	

Expected score range = 0 to 100, Data score range = 0 to 100

According to majority of the respondents (48.89%, 46.66% and 43.34%), the performance effectiveness of ASCs was found to be high in all the districts in the dissemination of information and technology. Almost 46.67 per cent of surveyed beneficiary farmers scored the ASCs into high category of performance in delivering different agricultural information and technologies to farmers. The result implies the adequacy, reliability and timeliness of ASCs in disseminating the information and technology to the farmers. The result obtained is desirable as one of the prime objective of ASC is to disseminate information and technology to farmers.

4.2.2. Performance of ASC in service delivery (X_2)

Performance of ASC in service delivery was assessed in terms of adequacy of different services of ASC to meet the requirements of farmers. PEI of this component was calculated based on the response of beneficiary farmers towards the service delivery and ASCs were classified into three categories based on range of PEI (X_2) i.e. Low, Medium and High.

Table 3: Categorization of ASC based on its performance in service delivery.

	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (<33)	15	33.33	13	28.88	13	43.34	41	34.17
Medium (33- 66)	23	51.12	28	62.23	17	56.66	68	56.67
High (>66)	7	15.55	4	8.89	0	0	11	9.16
Mean	44.37		44.30		34.73		41.94	
Total	45		45		30		120	

Expected score range = 0 to 100, Data score range = 0 to 100

The above table revealed that more than fifty per cent (56.67%) of the beneficiaries scored the ASCs into medium category of performance in service delivery followed by 34.17 per cent scored the ASCs into low category. Only 9.16 per cent of

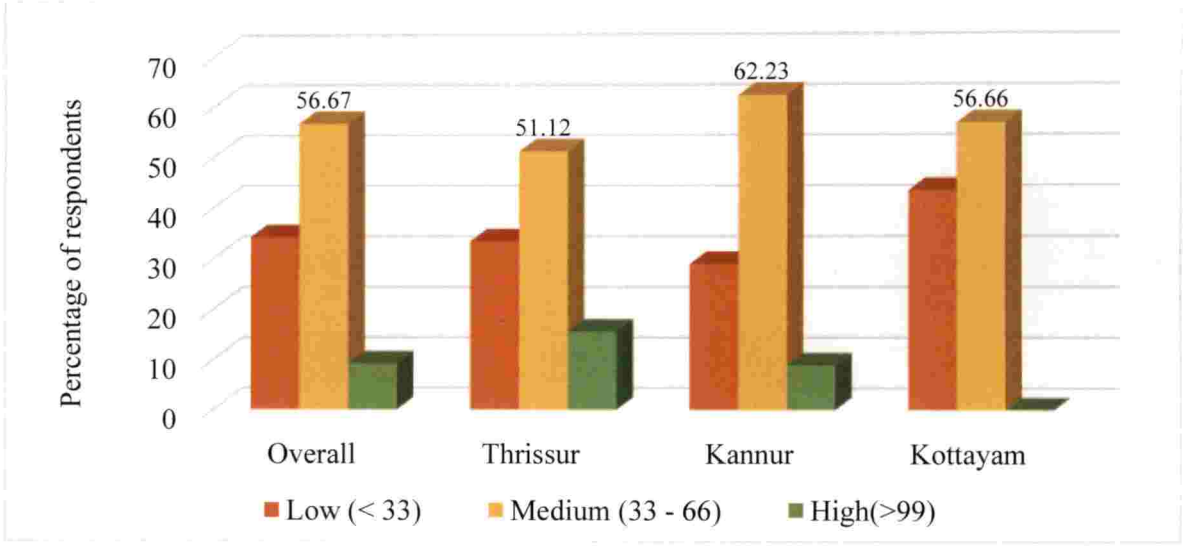

Figure 5: Categorization of ASCs based on its performance in service delivery - PEI (X_2)

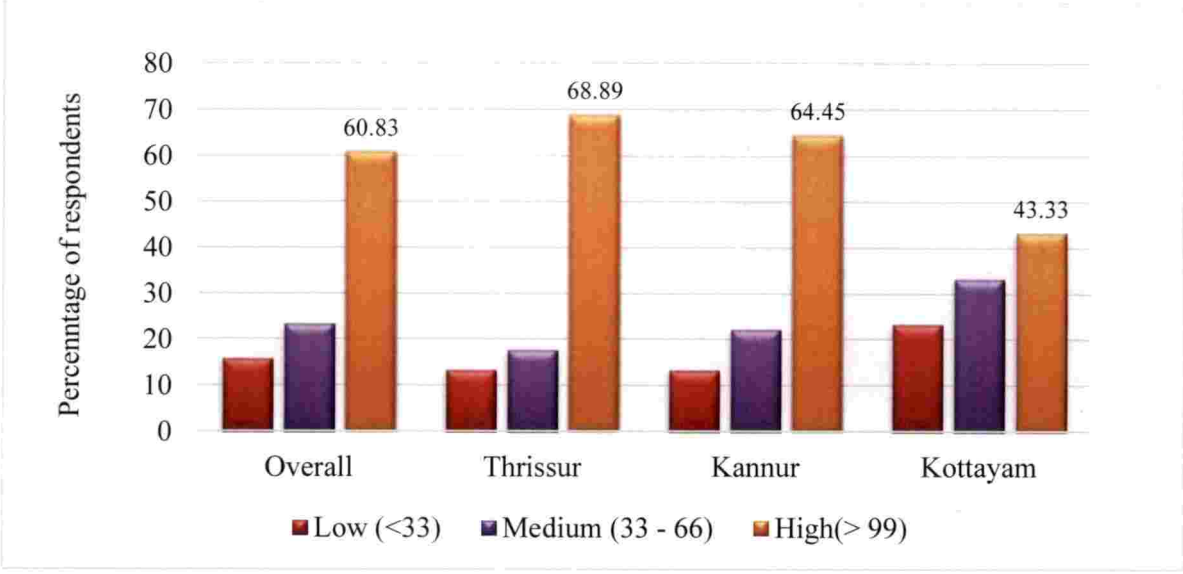

Figure 6: Categorization of ASCs based on its performance effectiveness on farmer's income - PEI (X_3)

beneficiaries were satisfied with the performance of ASCs in service delivery and hence they scored ASCs into high performance category. Similar trend was observed in the three studied districts also. Most of the farmers (51.12%, 62.23% and 56.66%) from Thrissur, Kannur and Kottayam districts grouped the ASCs into medium category of performance in service delivery. Only a few farmers (15.55% and 8.89%) from Thrissur and Kannur scored the ASCs into high category of performance in service delivery. There was no single farmer from Kottayam district who grouped the ASCs into high performance category in delivering the agro services, unlike the other two districts.

Hence it was clear from the above table that the performance of ASCs in service delivery has not yet been able to meet the current service needs of farmers. Lack of enough experience in handling the service delivery system of ASCs may be the reason for the poor performance of ASCs in service delivery.

4.2.3. Performance effectiveness of Agro Service Centres on farmer's income (X_3)

Performance effectiveness of Agro Service Centres on farmer's income was measured as the perception of beneficiaries on the change in income after utilizing the services from ASCs. PEI was calculated based on the responses and the ASCs were classified into three categories based on the range of PEI as scored by the farmer beneficiaries.

Table 4: Categorization of ASCs based on its performance effectiveness on farmer's income

	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (<33)	6	13.33	6	13.33	7	23.34	19	15.83
Medium (33- 66)	8	17.78	10	22.22	10	33.33	28	23.34
High (>66)	31	68.89	29	64.45	13	43.33	73	60.83
Mean	69.62		68.89		53.88		65.41	

Total	45	45	30	120

Expected score range = 0 to 100, Data score range = 0 to 100

The Table 4 revealed that considering the overall districts, majority (60.83%) of the beneficiaries scored the ASCs into high category of performance effectiveness on farmer's income followed by 23.34 per cent scored the ASCs into medium category of performance and 15.83 per cent beneficiaries scored the ASCs into the low category of performance effectiveness on farmer's income.

Similar trend was observed in all three districts, where 68.89%, 64.45% and 43.33% of farmers from Thrissur, Kannur and Kottayam districts respectively grouped the ASCs into high category of performance effectiveness on farmer's income followed by 17.78%, 22.22% and 33.33% of farmer beneficiaries from Thrissur, Kannur and Kottayam district respectively scored the ASCs into medium category of performance effectiveness on farmer's income. An equal number of farmers (13.33%) from Thrissur and Kannur scored the ASCs into low category of performance effectiveness on their income and 23.34 per cent of farmers from Kottayam district held the same opinion regarding the performance effectiveness of ASCs on farmer's income.

Hence it was clear from the above table that, for most of the farmers the services like machinery services, labour hiring services and different farming inputs from Agro Service Centres have contributed to an increase in income from farming. So we can interpret that one of the prime objective of ASC is being satisfactory met in all the three districts studied. Except in the case of Kottayam where 23.34 per cent were in low category all others shows a similar pattern. Inadequate experience of ASCs in Kottayam in the concerned areas of information and service delivery is reflected here.

4.2.4. Contribution of each component to total PEI

The contribution of each component to the total Performance Effectiveness Index was determined in terms of the contribution of indices of each component to PEI.

The contribution of indices to PEI was worked out as the mean of the percentage contribution of each indices to the total Performance Effectiveness Index of studied ASCs.

Table 5: Contribution of each component to total PEI

Components of PEI	Thrissur	Kannur	Kottayam	Overall
Performance effectiveness of ASC in dissemination of information and technology (X_1)	34.67	35.29	38.46	35.85
Performance of ASC in service delivery (X_2)	25.19	26.52	24.78	25.59
Performance effectiveness of ASC on farmer's income (X_3)	40.13	38.20	36.76	38.56

From the Table 5, it was clear that among these three components of PEI, performance effectiveness of Agro Service Centres on farmers income (X_3) contributed more (38.56%) to total PEI followed by performance effectiveness of Agro Service Centres in the dissemination of information and technology (X_1) with 35.85 per cent and performance of Agro service Centre in service delivery (X_2) with 25.59 per cent contribution to total PEI.

Also in the case of Thrissur and Kannur districts, performance effectiveness of ASCs on framer's income contributes more i.e. 40.13 per cent in Thrissur and 38.20 per cent in Kannur. But in case of Kottayam district, 38.46 per cent of contribution to total PEI was from performance effectiveness of ASCs in the dissemination of information and technology(X_1) followed by 36.76 per cent contribution from performance effectiveness of Agro Service Centres on farmer's income (X_3). Second component (X_2) contributed only 25.19%, 26.52% and 24.78% in Thrissur, Kannur and Kottayam district respectively.

District wise comparison shows that there is not much difference in the pattern of contribution of indices on PEI among the districts. From the results obtained it can be inferred that the performance of ASC in service delivery was not that satisfactory as

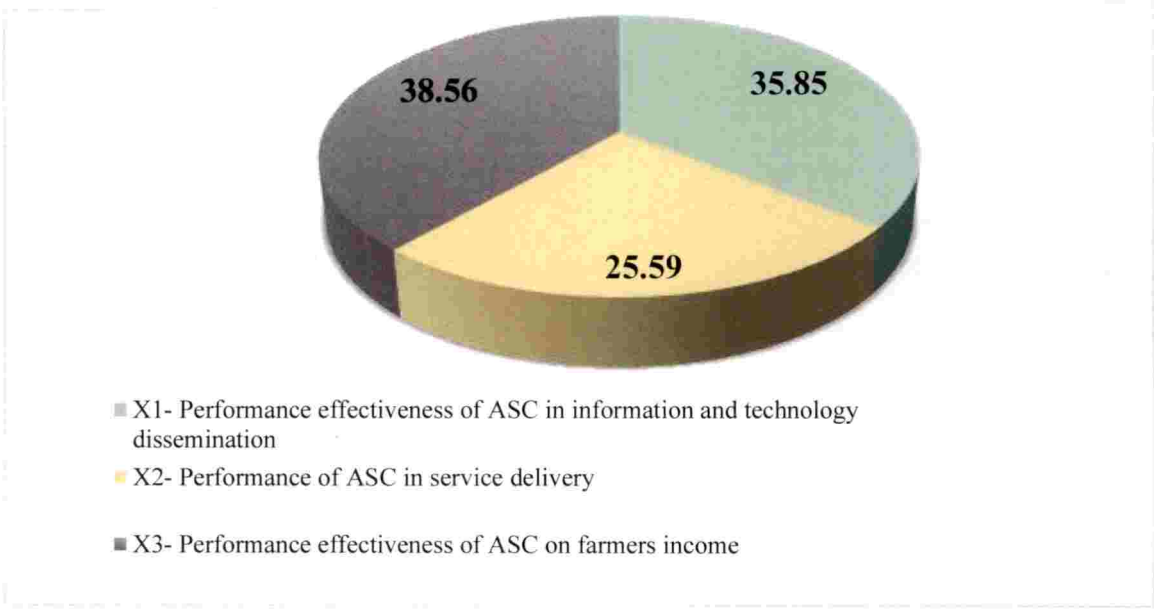

Figure 7: Contribution of each component to total PEI - Overall

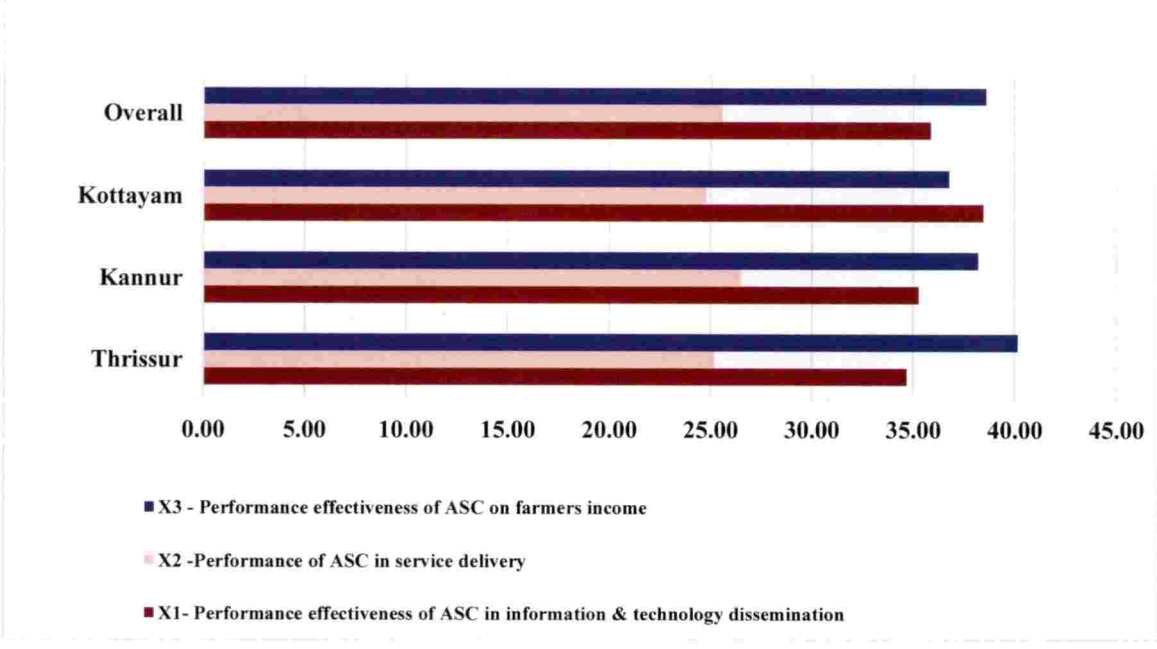

Figure 8: Contribution of each component to total PEI – District wise comparison

compared to the other two components. The services delivered by the Agro Service Centre to the farmers in order to enhance the production and productivity was less. Most of the Agro Service Centres were weak in providing services like consultancy services, soil testing support and training programmes to farmers, which makes the other two components comparatively stronger. This is an implication that in order to improve the performance of Agro Service Centres, they need to focus more in delivering different services to farmers at reasonable cost.

4.2.5. Comparison of three district with respect to performance effectiveness index as perceived by the farmers

Comparison is needed to identify the gap in extension work and hence it is an inevitable process in social science research. Comparison provides us an opportunity to understand the strength, weakness and opportunities in the performance of different extension agencies and thereby facilitates further improvement in the functioning of these agencies. Kruskal Wallis test was undertaken to test whether there is any significant difference in the PEI as perceived by the farmers among the three districts.

Table 6: Comparison of districts with respect to PEI of ASCs

	Thrissur	**Kannur**	**Kottayam**
Minimum	6.09	9.01	17.79
Maximum	96.24	92.47	86.02
Mean score	58.28	58.66	48.15
Mean rank	64.11	65.71	47.27
KW statistics	5.837		
χ^2 (0.05, 2)	5.991		
Inference	Non Significant		

When comparing the three districts in terms of Performance Effectiveness Index, the result shows that the estimated KW value was 5.837 which is less than the

chi square value at 2 degrees of freedom (5.991). Hence there was no significant difference in PEI at 1 per cent and 5 per cent level of significance among the districts. This result indicates that the farmer beneficiaries from these three districts had similar level of perception regarding the Performance Effectiveness Index of ASCs. Hence it is clear that the ability of ASCs to achieve the predetermined goals and objectives in time by retaining the quality of services was almost similar in all the three districts.

4.3. REGION WISE COMPARISON OF AGRO SERVICE CENTRES

Region wise comparison of Agro Service Centres was the made in terms of difference observed in the performance of ASCs in services provided to the farmers and the perceived difference in trend of adopting different information and technology disseminating system by ASC to ensure the reach of their extension services.

4.3.1. Region wise comparison of services provided in ASC

The services delivered by the Agro Service Centres in the three districts to the farmers in order to enhance the production and productivity were identified and compared. The total number and percentage of services provided by ASCs in each district were calculated based on the availability of services at 10 ASCs from Thrissur, 10 ASCs from Kannur and 6 ASCs from Kottayam district. The results of the comparative study are presented in Table 7.

Table 7: Region wise comparison of services provided in ASC

Services provided in ASC	Thrissur		Kannur		Kottayam	
	No	%	No	%	No	%
Machinery services	10	100	10	100	6	100
Labour hiring services	10	100	10	100	6	100
Consultancy services	3	30	5	50	1	16.66

Input supply services	8	80	9	90	4	66.66
Soil testing	2	20	1	10	0	0
Bio pharmacy	6	60	6	60	4	66.66
Marketing services	2	20	5	50	0	0

A critical examination of the Table 7 reveals that all ASCs in the three studied districts were providing machinery and labour hiring services to farmers. Various farming inputs like planting materials, fertilizers, plant protection means and the like were available in 8, 9 and 4 ASCs in Thrissur, Kannur and Kottayam district respectively. Six ASCs from Thrissur, 6 ASCs from Kannur and 4 ASCs from Kottayam district operates bio pharmacy for the sale of bio inputs like biofertilizers (Composts, FYM and other organic manures), biopesticides (Pseudomonas, Trichoderma, Neem based products and other herbal plant protection formulations) and the like to farmers. These bio pharmacies were part of the initiatives taken by the state government to make the state organic.

It was clear from the above table that the provision of soil testing and marketing services were comparatively less in all the three districts, where only 2 ASCs from Thrissur and one ASC from Kannur were providing soil testing support to farmers whereas marketing facilities to farmers were provided by 2 ASCs from Thrissur and 5 ASCs from Kannur district. No ASCs in Kottayam district provides soil testing and marketing support services to farmers. This may be the reason for the poor performance of ASCs as perceived by farmers in service delivery in Kottayam.

4.3.2. Region wise comparison of information &technology disseminating system by ASC

Different systems which are used by each ASCs for delivering agricultural information and technologies to the farmers in the three districts were identified and

compared. The total number and percentage of information and technology disseminating system by ASCs in each district were calculated based on the usage of different systems at 10 ASCs from Thrissur, 10 ASCs from Kannur and 6 ASCs from Kottayam district. The results of the comparative study are presented in Table 8.

Table 8: Region wise comparison of information and technology disseminating system by ASC

Information and technology disseminating system by ASC	Thrissur		Kannur		Kottayam	
	No	%	No	%	No	%
Meetings	8	80	9	90	4	66.66
Field visit	8	80	9	90	4	66.66
Field demonstrations	9	90	10	100	2	33.33
Exhibitions	2	20	1	10	0	0
Training programmes	1	10	2	20	1	16.66
Brochures / Leaflets	3	30	4	40	3	50
Social networking sites	2	20	3	30	1	16.66

A perusal of the Table 8 revealed that eight ASCs from Thrissur, nine ASCs from Kannur and four ASCs from Kottayam district regularly conducts meetings, field visits and field demonstrations for disseminating agricultural information and technologies to farmers. Four ASCs from Kannur and 3 ASCs from Thrissur and Kottayam district were using brochures / leaflets for creating awareness regarding the services of ASCs and most of the ASCs were poor in utilizing exhibitions, training programmes and social networking sites.

Therefore it can be concluded that region wise comparison of information and technology disseminating system of ASCs in all the three districts showed a similar trend where, field demonstrations, field visits, and meetings were the most frequently used dissemination system.

4.4. ATTITUDE OF BENEFICIARIES TOWARDS ASCs

The attitude of beneficiary farmers towards ASCs were measured using an arbitrary scale developed for the purpose and based on scores obtained and data score range the respondents were categorized into Low, Medium and High group. The results obtained are presented in Table 9.

Table 9. Distribution of beneficiaries based on their attitude towards ASCs

	Thrissur		**Kannur**		**Kottayam**		**Overall**	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (10 – 24)	5	11.12	6	13.33	16	53.34	27	22.5
Medium (24 – 38)	23	51.11	25	55.55	12	40	60	50
High (38 – 52)	17	37.77	14	31.12	2	6.66	33	27.5
Mean	35.71		34.86		27.46		33.33	
Total	45		45		30		120	

Expected score range = 10 to 50, Data score range = 18 to 47

From the above table, it was clear that majority (50%) of the respondents had a medium favourable attitude towards the Agro Service Centre followed by 27.5 per cent who had a high favourable attitude and 22.5 per cent had an unfavourable attitude towards ASCs. Majority of the farmers from Thrissur and Kannur district belonged to the category of people with moderate attitude. But in the case of Kottayam district, 53.34 per cent had unfavourable attitude followed by 40 per cent who had a medium attitude and only a very few farmers (6.66%) had a favourable attitude towards ASCs. The low attitude of farmers towards ASC is reflected in the performance effectiveness

index of ASCs of Kottayam district where some of the ASCs fail to render many of the proposed agro services to farmers.

It is clear from the Table 9 that, the performance of the Agro Service Centres in rendering different services to farmers affected the attitude of beneficiaries towards the centre. The results are in line with the findings of Sobanbhai (2014) and Koshy (2016), who reported that most of the farmers were having a medium favourable attitude towards the services of Kisan Call Centres.

4.4.1. Comparsion of three districts of Kerala with respect to attitude of beneficiaries towards ASCs

A meticulous comparison is required to know the difference in the response of farmers towards the single window mechanism of information and services delivery. Kruskal Wallis test was undertaken to test whether there is any significant difference in the attitude of farmer beneficiaries towards ASCs among the three districts. The result of this comparison paves a way to improve the existing functioning of ASCs.

Table 10: Comparison of the attitude of beneficiaries towards ASCs between the districts

	Thrissur	**Kannur**	**Kottayam**
Minimum	18	22	19
Maximum	47	46	39
Mean score	35.71	34.87	27.47
Mean rank	72.50	66.73	33.15
KW statistics	25.46		
χ^2 (0.05, 2)	5.991		
Inference	Significant		

When comparing the attitude of beneficiaries towards ASCs in the three districts, the result showed that the estimated KW value was 25.46 which is greater

than the chi square value at 2 degrees of freedom (5.991). Therefore, the result indicated that there was significant difference in the attitude of farmer beneficiaries towards ASCs among the three districts. Hence it is clear that the beneficiary farmers had different mental disposition towards the service delivery system of Agro Service Centres of Department of Agriculture, Kerala.

4.5. ATTITUDE OF EXTENSION PERSONNEL TOWARDS THE SERVICE DELIVERY SYSTEM OF ASCs

The attitude of extension personnel towards the service delivery system of ASCs were measured using an arbitrary scale developed for the purpose and based on scores obtained and data score range the respondents were categorized into Low, Medium and High group. The result obtained are presented in Table 11.

Table 11: Distribution of extension personnel based on their attitude towards the service delivery system of ASCs

Category	No.	%
Low (11 – 26)	3	5
Medium (26 – 41)	23	38.33
High (41 – 56)	34	56.67
Total no. of respondents: 60		

Expected score range = 11 to 55, Data score range = 23 to 53

Table 11, shows that majority (56.67%) of the extension personnel had a high favourable attitude towards the service delivery system of Agro Service Centre and a very few extension personnel had unfavourable attitude. Here the result implies that most of the officials had a favourable attitude towards the service delivery system of ASCs and they were always willing to provide services to the farmers. Since most of

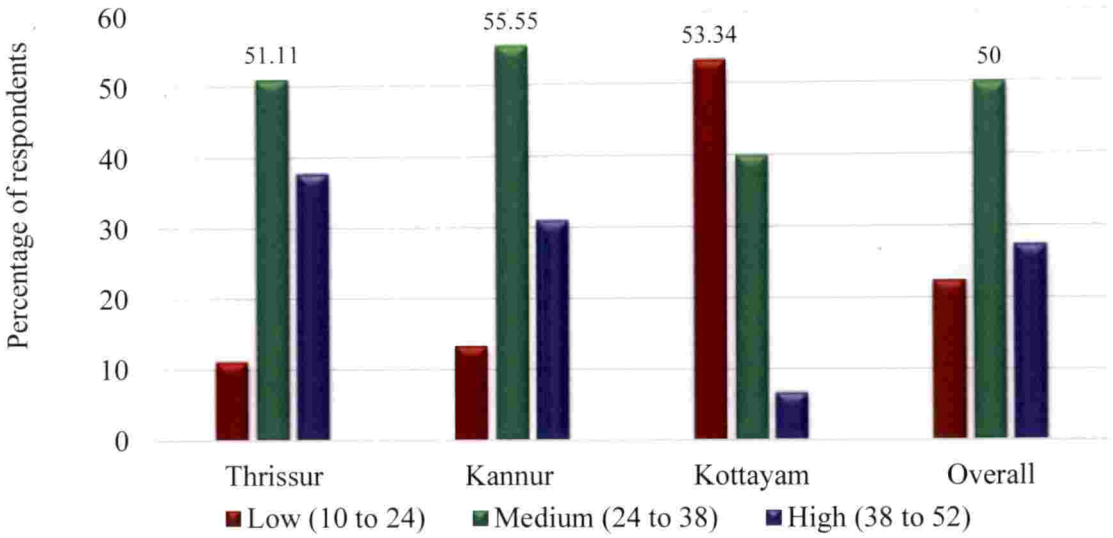

Figure 9: Distribution of beneficiaries based on their attitude towards ASCs

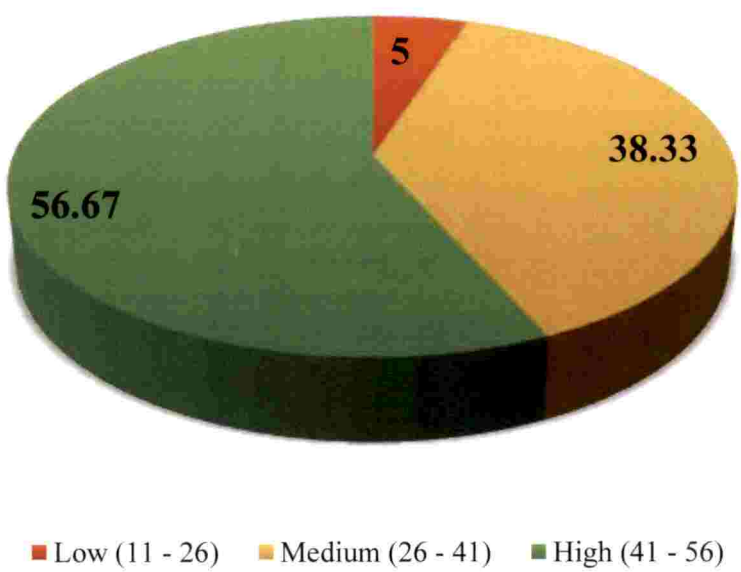

Figure 10: Distribution of extension personnel based on their attitude towards the service delivery system of ASCs

them were already employed in the State Department of Agriculture and many had agricultural background, which might be one of the reason for obtaining the above result. The result obtained is desirable because a favourable attitude will motivate the employees to perform better. Results are similar to that of Peter (2014) and Bortamuly (2015), where majority of the extension agents had favourable attitude towards different farming service delivery systems.

4.6. DISTRIBUTION OF RESPONDENTS BASED ON THEIR PROFILE CHARACTERISTICS

4.6.1. Distribution of beneficiaries of Agro Service Centres based on their personal and social characteristics

4.6.1.1. Age

The distribution of farmers based on their age are presented in Table 12.

Table 12. Distribution of beneficiary farmers of ASCs according to their age

Category	Thrissur		Kannur		Kottayam		Overall	
	No.	%	No.	%	No.	%	No.	%
Young age (<35)	3	6.66	4	8.89	4	13.34	11	9.16
Middle age (35 – 55)	15	33.34	19	42.23	9	30	43	35.84
Old age (>55)	27	60	22	48.88	17	56.66	66	55
Total no of respondents	45		45		30		120	

A perusal of Table 12, revealed that 55 per cent of the beneficiaries of Agro Service Centres surveyed belonged to old age category, followed by middle age category (35.84%) and young age category (9.16%). In the case of district wise distribution of respondents based on age, 60 per cent of beneficiaries of Agro Service Centre in Thrissur district belonged to old age category, whereas it was 48.88 per cent and 56.66 per cent in Kannur and Kottayam district respectively. Farmer beneficiaries

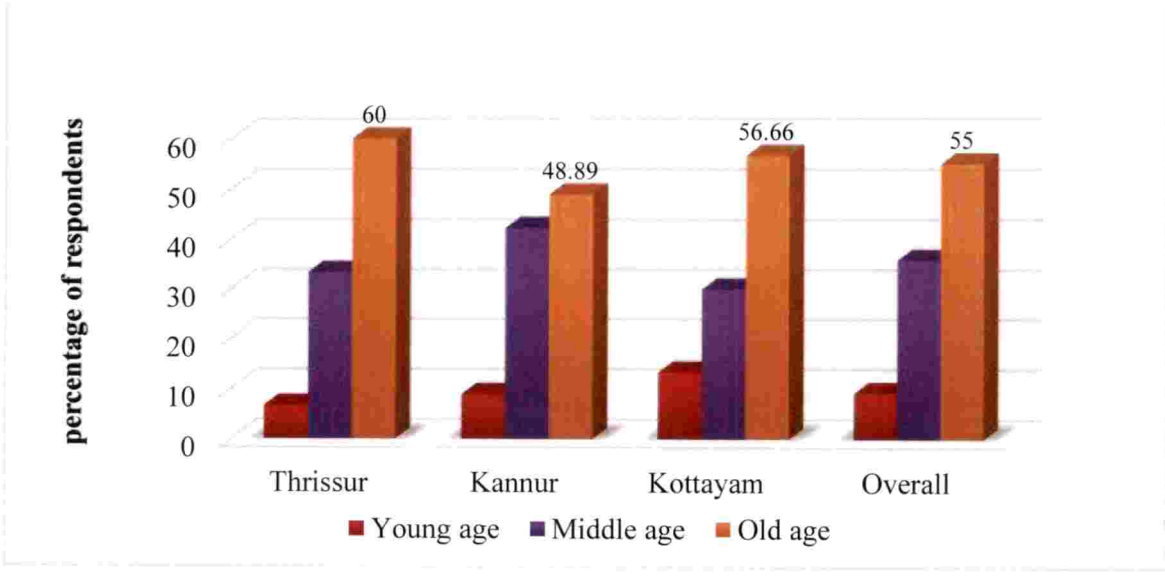

Figure 11: Distribution of beneficiary farmers of ASCs based on their age

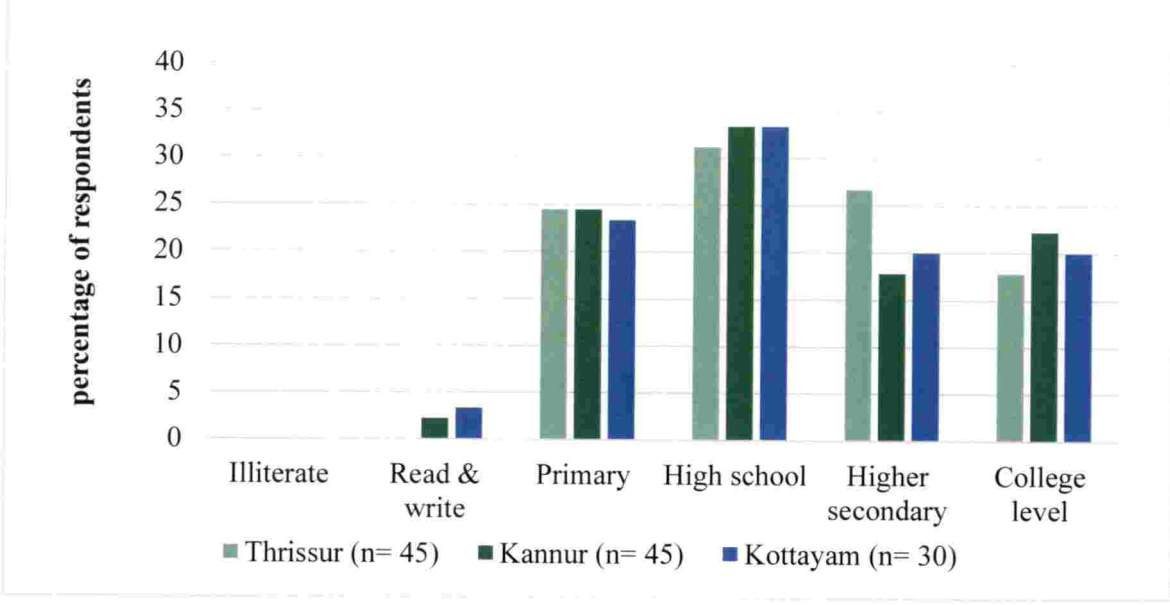

Figure 12: Distribution of beneficiary farmers of ASCs based on their education

of Agro Service Centre belonged to middle age category were 33.34%, 42.23% and 30% in Thrissur, Kannur and Kottayam district respectively. Youngsters are far behind in utilizing the service delivery system of Agro Service Centre effectively compared to old and middle categories. Only 6.66%, 8.89% and 13.34% of beneficiaries of Agro Service Centre in Thrissur, Kannur and Kottayam district belonged to young age category. Hence it was concluded that most of the beneficiaries of Agro Service Centre belonged to old age category followed by middle age category.

Most of the farmers were born and bought up in an era of practising conventional agriculture and it is very difficult for them to move along with the changing agricultural scenario. Hence they need assistance and services from experts of different agricultural service systems. This is the main reason for the high percentage of beneficiaries of ASC from old age category. However, now youngsters are attracted by white collar jobs which gives them more status and respect in society and moreover they aspire to explore opportunities beyond the horizons of the agricultural sector. So the number of young farmers involving in agriculture is less and also youngsters involved in agriculture find their way of farming with the help of modern agricultural information and technology system rather than seeking help from one-stop shop centres like ASCs. The findings are in agreement with the findings of Paul (2017) and Ajith (2018) where majority of the beneficiary farmers of LEADS and FPOs were aged.

4.6.1.2. Education

The distribution of farmer beneficiaries of ASC on the different category of literacy were recorded and are presented in Table 13.

Table 13: Distribution of beneficiary farmers of ASCs based on their education

District	Thrissur		Kannur		Kottayam		Overall	
Group	No.	%	No.	%	No.	%	No.	%

Illiterate	0	0	0	0	0	0	0	0
Read & Write	0	0	1	2.22	1	3.34	2	1.67
Primary school	11	24.44	11	24.44	7	23.33	29	24.17
High school	14	31.12	15	33.34	10	33.33	39	32.5
Higher secondary	12	26.66	8	17.78	6	20	26	21.66
College level	8	17.78	10	22.22	6	20	24	20
Total	45		45		30		120	

The table 13, showed that majority of the farmers are educated and more than 70 per cent of farmers had high school or above educational qualifications. Among this 32.5 per cent have studied up to high school, 21.66 per cent have studied up to higher secondary and 20 per cent of farmers have college-level education. 24.17 per cent of farmers have studied up to primary school and rest 1.67 per cent of farmers can read and write. The trend is almost similar in all the three surveyed districts. Most of the respondents in the three districts had high school level education i.e. 31.12%, 33.34% and 33.33% in Thrissur, Kannur and Kottayam district respectively. And the most interesting thing is that there are no illiterate farmers among the surveyed beneficiaries of ASC. This shows the higher literacy rate in Kerala. Hence this result indicates that services of Agro Service Centres are useful to all categories of farmers irrespective of their educational qualifications. The result is in line with the result of Paul (2017) and Ajith (2018).

4.6.1.3. Size of land holding

The distribution of farmer beneficiaries of ASCs based on the size of land holding was recorded and are presented in Table 14.

Table 14: Distribution of beneficiary farmers of ASCs based on size of land holding

District	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Marginal (< 1 ha)	25	55.56	26	57.78	16	53.34	67	55.84
Small (1 – 1.99 ha)	11	24.44	13	28.88	8	26.66	32	26.66
Semi medium (2 – 3.99 ha)	5	11.12	5	11.12	3	10	13	10.84
Medium (4 – 9.99 ha)	4	8.88	1	2.22	3	10	8	6.66
Large (10 ha & above)	0	0	0	0	0	0	0	0
Total	45		45		30		120	
Average size of land holding	1.13 ha		0.98 ha		1.28 ha		1.11 ha	

In the above table, farmers were classified into five categories based on the area under cultivation.

The table 14, revealed that most of the beneficiaries of ASC are marginal and small farmers with 55.84 per cent and 26.66 per cent respectively. About 10.84 per cent of farmers belonged to semi medium and 6.66 per cent belonged to medium categories. Among the surveyed farmers, there were no large farmers as beneficiaries of ASC. Moreover 55.56 per cent of beneficiaries of ASCs in Thrissur district belonged to marginal farmers. Whereas it was 57.78 per cent in Kannur and 53.34 per cent in Kottayam district. Marginal farmers were followed by small farmers with 24.44%, 28.88% and 26.66% in Thrissur, Kannur and Kottayam respectively. Equal per cent of farmers from Thrissur and Kannur district belonged to semi-medium category (11.12%) and it was 10 per cent in Kottayam district. The number of farmers with a land area of 4 to 10 ha (medium category) was very less and it was found that only 8.88%, 2.2% and 10% of beneficiaries of ASCs from Thrissur, Kannur and Kottayam respectively belonged to medium category of land size. The average area under

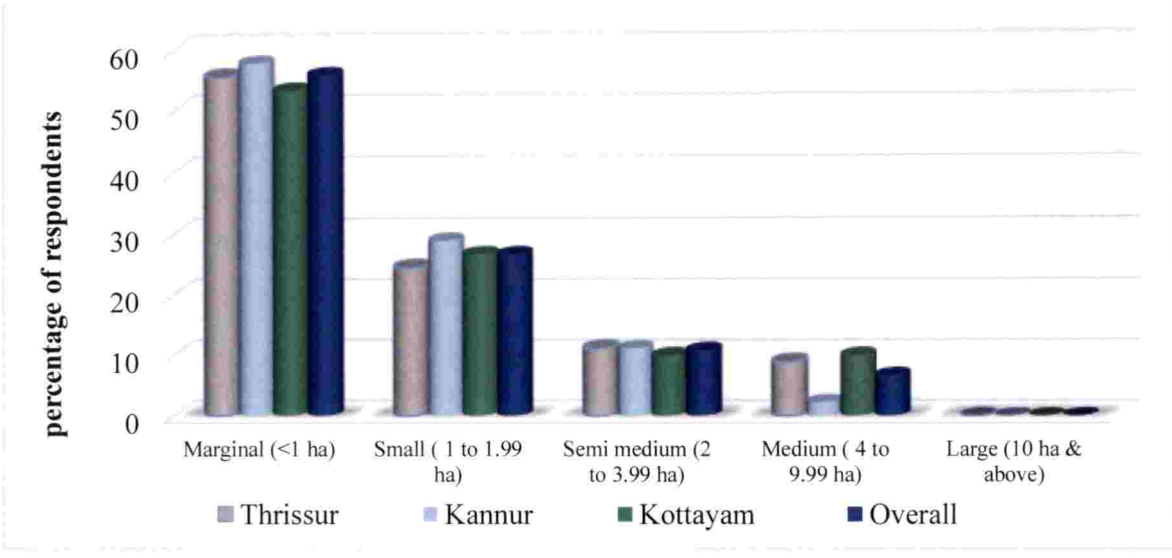

Figure 13: Distribution of beneficiary farmers of ASCs based on their size of land holding

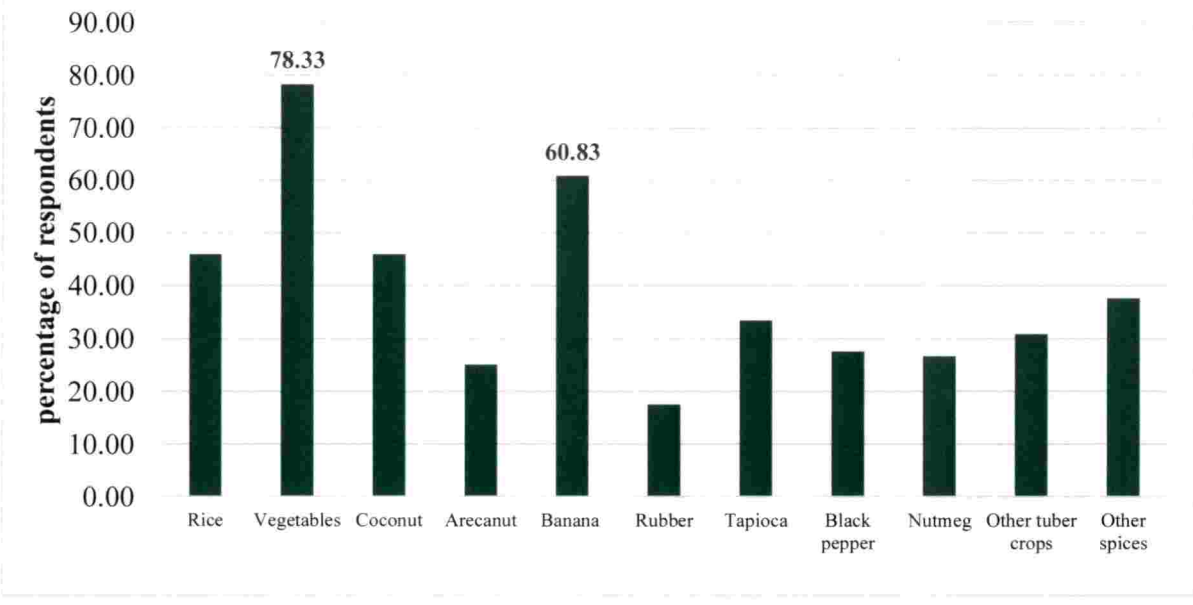

Figure 14: Distribution of beneficiary farmers of ASCs based on crops grown

cultivation was found to be very less in Kerala and it was 1.13 ha, 0.98 ha and 1.28 ha in Thrissur, Kannur and Kottayam districts respectively.

Hence it was concluded that the services of ASC are more utilized by small and marginal farmers as it stands for providing better farming services to them and it also validate the fact that majority of the farmers in Kerala are small and marginal farmers with an average area of 1.11 ha under cultivation. In Kerala, the land is increasingly being used for non-agricultural purposes because of the rising demand of land for the expansion of industrial and other sectors. Hence the area under cultivation shows a declining trend. Similar result was reported by Ganiger (2012).

4.6.1.4. Crops grown

Major crops grown by the beneficiary farmers of ASCs were identified and presented in Table 15.

Table 15: Distribution of beneficiary farmers of ASCs based on Crops grown

Crops	Thrissur		Kannur		Kottayam		Overall	
	No	%	No	%	No	%	No	%
Rice	23	51.11	27	60.00	5	16.67	55	45.83
Vegetables	39	86.67	36	80.00	19	63.33	94	78.33
Coconut	22	48.89	21	46.67	12	40.00	55	45.83
Arecanut	11	24.44	12	26.67	7	23.33	30	25.00
Banana	33	73.33	20	44.44	19	63.33	73	60.83
Rubber	0	0.00	6	13.33	14	46.67	21	17.50
Tapioca	12	26.67	9	20.00	18	60.00	40	33.33
Black pepper	11	24.44	14	31.11	8	26.67	33	27.50
Nutmeg	23	51.11	2	4.44	7	23.33	32	26.67
Other tubers	14	31.11	12	26.67	11	36.67	37	30.83
Other spices	20	44.44	13	28.89	12	40.00	45	37.50
Total no. of farmers	45		45		30		120	

A perusal of the above table reveals that among the beneficiaries, more number of vegetable (78.33%) and banana (60.83%) growers utilized the services of ASCs. When compared between the districts, more number of vegetable (86.67%) and banana (73.33%) growers utilized the services of ASCs in Thrissur. Eighty per cent of vegetable farmers and sixty per cent of paddy farmers utilized the services of ASCs in Kannur districts. In Kottayam, more number of vegetable (63.33%), banana (63.33%) and tapioca (60%) farmers utilized the services of ASCs. The result depicts that services of ASCs were more beneficial to vegetable farmers throughout the state. It was observed that the crops grown were different in the three districts. Apart from vegetables, farmers from Thrissur were cultivating banana, rice, nutmeg and coconut as major crops and the major crops grown by farmers from Kannur were rice, coconut and banana besides vegetables. The major cultivated crops in Kottayam district included banana, tapioca, rubber, coconut and other spices like ginger, turmeric and alike.

Hence it is clear from the table that vegetable farmers were utilizing the services of ASCs more effectively than others. ASCs were mainly concentrating on the supply of vegetable seedlings, composts, bio pesticides and other organic products for promoting vegetable cultivation. Rain shelter, cool chamber and wick irrigation unit for needy farmers were being made by the trained service providers of ASCs and also various department schemes like grow bag filling and distribution, kitchen garden and school vegetable garden were also implemented through ASCs. All these interventions of ASCs are intended to promote vegetable cultivation in the state, especially in households. This is a part of combined effort of government to attain self sufficiency in vegetable production and thereby reducing the import of vegetables from other states.

4.6.1.5. Annual farm income

The distribution of respondents based on their annual earnings from farming and allied sectors were identified and are presented in Table 16.

Table 16: Distribution of beneficiary farmers of ASCs according to their annual farm income

Category	Thrissur		Kannur		Kottayam		Overall	
	No.	%	No.	%	No.	%	No.	%
<50000	16	35.56	13	28.88	10	33.34	39	32.5
50000 – 100000	9	20	12	26.66	11	36.66	32	26.66
>100000	20	44.44	20	44.44	9	30	49	40.84
Total no of respondents	45		45		30		120	
Average annual farm income	Rs.1,50,956		Rs.1,47,644		Rs.1,26,750		Rs.1,43,663	

Table 16, revealed that 40.84 per cent of the farmers earn an annual income of more than one lakh and 32.5 per cent farmers were getting an income less than fifty thousand. Majority of the beneficiaries of Agro Service Centre from Thrissur and Kannur district were getting an income of more than one lakh from farming alone.

From the above table, it is evident that the annual farm income of majority of the farmers was found to be more than one lakh. This implies that the income of farmers who are utilizing the services of Agro Service Centre is substantial, which might be due to the increased utilization of technologies via ASC. Similar result was reported by Ajith (2018).

4.6.1.6. Farming experience

The distribution of farmers based on their farming experience was documented and are exhibited in Table 17.

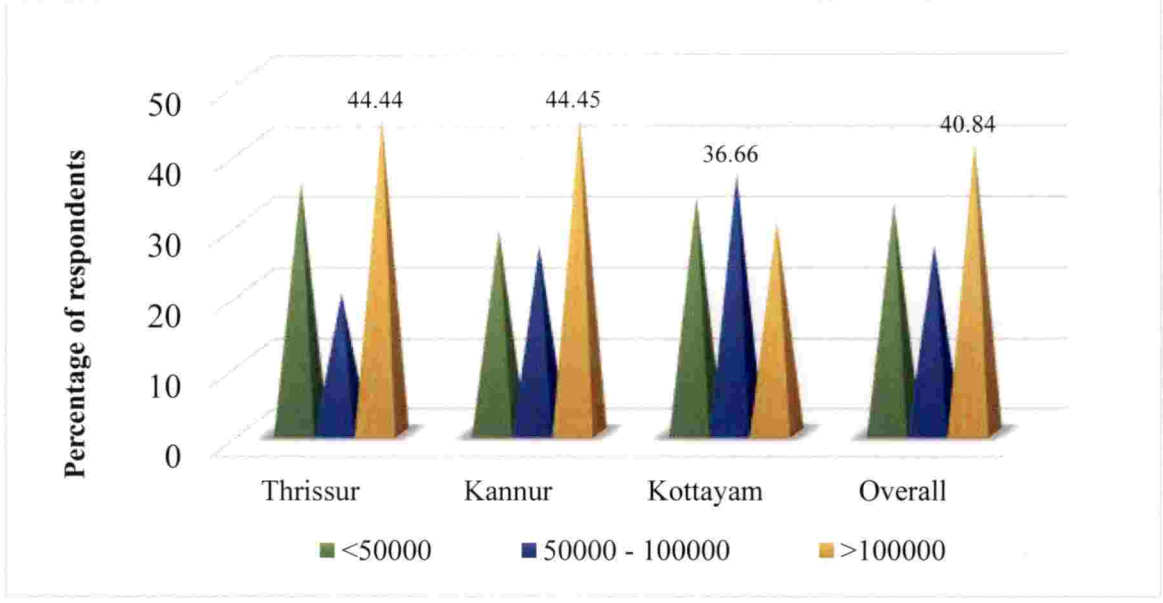

Figure 15: Distribution of beneficiary farmers of ASCs based on their annual farm income

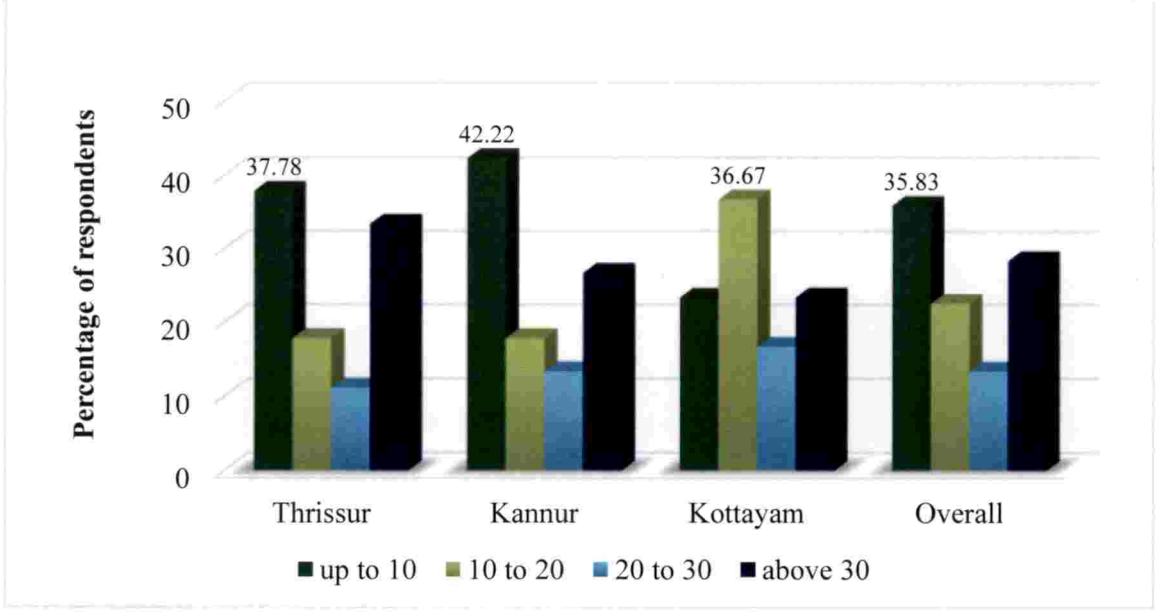

Figure 16: Distribution of beneficiary farmers of ASCs based on their experience in farming

Table 17: Distribution of beneficiary farmers of ASCs based on farming experience

District	Thrissur		Kannur		Kottayam		Overall	
Category (years)	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Up to 10	17	37.78	19	42.22	7	23.33	43	35.83
10 to 20	8	17.77	8	17.77	11	36.67	27	22.5
20 to 30	5	11.12	6	13.34	5	16.66	16	13.34
Above 30	15	33.33	12	26.67	7	23.34	34	28.33
Total	45		45		30		120	
Average experience (years)	22		19		18		20	

Table 17, reveals that majority of the farmers had farming experience of more than 10 years and only 35.83 per cent of beneficiaries of ASC were having farming experience of fewer than 10 years. Nearly 37.78%, 42.22% and 23.33% of farmers from Thrissur, Kannur and Kottayam district had less than 10-years of experience in farming. The result reveals that most of the beneficiaries of ASCs were involved in agriculture since their childhood and most of them belonged to the old and middle age category. Another implication of the result is that the youth need to be attracted to farming through motivation and conscientisation. Hence it may be concluded that experienced farmers utilize the services of ASC for modernizing their farming practices. Similar result was reported by Paul (2017) in her study on beneficiaries of LEADS.

4.6.1.7. Resource utilization

The distribution of farmer beneficiaries of ASCs based on resource utilization was identified and are shown in Table 18.

Table 18: Categorization of beneficiary farmers of ASCs based on resource utilization

District	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (10 – 17)	7	15.56	5	11.11	6	20	18	15
Medium (17 – 24)	13	28.88	8	17.77	6	20	27	22.5
High (24 – 31)	25	55.56	32	71.12	18	60	75	62.5
Total	45		45		30		120	
Mean	23.44		24.13		22.20		23.39	

Expected score range = 10 to 30, Data score range = 12 to 30

Table 18 summarizes the high utilization of resources by the respondents throughout the state. Among the surveyed respondents, 62.5 per cent of the farmers belonged to the category of high resource utilization followed by 22.5 per cent in the category of medium resource utilization and 15 per cent in low resource utilization category. Utilization of available resources was found to be high in northern Kerala (Kannur-71.12%) compared to southern Kerala (Kottayam-60%) and central Kerala (Thrissur -55.56%). Hence it is clear from the above table that beneficiaries of ASCs utilizes all the available on farm and off farm resources as well as services for the betterment of their farm.

4.6.1.8. Change proneness

The distribution of respondents based on their change proneness towards external factors was recognised and are shown in Table 19.

Table 19: Distribution of beneficiary farmers of ASCs based on their change proneness

District	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (9 – 15)	10	22.22	5	11.12	13	43.33	28	23.33
Medium (15 – 21)	25	55.56	23	51.11	10	33.33	58	48.33
High (21 – 27)	10	22.22	17	37.77	7	23.34	34	28.34
Total	45		45		30		120	
Mean	17.58		19.00		16.17		17.76	

Expected score range = 9 to 27, Data score range = 9 to 27

The table 19 depicts that most of the beneficiaries of ASC had a medium proneness to changes (48.33%) followed by high change proneness (28.34%) and low change proneness (23.33%). While coming to the case of Districts, majority of the farmers from Thrissur (55.56%) and Kannur (51.11%) districts were having medium change-proneness. But in the case of Kottayam district, most of the farmers (43.33%) were less prone to changes followed by moderate (33.33%) and high (23.34%) change proneness. More than twenty per cent (22.22%) of farmers each from Thrissur had high and low proneness to changes and 37.77 per cent farmers of Kannur had high change proneness and 11.12 per cent had low change proneness.

The result reflects that most of the farmers in Kerala were moderately influenced by the external factors including new technologies and innovative methods and they are very cautious in choosing among the alternatives in farming. But they are not traditional in nature and accept changes when situation demands. The results are in conformity with the conclusion drawn by Neethi (2013) in her study on beneficiaries of DAATT Centre.

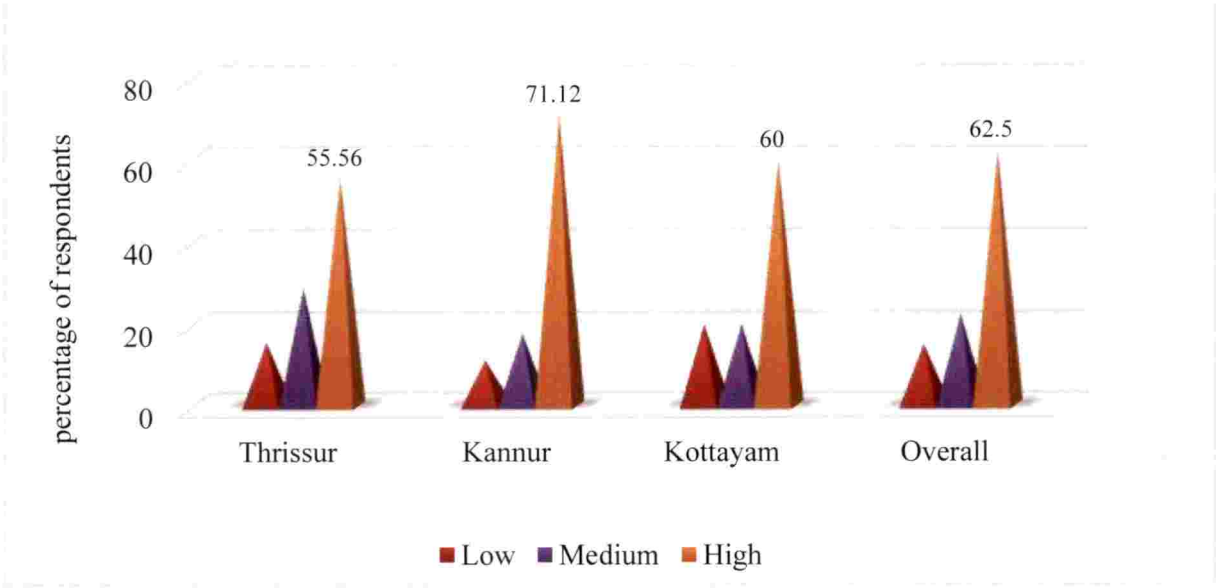

Figure 17: Distribution of beneficiary farmers of ASCs based on resource utilization

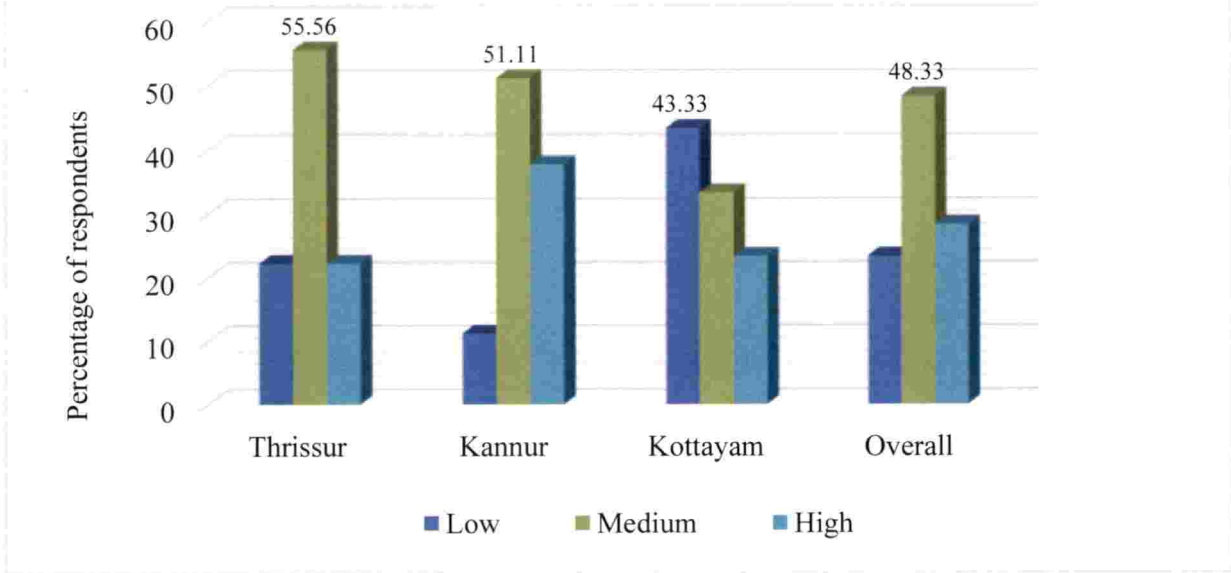

Figure 18: Distribution of beneficiary farmers of ASCs based on change proneness

4.6.1.9. Decision making ability

The distribution of respondents based on their decision making ability was identified and are shown in Table 20.

Table 20: Distribution of beneficiary farmers of ASCs based on their decision making ability

District	Thrissur		Kannur		Kottayam		Overall	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (6 – 14)	9	20	14	31.12	7	23.33	30	25
Medium (14 – 22)	23	51.12	10	22.22	5	16.67	38	31.66
High (22 – 30)	13	28.88	21	46.66	18	60	52	43.34
Total	45		45		30		120	
Mean	18.20		19.47		20.33		19.21	

Expected score range = 6 to 30, Data score range = 7 to 28

Decision-making ability of farmers was found to be high (43.34%) followed by medium (31.66%) and low (25%) among the beneficiaries of ASCs. More than fifty per cent (51.12%) of the beneficiaries of ASCs in Thrissur district had medium decision-making ability followed by high (28.88%) and low (20%) decision-making ability. But in Kannur (46.66%) and Kottayam (60%) district, most of the respondents had high decision-making ability. Nearly thirty per cent (31.12%) of beneficiaries of ASCs in Kannur and 23.33 per cent beneficiaries in Kottayam district had low decision-making ability followed by medium decision-making ability with 22.22% and 16.67% of respondents.

The decision making ability that is reflected upon by the farmers of Kottayam district unlike that of Thrissur and Kannur could be due to the differences in cropping systems

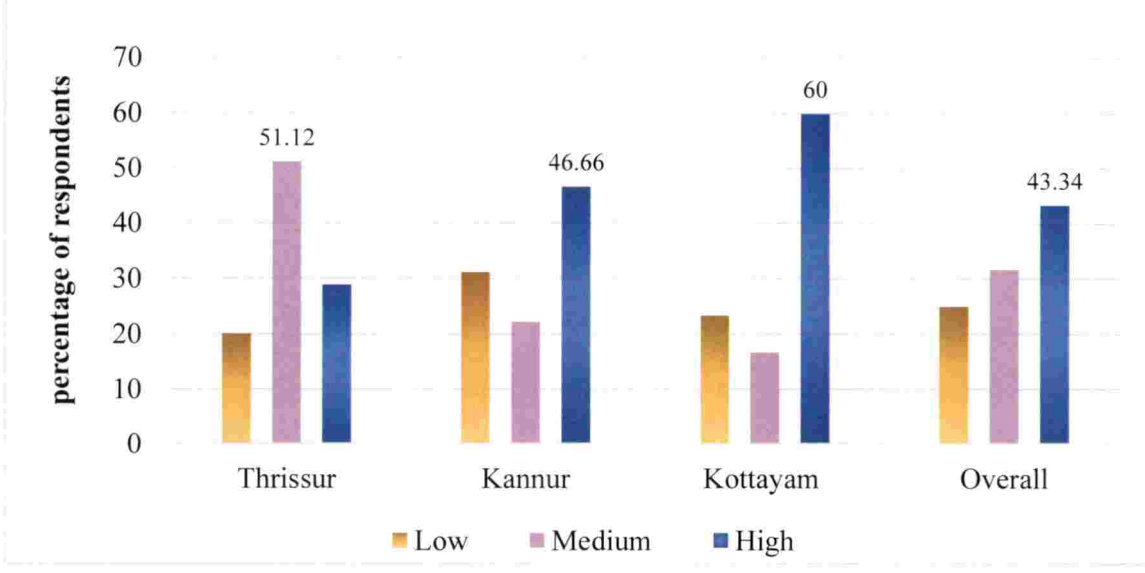

Figure 19: Distribution of beneficiary farmers of ASCs based on decision making ability

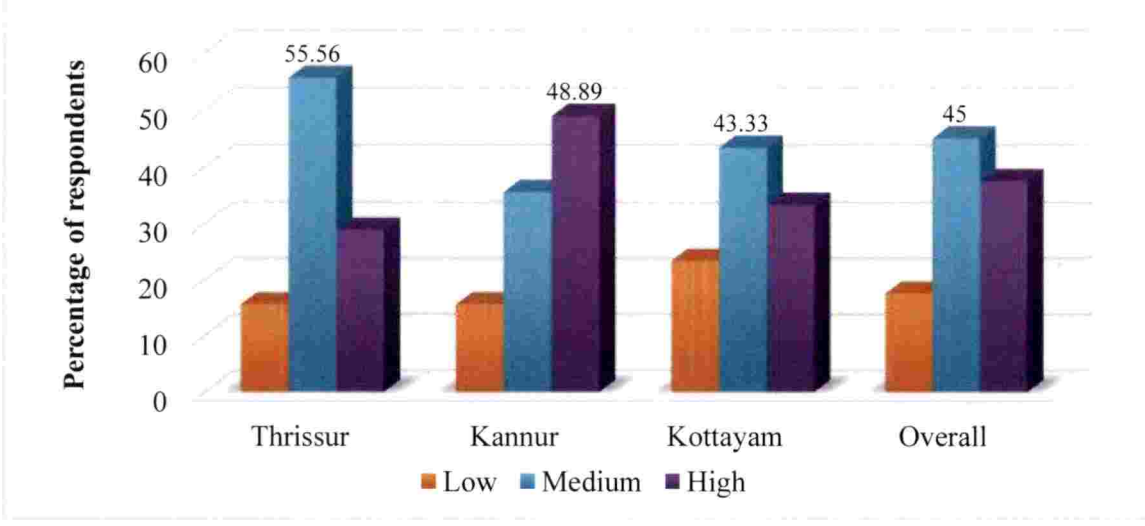

Figure 20: Distribution of beneficiary farmers of ASCs based on information source utilization

or due to a well established rubber based farming system. Continuous contact with the extension agencies helps to widen the knowledge horizon of farmers and therefore they are able to make the right decision appropriate to the situation.

4.6.1.10.Information source utilization

The distribution of farmer beneficiaries of ASCs based on information source utilization was identified and are presented in Table 21.

Table 21: Distribution of beneficiary farmers of ASCs based on information source utilization

District	**Thrissur**		**Kannur**		**Kottayam**		**Overall**	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (6 – 10)	7	15.55	7	15.56	7	23.34	21	17.5
Medium (10 – 14)	25	55.56	16	35.55	13	43.33	54	45
High (14 – 18)	13	28.89	22	48.89	10	33.33	45	37.5
Total	45		45		30		120	
Mean	12.38		13.49		12.27		12.77	

Expected score range = 6 to 18, Data score range = 8 to 18

A critical analysis of the Table 21 reveals that 45 per cent of the farmers moderately utilizes the available information sources followed by 37.5 per cent of farmers with high utilization of the information sources. Nearly twenty per cent (17.5%) of the farmers were very poor in utilizing the information sources.

The variation in the information source utilization pattern of beneficiaries of ASC in the three regions of the state is clear from the given table. Respondents from Northern Kerala had a tendency to utilize all the available information sources effectively. But in central and southern Kerala most of the farmers belong to the

medium category in utilizing the information sources. The extend of the utilization of information sources by the farmers substantially depends on their extent of contact with the available information and service sources and those who are having more networks in the social system utilizes resources more productively.

Hence the results indicate that the farmers who are efficiently utilizing the information sources are more cosmopolite in nature. The exposure of farmers beyond his social system helps them to familiarize with new information sources. So the farmers can realise the potential of these information sources and therefore they are able to utilize it more effectively than localite farmers. The result is in agreement with the results of Neethi (2013), Koshy (2016) and Kushwaha (2018).

4.6.1.11.Risk orientation

The distribution of farmers based on their risk orientation was identified and are presented in Table 22.

Table 22: Distribution of beneficiary farmers of ASCs according to their risk orientation

District	**Thrissur**		**Kannur**		**Kottayam**		**Overall**	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Low (6 – 14)	7	15.55	10	22.23	4	13.34	21	17.5
Medium (14 – 22)	20	44.45	13	28.89	11	36.66	44	36.66
High (22 – 30)	18	40	22	48.88	15	50	55	45.84
Total	45		45		30		120	
Total	19.47		20.20		20.97		20.12	

Expected score range = 6 to 30, Data score range = 10 to 28

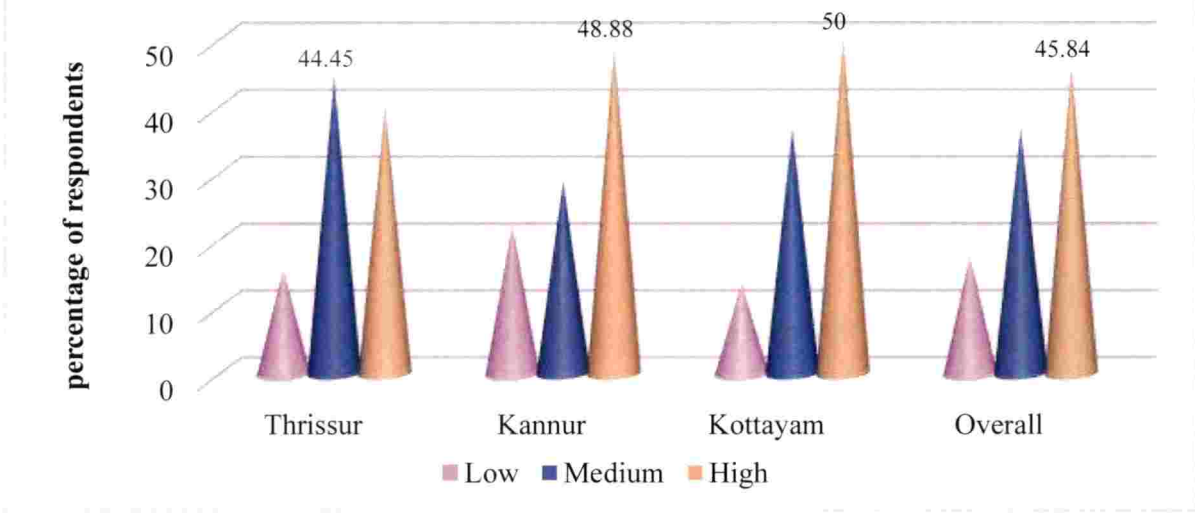

Figure 21: Distribution of beneficiary farmers of ASCs based on risk orientation

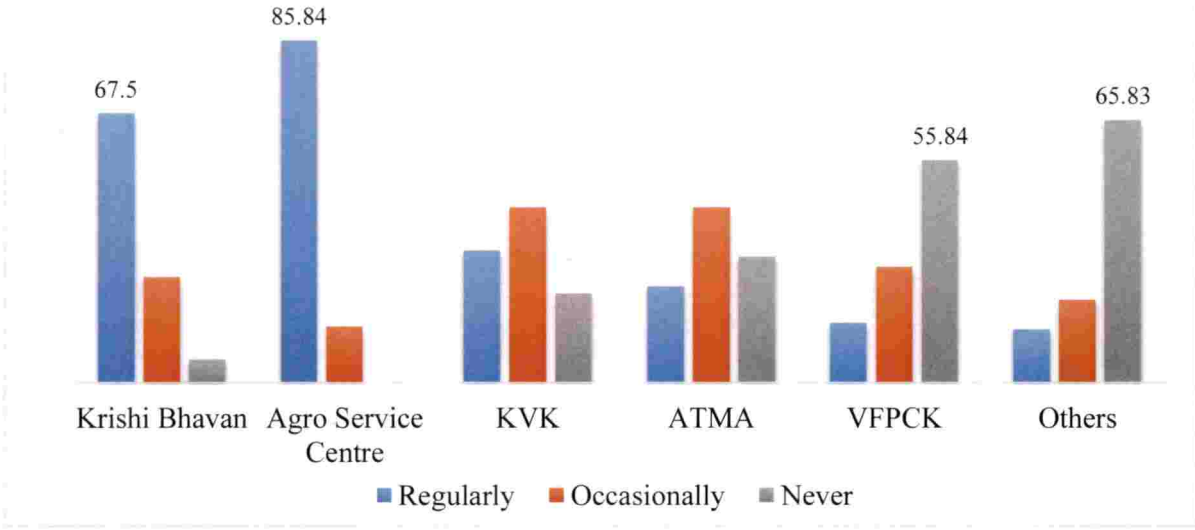

Figure 22: Distribution of beneficiary farmers of ASCs based on their extension agency contact

A perusal of Table 22 reveals that 45.84 per cent of the farmers had high risk orientation followed by 36.66 per cent with medium and 17.5 per cent with low risk orientation. While in the case of districts majority of the farmers in Kannur (48.88%) and Kottayam (50%) district were having high orientation towards risk followed by medium risk orientation with 28.89% and 36.66% of farmers respectively. But in the case of Thrissur district, 44.45 per cent of the farmers had medium risk orientation followed by high (40%) and low (15.55%) risk orientation. Nearly 15.55%, 22.23% and 13.34% of farmers from Thrissur, Kannur and Kottayam district respectively had less orientation towards risk and they are not ready to take any risk in farming.

The result implies that farmers with high-risk orientation always maintained their contact with extension agencies and receive guidance and suggestion from experts and subject matter specialists. So they are more oriented to the scientific method of cultivation and become self-sufficient in handling the problems. The results are in disagreement with those of Deekshit (2015) and Kushwaha (2018).

4.6.1.12.Extension agency contact

The distribution of respondents based on their contact with different extension agencies were recorded and are shown in Table 23.

Table 23: Distribution of beneficiary farmers of ASCs farmers based on extension agency contact

Category	Regularly		Occasionally		Never	
	No.	%	No.	%	No.	%
Krishi Bhavan	81	67.5	32	26.66	7	5.84
Agro Service Centre	103	85.84	17	14.16	0	0
KVK	40	33.33	53	44.17	27	22.5
ATMA	29	24.17	53	44.17	38	31.67

VFPCK	18	15	35	29.16	67	55.84
Any other,	16	13.34	25	20.83	79	65.83
Total number of farmers = 120						

Table 23, revealed that majority of the respondents had regular contact with extension agencies like Krishi Bhavan (67.5%) and Agro Service Centre (85.84%). More than forty per cent (44.17%) of respondents occasionally contacted the extension agencies like KVK and ATMA and the majority of the respondents had no contact with VFPCK and with other extension agencies like SHM, RARS, NGOs, FPOs, private extension agencies etc.

It is clear from the table that, most of the Agro Service Centres are functioning in association with the Krishi Bhavan and hence the farmers in the rural area can easily access the services of these two extension agencies. The extension agency contact helps the farmers in familiarizing with a number of alternatives and these leads to an increase in both the decision-making ability and risk-taking propensity of farmers. Another implication of the result is that since the farmers are satisfied with the technology support provided by ASC, they are contacting other extension agencies less frequently. Hence the result obtained is desirable.

4.6.2. Distribution of extension personnel of Agro Service Centres based on their personal and social characteristics

4.6.2.1. Age

The distribution of extension personnel based on their age are presented in Table 24.

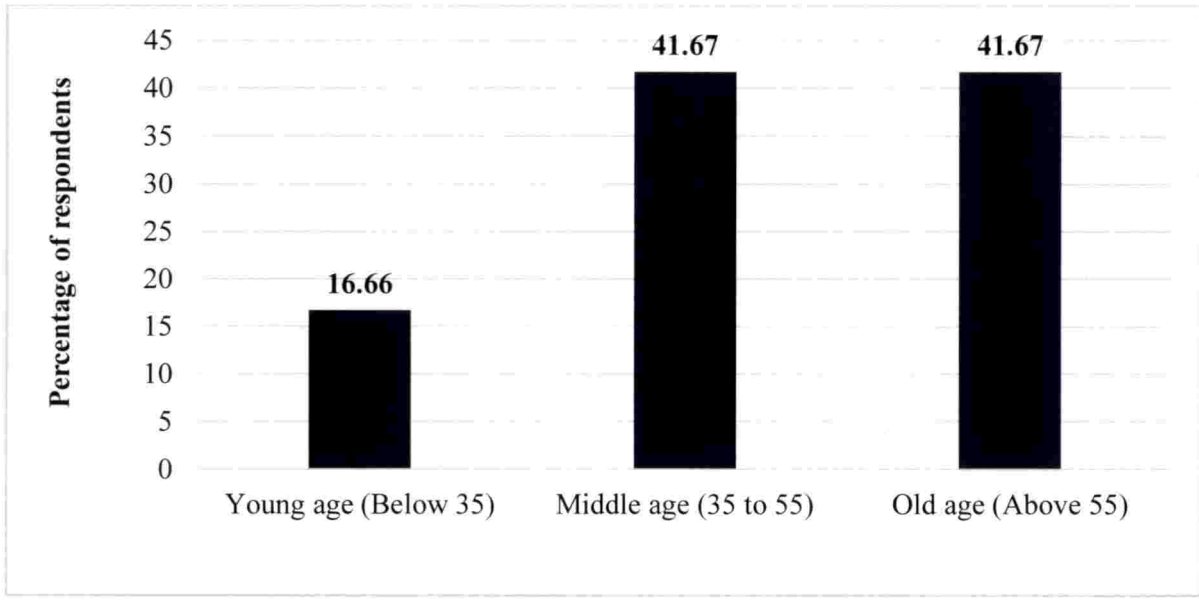

Figure 23: Distribution of extension personnel based on age

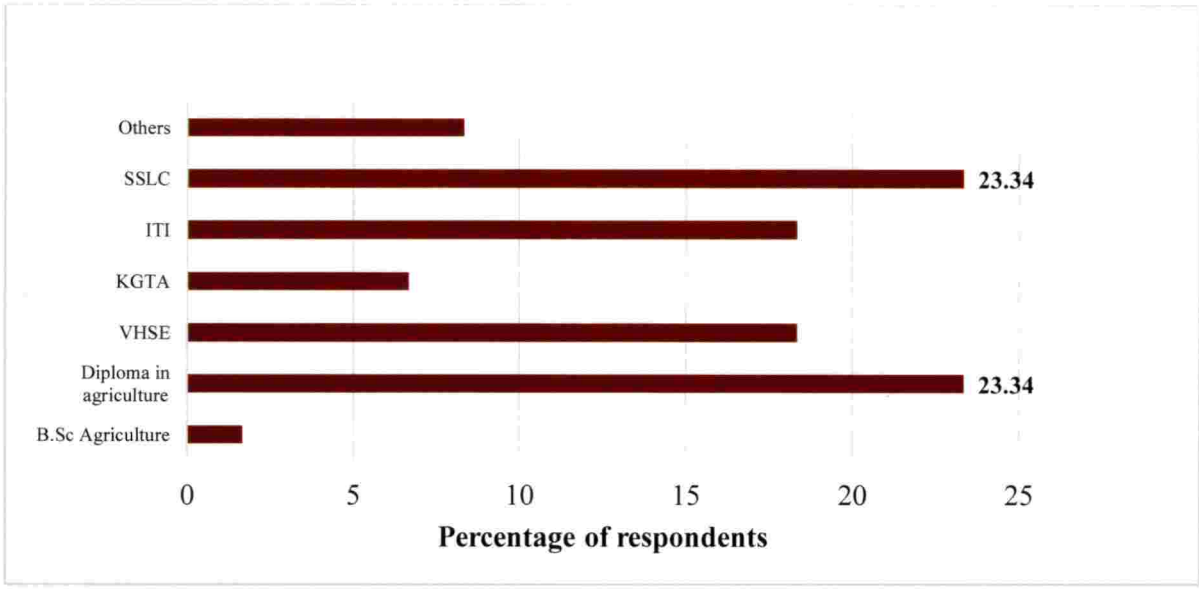

Figure 24: Distribution of extension personnel based on education

Table 24: Distribution of extension personnel based on their age

Category	No.	%
Young age	10	16.66
Middle age	25	41.67
Old age	25	41.67
Total no of respondents: 60		

Table 24 revealed that majority of the extension personnel of ASC belonged to middle and old age category. Only 16.66 per cent of extension agents were youngsters. Majority of the young service provider of Agro Service Centres discontinues and opt for other jobs and also most of the agricultural facililitators joined ASC after their retirement from the Department of Agriculture. This is the main reason for the low per cent of youth as extension worker in ASCs. Results are in line with that of Bhaurao (2014) and Bortamuly (2015), where majority of the extension personnel belonged to middle and old age category.

4.6.2.2.Education

The distribution of extension personnel based on their educational qualifications are presented in Table 25.

Table 25: Distribution of extension personnel based on their educational qualifications

Category	No.	%
B Sc. agriculture	1	1.66
Diploma in agriculture	14	23.34
VHSE	11	18.33
KGTA	4	6.67
ITI	11	18.33

SSLC	14	23.34
Others	5	8.33
Total no of respondents: 60		

Table 25 showed that 23.34 per cent of respondents had Diploma in agriculture and SSLC as educational qualification. Nearly twenty per cent (18.33%) of the respondents had studied VHSE and ITI. So, it is clear from the above table that only one extension agent had B Sc. Agriculture qualification. The result shows that most of the agricultural facilitators had Diploma in Agriculture followed by KGTA and VHSE qualification. But most of the service providers had qualification of SSLC, ITI and VHSE.

4.6.2.3.Occupational position

The distribution of extension agents in ASCs based on their occupational position was identified and are presented in Table 26.

Table 26: Distribution of extension personnel based on their occupational position

Category	**No.**	**%**
Agricultural facilitators	26	43.34
Service providers	34	56.66
Total no of respondents: 60		

Table 26 shows the distribution of respondents based on their occupational position in the Agro Service Centre. There were mainly two categories of respondents in ASC and they included Agricultural facilitators and Service providers. In this 56.66 per cent of respondents were service providers and 43.34 per cent of them were agricultural facilitators.

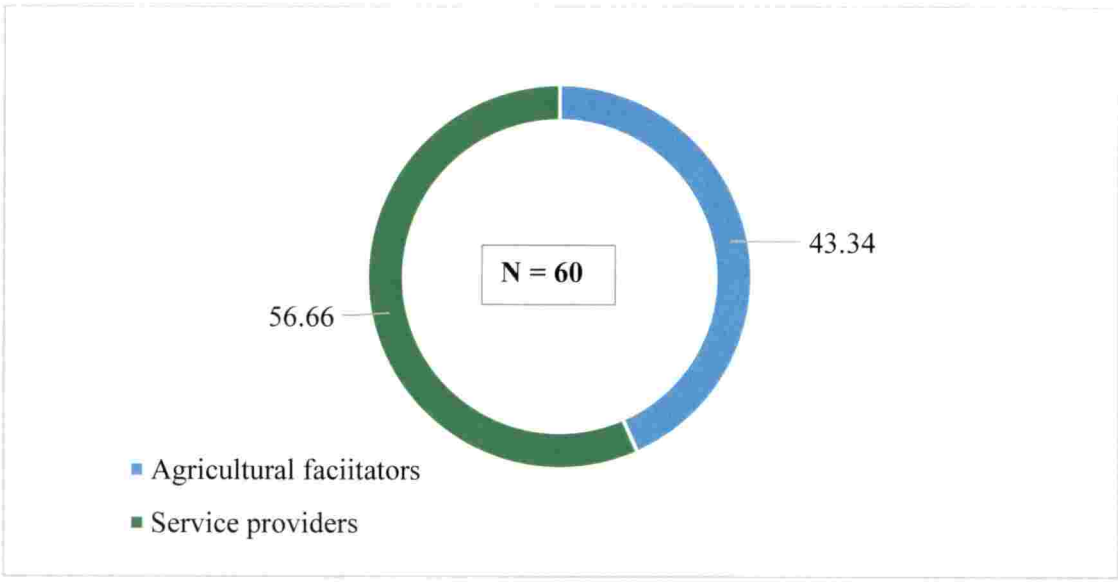

Figure 25: Distribution of extension personnel based on their occupational position

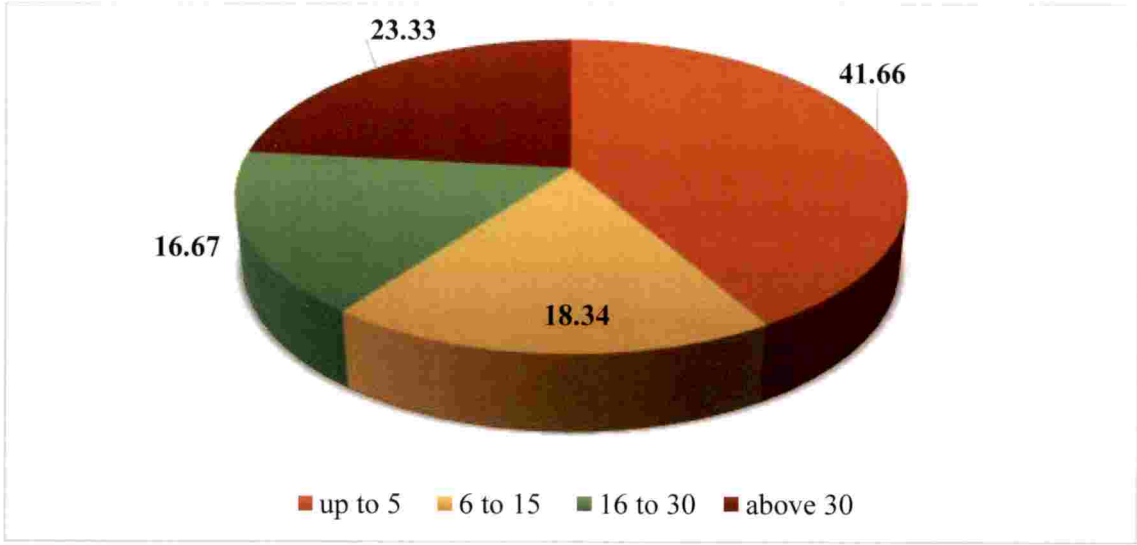

Figure 26: Distribution of extension personnel based on their experience in extension work

4.6.2.4.Experience in extension work

The distribution of f extension personnel based on their experience in extension work are shown in Table 27.

Table 27: Distribution of extension personnel based on their experience in extension work

	Overall		Agricultural facilitators		Service providers	
Category	**No.**	**%**	**No.**	**%**	**No.**	**%**
Up to 5	25	41.66	2	7.69	23	67.65
6 to 15	11	18.34	0	0	11	32.35
16 to 30	10	16.67	10	38.47	0	0
Above 30	14	23.33	14	53.84	0	0
Total number	60		26		34	

Table 27 revealed that majority (41.66%) of the respondents had experience in extension work up to five years followed by 23.33 per cent with more than 30 years of experience in extension work. But in the case of agricultural facilitators, most of them had experience of more than 30 years followed by experience between 15 to 30 years. Most of the service providers had less than 5 years of experience in extension work. The results indicate that the extension workers employed in ASC are rich in experience which is a desirable result.

4.6.2.5.Training received

Training is the formal and systematic alteration of one's capacity, capability, performance and productivity through learning which occurs as a result of education, instruction, development and planned experience. Training was provided to all extension personnel of ASCs. These scheduled training programmes were carried out

under the auspicious of ARS, Mannuthy and some other extension agencies in Kerala. The extension agents of Agro Service Centre were classified into three categories based on the number of training received by them. The distribution of extension personnel on the basis of training received are presented in Table 28.

Table 28: Distribution of extension personnel on the basis of training received

Category	No.	%
One training	16	26.67
Two training	34	56.66
Three training	10	16.67
Total no of respondents: 60		

The Table 28 reveals the training received by the respondent after joining in Agro Service Centre were mainly on the operation of farm machinery or for the enhancement of any particular skill related to farming. Majority (56.66%) of the extension agents received 2 training programmes and 26.67 per cent received only one training and 16.67 per cent of the respondents received more than 3 training programmes.

Agricultural facilitators were instructed on how to set and manage the Agro Service Centre and subsequently, extensive trainings were given to them for the same. The success of the Agro Service Centres depends on the management as well as operational skills imparted to the service providers. Twenty days training on the field operations, repair and maintenance of farm machinery were imparted to the service providers. After the training, they set the main working groups of the ASC. A Next level training for 20 days was given to the working group to operate farm clinic and diagnostic centre. The training was imparted on essential technologies to VHSC (Agri) members of the ASC working group. Farm machinery repairing and service training were provided to ITI people to operate repair service centre of machinery. The other

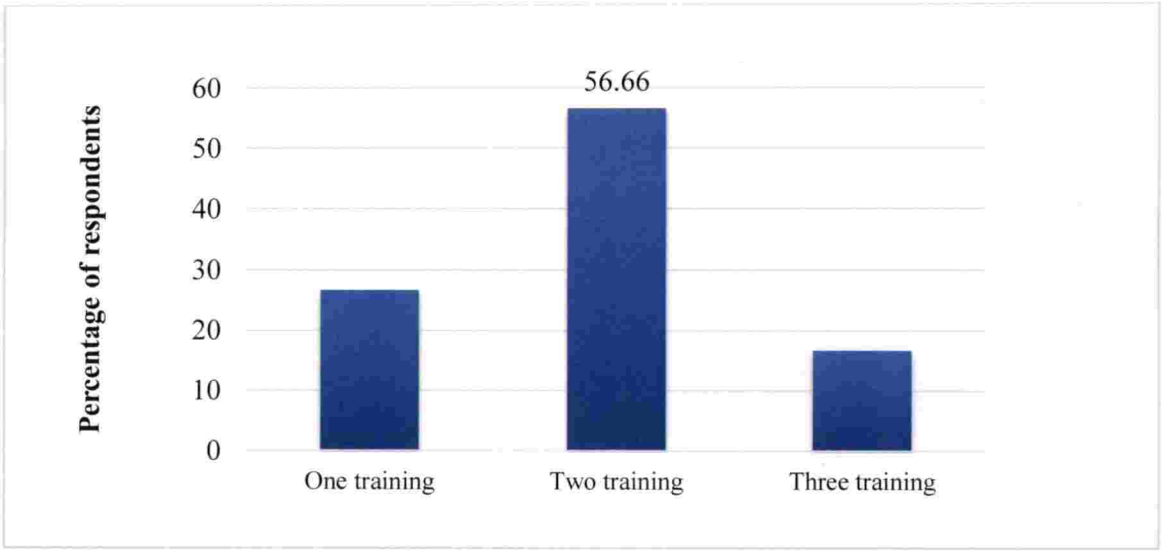

Figure 27: Distribution of extension personnel based on the number of training received by them

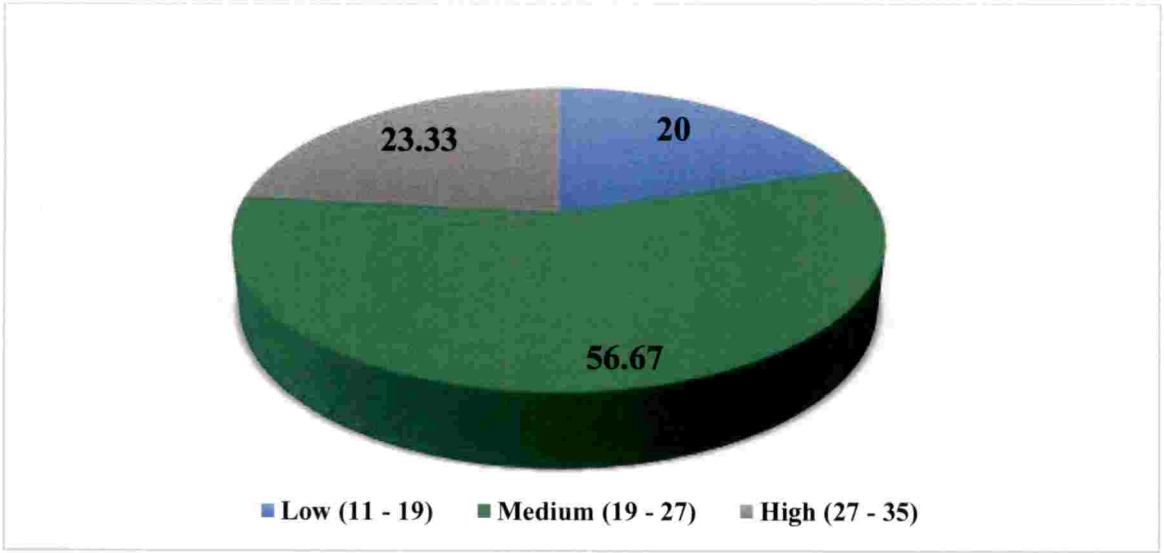

Figure 28: Distribution of extension personnel based on their extension service orientation

five members were imparted skill up-gradation training for the service they are offering in each area.

4.6.2.6. Extension service orientation

The distribution of extension personnel of ASCs on the basis of their extension service orientation are exhibited in Table 29.

Table 29: Distribution of extension personnel based on their extension service orientation

Category	**No.**	**%**
Low (11 to 19)	12	20
Medium (19 to 27)	34	56.67
High (27 to 35)	14	23.33
Mean = 23.25		
Total no of respondents: 60		

Expected score range = 11 to 33, Data score range = 15 to 30

Table 29 showed that more than fifty per cent of the extension personnel had medium extension service orientation followed by 23.33 per cent with high and 20 per cent with less extension service orientation.

The result obtained is desirable as eighty per cent of the extension workers were having medium to high extension service orientation which is a desirable trait in an extension worker. The result is not in agreement with the finding of Ganiger (2012).

4.6.2.7.Work commitment

The distribution of extension agents of ASCs based on their work commitment are presented in Table 30.

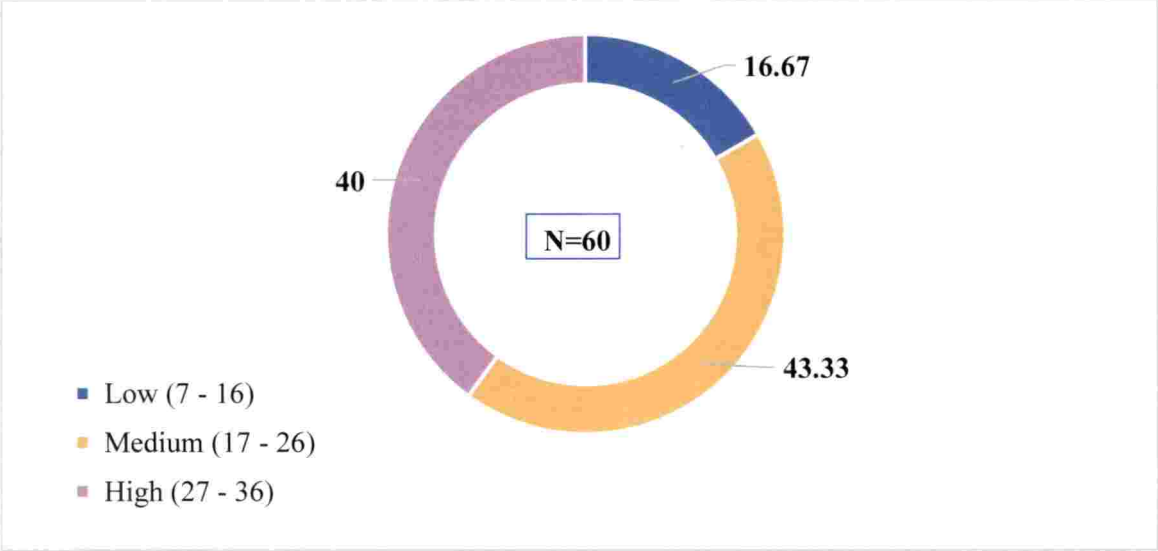

Figure 29: Distribution of extension personnel based on their work commitment

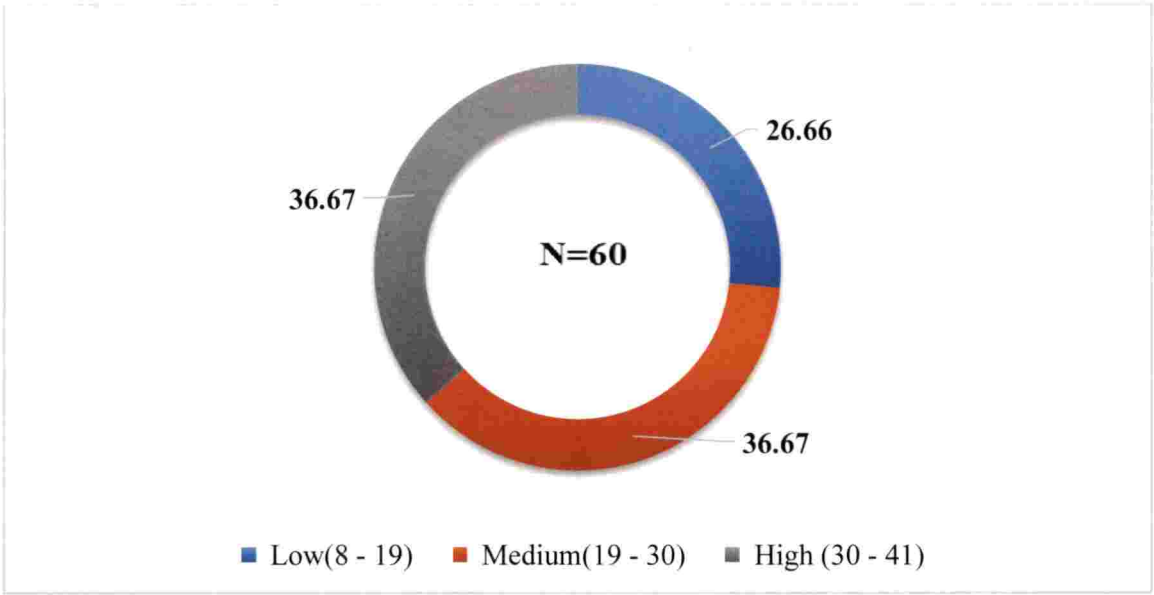

Figure 30: Distribution of extension personnel based on their problem solving ability

Table 30: Distribution of extension personnel based on their work commitment

Category	No.	%
Low (7 to 16)	10	16.67
Medium (17 to 26)	26	43.33
High (27 to 36)	24	40
Mean = 24.47		
Total no of respondents: 60		

Expected score range = 7 to 35, Data score range = 12 to 34

Table 30 revealed that 43.33 per cent of extension personnel of Agro Service Centre were having medium work commitment followed by 40 per cent with a high commitment to their work. Only 16.67 per cent of respondents belonged to the category of having less work commitment. Work commitment which is a desirable trait in an extension worker to perform excellently in his work was found to be more in the respondent category which is a positive observation. These result is in agreement with the findings of Chaudhary (2006) and Sundaran (2016).

4.6.2.8.Problem solving ability

The distribution of extension personnel of ASCs based on their problem solving ability are shown in Table 31.

Table 31: Distribution of extension personnel based on their problem solving ability

Category	No.	%
Low (8 to19)	16	26.66
Medium (19 to 30)	22	36.67
High (30 to 41)	22	36.67

Mean = 25.30
Total no of respondents : 60

Expected score range = 8 to 40, Data score range = 14 to 38

From the above table, we can see that 36.67 per cent each of extension agents had moderate and high problem solving ability. Only 26.66 per cent of respondents belonged to the category of extension agents with less problem solving ability. The role function which is limited in nature could be the reason why extension agents belonged to the category of low problem solving ability.

4.6.2.9.Leadership ability

The distribution of extension personnel based on their leadership ability are presented in Table 32.

Table 32: Distribution of extension personnel based on their leadership ability

Category	**No.**	**%**
Low (5 to 12)	11	18.33
Medium (12 to 19)	25	41.67
High (19 to 26)	24	40
Mean = 16.77		
Total no of respondents: 60		

Expected score range = 5 to 25, Data score range = 9 to 23

Majority of extension personnel of Agro Service Centres had medium and high leadership ability and 18.33 per cent of extension agents were belonging to low category of leadership. Extension workers with good leadership quality will be able to take initiative in various extension activities of ASC to help the farmers for betterment

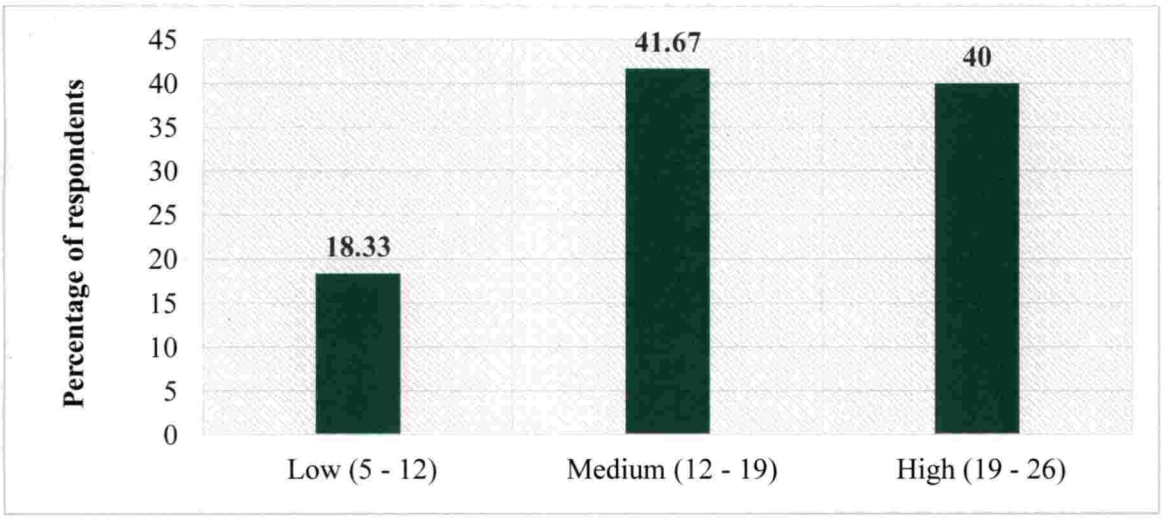

Figure 31: Distribution of extension personnel based on their leadership ability

of their farming. The result is in line with the findings of Shankar (2004) and Chaudhary (2006), where most of the extension agents were having moderate ability to lead others.

4.7. RELATIONSHIP OF PERFORMANCE EFFECTIVENESS INDEX AS PERCEIVED BY FARMERS WITH THEIR ATTITUDE TOWARDS ASCs.

Performance Effectiveness Index of ASCs was operationalized and measured as the perception of farmers about the ability of ASCs to achieve the predetermined goals and objectives in time by retaining the quality. Attitude of beneficiaries towards ASC was operationalized and measured as the mental disposition of the respondent towards its service delivery system. Correlation analysis was performed to find out the significance of the Performance Effectiveness Index of ASCs as perceived by the beneficiaries with their attitude towards ASCs.

Table 33: Correlation between PEI and attitude of farmers

Dependent variable	Correlation co-efficient
Attitude	0.66**

(**1 per cent significant level *5 percent significant level)

The result shows that the critical value of correlation was 0.660 which is greater than the correlation coefficient (0.234) at 1 per cent level of significance for a sample size of 120. The result indicates that the performance effectiveness of Agro Service Centres was positively and significantly correlated with the attitude of beneficiaries at 1 per cent level of significance. It was quite natural that attitude being a psychological construct will influence the performance effectiveness of ASC. Not worthy result was the significance at 1 per cent. Attitude of farmers towards performance effectiveness of ASCs would be influenced by the services rendered by the ASCs on a particular note. The result is in line with those of Koshy (2016), where he opined that the

moderate efficiency of the Kisan Call Centre might be due to the moderate and less favourable attitude of the majority of farmers.

Time-bound high-quality agro services are essential for the growth and development of the agricultural sector. Agro Service Centres satisfy the needs of small and marginal farmers by addressing their problems and also by providing support services to them. So the performance effectiveness of such a centre will be high. This might be the reason for the supportive attitude of farmers

4.8. RELATIONSHIP OF PERFORMANCE EFFECTIVENESS INDEX OF ASCs AND ATTITUDE OF BENEFICIARIES TOWARDS ASC WITH PROFILE CHARECTERISTICS OF FARMERS

Correlation analysis was performed to evaluate the significance of the performance effectiveness of Agro Service Centres and Attitude of beneficiaries towards Agro Service Centres with selected independent variables.

Table 34: Correlation of the profile characteristics of farmers with Performance Effectiveness Index and attitude of beneficiaries towards ASCs.

No.	Independent variables	PEI (r value)	Attitude (r value)
1	Age	-0.236**	-0.073
2	Education	0.161	0.133
3	Size of land holding	0.073	0.070
4	Annual farm income	0.216*	0.185*
5	Farming experience	0.190*	0.246**
6	Resource utilization	0.070	0.232*
7	Change proneness	0.216*	0.332**
8	Decision making ability	-0.125	-0.106
9	Information source utilization	0.036	0.094

10	Risk orientation	-0.222*	-0.307**
11	Extension agency contact	-0.080	-0.139
If N = 120, r_{table} = 0.179 (5%) & r_{table} = 0.234 (1%)			

(**1 per cent significant level *5 percent significant level)

Performance effectiveness index was positively and significantly correlated with farming experience, annual farm income and change proneness and it was negatively and significantly correlated with age and risk orientation of the farmers. The result also showed that age of the farmers was negatively and significantly correlated with performance effectiveness index at 1 per cent and farming experience, Annual farm income and change proneness were positively and significantly correlated to performance effectiveness at 5 per cent. But risk orientation of farmers was negatively and significantly correlated with performance effectiveness at 5 per cent only. The independent variables like education, size of land holding, resource utilization and information source utilization was found to be positive and non significant with performance effectiveness index as perceived by the farmers. Decision making ability and extension agency contact of farmers was found to be negative and non significant with performance effectiveness.

A significant and negative correlation was found between Performance effectiveness index of Agro Service Centre as perceived by the farmers and the age of the farmers. Aged farmers are traditional in nature and they may not be aware of different agro advisory services available. Hence they might be far behind in utilizing the services of these centres for improving their farm. Also, due to their dogmatic nature they may be reluctant to utilize the services. This could be the reason for obtaining negative correlation of age with performance effectiveness index. The results are in agreement with the views of Mauceri *et al.* (2005) and Mwangi and Kariuki (2015), where they opined that perception of farmers about latest technologies and its delivering agencies got reduced as they grow older.

There was a significant and positive correlation observed between performance effectiveness index of Agro Service Centres and the annual income of the farmers. The farm income will increase to those farmer beneficiaries who utilize the services of Agro Service Centre effectively because utilization of modern technologies and services from Agro Service Centre leads to a reduction in the cost of cultivation and increase in the production and productivity of crops and thereby an increase in income from farming. Similar results were reported by Issa *et al.* (2011) and Avinash (2013).

The farming experience was positively and significantly correlated with the performance effectiveness index of ASCs. Experienced farmers have a tendency to utilize all the available resources effectively and hence they perceive Agro Service Centres as a better source of information and services for modernizing their farm. Similar result was reported by Issa *et al.*(2011).

Change proneness was significantly and positively correlated with the performance effectiveness index of ASCs. This may be due to the fact that those who are prone to changes through the influence of external factors will have a favourable attitude towards new information and technology disseminating services. Perception of farmers on the performance of any organization or technology is essential for its acceptance and adoption. Hence the result is not in agreement with the result of Neethi (2013) where change proneness was found to be positive and non-significant with extent of adoption and hence non-significant with the perception of farmers on the performance of DAATT Centre.

There was a significant and negative correlation between performance effectiveness index as perceived by the farmers and risk orientation. Farmers with high-risk orientation will be self-sufficient in handling problems related to farming and they will not go for the agro advisory services of any extension agencies. This may be the probable reason for the poor perception of farmers about the performance effectiveness of Agro Service Centres. The result is not in agreement with the findings of Deekshit (2015), where risk orientation was positively and significantly correlated with the

perception of farmers regarding the performance of private veterinary services delivery systems.

Attitude of beneficiaries towards Agro Service Centre was positively and significantly correlated with farming experience, annual farm income, resource utilization and change proneness and it was negatively and significantly correlated with risk orientation. The result also showed that farming experience and change proneness was positively and significantly correlated with attitude of farmers at 1 per cent. Resource utilization was positively and significantly correlated with attitude of beneficiaries of ASC at 5 per cent and the result also showed that risk orientation is negatively and significantly correlated with attitude of ASC at 1 per cent level of significance.

A significant and positive correlation was found between the Attitude of beneficiaries towards ASCs and their annual farm income. Farmers earning a good income from agriculture will try to utilize all ways to improve their farming. The farmers who earn income from farming will try to adopt all possible means and technologies for the further improvement in production and productivity of crops. These farmers will be having a favourable attitude towards any agency which is providing different agricultural services and information regarding the new farming technologies. Similar result was reported by Sobanbhai (2014).

Farming experience plays an important role in determining the attitude of farmers. Experienced farmers are more conscious about the different agro advisory systems around them and they know the importance of such a system. So they will have a positive attitude towards all the interventions for the upliftment of the farming community. The result is not in agreement with the result of Chittem (2010).

Resource utilization is the ability of the farmer to utilize the available on farm and off-farm resources and services at its fullest potential. Resource utilization directly influences the attitude of farmers. So these farmers recognise everything around them

as an opportunity for agricultural growth and hence they perceive ASCs as a better source of resources. This leads them to develop a favourable attitude towards ASCs.

There was a significant and positive correlation between attitude and change-proneness of farmers. Those who are ready to accept the changes will definitely support the changes in the agricultural information and technology disseminating system. Therefore, they will be having a favourable attitude towards Agro Service Centres. The results are in line with the findings of Neethi (2013), where she reported that there exists a positive and significant relationship between change proneness of farmers and the utilization of services from DAATT centres. This is an indication that the farmers who efficiently utilize DAATT centre services will have a favourable attitude towards the delivery system of the centre.

A significant and negative correlation was found between attitude and risk orientation. Farmer's attitude becomes more favourable according to the performance effectiveness of Agro Service Centres. Consequently, the tendency of farmers who depend on such centres for the support will increase. This leads to a shift in their decision-making habit and ultimately it might have reduced the risk-taking propensity of farmers, which explains negative significant relation between attitude and risk orientation observed in the study. The result is not in agreement with the findings of Sobanbhai (2014) and Kushwaha (2018).

4.9. RELATIONSHIP OF ATTITUDE OF EXTENSION PERSONNEL TOWARDS THE SERVICE DELIVERY SYSTEM OF ASC WITH THEIR PROFILE CHARACTERISTICS

Correlation analysis was performed to evaluate whether there is any significant relationship between the attitude of extension personnel towards the service delivery system of ASCs and selected independent variables.

Table 35: Correlation of the profile characteristics of extension personnel with their attitude towards the service delivery system of ASCs

No.	Independent variables	Correlation co-efficient
1	Age	0.224
2	Experience in extension work	0.180
3	Training received	0.044
4	Extension service orientation	0.523**
5	Work commitment	0.476**
6	Problem solving ability	0.600**
7	Leadership ability	0.255*
N = 60, r_{table} = 0.330 (1%) & r_{table} = 0.254 (5%)		

(**1 per cent significant level *5 percent significant level)

The attitude of extension personnel was positively and significantly correlated with extension service orientation, work commitment, problem solving ability and leadership ability of the respondents. The result also showed that extension service orientation, work commitment and problem solving ability were positively and significantly correlated to attitude at 1 per cent and leadership ability was positively and significantly correlated to attitude at 5 per cent level of significance. The independent variables like Age, experience in extension work and training received were found to be positive and non significant with the attitude of extension personnel.

The performance effectiveness of Agro Service Centre was determined in terms of extension service orientation, work commitment, problem solving ability and leadership ability of the extension personnel. There was a significant and positive correlation between extension service orientation and attitude of extension personnel. Service minded extension agents will be more interested in providing services to

farmers. This leads to improvement in the performance of Agro Service Centres and thereby enhance the standard of living of farmers. This may be the reason for the favourable attitude of extension personnel towards the service delivery mechanism of Agro Service Centres. The results are in line with the findings of Ganiger (2012) where he reported that extension service orientation was positively and significantly correlated with role performance. The one who performs well in his role as an extension agent will have favourable attitude towards agro advisory services.

Work commitment was significantly and positively correlated with the attitude of extension agents. Those who have more dedication and responsibility in doing work will have a favourable attitude towards the service delivery system. This is in line with the result of Ravikishore (2018).

Problem solving ability and leadership ability of extension personnel were significantly and positively correlated with their attitude towards the service delivery system of ASCs. Similar result was reported by Chaudhary (2006), where attitude of Agricultural Supervisors was significantly and positively related with their leadership ability.

The key factors that determine the confidence of extension personnel are their ability to convince farmers that they can solve problems and has the ability to lead the farmers. Those extension agents with these abilities will have a favourable attitude towards the service delivery system of ASCs. Therefore, it is clear that the performance effectiveness of Agro Service Centre was determined in terms of extension service orientation, work commitment, problem solving ability and leadership ability of the extension personnel.

4.10. CONSTRAINTS FACED BY THE RESPONDENTS

Constraints are various hurdles that block the smooth flow of information and services to those people who are in need. Constraint analysis of respondents is required to understand the actual performance effectiveness of Agro Service Centres. There is a

need to know the obstacles confronted by the extension personnel while delivering services to the farmers as well as the problems encountered by the farmers in getting the services. The major constraints which affect the performance of Agro service centres were enlisted after conducting the pilot study. The enlisted constraints were ranked based on the weighted mean score.

4.10.1. Constraints faced by beneficiaries of Agro Service Centre

Agro Service Centre renders all inputs and certain services at a fixed price and the farmers do not receive any reduction in price or any subsidy. So the major problem in their view was lack of subsidy. The other major problems encountered by the farmers were non-availability of services from Agro Service Centre in time, poor response to repair the machinery, inefficiency of service providers in delivering the services. All these gives an indication that the functioning of ASCs needs improvement especially with respect to service delivery mechanism.

Table 36: Constraints faced by the beneficiaries of Agro Service Centres

Statements	Weighted mean	Rank
There is no subsidy for farming inputs from ASC	7.03	1
Service from Agro Service Centre is not received when required.	6.79	2
Poor response from ASC for repair and other services of machinery.	6.48	3
Poor delivery of agro services by the service providers due to their inefficiency in doing work	6.03	4
Lack of basic infrastructural facilities for the proper functioning of ASC	5.46	5
The absence of storage and marketing facilities at ASC	4.83	6

Accessibility to services from ASC is difficult	3.51	7
ASC guidelines are not matching with the existing need of farmers	2.69	8
Availing benefits from ASC involves difficult procedures	2.18	9

4.10.2. Constraints faced by the extension personnels of Agro Service Centre

The major obstacle in the function of ASCs was the discontinuance of service providers for better jobs. This is mainly because the service providers of most of the Agro Service Centres does not get work on regular basis. The proper functioning of most of the centres was affected by the absence of land and other basic infrastructure facilities like machinery yard, nursey etc. The majority of the Agro Service Centres were functioning by paying the rent for land and building. Lack of experienced service personnel and non-availability of vehicles were other obstacles faced by ASC.

Table 37: Constraints faced by the extension personnel of Agro Service Centres

Statements	Weighted mean	Rank
Service provider of Agro Service Centres discontinues and opt other jobs.	7.37	1
No permanent job or salary can be ensured in ASCs	7.25	2
The absence of land and building to keep the seedlings and farm machinery	6.73	3
Lack of adequate experienced service personnel because the work nature is not constant	6.47	4
Non-availability of vehicles in ASC for transport of machinery and agricultural tools to the work site	5.08	5

Facility for complaint redressal with respect to ASC services are absent	4.58	6
Funds under government schemes are not adequate	2.75	7
Funds from the government are not timely	2.68	8
Implementation of different crop development schemes by ASC is difficult	2.13	9

4.11. SUGGESTIONS TO IMPROVE THE PERFORMANCE OF ASCs

Relevant Suggestions are essential for any studies in order to succeed and mitigate the barriers faced by the respondents. Opinions are required for further growth and development of the service delivery systems. Extension personnel gave their suggestions for the smooth functioning of the centre and also for delivering the services effectively to the needy farmers. Farmers bestowed their views and shared their needs for availing better services from ASCs.

The performance of ASCs can be enhanced through coordinating the activities of different extension agencies, regular monitoring and inspection by the officials of the concerned department, ensuring the availability of basic infrastructures like land buildings, storage facility and the like. Linking the ASCs with labour banks in the nearby area is also essential to ensure the availability of labour

The inputs and services of ASC are limited to organic farming only. So it is essential to provide inputs and services for practising integrated management also. Farmers require more training programmes in order to acquire new skills in farming. Marketing and storage facilities for ensuring better price for their products, subsidies to inputs for reducing the cost of cultivation, latest technologies to save time and resources and support for the development of entrepreneurship among the poor farmers are also required to improve the performance effectiveness of Agro Service Centres.

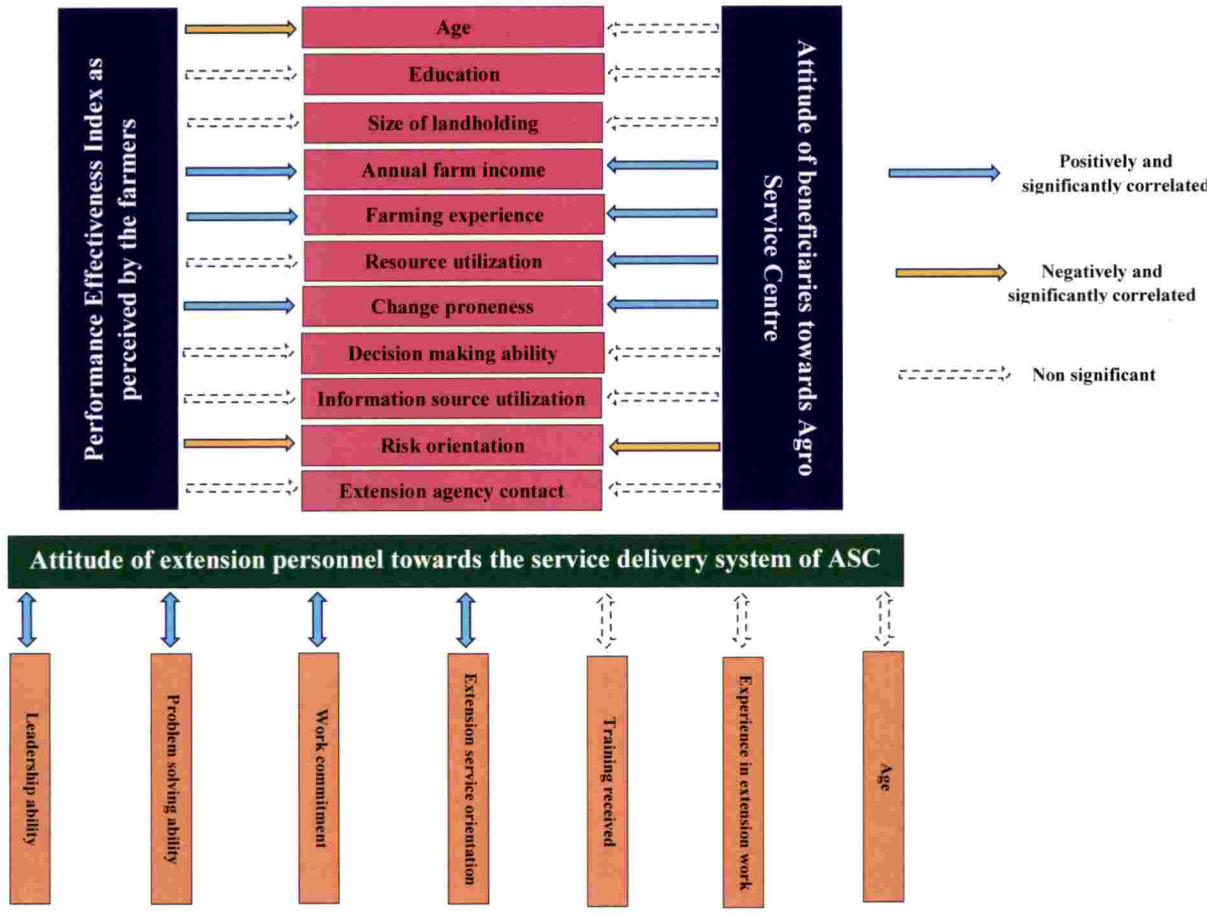

Figure 32: Empirical model of the study

Summary

SUMMARY

Agro Service Centre (ASC) is an initiative by the Department of Agriculture and Farmers Welfare at block level from 2012-13 onwards and it was designed as a single window delivery system for different farming inputs and services to farmers (GoK, 2016). In Kerala, Agro Service Centres help to bridge the gap between the farmers and the service delivery system of Department of Agriculture. Hence there is a need to assess the performance effectiveness of Agro Service Centres and its impacts in the field of agriculture. In this context the present study was conducted during 2018-19 with the following objectives

- Assess the performance effectiveness of Agro Service Centres in the dissemination of information and technology
- Measure the performance effectiveness of Agro Service Centres on farmer's income
- Study the attitude of the farmers towards Agro Service Centres
- Elicit the problems encountered by Agro Service Centres in providing services to the farmers.

The study was undertaken among the beneficiary farmers and all extension personnel of Agro Service Centres in Thrissur, Kannur and Kottayam districts representing the central, northern and southern Kerala. The sample of the study comprised of 120 farmers i.e., 45 farmers from Thrissur, 45 farmers from Kannur and 30 farmers from Kottayam and sixty extension personnel associated with Agro Service Centres.

Performance effectiveness as perceived by farmers, attitude of beneficiaries towards ASC and attitude of extension personnel towards the service delivery system of ASC were the dependent variables of the study. Performance effectiveness Index was measured and analyzed on the basis of three components namely performance

effectiveness of ASC in dissemination of information and technology, Performance of ASC in service delivery and performance effectiveness of ASC on farmer's income. Twelve independent variables for farmers and nine independent variables for extension personnel were selected and the correlation of independent variables with performance effectiveness and attitude were analyzed. The major findings of the study include

1. Forty per cent of the farmers scored the ASCs into high category of PEI followed by 38.34 per cent of the farmers scored the ASCs into medium category of PEI.
2. Majority (46.67%) of farmers scored the ASCs into high- performance effectiveness category in the dissemination of information and technology.
3. More than fifty per cent (56.67%) of the beneficiaries scored the ASCs into medium category of performance in service delivery followed by 34.17 per cent scored the ASCs into low category.
4. Majority (60.83%) of the beneficiaries scored the ASCs into high category of performance effectiveness on farmer's income followed by 23.34 per cent scored the ASCs into medium category of performance and 15.83 per cent beneficiaries scored the ASCs into the low category of performance effectiveness on farmer's income.
5. Among the three components of PEI, performance effectiveness of ASCs on farmer's income contributed 38.56 per cent of the PEI followed by performance effectiveness of ASCs in the dissemination of information and technology (35.85%) and performance of ASCs in service delivery (25.59%).
6. Region wise comparison of services provided in ASC exhibited a similar trend where all ASCs in the three districts were providing machinery and labour hiring services to farmers.
7. Region wise comparison of information and technology disseminating system of ASCs in all the three districts showed a similar trend where, field demonstrations,

field visits and meetings were the most frequently used dissemination system in the studied districts.

8. Half of the respondents (50%) had a medium level of favourable attitude towards ASCs.
9. Majority (56.67%) of the extension personnel had a favourable attitude towards the service delivery system of ASCs.
10. Most of the beneficiaries of the ASCs belonged to old age category and had a high school or above educational qualification.
11. Majority of the beneficiaries of ASCs were marginal (55.84%) and small (26.66%) farmers.
12. More number of Vegetable (78.33%) and Banana (60.83%) growers utilized the services of ASCs.
13. Annual farm income of majority (40.84%) of the farmers was found to be more than one lakh.
14. Most of the farmers had farming experience of more than 10 years and only 35.83 per cent of the beneficiaries of ASCs were having farming experience of fewer than 10 years.
15. Among the surveyed respondents, 62.5 % of the farmers belonged to the category of high resource utilization.
16. Most of the beneficiaries of ASC had a medium proneness to changes (48.33%) followed by high change proneness (28.34%).
17. Decision-making ability of farmers was found to be high (43.34%) followed by medium (31.66%) and low (25%) among the beneficiaries of ASCs.
18. Forty five per cent of the farmers moderately utilized the available information sources followed by 37.5% of farmers with high utilization of the information sources.
19. More than forty five per cent (45.84%) of the farmers had high- risk orientation
20. Majority of the respondents had regular contact with extension agencies like

Krishi Bhavan (67.5%) and ASC (85.84%).

21. Agricultural facilitators and service providers were the two main categories of extension personnel in ASCs.
22. Majority of the extension personnel of ASCs belonged to middle and old age category
23. Nearly twenty five per cent of respondents (23.34 %) had Diploma in agriculture and SSLC as educational qualification.
24. Most of the respondents (41.66%) had experience in extension work up to five years
25. Majority (56.66%) of the extension agents received 2 training programmes
26. More than fifty per cent (56.67%) of the extension personnel had medium extension service orientation
27. Work commitment of 43.33 per cent of extension personnel of ASCs was found to be medium
28. More than thirty five per cent (36.67%) of extension agents had moderate and high problem solving ability.
29. There was almost equal distribution of respondents in medium and high category with respect to leadership ability.
30. Performance effectiveness of ASCs was positively and significantly correlated with the attitude of beneficiaries at 1 per cent level of significance.
31. Performance effectiveness index was positively and significantly correlated with farming experience, Annual farm income and change proneness and it was negatively and significantly correlated with age and risk orientation of the farmers.
32. Attitude of beneficiaries towards Agro Service Centre was positively and significantly correlated with farming experience, annual farm income, resource utilization and change proneness and it was negatively and significantly correlated with risk orientation.

33. The attitude of extension personnel was positively and significantly correlated with extension service orientation, work commitment, problem solving ability and leadership ability of the respondents.
34. Discontinuance of service providers for better jobs, insecurities related to permanent job or salary and absence of land and other basic infrastructure facilities were the three major constraints faced by the extension personnel of ASCs while delivering services to the farmers.
35. The most important problems encountered by the farmers in getting the services were lack of subsidy, non-availability of services in time and poor response to repair the machinery.
36. Suggestions by the farmers and extension personnel to strengthen the service delivery aspects of the ASCs includes dissemination of latest technologies, subsidized inputs delivery, coordinating the activities of different extension agencies, regular monitoring and inspection by the officials of the concerned department, ensuring the availability of basic infrastructures and linking the ASCs with labour banks.

5.1. IMPLICATIONS OF THE STUDY

The study was restricted to purposively selected three districts of Kerala and also limited to Agro Service Centres established until 2016-17 and therefore related studies can be done in other blocks and districts of Kerala where ASCs are functioning. The effectiveness of ASCs is directly reflected in the increase in income and standard of living of the farmers associated with the ASCs. Over the years, the number of ASCs has increased and the number of farmers approaching the centres has also increased. They have brought up and familiarized new technologies among the farmers, and ensured that such technologies are beneficial for the farming community. The increase in farmer's income is a good indication of the services envisaged by ASCs, which has led to the establishment of more ASCs across the

state.

5.2. SUGGESTIONS FOR FUTURE RESEARCH

Future studies can be conducted to develop extension strategies for improving the performance and functioning of ASCs, to analyze the adoption rate of information and services delivered by ASCs. A comprehensive study can be conducted on the role performance of Agricultural facilitators and service providers in the functioning of ASCs and to analyze their managerial competencies.

Plate no 1: Interviewing agricultural facilitator of Irikkoor Agro Service Centre

Plate no 2: Bio input centre of Model Agro Service Centre, Cheruvanchery

Plate no 3: Interviewing a beneficiary farmer of Kankol Agro Service Centre

Plate no 4: Interviewing a beneficiary farmer of Irinjalakkuda Agro Service Centre

Plate no 5: Data collection from different Agro Service Centres

Plate no 6: Interviewing agricultural facilitator of Kuruppanthara Agro Service Centre

Plate no 7: Interviewing agricultural facilitator of Pinarayi Agro Service Centre

Plate no 8: Seedling nursery of Munderi Agro Service Centre

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Appendices

APPENDIX I

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE
Department of Agricultural Extension
Vellayani - 695 522
Thiruvananthapuram

Prof. (Dr). B. Seema
Professor& Head
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Date: 23-10-2018

Sir/Madam,

Ms. Safna Vatakke kandy Meethal (Ad. No. 2017-11-070), the post graduate student in the Department of Agricultural Extension, College of Agriculture, Vellayani is undertaking a research study entitled "Performance of Agro Service Centres of Department of Agriculture-Kerala: A Multidimensional analysis" as part of her research work. Variables supposed to have close association with the study have been identified after extensive review of literature.

Considering your vast experience and knowledge on the subject, I request you to kindly spare some of your valuable time for examining the variables critically as a judge to rate the relevancy of them. Kindly return the list duly filled at the earliest in the self-addressed stamped envelope enclosed with this letter.

Thanking you

Yours faithfully

Dr. B. Seema

PERFORMANCE OF AGRO SERVICE CENTRES OF DEPARTMENT OF AGRICULTURE-KERALA: A MULTIDIMENSIONAL ANALYSIS

Objectives

To assess the performance effectiveness of Agro Service Centres in the dissemination of information and technology and measure the performance effectiveness of Agro Service Centres on farmers income. To study the attitude of the farmers towards Agro Service Centres and elicit the problems encountered by Agro Service Centres in providing Services to the farmers.

Personal, Socio-psychological variables taken for the study

Variables are given in bold cases and their respective meaning is explained for easy understanding of intended meaning. You may please rate the statement with a tick mark in the appropriate column against the statement with special reference to its importance to meet the objectives of the study

Independent variables for farmers

Sl. No.	Variable	Operational definition	Relevancy rating (R - relevant)				
			Most R	More R	R	Less R	Least R
1	**Age**	Refers to number of calendar years completed by the respondent at the time of interview					
2	**Education**	Refers to academic qualification attained by the respondent at the time of enquiry					
3	**Size of land holding**	Operationally defined as the extend of land area possessed by the farmer beneficiary of agro service centres					
4	**Area under cultivation**	Refers to gross area under cultivation in an year in hectares					
5	**Annual income**	Refers to total earning of the respondent from farming and allied sectors for one year					
6	**Farming experience**	Refers to number of years of experience in farming and related					

		activities, a farmer possessed at the time of enquiry					
7	**Extension agency contact**	Operationally defined as the degree to which a farmer contact extension personnel of Agro Service Centre, Krishi Bhavan and other agencies to get information and services on farming related aspects					
8	**Cosmopolit eness**	Operationally defined as the farmer's extent of contact with outside of his social system such as nearest farmers co-operatives, padashekhara samities, farmers clubs etc					
9	**Training received**	Defined as the training received by the respondent on operation of farm machinery or for the enhancement of any particular skill related to farming					
10	**Extent of adoption**	Defined as the extent to which information and services from agro service centre were adopted by the respondent in his/her farming					
11	**Innovative ness**	Defined as the degree to which the respondent is relatively earlier in adopting new ideas.					
12	**Change proneness**	Operationally defined as the degree to which an individual is changed through influence of service delivery system of agro service centre					
13	**Economic motivation**	Operationally defined as the respondent's urge of getting wealth by putting delivered services and technologies from agro service centre into practice					
14	**Informatio n source utilization**	Defined as the use of various information sources by the respondent in order to acquire information on crop production and management					
15	**Risk orientation**	Operationally defined as the willingness of farmer to take risk					

		in adopting recommended practices given by the service delivery system of agro service centre					
16	**Level of satisfaction**	Operationally defined as the degree to which the respondents feel satisfied with the service of agro service centre					
17	**Use of resources**	Defined as the ability of farmer to utilize the available on farm and off farm resources and services at its fullest potential					
18	**Cost of cultivation**	The cost of cultivation incurred by the farmer on an average after receiving services from the agro service centre					
19	**Knowledge in farming**	Defined as the extent to which the respondent possess knowledge in crop production and management					
20	**Willingness to hire services**	Defined as the degree to which respondent is willing to hire services from agro service centre					
21	**Informatio n seeking behaviour**	All activities performed by the respondent for seeking scientific and technical information on farming and non farming activities					
22	**Awareness**	Understanding of farmers about the performance and functions of agro service centres and its service delivery system					
23	**Decision making ability**	Operationally defined as the ability of the farmer to take decision on crop production from the available alternatives					
24	**If any other, specify**						

Independent variables for extension personnel

Sl. No.	**Variable**	**Operational definition**	**Relevancy rating (R - relevant)**				
			Most R	**More R**	**R**	**Less R**	**Least R**

1	**Age**	Refers to number of calendar years completed by the respondent at the time of interview					
2	**Education**	Refers to academic qualification attained by the respondent at the time of enquiry					
3	**Occupational position**	Defined as the occupational position of the respondent in the agro service centre					
4	**Experience in extension work**	Operationally defined as the number of completed years of service the extension personnel had in agricultural service delivery system in the Kerala State department of Agriculture and Farmers welfare					
5	**Training received**	Operationally defined as the training received by the respondent on operation of farm machinery or for the enhancement of any particular skill related to farming					
6	**Extension service orientation**	Operationally defined as the degree to which extension personnels of agro service centre are oriented to provide extension and agro advisory services					
7	**Work commitment**	Extent of dedication and responsibility of the respondent while delivering the agricultural information and services					
8	**Problem solving ability**	Ability of extension personnel to identify and solve problems faced by the farmers, who are beneficiary of agro service centre					
9	**Leadership ability**	Degree to which an individual is oriented towards his own capabilities of influencing others and developing strategies for the effective delivery of agro advisory services					
10	**If any other, specify**						

Place :
Date :

Name and Designation

APPENDIX II

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI,
THIRUVANANTHAPURAM
DEPARTMENT OF AGRICULTURAL EXTENSION
Performance of Agro Service Centres of Department of Agriculture-Kerala: A Multidimensional analysis
Interview schedule for farmers

No. Date:

1. Name and address of the respondent:

2. Name of the block and panchayath:

3. Name of the ASC in which he/she is receiving services:

4. Age :

5. Academic qualification :

6. Area under cultivation :

7. Crops grown:

8. Experience in farming (in years) :

9. Annual Farm Income:

10. Resource utilization:

Indicate your response to the following statements in appropriate columns

Sl. no	Statements	Agree	Partially agree	Disagree
1	I approach different Agro service delivery agencies like RARS,KVK, Krishi Bhavan and other private agencies for help			
2	I purchase quality inputs from the Agro Service Centre as well as from Krishi Bhavan			

3	I try to attend the training on all aspects of agriculture			
4	I utilize different crop development schemes and subsidy programmes for the development of my farm offered from the State Department of Agriculture			
5	I make use of all the services available in the Agro Service Centre			
6	I seek information regarding the latest technologies and market price from all available sources			
7	I do not hire farm machinery from any source			
8	I do not make use of farm publications and agricultural programmes telecasted in different channels			
9	I never leave any of my land fallow			
10	I always convert biowaste from my farm to compost			

11. Change proneness:

Please express your feelings about statements by indicating degree of your agreement or disagreement on the three point continuum (A- Agree, UD-Undecided, DA-Disagree)

Sl. no	Statements	Degree of agreement		
		A	UD	DA
1	From time to time, I have heard of numerous new technologies and I tried many of these for the last few years			
2	Usually, I want to see the outcome obtained to others before I brought the novel technique			
3	Somehow I believe that the traditional means of technologies are best			
4	I am careful about trying innovative technologies			
5	Our forerunners were using old technologies, I do not see any reason for altering those old technologies.			
6	If new technologies are encouraging, I would surely prefer to use them			

7	I try to remain up-to-date on the latest technologies but this does not imply that I will try out all			
8	I feel restless until I try out the newly heard technology			
9	These days people speak about several new technologies, though nobody recognises whether they are better over traditional ones			

12. Decision making ability:

Please express your response about statements by indicating degree of your agreement or disagreement (SA- Strongly Agree, A- Agree, UD- Undecided, DA-Disagree, SDA- Strongly Disagree)

Sl. no	Statements	SA	A	UD	DA	SDA
1	I interpret problems by examining the pros and cons and make decisions					
2	I will not take a decision without conferring others					
3	In general, I hold my choices					
4	Once I take a decision, I will stick on it					
5	I require more time to take a decision					
6	I can take firm decision and initiate action when there are more alternatives					

13. Information source utilization:

Sl no.	Source	Frequency of use		
		Regularly (3)	Occasionally(2)	Never (1)
1	Krishi Bhavan			
2	Agro service centre			
3	Television			
4	Radio			
5	Newspaper			
6	Internet			

14. Risk orientation:

Please give your degree of agreement about each of 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 raise a large number of crops to avoid greater risks involved in raising one or two crops					
2	A farmer should take more of a change in making a large profit than to be satisfied with the smaller but less risky profit					
3	A farmer who is willing to take greater risk than the ordinary farmer usually does it better financially					
4	It is good for a farmer to take the risk when he knows his chance of success is somewhat high					
5	It is better for a farmer not to try a new farming method unless most others have used it with success					
6	Trying an entirely innovative method for a farmer involves higher risks but it is worthy					

15. **Extension agency contact:**

Please indicate your response based on the regularity of contact with extension officials of different agencies

Sl no	Category	Regularly (3)	Occasionally (2)	Never (1)
1	Krishi Bhavan			
2	Agro Service Centre			
3	KVK			
4	ATMA			
5	VFPCK			
6	Any other,			

16. **Attitude of beneficiaries towards ASC:** (SA- Strongly Agree, A- Agree, UD- Undecided, DA-Disagree, SDA- Strongly Disagree)

Sl. no	Statements	SA	A	UD	DA	SDA
1	ASC helps to bridge the gap between farmers and agricultural domain experts					
2	ASC brings welfare to the small and marginal farmers					
3	ASC is not a solution to address the marketing problem in the rural area					
4	More rural unemployed youth attracted to work under ASC as service providers					
5	Entrepreneurship promotion among the farmers envisioned in ASC is a futile dream					
6	Agro advisory services through ASC enhances the confidence of farmers					
7	The setting up of ASC is simply wasting public money					
8	There is an of improvement in crop production in rural areas with the introduction of ASC					
9	Providing custom hiring services of farm machinery is inadequate to improve the earnings of the farmer					
10	ASC is required for small and marginal farmers to utilize the potential of agro advisory services by experts					

17. **Performance effectiveness index as perceived by farmers:**

Please indicate your response by putting a tick mark in the appropriate column against each statement

A. Performance of ASC in information and technology dissemination:

Sl no	Statements	Good (3)	Average (2)	Below average (1)
1	Reliability of information and technology disseminated through ASC			
2	Dissemination of latest information and technologies in farming			
3	Timely dissemination of information and technology			
4	Adequacy in information and technology dissemination			
5	Use of farmer friendly approaches in dissemination of information			

B. Performance of ASC in service delivery:

(Adequate-A, Moderate- M, Not adequate- NA)

Sl no	Statements	Yes	No	If yes,											
				Need-based			Timely			High quality			Adequate quantity		
				A	M	NA	A	M	NA	A	M	NA	A	M	NA
1	Machinery services														
2	Supply of planting materials														
3	Supply of bio farming inputs														
4	Consultancy services														
5	Soil testing support														

6	Farmers training programmes														

C. Performance effectiveness of ASC on farmer's income:

Sl no	Statements	Increase (3)	No change (2)	Decrease (1)
1	Area under cultivation			
2	Diversity of crops/ enterprise			
3	Income from farming			

18. Constraints Analysis of farmers:

Please rank the following statements in descending order according to your experience

Sl. no	Statements	Rank
1	Service from Agro Service Centre is not received when required.	
2	Accessibility to services from ASC is difficult	
3	Availing benefits from ASC involves difficult procedures	
4	Poor response from ASC for repair and other services of machinery.	
5	ASC guidelines are not matching with the existing need of farmers	
6	The absence of storage and marketing facilities at ASC	
7	There is no subsidy for farming inputs from ASC	
8	Lack of basic infrastructural facilities for the proper functioning of ASC	
9	Poor delivery of agro services by the service providers due to their inefficiency in doing work	

19. Suggestions to improvement:

What all are you expecting from Agro Service Centre so as to increase its performance

i)
ii)
iii)

APPENDIX III

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI,
THIRUVANANTHAPURAM
DEPARTMENT OF AGRICULTURAL EXTENSION
Performance of Agro Service Centres of Department of Agriculture-Kerala: A multidimensional analysis
Interview schedule for extension personnel

No. **Date:**

1. Name of the Agro Service Centre (ASC):
2. Month and year of establishment:
3. Name of the block and panchayath:
4. Name of the extension personnel:
5. Age:
6. Occupational position in ASC:
7. Academic qualification:
   (Ph D/M.Sc/B.Sc/Diploma/VHSE/ITI/others)
8. Total service experience(in years):
9. Do you receive training from any organization? Yes / No
   If yes, then please specify,
   a) No. of trainings received:
   b) Type of training
   c) Year and duration of training
10. Facilities available in ASC:
11. Major activities of ASC:

12. Extension service orientation:

Indicate your response to the following statements in appropriate columns.

Sl. no	Statements	Agree	Undecided	Disagree
1	Delivering location-specific information and services are better than providing any high-cost technologies			
2	Along with plant protection chemical, I also explain the right way of application.			
3	In case of nil stock of any farming input and planting material I facilitate farmer to buy from other sources			
4	While providing fertilizers and manures I prescribe as per the soil-test results.			
5	Before I advise on cultivation and management of crop I take the details of farmers economic status, crops grown and other details to provide suitable input and services			
6	While giving fertilizers I also advise on dosage and mode of application.			
7	I supply seed as per recommended seed rate			
8	I update farmers about crop development schemes and subsidies and direct them to consult department or organization concerned.			
9	I also encourage farmers to sustain beneficial insects on his farm.			
10	I ensure credit facilities to the farmers on different farm services and inputs			
11	I advise farmers on the importance of bio-pesticides and bio-fertilizers to ensure eco-friendly and quality produce to consumers			

13. Work commitment:

Please indicate your agreement or disagreement to the following statements (SA- Strongly Agree, A- Agree, UD- Undecided, DA-Disagree, SDA- Strongly Disagree)

Sl. no	Statements	SA	A	UD	DA	SDA
1	After joining the organisation, the organisation's values and my values have become alike					
2	I feel a sense of ownership for the organisation					
3	I am proud to tell others that this organisation is a part of our farming society					
4	The reason I prefer this organisation to others is that of what it stands for its value					
5	I express this organisation to my colleagues as a great place to work for					
6	My work is in a comfortable place					
7	I am proud to tell others that I am part of this organisation					

14. Problem solving ability:

Please indicate your agreement or disagreement to the following statement (SA- Strongly Agree, A- Agree, UD- Undecided, DA-Disagree, SDA- Strongly Disagree)

Sl. no	Statement	SA	A	UD	DA	SDA
1	Usually, I am able to think effective alternatives to solve a problem					
2	I make decisions and later regret them					
3	I ask someone for advice and follow it					
4	I trust my capacity to solve new and complex problems					
5	I make decisions and I am happy with them later					
6	I am unsure whether I can manage the problem					

7	When faced with a problem I collect all piece of information about the situation					
8	I am sure that I can solve a problem					

15. **Leadership ability**:

Please indicate your responses in a five point continuum.

Sl no	Statements	Always	Often	Some times	Seldom	Never
1	Listen patiently to what they say					
2	Encourages others to ask questions					
3	Begins discussion					
4	Summarises points made					
5	Examine and assess the problem					

16. **Attitude of extension personnel towards the service delivery system of ASC**:

Please express your response about statements by indicating degree of your agreement or disagreement (SA- Strongly Agree, A- Agree, UD- Undecided, DA- Disagree, SDA- Strongly Disagree)

Sl. no	Statements	SA	A	UD	DA	SDA
1	The extension personnel of ASC are competent to extend consultancy services to the farmers					
2	Linkage with other extension agencies are weak in agro service delivery system of ASC					
3	The agro service delivery system of ASC has lessened the problems of farmers					
4	Agro advisory service delivery methods of ASC are easy to follow					

5	Performance of farmers has not improved on adopting agro advisory services of ASCs					
6	Service delivery mechanism of ASC is sufficient to meet the needs of farmer					
7	Farm machineries for custom hiring services in ASC are location specific					
8	There is less flexibility in the existing information and service delivery mechanisms of ASC					
9	Agro service delivery system of ASC is not up to date					
10	Technology delivery system of ASC encourages me to share more scientific information					
11	Service delivery system of ASC is not essential for technology transfer					

17. Constraints Analysis of extension agents:

Please rank the following statements in descending order according to your experience

Sl. no	**Statements**	**Rank**
1	No permanent job or salary can be ensured in ASCs	
2	Funds under government schemes are not adequate	
3	Funds from the government are not timely	
4	Service provider of Agro Service Centres discontinues and opt other jobs.	
5	Lack of adequate experienced service personnel because the work nature is not constant	
6	Implementation of different crop development schemes by ASC is difficult	
7	Non-availability of vehicles in ASC for transport of machinery and agricultural tools to the work site	
8	The absence of land and building to keep the seedlings and farm machinery	

9	Facility for complaint redressal with respect to ASC services are absent	

18. Suggestions to improve the performance of Agro Service Centres:

APPENDIX IV

LIST OF AGRO SERVICE CENTRES (2016-17)

Sl no.	Name of Agro Service Centre	Block	Krishi Bhavan	Year of establishment
A. Thrissur				
1	Pazhayannur Block Agro Service Centre	Pazhayannur	Paanjal	2012-13
2	Irinjalakkuda Block Agro Service Centre	Irinjalakkuda	Purathussery	2012-13
3	Vadakkanchery Block Model Agro Service Centre	Vadakkanchery	Thekkumkara	2012-13
4	Mala Block Agro Service Centre	Mala	Mala	2014-15
5	Chovvannur Block Agro Service Centre	Chovvannur	Kandanisseri	2015-16
6	Kodakara Block Agro Service Centre	Kodakara	Mattathur	2015-16
7	Chalakkudy Block Agro Service Centre	Chalakkudy	Kodassery	2015-16
8	Mathilakam Block Agro Service Centre	Mathilakam	Mathilakam	2015-16
9	Anthikkad Block Agro Service Centre	Anthikkad	Anthikkad	2016-17
10	Ollukkara Block Agro Service Centre	Ollukkara	Ollur	2016-17
B. Kannur				

1	Model Agro Service Centre, Cheruvanchery	Koothuparambu	Paadyam	2012-13
2	Irikkoor Block Agro Service Centre	Irikkoor	Sreekandapuram	2012-13
3	Agro Service Centre, Kankol	Payyannur	Kankol	2012-13
4	Agro Service Centre, Ezhome	Kalyasseri	Ezhome	2014-15
5	Agro Service Centre, Bakkalam	Thalipparambu	Anthoor	2014-15
6	Agro Service Centre, Pinarayi	Thalassery	Pinarayi	2014-15
7	Munderi Agro Service Centre	Edakkaad	Munderi	2014-15
8	New Mahe Agro Service Centre	Thalassery	New Mahe	2015-16
9	Eranjoli Agro Service Centre	Thalassery	Eranjoli	2016-17
10	Vengad Agro Service Centre	Thalassery	Vengad	2016-17
C. Kottayam				
1	Panachikkad Agro Service Centre	Pallam	Panachikkad	2012-13
2	Agro Service Centre, Kuruppanthara	Uzhavoor	Manjoor	2012-13
3	Kaduthuruthy Block Agro Service Centre	Kaduthuruthy	Kaduthuruthy	2014-15
4	Madappally Block Agro Service Centre	Madappally	Paayippadu	2015-16
5	Vaikkam Agro Service Centre	Vaikkam	Thalayazham	2016-17

6	Kanjirappally Block Agro Service Centre	Kanjirappally	Koottikkal	2016-17

PERFORMANCE OF AGRO SERVICE CENTRES OF DEPARTMENT OF AGRICULTURE-KERALA: A MULTIDIMENSIONAL ANALYSIS

by

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ABSTRACT

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ABSTRACT

The study entitled " Performance of Agro Service Centres of Department of Agriculture-Kerala: A Multidimensional analysis" was conducted among the beneficiaries and all extension personnel of Agro Service Centres in Thrissur, Kannur and Kottayam districts representing the central, northern and southern Kerala respectively, during the year 2018-19. The main focus of the study was to assess the performance effectiveness of Agro Service Centres in the dissemination of information and technology, measure the performance effectiveness of Agro Service Centres on farmer's income and, study the attitude of farmers towards Agro Service Centres and elicit the problems encountered by these centres in providing services to the farmers. The sample of the study comprised of 120 farmers i.e., 45 farmers from Thrissur, 45 farmers from Kannur and 30 farmers from Kottayam and sixty extension personnel associated with Agro Service Centres.

Agro Service Centre (ASC) is an initiative by the Department of Agriculture and Farmers Welfare from 2012-13 onwards and it was designed as a single window delivery system for different farming inputs and services to farmers (GoK, 2016).

Performance effectiveness of ASCs as perceived by farmers was measured using Performance Effectiveness Index (PEI) developed consisting of three components. Among these, performance effectiveness of ASCs on farmer's income contributed 38.56 per cent of the PEI followed by performance effectiveness of ASCs in the dissemination of information and technology (35.85%) and performance of ASCs in service delivery (25.59%). Based on the analysis of data, it was found that 40 per cent of the farmers scored the ASCs into high category of PEI. Majority (46.67%) of farmers scored the ASCs into high- performance effectiveness category in the dissemination of information and technology and 56.67 per cent of the beneficiaries scored the ASCs into the medium category of performance in service delivery. Nearly sixty per cent (60.83%) of the beneficiaries scored ASCs into high category based on its performance effectiveness on farmer's income. Half of the

respondents (50%) had a medium level of favourable attitude towards ASCs. Majority (56.67%) of the extension personnel had a favourable attitude towards the service delivery system of ASCs.

The study revealed that most of the beneficiaries of the ASCs belonged to old age category and had a high school or above educational qualification. Most of the beneficiaries of ASCs were marginal (55.84%) and small (26.66%) farmers. Annual farm income of majority (40.84%) of the farmers was found to be more than one lakh rupees. Most of the farmers had farming experience of more than 10 years and only 35.83 per cent of the beneficiaries of ASCs were having farming experience of fewer than 10 years. Among the beneficiaries, more number of Vegetable (78.33%) and Banana (60.83%) growers utilized the services of ASCs. The study revealed that 62.50 per cent of farmers belonged to the high category of resource utilization. More than forty per cent (43.34%) of the farmers had high decision-making ability and high- risk orientation (45.84%). Nearly fifty per cent (48.33%) of the farmers were in the medium category of change proneness and information source utilization (45%). Majority of the respondents had regular contact with extension agencies like Krishi Bhavan (67.5%) and ASC (85.84%). Agricultural facilitators and service providers were the two main categories of extension personnel in ASCs. Majority of the extension personnel of ASCs belonged to middle and old age category and 23.34 % of respondents had a Diploma in agriculture and SSLC as educational qualification. Majority (41.66%) of the respondents had experience in extension work up to five years and majority (56.66%) of the extension agents received 2 training programmes. More than fifty per cent (56.67%) of the extension personnel had medium extension service orientation and 43.33 per cent of extension personnel of ASCs had medium work commitment and 36.67 per cent of extension agents had moderate and high problem solving ability. There was almost equal distribution of respondents in medium and high category with respect to leadership ability.

Correlation analysis revealed that the performance effectiveness of ASCs was

positively and significantly correlated with the attitude of beneficiaries at 1 per cent level of significance. The results of the correlation between PEI and independent variables revealed that farming experience, annual farm income and change-proneness had a positive and significant correlation with PEI and age and risk orientation had a negative and significant correlation with PEI. The attitude of beneficiaries towards Agro Service Centre was positively and significantly correlated with farming experience, annual farm income, resource utilization and change-proneness and it was negatively and significantly correlated with risk orientation. The result of the correlation between attitude of extension personnel and independent variables of extension personnel pointed out that extension service orientation, work commitment, problem-solving ability and leadership ability had a positive and significant correlation with the attitude of extension personnel.

Region wise comparison of information and technology disseminating system of ASCs in all the three districts showed a similar trend where, field demonstrations, field visits and meetings were the most frequently used dissemination system.

Discontinuance of service providers for better jobs, insecurities related to permanent job or salary and absence of land and other basic infrastructure facilities were the three major constraints faced by the extension personnel of ASCs while delivering services to the farmers. The most important problems encountered by the farmers in getting the services were lack of subsidy, non-availability of services in time and poor response to repair the machinery.

It can be concluded that considering the 26 ASCs brought under the purview of the study, 40 per cent of them were categorized in high performance group by the respondents and of the three indices, service delivery was identified as the least contributing factor to the performance effectiveness which is also reflected in the constraints identified by the respondents. This implies the need to strengthen the service delivery aspects of the ASCs.