# A MULTIDIMENSIONAL ANALYSIS OF AWARDEE FARMERS OF DEPARTMENT OF AGRICULTURE DEVELOPMENT AND FARMERS' WELFARE IN SOUTHERN KERALA

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**(2018-11-080)**

**DEPARTMENT OF AGRICULTURAL EXTENSION**

**COLLEGE OF AGRICULTURE**

**VELLAYANI, THIRUVANANTHAPURAM- 695522**

**KERALA, INDIA**

**2020**

# A MULTIDIMENSIONAL ANALYSIS OF AWARDEE FARMERS OF DEPARTMENT OF AGRICULTURE DEVELOPMENT AND FARMERS' WELFARE IN SOUTHERN KERALA

*by*

**RESHMA R.S.**

**(2018-11-080)**

**THESIS**

**Submitted in partial fulfillment of the**

**Requirements for the degree of**

**MASTER OF SCIENCE IN AGRICULTURE**

**Faculty of Agriculture**

## Kerala Agricultural University

**DEPARTMENT OF AGRICULTURAL EXTENSION**

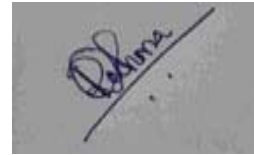**COLLEGE OF AGRICULTURE**

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**KERALA, INDIA**

**2020**

# DECLARATION

I, hereby declare that this thesis entitled "**A multidimensional analysis of awardee farmers of Department of Agriculture Development and Farmers' Welfare in Southern Kerala**" is a bonefide record of research work done by me during the course of research and that the thesis has not previously formed the basis of the award to me any of degree, diploma, associateship, fellowship or another similar title, of any other university of society.

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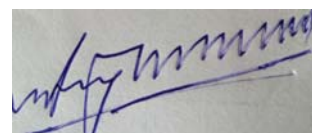
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## CERTIFICATE

Certified that this title entitled "**A multidimensional analysis of awardee farmers of Department of Agriculture Development and Farmers' Welfare in Southern Kerala**" is a research work done independently by Ms. Reshma R.S. (2018-11-080) under my guidance and supervision and that it has not previously formed the basis of the award of any degree, diploma, associateship or fellowship to her.
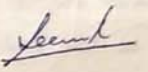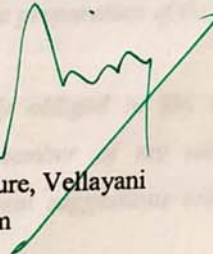
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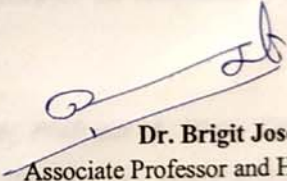College of Agriculture, Vellayani
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We, the undersigned members of the advisory committee of Ms. Reshma R.S. (2018-11-080), a candidate for the degree of Master of Science in Agriculture, with major in Agricultural Extension, agree that the thesis entitled "**A multidimensional analysis of awardee farmers of Department of Agriculture Development and Farmers' Welfare in Southern Kerala**" may be submitted by Ms. Reshma R.S., in partial fulfillment of the requirement for the degree.

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# LIST OF ABBREVIATIONS

| Abbreviations | Full form |
|---|---|
| % | Percentage |
| F | Frequency |
| Ha | Hectare |
| FAO | Food and Agriculture Organization |
| KAU | Kerala Agricultural University |
| POP | Package of Practices |
| GOI | Government Of India |
| GOK | Government Of Kerala |
| SD | Standard Deviation |
| N | Total number of respondents |
| ITK | Indigenous Technical Knowledge |
| INM | Integrated Nutrient Management |
| IPM | Integrated Pest Management |
| GAP | Good Agricultural Practices |
| ITD | Innovations in Technology Dissemination |
| FDGs | Farmers Discussion Groups |
| NWDPRA | National Watershed Development Project for Rainfed Areas |
| MMS | Mobile Message Service |
| SHGs | Self Help Groups |
| MPCON | Madhya Pradesh Consultancy Organization Limited |

*Introduction*

# 1. INTRODUCTION

Demand for agriculture is increasing rapidly with population growth and per capita income. A farmer who produced more was considered successful in earlier times. But now, a farmer who obtains higher productivity from his fields, who uses resources effectively and sustainably, markets his produce efficiently and can maintain quality in line with national and international standards, is considered as a successful farmer.

Farmers are the most economically challenged group in the production sector, facing challenges. Amidst such situations, farmers who have been successful needs to be applauded for their work and felicitating them with an award for the hard work put in pulls in attention of more farmers into adding efforts in agriculture. A recognition given by central and state government establishments, agricultural departments, Non-Governmental and other organizations to farmers through awards generates interest in them to practice new technologies and improve the quality of the produce. These awardee farmers vary from other farmers in certain ways such as the utilization of resources, marketing strategies, adoption of advanced technologies, etc.

Agribusiness is essential for the global supply of food and for developing economies. Indeed, bringing agricultural products from remote rural areas into bigger markets has its challenges. These include the lack of connection between producers and customers, inconsistent quality of product, poor infrastructure, lack of transportation and storage facilities etc. Agripreneurship is a crucial element in the sustainability of small-scale farming in an ever-changing and increasingly complex global economy. It is an employment strategy that can lead to the economic self-sufficiency of rural people thereby enabling small scale farmers to confront issues such as under-employment and need for new jobs. An agripreneur is a person who starts a new business and is conscious of the associated risks and ambiguities for benefit and growth. A farmer who

wishes to become a successful agripreneur needs to be energetic, curious, determined, persistent, inspired, and diligent, come up with ideas, communicate with strong management and organizational skills, recognize appropriate marketing opportunities, manages the optimum resources for bearing the risk.

Government of Kerala has introduced the awards viz. K Viswanathan (Mithranikethan) Memorial Nelkathir award, Karshakothama award, Karshakathilakam award, Kerakesari award etc. to prompt and inspire the progressive farmers from the state. In addition, the "awardee farmers" are the progressive farmers who not only adopt the recommended practices in their farm, but also introduce their own innovative ideas.

## 1.1 OBJECTIVE OF THE STUDY

To study the agripreneurial behaviour of awardee farmers and their adoption behaviour with respect to package of practices and recommendations of Kerala Agricultural University (KAU) in major crops. The study also aims at documenting the good agricultural practices (GAP) followed by awardee farmers in these crops. The constraints faced by the farmers at the farm level and strategies to overcome the constraints will also be assessed.

## 1.2 SCOPE, NEED AND IMPORTANCE OF THE STUDY

The research would help to explain different dimensions of agripreneurial behaviour and adoption behaviour of awardee farmers of Southern Kerala. It is hoped that the study could come out with the good agricultural practices adopted by the awardee farmers in order to increase the efficiency of utilization of resources, rising production level and boosting the net income of the farmers. The results obtained from this study is expected to motivate other farmers to take up improved agricultural practices in the field. The study is proposed to investigate the psychological and socio economic profile of awardee farmers. The study will also help in finding the factors hindering the farmers and

constraints faced at the farm level and thereby formulating the strategies for eliminating or at least reducing the constraints.

## 1.3 LIMITATIONS OF THE STUDY

The study had the restriction of time and resources available for a single investigator. The items included in the research for thorough investigation were also limited because in a short period it was not possible to analyze all the areas.  The area of investigation was restricted to two districts of Southern Kerala due to the covid 19 pandemic.

## 1.4 ORGANIZATION OF THE THESIS

The overview of the research work has been given under five chapters. The first chapter starts with introduction, objectives, scope, importance and limitations of the study. Review of literature related to the current study is discussed in the second chapter. The third chapter deals with the methodology used for the study. The fourth chapter deals with the results of the study and discussion of the result whereas the fifth chapter discusses the summary of the study and strategy for the development. References and abstract of the thesis are given at the end.

*Review of Literature*

# 2. REVIEW OF LITERATURE

Review of literature is a detailed overview of previous research on a topic. The literature review surveys academic journals, books, and other applicable sources relevant to a specific research field. The review should enumerate, describe, summarize, critically assess, and clarify previous research.

The main technique for seeking new clarifications on a problem or gaining a new perspective is to think from different vectors about a research topic. Nearly every field of study has at least one detailed database assigned to indexing the research literature (Robert, 2010).

The reviews are described below under various headings according to the objectives of the study undertaken.

2.1. Overview of awards given by Department of Agriculture Development and Farmers' Welfare

2.2. Variables and their review

2.3. Documentation of good agricultural practices of awardee farmers

2.4. Constraints faced by awardee farmers at the farm level

2.5. Strategies of the awardee farmers to overcome the constraints

**2.1.Overview of awards given by Department of Agriculture Development and Farmers' Welfare**

Department of Agriculture Development and Farmers' Welfare provides a number of awards as a token of reward to encourage farming activities.

| Sl. No. | Name of the award | Award details |
|---|---|---|
| 1. | K. Viswanathan (Mithranikethan) Memorial Nelkathir award- For the best farming society | Cash prize worth five lakh rupees, shield, certificate |
| 2. | Karshakothama award- For the best farmer | Cash prize worth two lakh rupees, gold medal, shield, certificate |
| 3. | Yuvakarshaka award- For young farmer (Female) | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 4. | Yuvakarshakan award- For young farmer (Male) | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 5. | Karshaka Thilakam award- For the best farmer (Female) | Cash prize worth fifty thousand rupees, gold medal, shield, certificate |
| 6. | Kera Kesari award- For best coconut farmer | Cash prize worth two lakh rupees, gold medal, shield, certificate |
| 7. | Haritha Mithra award- For the best vegetable farmer | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 8. | Udyana Sreshta award | Cash prize worth one |

| | | lakh rupees, gold medal, shield, certificate |
|---|---|---|
| 9. | Karshaka Jyothi award- For the best farmer belonging to SC / ST communities | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 10. | High-tech Farmer award | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 11. | Sramasakthi award- For the best agriculture worker | Cash prize worth twenty five thousand rupees, gold medal, shield, certificate |
| 12. | Krishi Vijnan award- For the best scientist in the field of agriculture | Cash prize worth twenty five thousand rupees, gold medal, shield, certificate |
| 13. | Kshoni Samrakshana award- For soil conservation | Cash prize worth twenty five thousand rupees, gold medal, shield, certificate |
| 14. | Karshaka Bharathi award- For the best agricultural journalist | Cash prize worth twenty five thousand rupees, gold medal, shield, certificate |
| 15. | Haritha Keerthi award- For the best agricultural farm under the Department of Agriculture Development and Farmers' Welfare | Cash prize worth fifty thousand rupees, shield, certificate |
| 16. | Haritha Mudra award- For the best | Cash prize worth fifty |

| | agricultural programme on radio, print and visual media | thousand rupees, shield, certificate |
|---|---|---|
| 17. | Best commercial nursery | Cash prize worth one lakh rupees, gold medal, shield, certificate |
| 18. | Karshaka Thilakom (School- Girl) | Cash prize worth ten thousand rupees, gold medal, shield, certificate |
| 19. | Karshaka Prathibha (School- Boy) | Cash prize worth ten thousand rupees, gold medal, shield, certificate |
| 20. | Karshaka Prathibha (Higher Secondary School) | Cash prize worth ten thousand rupees, gold medal, shield, certificate |
| 21. | Best Farm Officer | Cash prize worth twenty five thousand rupees, gold medal, shield, certificate |
| 22. | Best Organic Farmer | Cash prize worth fifty thousand rupees, gold medal, shield, certificate |
| 23. | Karshaka Mithra award- For the best agriculture officer | Cash prize worth fifty thousand rupees, gold medal, shield, certificate |

(GOK, 2000)

## 2.2. Variables and their review

## 2.2.1. Dependent variables

### 2.2.1.1. Agripreneurial behaviour and its dimensions

Agripreneurial behaviour is defined as a series of activities a farmer performs to establish his enterprise.

Bhaskaran (1978) based on his study on impact of institutional credit and its influence in the behaviour of farmers in adopting high yielding varieties of paddy cultivation observed that the risk perception of farmers is not related to the adoption behaviour and utilization of credit.

Kumar and Swami (2002) conducted a study on entrepreneurial behaviour of farmers adopting sustainable agriculture in India reported that a substantial difference was there in the entrepreneurial behaviour of farmers practicing sustainable agriculture under various age groups, education and organizational involvement.

Herron and Robinson (2003) found that passion, resourcefulness, persistence, broad mindedness and innovativeness are the major agripreneurial characteristics of farmers.

Vijaykumar *et al.* (2003) in their study on entrepreneurial behaviour of floriculture farmers noticed a positive and significant relationship between size of land holding and entrepreneurial behaviour of farmers.

Gurubalan (2007) based on his study on entrepreneurial behaviour of coconut oil-based unit –owners reported that most of the respondents (60.00%) were having medium level of entrepreneurial behaviour followed by high (23.33%) and low (16.67%) level of entrepreneurial behaviour.

Subrahmanyeswari *et al.* (2007) conducted a study on entrepreneurial behaviour of rural women farmers in dairying revealed that farmers who plan to cultivate a particular crop or use scientific methods to grow crops also show entrepreneurial behaviour.

Bennur (2011) in his study on entrepreneurial qualities and adoption behaviour of banana growers observed that risk orientation is an essential part of agripreneurial behaviour which orients the farmer towards facing the circumstances of risks and uncertainties.

Lawrence and Ganguly (2012) based on their study on entrepreneurial behaviour of dairy farmers in Tamil Nadu stated that majority (55.00%) of the dairy farmers had medium entrepreneurial behaviour followed by low (33.00%) and high (12.00%) entrepreneurial behaviour.

Wankhade *et al.* (2013) in his study on entrepreneurial behaviour of vegetable growers observed that most of the vegetable growers had medium level of all agripreneurial attributes.

Mujuru (2014) identified that entrepreneurial agriculture in both irrigation and dry land farming will reduce the pressure and burden on the government as people would be able to provide food on their own, provided they obtain inputs to start their farming sector.

### 2.2.1.2. Adoption behaviour

According to Rogers (1982), adoption process is the mental process that a person moves from his or her hearing about an innovation to its final adoption.

Leagans (1985) reported that adoption behaviour is particular to specific innovations, persons and environment.

Sulaiman (1989) noticed that perception of the attribute and appropriateness of the innovation as judged by the farmers is crucial in deciding their adoption behaviour.

Venkitapirabu and Seetharaman (1999) observed that cent per cent of the progressive Farmers Discussion Groups (FDGs) adopted better varieties, spacing, usage of fertilizers and pesticides, compared to non-.progressive Farmers Discussion Groups (FDGs).

Manjula (2003) in her study on analysis of behaviour of Krishiprashasthi awardee farmers and their influence. on the neighbouring farmers identified that cent percentage of awardee farmers used more than the required amount of nitrogen for top dressing and two-third (66.67 per cent) of them used more than the recommended seed rate and chemical fertilizer for ragi.

Jaganathan (2004) in his study on analysis of organic farming practices in vegetable cultivation in Thiruvananthapuram district found that majority of the farmers (64%) had medium level of adoption followed by low (19%) and high (17%) levels.

Yadav *et al.* (2006) revealed that majority of the respondents (71.79%) belonged to medium category of adoption followed by high (16.67%) and low (11.54%) category of adoption.

Verma *et al.* (2012) conducted a study on adoption of organic farming practices in paddy cultivation by tribal farmers of Chhattisgarh noticed that 55 per cent of the respondents were in medium level of overall adoption followed by low (37.00%) and high (8.00%) level of overall adoption.

**2.2.2. Independent variables**

**2.2.2.1 Age**

Manjula (2003) studied on analysis of behaviour of Krishiprashasthi awardee farmers and their influence on the neighbouring farmers found that 55.56% of awardee farmers were middle aged, while 33.33% and 11.11% of awardee farmers were old and young aged farmers, respectively.

Vimalraj (2010) conducted a study on best practices and competencies of award winning agripreneurs of Tamil Nadu and noticed that 90 per cent of respondents were middle-aged, while 6.70 per cent belonged to the elderly and 3.30 per cent belonged to the young.

Shilpashree (2011) reported that middle-aged farmers are usually more enthusiastic and productive at work than older and younger farmers.

Farid *et al*. (2015) conducted a study on factors affecting adoption of improved farm practices by the farmers revealed that age has no effect in the adoption of farm practices.

Thasneem (2016) in her study on technology utilization of banana in Thiruvananthapuram district identified that more than half of the respondents (58.9 per cent) were middle aged.

Mergewar *et al.* (2017) studied about relationship between profile of awardee farmers and the cropping pattern followed by them in Marathwada region, revealed that age had an insignificant relationship on the cropping pattern of the awardee farmers.

Kale *et al.* (2018) in their study about relationship between personal, socio-economic characteristics and cropping pattern of the awardee farmers found that majority of the respondents (73.33%) were in the middle-aged group, while 16.67 per cent were in the young age group and 10.00 per cent were in the old age group.

### 2.2.2.2 Education

Vedamurthy (2002) in his study on the management of areca gardens and marketing pattern preferred by the areca nut farmers of Shimoga district, revealed that 38.66 per cent of respondents studied in high school, middle school (18.66 per cent) and nearly the same proportion of farmers were educated in high school (13.33 per cent) and college (14.66 per cent), while only 8 per cent of respondents were illiterate and 6.66 per cent had education up to graduation level.

Manjula (2003) reported that the vast majority of the awardee farmers (77.78%) had education up to high school, while the proportion of primary and middle school group (11.11%) was similar.

Truong (2008) stated that education is one of major factors that affect adoption of new technologies in farming system.

Shilpashree (2011) noticed that farmers with higher education are more connected to the outside world, leading to greater communication with extension workers and likely to gain more information for their future.

Vimalraj *et al*. (2012) pointed out that education provides information and skills to awardee farmers to lead their enterprises towards success.

Mergewar *et al.* (2017) found that most of the respondents (35.00%) were having education upto higher secondary level followed by secondary education (23.33%), graduate education (19.00%), primary education (13.33%) and postgraduate education (9.33%). None of the respondents were found in the pre-primary and illiterate groups.

**2.2.2.3 Size of land holding**

Naik (1993) conducted a study on awareness, attitude and use pattern of seed supplying agencies by farmers in Dharwad district identified that 40 per cent of the farmers possessed big land holding followed by small (30.00 %) and marginal (26.00 %) land holding.

Manjula (2003) revealed that nearly fifty per cent (44.45 %) of the awardee farmers owned more than 20 hectares of land, followed by 33.33 per cent owned 15-20 ha and around equal per cent (11.11%) of them owned land between 10-15 ha and 5-10 ha of land.

Vimalraj (2010) reported that 43.30 per cent of the awardee farmers had medium land holding followed by semi medium (30.00 per cent), large (16.70 per cent) and small (10.00 per cent) land holdings.

Basanayak (2012) in his study on innovative behaviour and diffusion of technology by awardee farmers in north Karnataka found that about one third of the awardee farmers (35.00%) were 'large' farmers with 10.01 ha, followed by 'medium' farmers (29.17%) with 4.01 to 10.00 ha of land whereas 17.50 per cent were 'semi-medium' farmers (2.01 to 4.00 ha) and 10.83 per cent were 'small' farmers (1.01 to 2.00 ha). A meagre (7.50 %) of them were 'marginal' farmers with less than 1 ha.

Kale (2016) conducted a study on cropping pattern followed by awardee farmers in Konkan region suggested that the awardee farmers were having relatively medium to

large holdings of land. The larger landowners are typically the resourceful individuals who can afford to use the various innovations on their fields, which may have helped to increase their income level.

**2.2.2.4 Farming experience**

Chandrasekhara (1999) in his study on knowledge and adoption gaps in coffee cultivation practices among coffee growers reported that 39% of respondents had a medium experience in coffee cultivation , while 31.5% and 29.5% had a high and low experience in coffee cultivation respectively.

Chatterjee (2000) in his study on impact of National watershed development project for rainfed areas (NWDPRA) in Burdwan district of West Bengal revealed that majority of the respondents (66.67 %) had medium level of experience in farming.

 Prasad (2003) conducted a study on differential innovation decision and attitude of rice growing farmers towards eco – friendly technologies in Andhra Pradesh observed that majority of rice growers (71.00%) had medium level of farming experience, followed by high (19.00%) and low (9.40%) levels, respectively.

Shilpashree (2011) suggested that enhanced confidence and information are usually linked with increased farming experience.

Mergewar *et al.* (2017) pointed out that the respondents having higher area of cultivation and more farming experience looked towards agriculture as an economic practice.

**2.2.2.5 Annual income**

Chandran (1997) conducted a study on knowledge and adoption of farmers cultivating tapioca in Ernakulam district of Kerala revealed that 40.00% of the farmers belonged to the medium income group while 33.33% and 26.37% were under low and high income groups respectively.

Amol (2006) conducted a study on indigenous technical knowledge about rice cultivation and bovine health management practices in Konkan region identified that most of the respondents (85.92%) belonged to medium income category (Rs. 12,680 to Rs.71,320).

Deshmukh *et al*. (2007) in their study on knowledge and adoption of agricultural technologies in Marathwada observed that majority (81.59%) of the respondents were having medium level of income followed by high (10.76%) and low (7.63%) level of income.

Belli (2008) in his study on Leadership behaviour of presidents of Panchayat raj institutions for Horticulture development in Bijapur District of Karnataka found that 38.70% of respondents were from the 'low' income group (up to Rs.71,444), followed by 35.50% in the 'medium' income group (Rs. 71,445- Rs. 1,23,997) and 25.80% in the 'high' income group (Rs. 1,23,997) respectively.

Basanayak (2012) reported that most of the awardee farmers (62.50 per cent) were in the 'high' income group followed by 19.16 per cent in the 'low' income group and 18.33 per cent in the 'medium' income group.

Kale *et al.* (2018) noticed that farmers with higher economic position usually hold prominent positions in rural areas and are seen as reputable personalities in the village. Normally these farmers first adopt the latest technologies in the field.

**2.2.2.6 Decision making ability**

Kumar (2001) in his study on entrepreneurial behaviour of floriculture farmers in Ranga Reddy district of Andhra Pradesh stated that about half of the farmers (46.66%) had medium level of decision making ability.

Suresh (2004) conducted a study on entrepreneurial behaviour of milk producers in Chittoor district of Andhra Pradesh revealed that most of the milk producers (65.83%) belonged to category of medium decision-making ability, followed by a low decision-making ability (21.67%) and high decision-making ability (12.50%).

Nagesha (2005) studied about entrepreneurial behaviour of vegetable seed producing farmers of Haveri district noticed that majority of the farmers (74.2%) had intermediate decision making ability followed by low (13.3%) and high (12.5%) decision making ability.

Ravi (2007) in his study on entrepreneurial behavioral characteristics of SC and ST farmers of Gulbarga district observed that 38.75% of farmers had low farm decision-making ability, while 33.12% and 28.13% had high and medium decision-making ability respectively.

Basanayak (2012) found that due to the ability to take prompt and appropriate decisions, awardee farmers are considered as progressive farmers.

Shankaraiah and Swamy (2012) in their study on attitude of farmers and scientist towards dissemination of technologies through Mobile Message Service (MMS) reported that 40 per cent of the respondents were having medium decision making ability.

Maratha *et al*. (2017) based on their study on corollary relationship between entrepreneurial behaviour and other attributes of chilli growers observed that majority of the chilli growers (56.66%) were having medium decision making ability, followed by high (25.83%) and low (17.5%) decision making ability.

**2.2.2.7 Economic motivation**

Chandran (1997) noticed that nearly half of the respondents (46.66 %) had medium level of economic motivation.

Sivaprasad (1997) stated that economic motivation is an important aspect which motivates farmers to adopt improved farming practices to ensure sustainable returns from agriculture.

Israel (2003) found that majority of the respondents (40.42%) had high economic motivation followed by medium level (31.25%) and low level (28.33%) of economic motivation respectively.

Jaganathan (2004) noticed that most of the vegetable growers (71%) were having medium economic motivation.

According to Sandesh (2004), 51.67 % of the respondents belonged to category of medium economic motivation followed by high (28.33%) and low (20.00%) level of economic motivation.

Patil (2008) conducted a study on constraints analysis of grape exporting farmers of Maharashtra reported that 77.00% of farmers had medium economic motivation, followed by high (29.00%) and low (13.00%) levels of economic motivation.

Shilpashree (2011) revealed that higher income always provides more fulfillment and also farmers can maintain their livelihood of the family.

Reghunath (2016) in his study about Innovations in Technology Dissemination (ITD) in Kannur district observed that majority (85.00%) of progressive farmers belonged to medium category of economic motivation followed by 10.00 percentage respondents in low level and 5.00 percentage respondents in high level of economic motivation.

Namitha (2017) noticed that majority of the respondents (52%) were having medium level of economic motivation followed by high (25%) and low (23%) level of economic motivation.

**2.2.2.8 Dealing with failure**

Sundaran (2016) reported that the entrepreneurial behaviour of women respondents showed a significant and positive relationship with dealing with failure at 5% level.

**2.2.2.9 Level of aspiration**

According to English and English (1958), level of aspiration is the degree by which an individual evaluates his own performance as success or failure or as being up to what he expects of himself.

Sanoria and Sharma (1982) in their study on comparative analysis of adoption behaviour of beneficiaries of farm development programme revealed that there was a positive and significant relationship between level of aspiration and adoption behaviour.

Rao and Reddy (1999) based on their study on Information preference of tribal farmers of International Fund for Agricultural Development Area in mango production technology observed that there was a positive and significant relationship between level of aspiration and information preference.

Choubey (2009) conducted a study on women empowerment through agricultural entrepreneurial activities of Self Help Groups (SHGs) in Jabalpur district stated that most of the respondents (55.56%) were having medium level of aspiration.

Vimalraj (2010) found that majority of the awardee farmers had moderate level of aspiration.43.3% of respondents had low level of aspirations regarding children's education, increased  income levels and increased  enterprise(farm) growth.

Shrivastava (2013) conducted a study on analysis of entrepreneurship development of women through Madhya Pradesh Consultancy Organization Limited (MPCON) in Jabalpur district noticed that majority of the respondents (48.89%) had medium level of aspiration followed by high (30.00%) and low (21.11%) level of aspiration.

**2.2.2.10 Creativity**

Vijayalakshmi (1980) based on her study on academic achievement and socio-economic status as predictors of creative talent pointed that the respondents having high socio economic status were found to be more creative.

Sangeetha (1997) in her study on managerial behaviour of commercial banana growers in Thiruvananthapuram district reported that creativity positively related to the adoption behaviour of recommended cultivation practices of commercial palayankodan growers. She revealed   that 63% had high creative skills, 29% had medium and just 7% had low creative skills.

Simonton (2011) conducted a study on psychology of creativity revealed that creativity helps an individual to adapt to the new circumstances and solve unexpected problems.

Dudhate (2014) in his work on creativity of agricultural technical school students noticed that profile characteristics like land holding, institutional climate showed a positive and significant correlation with creativity at 1 per cent significant level.

**2.2.2.11 Credit orientation**

Porchezian (1991) conducted a study on analysis of entrepreneurial behaviour of farmers stated that those farmers were having high credit orientation had high entrepreneurial behaviour.

Hanumarangaiah (1996) in his study on factors influencing the productivity of paddy and sugarcane under irrigation found that 12 per cent of farmers having low credit orientation had low productivity of paddy.

Bhuvaneswari and Varadarajan (1998) conducted a study on role of credit in capital formation on farms pointed out that the most significant factor affecting capital formation was credit availability.

Manjula (2003) revealed that 44.45 per cent of awardee farmers had a high credit orientation followed by a medium credit orientation (33.38 per cent), while about one fifth (22.22 per cent) of awardee farmers had low credit orientation.

Vimalraj *et al.* (2012) noticed that the credit orientation of awardee farmers was positively and significantly (0.592 * *) correlated to agripreneurial performance and the attitude of farmers seeking credit led to the adoption of some new, cost-effective technologies to increase their net income by growing more crops with credit to buy the necessary inputs for their farming.

Namitha (2017) found that majority of the vegetable growers (69.00%) belonged to medium category of credit orientation followed by high (18.00%) and low (13%) category.

**2.2.2.12 Training acquired**

Rao (1996) conducted a study on technological gaps in sweet orange cultivation reported that majority of the respondents (56.67%) were in medium category of training followed by low (35.00%) and high (8.33%) categories.

Reddy (2003) in her study on entrepreneurial behaviour of sericulture farmers in Chittoor district of Andhra Pradesh stated that majority of the sericulture farmers (74.67%) had medium level of training followed by low level (16.66%) and high level (8.67%) of training.

According to Vimalraj (2010), majority of the awardee farmers (56.70%) were having medium level of training followed by high (25.36%) and low (17.94%) level of training.

Shilpashree (2011) observed that longer the training period, more will be knowledge retention and comprehension on a specific subject.

Jadhav (2015) in his study on agriculture in peri urban area around Mumbai found that two-fifth (40.00 %) of the farmers were in the category of 'one training' while one-third of them (33 %) did not acquire any training, 16.67 per cent of them had 'two trainings'. Only 10.00 % had completed 'three and above trainings.'

Mergewar *et al.* (2017) stated that additional number of trainings creates greater interaction with the sources of information about current farming practices and improves knowledge and adoption of cropping pattern.

Kale *et al.* (2018) suggested that the trained person is more conscious of improving his / her overall standard of living by making good use of available resources.

**2.3. Documentation of good agricultural practices of awardee farmers**

Randall *et al.* (1996) conducted a study on frost seedling legumes into established switch grass identified that incorporation of legumes in established grass can provide symbiotic nitrogen and increase the herbage quality.

Singh *et al.* (1997) in his study on consistency in income and employment generation in various farming systems observed that the implementation of an effective mixed farming system comprising the production of crops and animal component should be considered as optimal for extra family labour throughout the year.

Good agricultural practices are a set of principles to be applied to on-farm production and post-production processes, resulting in safe and balanced agricultural food and non-food products, taking into account economic, social and environmental sustainability (FAO, 2003).

Vimalraj (2010) inferred that about 73.30 % of award winning agripreneurs partially adopted the best practices given by FAO whereas 26.7 % of them were fully adopted.

Shilpashree (2011) identified that the common enterprises adopted by the awardee and non awardee farmers were agriculture-horticulture-forestry-forage crops-dairy-poultry-sheep/goat rearing while some of the awardee farmers adopted aquaculture, vermicompost and other enterprises.

Sujitha (2015) in her study on technology assessment of plant protection practices of economically dominant crops in home gardens found that there are many ITK plant protection measures in banana cultivation which are still used by the banana growers in their home gardens.

Thasneem (2016) noticed that majority of the respondents (72.2%) practiced smearing of cow dung on banana suckers for faster bud initiation.

Mergewar *et al.* (2017) found that majority of the farmers who practiced dairy and nursery as subsidiary enterprises helped them to gain a higher income and made it possible for them to win awards.

**2.4. Constraints faced by the farmers at the farm level**

Resmy *et al*. (2001) inferred that due to lack of knowledge, expert guidance and lack of information sources, farmers did not adopt sustainable farming practices in banana and coconut.

Sunilkumar (2004) conducted a study on farmers knowledge and adoption of production and post harvest technology in tomato found that 75.83% of the respondents expressed the problem of lack of technical knowledge and guidance about modern cultivation and post production aspects.

Nagesh (2006) conducted a study on entrepreneurial behaviour of pomegranate growers revealed the major constraints as lack of skilled labour for pruning, high cost of pesticides and chemicals, non availability of storage facilities etc.

Vimalraj (2010) inferred that the major constraints faced by the awardee farmers are non availability of inputs on time, fall in market price, non availability of loan facilities on time etc.

Shilpashree (2011) reported that cent per cent of non-awardee farmers and about seventy per cent of awardee farmers had the price variation problem.

Basheer (2016) conducted a study on technology utilization of bitter gourd in Thiruvananthapuram district observed that the major constraints faced by the farmers were pests and diseases, seasonal factor like flood, shortage of labour, lack of water resources etc.

Namitha (2017) in her study on sustainability of commercial vegetable cultivation in Thiruvananthapuram district found that majority of the farmers experienced the constraints like lack of water resources, extreme seasonal variations, pests and diseases attack etc.

**2.5. Strategies of the farmers to overcome the constraints**

Lakshmisha (2000) conducted a study on impact of cashew demonstration knowledge and adoption and yield levels of farmers in Dakshina Kannada district noticed that

majority of the respondents suggested the need of Integrated Pest Management (IPM) approach to control the pests in a wide range.

Patil (2011) in her study on technological change in agriculture in progressive and non-progressive village revealed that 80 per cent of the respondents expressed their suggestion as 'input should be provided at low price', whereas 76.67 per cent of them suggested for 'strengthening of supply and support system'.

Vadu (2013) conducted a study on existing cultivation practices followed by the litchi (*Litchi chinensis* Sonn.) growers in Thane district observed that 93.88 per cent of the respondents expressed their suggestion as 'suitable harvesting machine of litchi be developed'.

Kale (2016) reported that majority of the awardee farmers (91.66 %) suggested for 'requirement of training on scientific cultivation technologies by various organizations' while 83.33 per cent of them suggested 'need of better irrigation facilities'.

*Methodology*

# 3. METHODOLOGY

Research methodology is a procedure of how to answer the research problem technically (Kothari, 1985).

Methodology is that aspect of the research that provides readers with adequate information to determine its appropriateness or to replace it (Smith and Davis, 2007).

The study was conducted in Thiruvananthapuram and Pathanamthitta districts.

This chapter discusses the methods and procedures that were used to fulfill the objectives of the study. The methods and procedures used in the study are depicted under the following sub headings.

3.1 Research design

3.2 Locale of the study

3.3 Selection of respondents

3.4 Data collection methods and tools

3.5 Operationalization and measurement of dependent variables

3.6 Operationalization and measurement of independent variables

3.7 Documentation of good agricultural practices of awardee farmers

3.8 Constraints faced by the awardee farmers at the farm level

3.9 Strategies to overcome the constraints faced by the farmers

3.10 Statistical tools used

## 3.1 RESEARCH DESIGN

The selection of research design is a crucial step in the whole research procedure. According to Kerlinger (1978), research design is a plan, structure and strategy of inquiry considered to find out answers to research questions and to control variance.

Ex-post facto research design was used for the study of awardee farmers. It is a kind of research design in which structured empirical examination is done by the researcher who does not have direct control of independent variables because their expressions have already occurred or because they cannot be manipulated.

3.2 LOCALE OF THE STUDY

**3.2.1 Selection of districts**

Thiruvananthapuram and Pathanamthitta were selected as the location for the study of awardee farmers. The study was mainly focused on the awardee farmers cultivating major crops like coconut, rice, banana and vegetables in an integrated manner. As the number of these farmers were relatively more in Thiruvananthapuram and Pathanamthitta districts, these two districts were selected.

3.3 SELECTION OF THE RESPONDENTS

Thirty five awardee farmers nominated for state awards from Thiruvananthapuram and Pathanamthitta, during the period 2014-18 were selected in consultation with Principal Agricultural Officers and other officials of Department of Agriculture Development and Farmers' Welfare, making the total sample size of respondents 70.

3.4 DATA COLLECTION METHOD AND TOOLS

Considering the scope and objectives of the research, an interview schedule was prepared after consultation with the experts in extension and other related fields. A pilot study was done in the non-sampling area and the final interview schedule was prepared with suitable modifications.
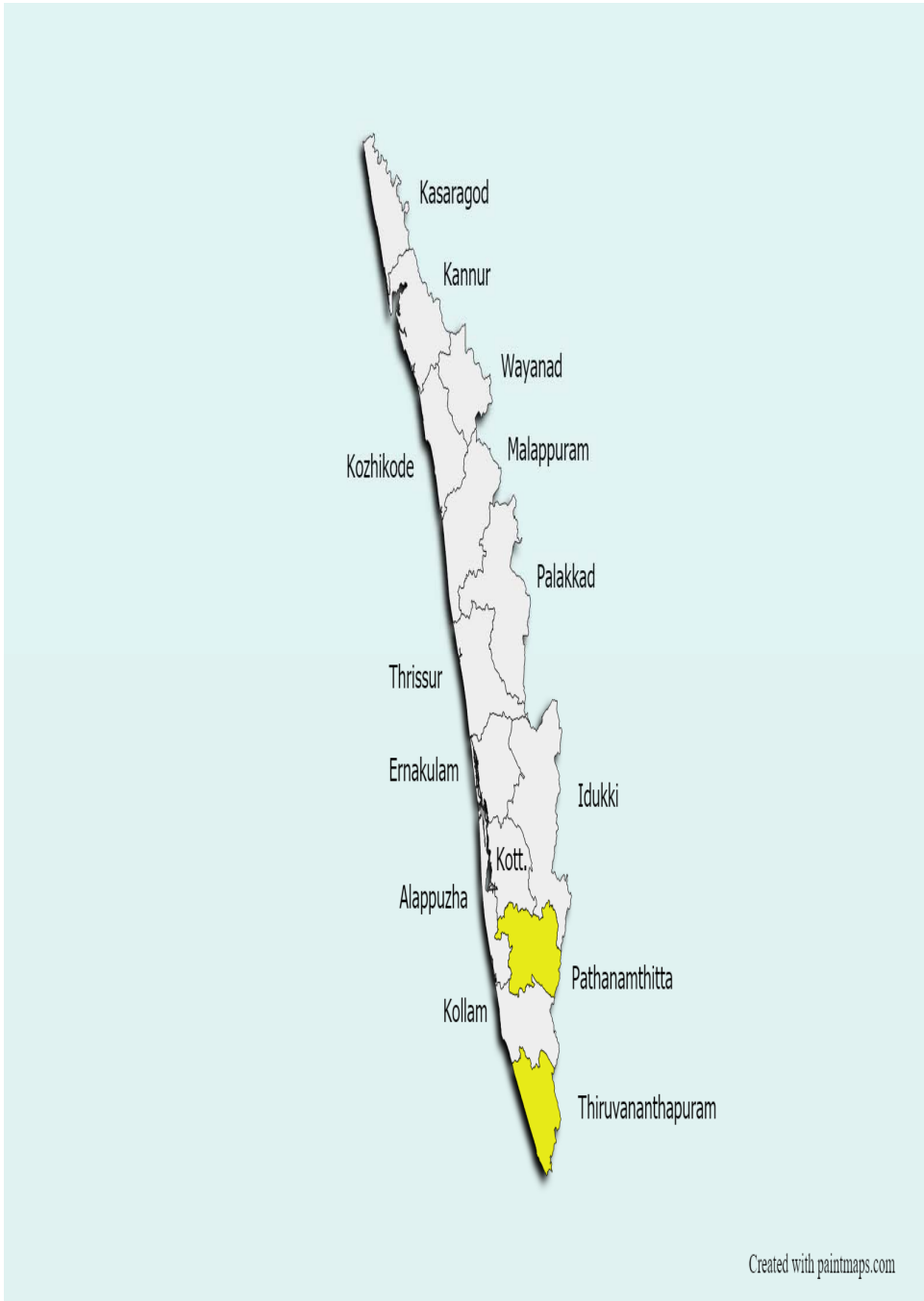
Plate 1. Location map

3.5 OPERATIONALIZATION AND MEASUREMENT OF DEPENDENT VARIABLES

3.5.1. Agripreneurial behaviour of awardee farmers of Department of Agriculture Development and Farmers' Welfare

To study the agripreneurial behaviour of awardee farmers, Agripreneurial attributes self assessment scale developed by Wankhade *et al*. (2013) and adopted by Raj (2018) was used. Agripreneurial behaviour of awardee farmers is operationally defined as cumulative outcome of ten components/attributes namely risk taking, hope of success, persuasability, manageability, self-confidence, knowledgeability, persistence, feedback usage, innovativeness, and achievement motivation.

The scale comprises of ten agripreneurial attributes, namely risk taking, hope of success, persuasability, manageability, self-confidence, knowledgeability, persistence, feedback usage, innovativeness, and achievement motivation. The agripreneurial attributes self assessment scale has a total of 50 statements. It was measured on a five-point continuum such as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with weightage of 5,4,3,2 and 1. The score ranges from 5 to 25 for each dimension.

Agripreneurial Behaviour Index was used to measure the agripreneurial behaviour of awardee farmers. Awardee farmers were classified into three categories ranging from low to high by considering the mean and standard deviation values.

Agripreneurial Behaviour Index

$$(ABI) = \frac{\text{Sum of obtained score on ten agripreneurial attribute} - \text{Minimum}}{\text{Maximum obtainable score on ten agripreneurial attribute} - \text{Minimum}} \times 100$$

The ten dimensions with the respective statements were given in the interview schedule (Appendix II). Operational definitions of the dimensions are given below:

**3.5.1.1. Risk taking willingness**

Refers to the degree to which the farmer is directed towards risk and uncertainty with respect to facing problems in agriculture.

### 3.5.1.2. Hope of Success

It is the degree to which a person believes that difficulties and barriers that he/she faces can be turned to different opportunities.

### 3.5.1.3. Persistence

Defined as the degree to which a farmer is persistent to accomplish his goal.

### 3.5.1.4. Use of Feed Back

The degree to which a farmer is ready to receive the feedback.

### 3.5.1.5. Self-Confidence

The degree to which a farmer trusts in his/her qualities, capabilities and perceptions.

### 3.5.1.6. Knowledgeability

Defined as the degree to which an individual has the knowledge of production, market, demand and supply.

### 3.5.1.7. Persuasability

Refers to the ability of an individual to influence and guide other individuals, customers and even competitors to create and maintain a good relationship.

### 3.5.1.8. Manageability

Defined as the degree to which a person is capable of managing his business by himself.

### 3.5.1.9. Innovativeness

Refers to the extent that a person adopts new ideas relatively earlier than other members of the social system.

### 3.5.1.10. Achievement motivation

It is a psychological variable that varies from person to person and it inspires individual to achieve some goals, that he has set for himself.

### 3.5.2. Adoption behaviour of awardee farmers

Extent of adoption refers to the degree to which the farmer had actually adopted the selected practices.

To study the adoption behaviour of awardee farmers, a list of forty-three practices in coconut, rice, banana and vegetables were selected from package of practices recommendations of Kerala Agricultural University (KAU, 2016) based on the discussion with the experts in the respective fields (Appendix II). These practices were administered to awardee farmers and it was measured as No adoption, Partial adoption, Full adoption and Modified adoption with the score of 1, 2, 3 and 4 respectively. Then adoption index was calculated using the equation as given below.

$$\text{Adoption index} = \frac{\text{Respondent's total score}}{\text{Total possible score}} \times 100$$

The mean and standard deviation of adoption index was calculated. Based on mean±standard deviation, the respondents were categorized into low, medium and high categories of adoption.

### 3.6 OPERATIONALIZATION AND MEASUREMENT OF INDEPENDENT VARIABLES

After discussion with extension experts and review of literature, a list of thirty-two independent variables relevant to the study were selected. Then these variables with its operational definitions were sent to twenty experts in the field of extension. It was

given in the form of questionnaire (Appendix I) and asked to mark the relevancy in a five-point continuum ranging from most relevant, more relevant, relevant, less relevant and least relevant with scores 5, 4, 3, 2, 1 respectively.

The final variables were selected on the basis of the average score of relevancy obtained by adding the weightages obtained and dividing them by the number of judges responded. Those variables that scored more than the average score were selected for the study.

Table 2. Independent variables and their measurement

| Variable | Measurement |
|---|---|
| Age | Census report of GOI (2011) |
| Education | Categorisation by Thomas(2004) |
| Size of land holding | Total land possessed by the respondent at the time of enquiry |
| Farming experience | Number of years the respondent has been engaged in farming |
| Annual income | Annual income in rupees |
| Decision making ability | Scale developed by Parimaladevi (2004) |
| Economic motivation | Scale developed by Fayas (2003) and followed by Anju (2016) |
| Dealing with failure | Scale developed by Neff *et al.*(2011) and followed by Sundaran (2016) |
| Level of aspiration | Scale developed by Saradamony (1983) and followed by Nair (2017) |

| Creativity | Scale developed by Reddy (1990) and followed by Raj (2018) |
|---|---|
| Credit orientation | Procedure developed by Beal and Sibley (1967) and followed by Anju (2016) |
| Training acquired | Number of trainings acquired by the respondent for the last 5 years |

## 3.6.1 Age

Age is defined as the number of years completed by the respondent at the time of investigation. Classified on the basis of census report (2011).

Age-wise distribution of respondents

| Sl. No. | Age category | Years | Score |
|---|---|---|---|
| 1. | Young | <35 | 1 |
| 2. | Middle aged | 35 to 55 | 2 |
| 3. | Old age | >55 | 3 |

## 3.6.2 Education

It refers to the number of years of formal education completed by the farmer. Measured by the categorization developed by Thomas (2004). The scoring pattern of education is given below.

| Sl. No. | Category | Score |
|---|---|---|
| 1. | Illiterate | 0 |
| 2. | Primary | 1 |
| 3. | Middle | 2 |
| 4. | High School | 3 |

| 5. | Collegiate | 4 |
|----|------------|---|

### 3.6.3 Size of land holding

Defined as the total extent of land under cultivation possessed by the individual in acres at the time of enquiry. Measured by directly asking the respondent. Scoring procedure is represented as below:

| Sl. No. | Category | Score |
|---------|----------|-------|
| 1. | Low | 1 |
| 2. | Medium | 2 |
| 3. | High | 3 |

### 3.6.4 Farming experience

Refers to the involvement of farmers in farming measured in number of years. Scoring procedure is given as below:

| Sl. No. | Category | Score |
|---------|----------|-------|
| 1. | Low | 1 |
| 2. | Medium | 2 |
| 3. | High | 3 |

### 3.6.5 Annual income

Refers to the total earning of the respondent through farm entrepreneurship per year. It was measured by directly asking the respondents, based on which scoring was done.

| Sl. No. | Annual income | Score |
|---------|---------------|-------|
| 1. | Low | 1 |
| 2. | Medium | 2 |
| 3. | High | 3 |

### 3.6.6   Decision making ability

It is operationalized as the degree to which a farmer determines the selection of most effective means from the available alternatives based on the scientific criteria for achieving maximum economic profit.

It was measured using a scale developed by Parimaladevi (2004). The scale consists of six statements on a four-point continuum, strongly agree, agree, disagree, and strongly disagree. A score of 4, 3, 2 and 1 given for positive statements, and 1, 2, 3 and 4 for negative statements respectively. The scores were finally added to measure the decision making capacity of each respondent. The score ranges between 6 and 24 (Appendix II).

### 3.6.7   Economic motivation

It is operationally defined as the extent to which a farmer is oriented towards profit maximization and the relative value he places on monetary gains. It was measured using a scale developed by Fayas (2003). Scale consists of six statements in which fifth and sixth statements were negative. The responses were collected on a four-point continuum as strongly agree, agree, disagree and strongly disagree with scores of 4,3,2,1 respectively and scoring was reversed for the negative statements. The score ranges from 6-24 (Appendix II).

### 3.6.8   Dealing with failure

It is defined as character of the farmer to deal with failure and being more intended on success. It was measured using Self Compassion Scale –Short form (Appendix II) developed by Neff *et al*. (2011) and followed by Sundaran (2016). Scale consists of seven statements which was measured in a five-point continuum ranging from

'almost always', 'fairly often', 'about half of time', 'occasionally' and 'almost never' with scores 5,4,3,2,1 respectively and vice-versa for negative statements. The score ranges from 7-35 (Appendix II).

### 3.6.9 Level of aspiration

It is operationally defined as the overall life goals in his reality world that the farmer is striving for. Scale developed by Saradamony (1983) and followed by Nair (2017) was used. Scale consists of four statements which was measured in a two-point continuum ranging from 'true' and 'false' with scores 2 and 1 respectively. The score ranges from 4-8 (Appendix II).

### 3.6.10 Creativity

It refers to the ability to create innovative ideas and to solve problems. Scale developed by Reddy (1990) and followed by Raj (2018) was used. There were six statements which was measured in a five-point continuum ranging from 'Always', 'Very often', 'Sometimes', 'Rarely', and 'Never' with scores 5,4,3,2,1 respectively. The score ranges from 6-30 (Appendix II).

### 3.6.11 Credit orientation

It is operationally defined as the orientation of the farmers to take advantage of the financial institutions for credit, which may help them to improve their economic condition. The procedure developed by Beal and Sibley (1967) and followed by Anju (2016) was used. There were five statements measured in a two-point continuum ranging from true and false with scores 2 and 1 respectively. The scores ranges from 5-10 (Appendix II).

### 3.6.12 Training acquired

Operationally defined as the number of trainings the awardee farmer had in the last 5 years, either formally or informally, which gave them the knowledge and skills to

improve their performance and thus bring them accolades in the form of prizes. Measured by directly asking the respondents.

## 3.7 DOCUMENTATION OF GOOD AGRICULTURAL PRACTICES OF AWARDEE FARMERS

Good agricultural practices refer to the on-farm eco friendly practices, other than package of practices recommendations of Kerala Agricultural University (KAU), adopted by the farmers to increase the yield. An open ended questionnaire was prepared to document the good agricultural practices followed by awardee farmers in major crops.

## 3.8 CONSTRAINTS FACED BY THE AWARDEE FARMERS AT THE FARM LEVEL

Constraints faced by the awardee farmers were enlisted through review of literature and pilot study. These were ranked using Garrett ranking technique. The main advantage of this technique is that constraints were arranged and ranked on the basis of the importance from the view point of respondents.

## 3.9 STRATEGIES TO OVERCOME THE CONSTRAINTS FACED BY THE AWARDEE FARMERS

Strategies to overcome the constraints were collected from the respondents through discussion with them.

## 3.10 STATISTICAL TOOLS USED

### 3.10.1 Frequency and Percentage analysis

The selected variables were represented in terms of frequency and percentage, to draw simple comparisons and to classify the respondents wherever needed. The percentage was determined by finding the relevant cell frequency multiplied by 100 and subsequently divided by the total number of respondents.

### 3.10.2 Mean and standard deviation

Mean is calculated by dividing the sum of observations by total number of observations.

Standard deviation is found out by taking the root mean square deviation of values from their arithmetic mean.

The respondents were categorized into low (<mean-SD), medium (mean±SD) and high (>mean+SD) for the variables.

### 3.10.3 Correlation Analysis

Simple correlation analysis was used to study the relationship between dependent and independent variables. The significance of correlation coefficient was tested at 5% and 1% level of significance.

### 3.10.4 Factor analysis

Factor analysis was done to understand the contribution of each attribute to agripreneurial behaviour. The factors extracted having Eigen value more than 1 were retained for further analysis.

### 3.10.5 Garrett ranking

Constraints were ranked based on the preference of respondents and given the Garrett score from the Garrett table.

$$\text{Per cent Position} = \frac{100 \, (R_{ij} - 0.5)}{N_j}$$

$R_{ij}$ = Rank given for the $i^{th}$ variable by the $j^{th}$ respondent

$N_j$ = Number of variables ranked by the $j^{th}$ respondent.

Age

Education

Size of land holding

Farming experience

Annual income

Decision making ability

Economic motivation

Dealing with failure

Level of aspiration

Creativity

Credit orientation

Training acquired

Agripreneurial behaviour

Adoption behaviour
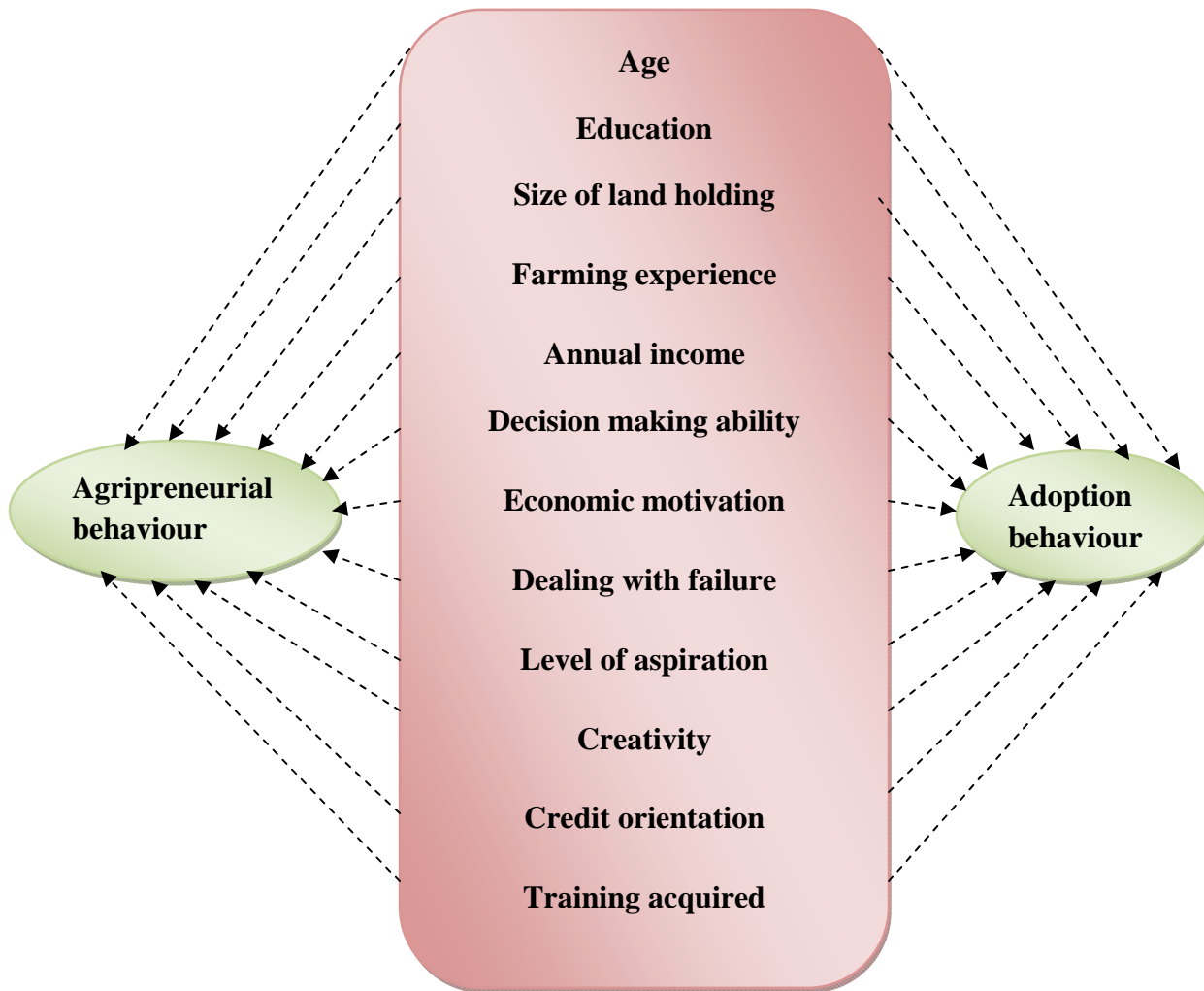
Plate 2. Conceptual framework of the study

# *Results and Discussion*

# 4.RESULTS AND DISCUSSION

This session is the key component of the research study which provides the analysis and interpretation of data. The study was conducted in Thiruvananthapuram district and Pathanamthitta district consisting seventy awardee farmers, with thirty five each from the respective two districts. The data is collected and later analyzed using appropriate statistical methods. The results and discussion are organized under the following sub headings.

4.1 Distribution of respondents according to their profile characteristics

4.2 Agripreneurial behaviour of awardee farmers

4.3 Factor analysis of attributes of agripreneurial behaviour of awardee farmers

4.4 Correlation between agripreneurial behaviour and independent variables

4.5 Adoption behaviour of awardee farmers

4.6 Correlation between adoption behaviour and independent variables

4.7 Documentation of good agricultural practices followed by awardee farmers in major crops

4.8 Constraints faced by the farmers

4.9 Strategies to overcome the constraints

4.10 Conclusion

4.1 Distribution of respondents according to their profile characteristics

**4.1.1 Age**

Table 3. Distribution of awardee farmers based on age

| Category | Age group | Frequency (N=70) | Percentage |
|----------|-----------|------------------|------------|
| Young | <35 years | 01 | 1.43 |
| Middle aged | 35-55 years | 38 | 54.28 |
| Old | >55 years | 31 | 44.28 |
| Total | | 70 | 100 |
| Mean- 53 | SD- 9.79 | | Range- 33-69 |

Table 3 and Fig.1 clearly shows that majority (54.28%) of the awardee farmers belonged to middle aged group, whereas 44.28 per cent and 1.43 per cent of them belonged to old and young age groups, respectively. Middle-aged farmers are usually enthusiastic and have more flexibility in their work than older ones. The result clearly points out the reluctance of youth towards agriculture as only one person out of 70 respondents belonged to the category of young. These results were in line with the findings of Manjula (2003) and Vimalraj (2010).

**4.1.2 Education**

Table 4. Distribution of awardee farmers based on education

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1 | Illiterate | 0 | 0 |
| 2 | Primary | 04 | 5.71 |
| 3 | Middle | 10 | 14.28 |
| 4 | High School | 36 | 51.42 |
| 5 | Collegiate | 19 | 27.14 |
| | Total | 70 | 100 |
| Mean – 10.68 | | SD  -  3.48 | |

Most of the awardee farmers had education upto high school level (51.42%) followed by collegiate level (27.14%), middle school (14.28%) and primary school (5.71%) as evident from Table 4 and Fig.2. None of the awardee farmers were found to be illiterate and only 5.71 per cent of them belonged to the category of primary education. Majority of the respondents belonged to collegiate category or education up to high school which might have helped the farmers in better exposure to the outside world and utilizing the available resources properly.
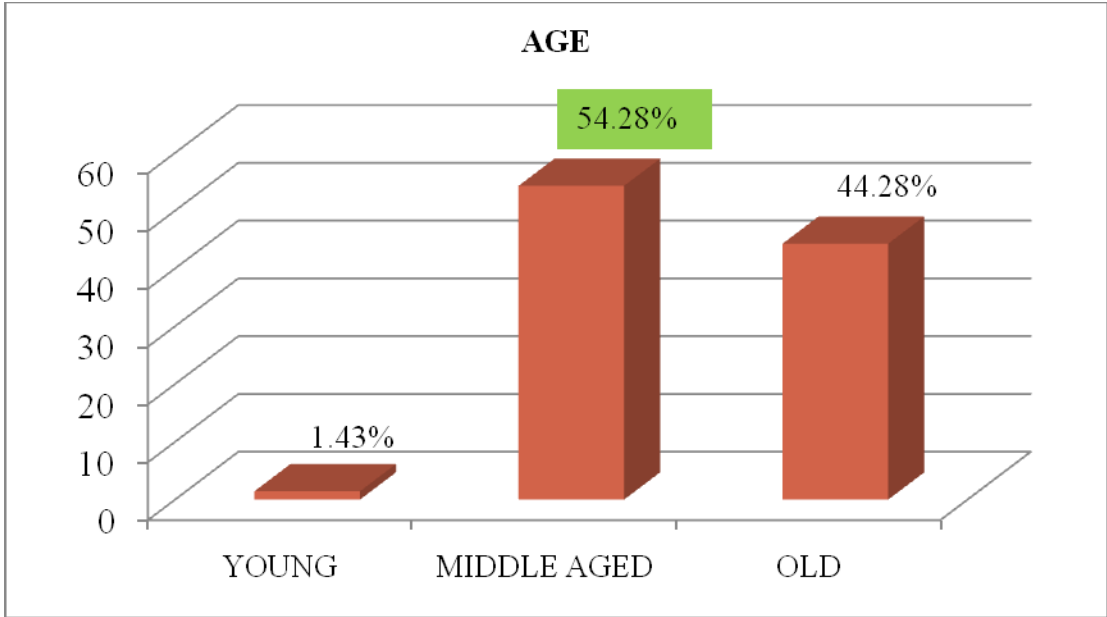
Fig 1. Distribution of awardee farmers based on age
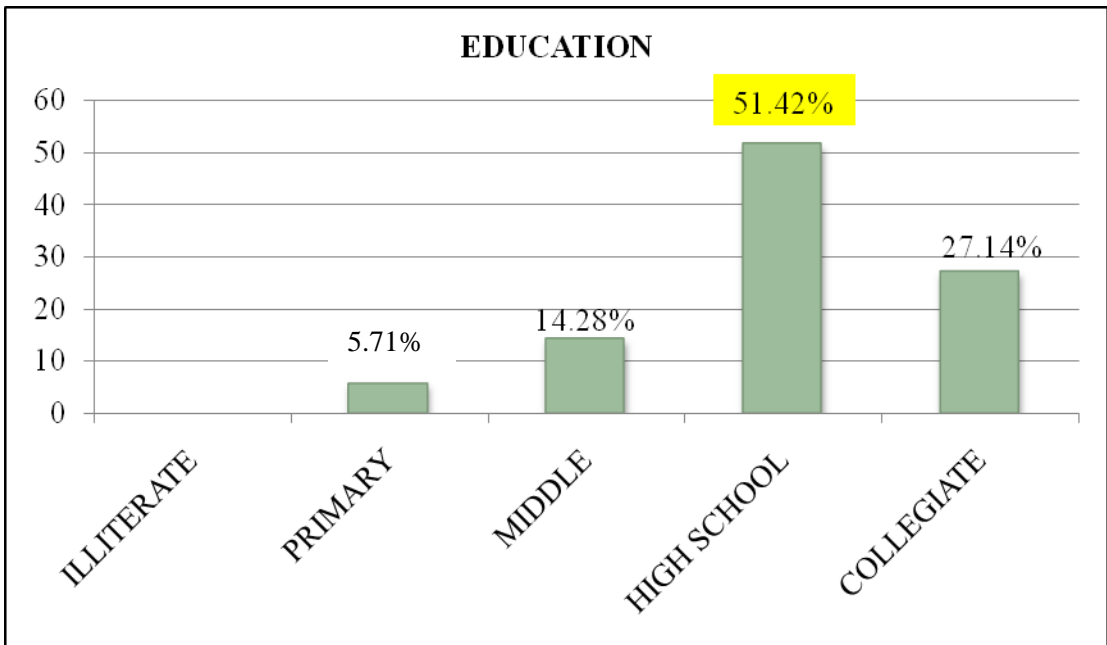


Fig 2. Distribution of awardee farmers based on education

### 4.1.3 Size of land holding

Table 5. Distribution of awardee farmers based on size of land holding

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Small(<1 acre) | 02 | 2.86 |
| 2. | Medium(1-5 acres) | 62 | 88.57 |
| 3. | Large(>5 acres) | 06 | 8.57 |
| | Total | 70 | 100 |
| Mean-3.06 | SD    -2.7 | | Range  -  0.8-15 |

The perusal of table 5 reveals that    88.57 per cent of the awardee farmers possessed medium land holding whereas 8.57 per cent had large land holding followed by small size of land holding (2.86%). The farmers with larger area are generally the resourceful persons who can afford to use the different technologies on their fields, which might have helped to increase the income and procure awards. The result was in line with the findings of Kale (2016).

### 4.1.4 Farming experience

Table 6. Distribution of awardee farmers based on farming experience

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (4-6 years) | 09 | 12.85 |
| 2. | Medium(7-27 years) | 42 | 60 |
| 3. | High(28-40 years) | 19 | 27.14 |
| | Total | 70 | 100 |
| Mean – 18 | SD -10.3 | | Range  -  4-40 |
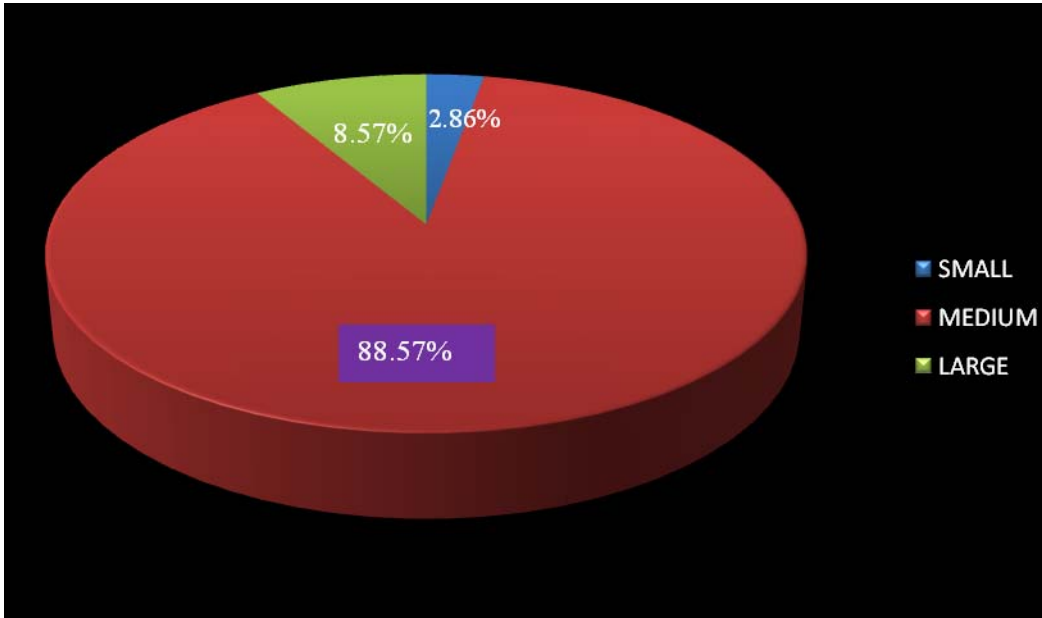
Fig. 3. Distribution of awardee farmers based on size of land holding
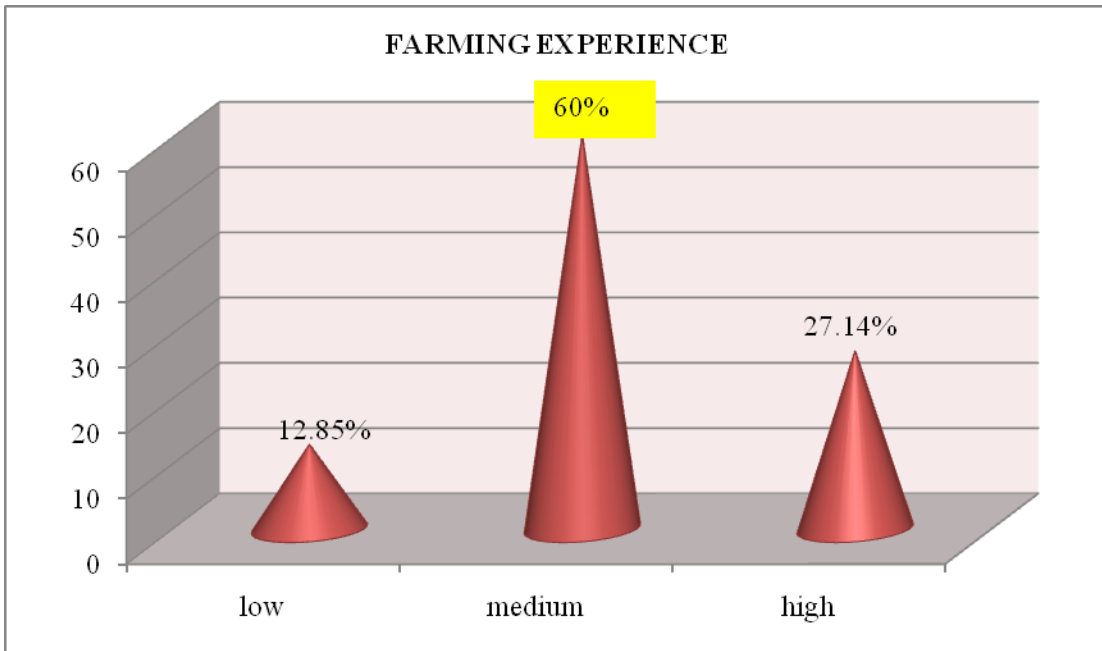


Fig. 4. Distribution of awardee farmers based on farming experience

Table 6 and Fig.4 indicates that 60 per cent of the awardee farmers had medium farming experience followed by high (27.14%) and low (12.85%) farming experience. Farming experience plays an influential role in the acquirement of knowledge and skills of farmers.

The result was in line with the results of Chandrasekhara (1999) and Prasad (2003).

**4.1.5 Annual income**

Table 7. Distribution of awardee farmers based on annual income

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (Below Rs.80000) | 05 | 7.14 |
| 2. | Medium (Rs.80000-Rs.300000) | 54 | 77.14 |
| 3. | High (Above Rs.300000) | 11 | 15.71 |
| | Total | 70 | 100 |

Mean -194000                    Range -  80000-500000

From table 7 and fig.5 it is clear that more than half of the awardee farmers (77.14%) belonged to medium category of annual income whereas 15.71 per cent and 7.14 per cent of them belonged to high and low category of annual income, respectively. The crop diversification and enterprise diversification might be the reason for this finding.

The results were in line with the findings of Amol (2006) and Deshmukh *et al*. (2007).

**4.1.6 Decision making ability**

Table 8. Distribution of awardee farmers based on decision making ability

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low(12-14) | 11 | 15.71 |
| 2. | Medium(15-18) | 47 | 67.14 |
| 3. | High(19-23) | 12 | 17.14 |
| | Total | 70 | 100 |
| Mean- 17.13 | SD- 2.77 | Range  - 12-23 | |

Table 8 and Fig.6 shows that majority of the awardee farmers (67.14 %) were having medium decision making ability followed by high (17.14%) and low (15.71%) level of decision making ability. The reason might be due to medium annual income and medium size of land holding. The results were in line with the findings of Maratha *et al*. (2017).
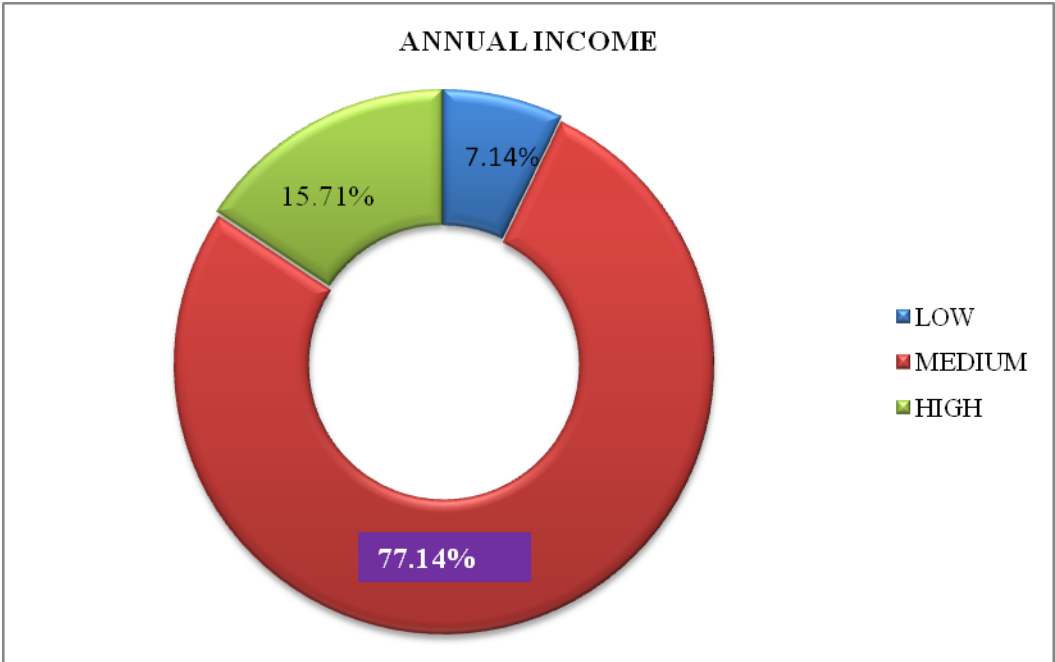
Fig. 5. Distribution of awardee farmers based on annual income
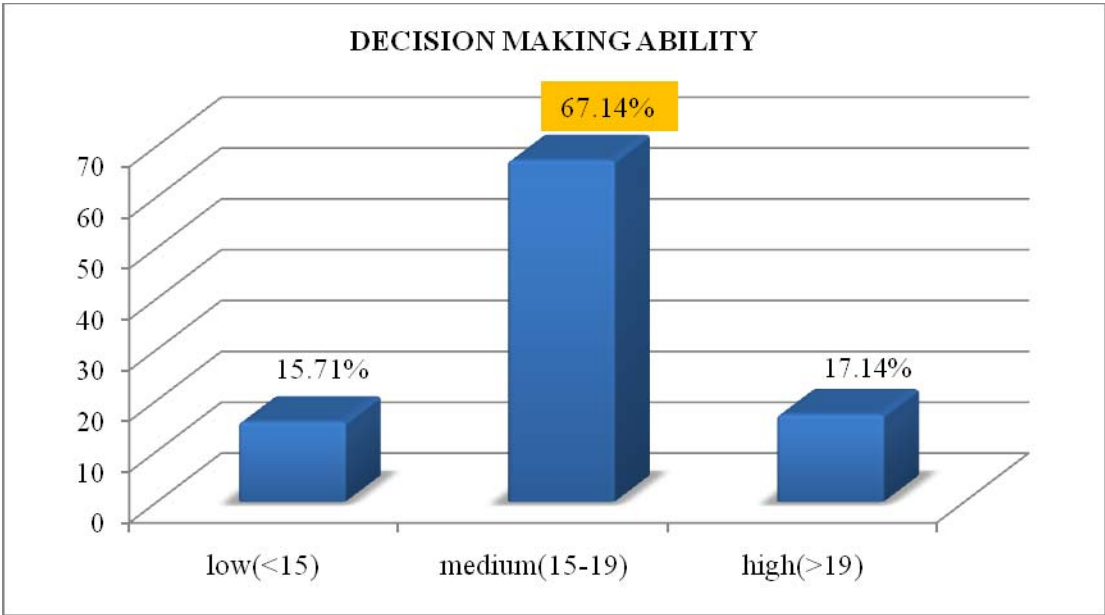


Fig. 6. Distribution of awardee farmers based on decision making ability

**4.1.7 Economic motivation**

Table 9. Distribution of awardee farmers based on economic motivation

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low(11-14) | 08 | 11.43 |
| 2. | Medium (15-20) | 54 | 77.14 |
| 3. | High(21-23) | 08 | 11.43 |
| | Total | 70 | 100 |

Mean-17.7        SD   -2.96        Range – 11-23

       From table 9 and fig.7, it is clear that most of the awardee farmers (77.14%) had medium level of economic motivation, whereas an equal per cent (11.43%) had low and high level of economic motivation.

**4.1.8 Dealing with failure**

Table 10. Distribution of awardee farmers based on dealing with failure

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (12-14) | 05 | 7.14 |
| 2. | Medium (15-24) | 53 | 75.71 |
| 3. | High (25-30) | 12 | 17.14 |
| | Total | 70 | 100 |

Mean-20.31        SD - 4.54        Range – 12-30

Most of the awardee farmers (75.71%) belonged to medium category of dealing with failure, whereas 17.14 per cent of them belonged to high category and 7.14 per cent belonged to low category of dealing with failure. Failure in agriculture might not pull them back as they have high risk taking ability and they might be well aware of how to tackle the problems.

Fig.8 depicts the graphical representation of the distribution of awardee farmers based on dealing with failure.

### 4.1.9 Level of aspiration

Table 11. Distribution of awardee farmers based on level of aspiration

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (4-5) | 05 | 7.14 |
| 2. | Medium (5-7) | 51 | 72.85 |
| 3. | High (7-8) | 14 | 20 |
| | Total | 70 | 100 |
| Mean -6.27 | SD - 1.22 | | Range- 4-8 |

Table 11 and Fig.9 shows that majority of the awardee farmers (72.85%) were having medium level of aspiration followed by high (20%) and low (7.14%) level of aspiration respectively. This might be due to their medium decision making ability and medium annual income. The result was in line with the findings of Shrivastava (2013).
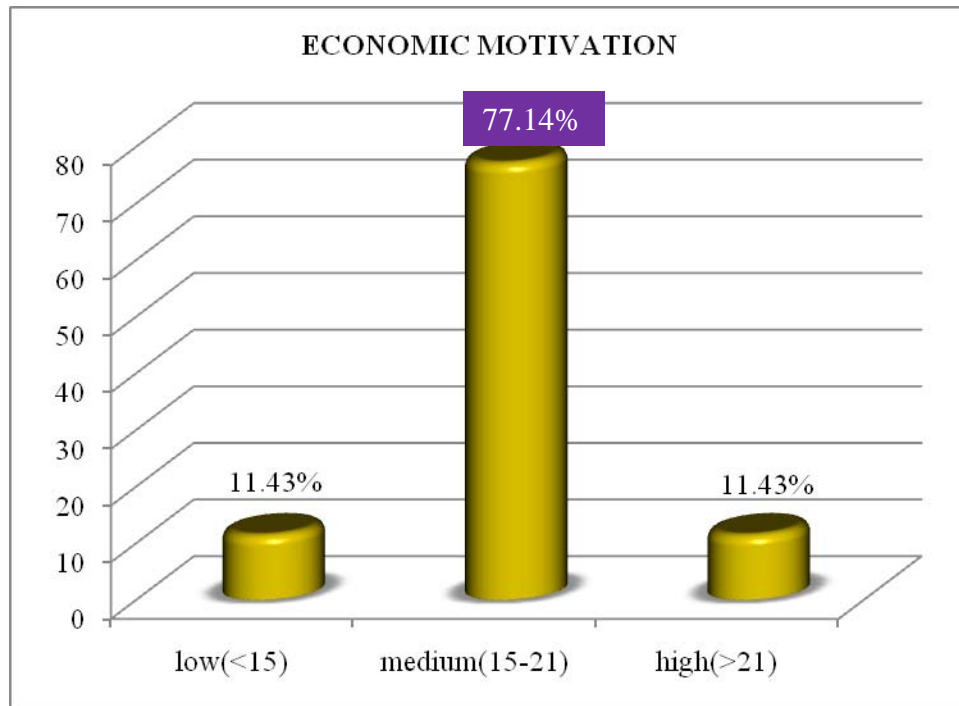
Fig. 7. Distribution of awardee farmers based on economic motivation
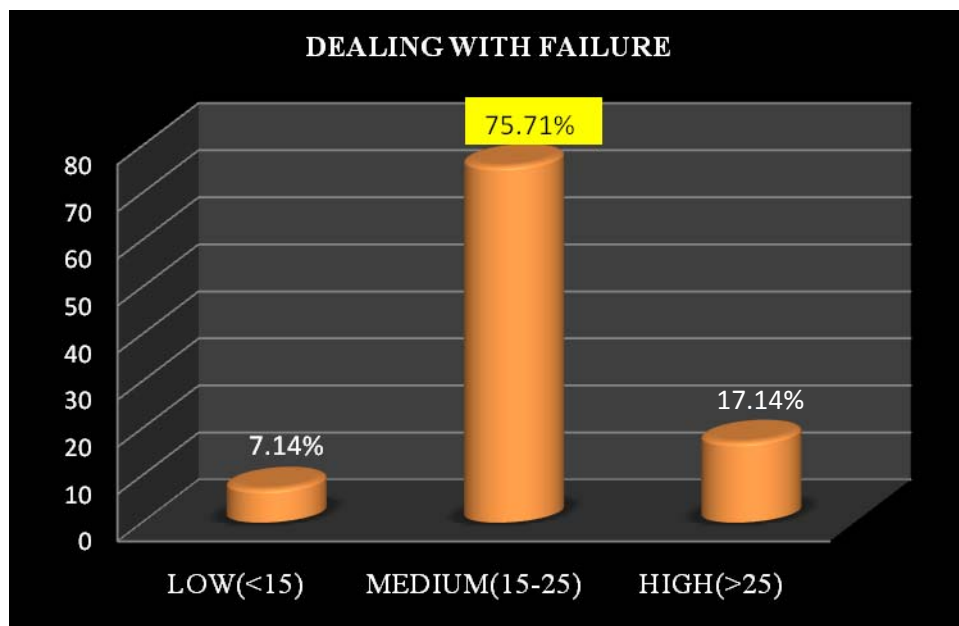


Fig.8. Distribution of awardee farmers based on dealing with failure

**4.1.10 Creativity**

Table 12. Distribution of awardee farmers based on creativity

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (12-14) | 08 | 11.43 |
| 2. | Medium (15-22) | 50 | 71.43 |
| 3. | High (23-30) | 12 | 17.14 |
| | Total | 70 | 100 |
| Mean – 19.54 | SD - 4.1 | | Range - 12-30 |

Table 12 and fig. 10 shows that majority (71.43%) of the awardee farmers had medium level of creativity, while 17.14 per cent had high level of creativity and 11.43 per cent had low level of creativity. Medium and high levels of creativity shows their ability to do innovative things in a different way to achieve success in their farming and might have helped them to secure awards.
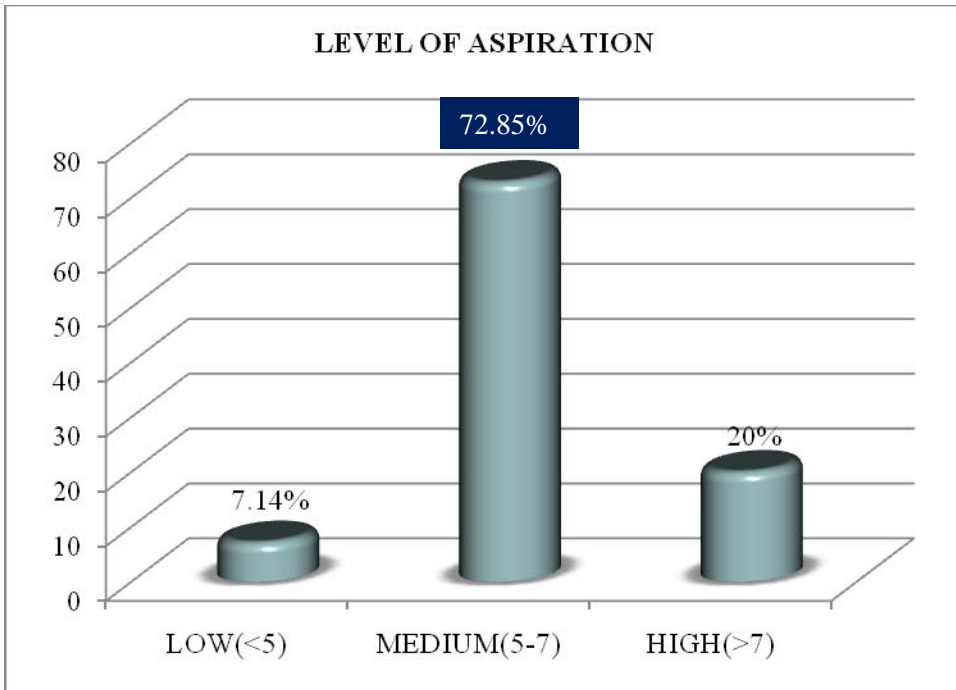
Fig. 9. Distribution of awardee farmers based on level of aspiration
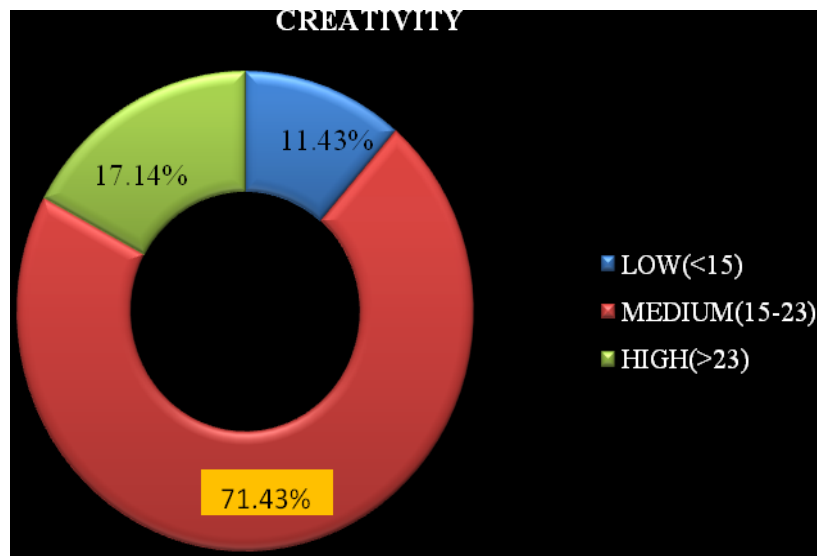


Fig. 10. Distribution of awardee farmers based on creativity

**4.1.11 Credit orientation**

Table 13. Distribution of awardee farmers based on credit orientation

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (5-6) | 10 | 14.28 |
| 2. | Medium(6-8) | 45 | 64.28 |
| 3. | High (8-10) | 15 | 21.43 |
| | Total | 70 | 100 |
| Mean – 7.5 | SD - 1.48 | Range – 5-10 | |

Table 13 and Fig.11 clearly shows that 64.28 per cent of the awardee farmers belonged to medium category of credit orientation whereas 21.43 per cent of them had high level of credit orientation and 14.28 per cent had low level of credit orientation. The medium and high credit seeking behaviour might be due to their medium level of economic motivation. The result was in line with the findings of Namitha (2017).

**4.1.12 Trainings acquired**

Table 14. Distribution of awardee farmers based on trainings acquired

| Sl. No. | Category | Frequency(N=70) | Percentage |
|---------|----------|-----------------|------------|
| 1. | Low (1-5) | 08 | 11.43 |
| 2. | Medium (5-15) | 46 | 65.71 |
| 3. | High (15-25) | 16 | 22.86 |
| | Total | 70 | 100 |
| Mean – 12 | SD – 6 | Range – 1-25 | |

Majority of the awardee farmers (65.71%) belonged to medium category of trainings acquired followed by high (22.86%) and low (11.43%) category of trainings acquired. Training helps to motivate the farmers and increase their competitive ability in receiving awards. The result was in line with the findings of Vimalraj (2010).

Fig.12 shows the graphical representation of distribution of awardee farmers based on trainings acquired.
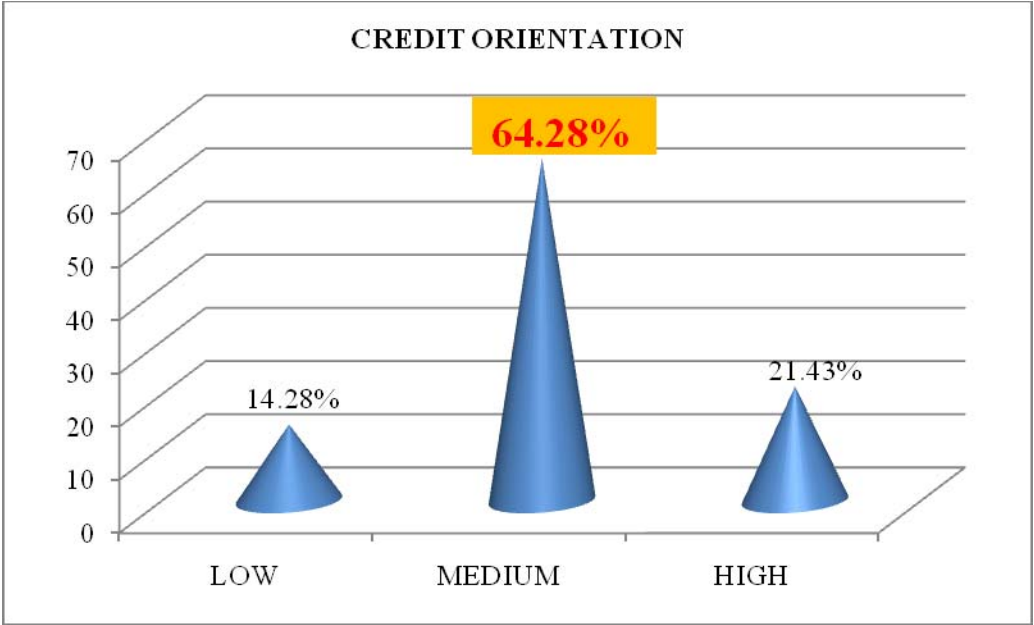
Fig. 11. Distribution of awardee farmers based on credit orientation
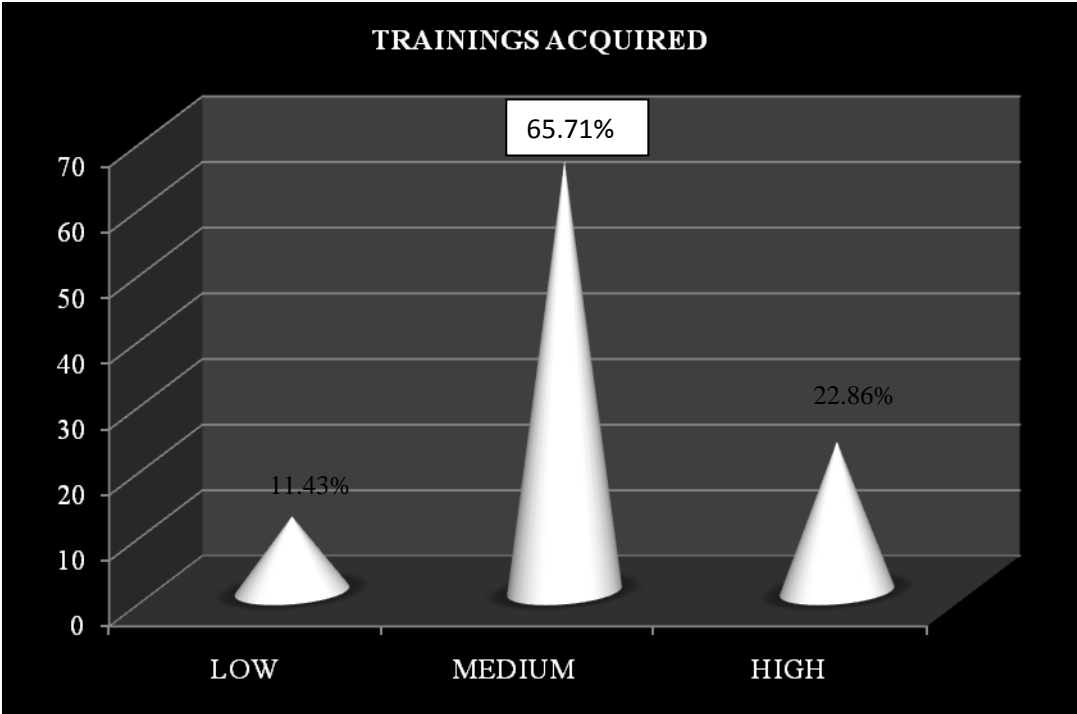


Fig. 12. Distribution of awardee farmers based on trainings acquired

4.2 Agripreneurial behaviour of awardee farmers

Table 15. Distribution of awardee farmers based on Agripreneurial Behaviour Index

| Sl. No. | Category | Frequency (N=70) | Percentage |
|---------|----------|------------------|------------|
| 1. | Low (50-56) | 12 | 15.71 |
| 2. | Medium (57-72) | 47 | 67.14 |
| 3. | High (73-81) | 11 | 17.14 |
| | Total | 70 | 100 |

Mean- 64.6　　　　　　　　SD- 7.5　　　　　　　　　　　　　　Range- 50-81

Table 15 and fig.13 shows that majority of the awardee farmers (67.14%) were having medium level of agripreneurial behaviour followed by high (17.14%) and low (15.71%) agripreneurial behaviour levels. The awardee farmers follow many recent technologies in addition to the traditional practices, which helps them in establishing new farming enterprises. The result of the study reveals that majority of the awardee farmers (75.71%) were in the medium category of dealing with failures as depicted in (table 10), 72.85 per cent had medium level of aspirations (table 11) and 71.43% of the respondents had medium creativity (table 12) which are closely associated with agripreneurial behaviour. The result was in line with the findings of Gurubalan(2007).
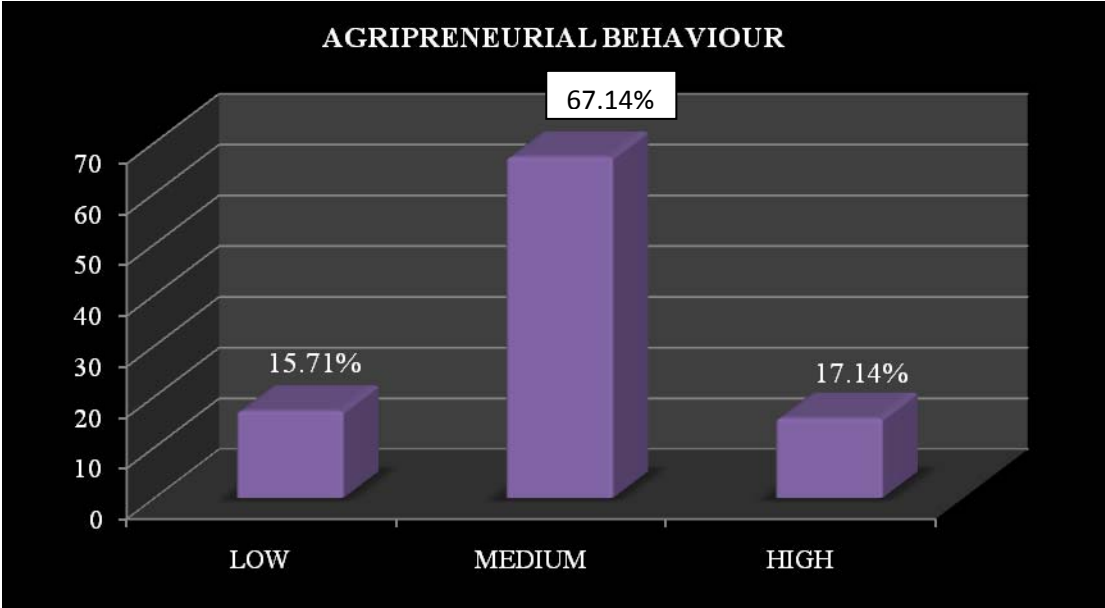
Fig. 13 . Distribution of awardee farmers based on Agripreneurial Behaviour Index

4.3 Factor analysis of attributes of agripreneurial behaviour of awardee farmers

Factor analysis was done to understand the contribution of each attribute to agripreneurial behaviour and it is shown in table 16.

Table 16. Factor analysis of the attributes of agripreneurial behaviour

| Components | Factors | | | Communality(%) |
|---|---|---|---|---|
| | 1 | 2 | 3 | |
| Risk taking willingness | **0.66** | 0.33 | 0.11 | 55.8 |
| Hope of success | 0.07 | **0.74** | 0.02 | 55.8 |
| Persistence | -0.33 | **0.66** | 0.26 | 60.8 |
| Use of feedback | 0.05 | 0.11 | **0.78** | 61.5 |
| Self confidence | 0.43 | -0.21 | **0.63** | 62.2 |
| Knowledgeability | **0.70** | 0.11 | 0.20 | 54.8 |
| Persuasability | **0.66** | -0.11 | -0.00 | 44.0 |
| Manageability | 0.00 | 0.28 | **0.61** | 44.7 |
| Innovativeness | 0.24 | 0.52 | 0.34 | 44.3 |
| Achievement motivation | 0.46 | 0.58 | -0.05 | 55.2 |
| Eigen value | 1.93 | 1.86 | 1.60 | |
| % of variance | 19.34 | 18.59 | 15.98 | |
| Cumulative % | 19.34 | 37.93 | 53.91 | |

It is evident from Table 16. that three factors extracted were having Eigen value more than one and were retained for further analysis. Factor 1 explained 19.34 per cent of total variation present in agripreneurial behaviour of awardee farmers followed by factor 2 (18.59%) and factor 3 (15.98%). The first three factors together accounted for 53.91 per cent of the total variation and influence of attributes was identified based on the loadings of attribute on factors and communality.

On examining the factor loadings, it was found that the attributes like risk taking willingness (0.66), persuasability (0.65) and knowledgeability (0.70) are having high loadings on factor 1 with a communality of 55.8, 44 and 54.8 per cent respectively whereas, hope of success (0.74) and persistence (0.66) possess high loadings on factor 2 and use of feedback (0.78), self confidence (0.63) and manageability (0.61) had high loadings on factor 3. But innovativeness and achievement motivation didn't show a good loading value on any of the extracted factors.

4.4 Correlation between agripreneurial behaviour and independent variables

Correlation analysis of agripreneurial behaviour with independent variables done and it is given in Table 17.

Table 17 shows that decision making ability, economic motivation, dealing with failure, level of aspiration, creativity, credit orientation and trainings acquired were positively and significantly correlated to agripreneurial behaviour.

Table 17. Correlation between agripreneurial behaviour and profile characteristics of awardee farmers

| INDEPENDENT VARIABLES | CORRELATION COEFFICIENT |
|---|---|
| Age | 0.042 |
| Education | 0.015 |
| Size of land holding | 0.187 |
| Farming experience | 0.058 |
| Annual income | 0.030 |
| Decision making ability | 0.907** |
| Economic motivation | 0.927** |
| Dealing with failure | 0.873** |
| Level of aspiration | 0.336** |
| Creativity | 0.908** |
| Credit orientation | 0.973** |
| Training acquired | 0.730 ** |

** 1% significant level

Decision making ability was positively and significantly correlated with agripreneurial behaviour at one per cent level. The secret to success in any field is to take the right decision at the right time. A farmer with good decision making ability might have high chances of success through effective utilization of available resources and increase their income. The analysis is also in line with the result of the study which is evident from table 8 that 67.18% of the respondents have medium decision taking ability

Economic motivation was positively and significantly correlated with agripreneurial behaviour at one per cent level. For profit maximization, the respondents were involved in crop diversification and enterprise diversification which might have resulted in their high agripreneurial abilities.

Dealing with failure was positively and significantly correlated with agripreneurial behaviour at one per cent level. A successful person always learns lessons from the failure and it is obvious that the respondents being the awardee farmers might have learned lessons from failures due to crop loss and managed to overcome it. It was also found out during the study that all the awardee farmers had the habit of insuring the crop as prescribed by the Department of agriculture development and farmers' welfare which was the major strategy to overcome the crop loss. The result was in line with the findings of Sundaran (2016).

Level of aspiration was positively and significantly correlated with agripreneurial behaviour at one per cent level. Awardee farmers might have the hastiness to achieve the life goals immediately which in turn contribute to their higher agripreneurial behaviour.

Creativity was positively and significantly correlated with agripreneurial behaviour at one per cent level. Higher creativity might have helped the awardee farmers to adopt the innovative methods in all areas of farming like crop production, crop protection, post-harvest handling, value addition and marketing which finally enhanced their agripreneurial abilities.

Credit orientation was positively and significantly correlated with agripreneurial behaviour at one per cent level. The credit seeking behaviour of awardee farmers might have helped them to initiate recent innovative technologies which led to expansion of their farming enterprise. The result was in line with the findings of Porchezian (1991).

Trainings acquired was positively and significantly correlated with agripreneurial behaviour at one per cent level. Trainings might have increased the knowledge and skills of awardee farmers to perform in an efficient way.

4.5 Adoption behaviour of awardee farmers

Table 18.Distribution of awardee farmers based on adoption index

| Sl. No. | Category | Frequency (N=70) | Percentage |
|---------|----------|------------------|------------|
| 1. | Low(<51) | 11 | 15.71 |
| 2. | Medium (51-67) | 46 | 65.71 |
| 3. | High (>67) | 13 | 18.57 |
| | Total | 70 | 100 |
| Mean- 59.48 | SD- 7.96 | | Range – 43.25-77.20 |

Table 18 and fig. 14 shows that majority of the awardee farmers (65.71 %) belonged to medium category of adoption behaviour followed by high (18.57%) and low (15.71%) category of adoption behaviour. This might be due to their medium level of farming experience and trainings acquired.

Fig .14 Distribution of awardee farmers based on adoption index

4.6 Correlation between adoption behaviour and independent variables

Correlation analysis of adoption behaviour with independent variables was done and it is shown in Table 19.

Table 19. Correlation on adoption behaviour and profile characteristics of awardee farmers

| INDEPENDENT VARIABLES | CORRELATION COEFFICIENT |
|---|---|
| Age | 0.116 |
| Education | 0.010 |
| Size of land holding | 0.022 |
| Farming experience | 0.273* |
| Annual income | 0.159 |
| Decision making ability | 0.416** |
| Economic motivation | 0.485** |
| Dealing with failure | 0.503** |
| Level of aspiration | 0.344** |
| Creativity | 0.439** |
| Credit orientation | 0.495** |
| Trainings acquired | 0.390** |

** 1 per cent significant level      *5 per cent significant level

From table 19. it is clear that independent variables like farming experience, decision making ability, economic motivation, dealing with failure, level of aspiration,

creativity, credit orientation and trainings acquired were positively and significantly correlated to adoption behaviour.

Farming experience was positively and significantly correlated with adoption behaviour at 5 per cent level. Higher experience in farming provides more knowledge and potential to work efficiently hence the awardee farmers adopt most of the package of practices recommendations of Kerala Agricultural University.

Decision making ability was positively and significantly correlated with adoption behaviour at one per cent level. Higher decision making ability might have helped the awardee farmers to adopt the most effective package of practices at a reasonable cost.

Economic motivation was positively and significantly correlated with adoption behaviour at one per cent level. To acquire modern technologies and farming methods for gaining higher returns from farms economically motivated awardee farmers would be very anxious to use all the avenues which might be reason for their higher adoption behaviour.

Dealing with failure was positively and significantly correlated with adoption behaviour at one per cent level. Even though the awardee farmers had to face failure in their crop, they might have the capability to use another effective measure to cope up with.

Level of aspiration and creativity were positively and significantly correlated with adoption behaviour at one    per cent level. Due to the high aspiration from the family members and extension personnels, they might be more confident to adopt the package of practices. The results were in line with the findings of Sanoria and Sharma (1982).

Credit orientation was positively and significantly correlated with adoption behaviour at one per cent level. The credit seeking behaviour of awardee farmers has an impact on purchase of costly inputs and technologies which helped them to increase their income.

Trainings acquired was positively and significantly correlated with adoption behaviour at 1 per cent level. Training helps farmers in gaining more knowledge and skills through interaction. Greater number of trainings enables more contact with the information sources about recent farming practices and increase knowledge and adoption of package of practices recommendations of Kerala Agricultural University.

4.7 Documentation of good agricultural practices followed by awardee farmers in major crops

Good Agricultural Practices followed by the awardee farmers in coconut, rice, banana and vegetables (vegetable cowpea, solanaceous vegetables and cucurbitaceous vegetables) were documented and inventoried.

4.7.1 Documentation of good agricultural practices followed by awardee farmers in coconut

Table 20 shows that 92.8 per cent of awardee farmers applied mixture of sand, salt and ash in the coconut pit before transplanting. The reason is that sand improves the texture of soil and facilitates easy rooting of seedlings. Salt and ash have germicidal property. Ash controls termite attack effectively. In order to control bud rot, 70 per cent of the awardee farmers applied salt and ash mixture in the crown. About 61.43 per cent of them followed burial of banana pseudostem in the coconut pit because well dried pieces of pseudostem attract pests. 52.86 per cent of them practiced deposition of palm waste at the base of the trunk which helps to prevent loss of fertile top soil through run off and to decrease soil temperature.

Table 20. Documentation of good agricultural practices in coconut

| Sl. No. | Practices in coconut | F(N=70) | Percentage |
|---------|---------------------|---------|------------|
| 1. | Application of a mixture of sand, salt and ash in the pit before transplanting | 65 | 92.8 |
| 2. | Application of salt and ash mixture in the crown | 49 | 70 |
| 3. | Burial of pseudostem of banana in the pit | 43 | 61.43 |
| 4. | Shading the seedlings with coconut leaves | 39 | 55.71 |
| 5. | Deposition of palm waste at the base of the trunk | 37 | 52.86 |

4.7.2 Documentation of good agricultural practices followed by awardee farmers in rice

Table 21 shows that majority of the awardee farmers (81.43%) followed soaking of rice seeds in fresh water in jute sacks for one day and keeping wet seeds for 3 days for better germination. In the case of plant protection, 72.86 per cent of them practiced clipping of seedlings leaf tips prior to transplantation to destroy the egg masses of stem borer. In order to attract and kill the moths of leaf folder, stem borer, Brown Plant Hopper, gall fly and rice bug, 70 per cent of them installed light traps in the field. More than half (68.57%) of the awardee farmers follow application of neem oil (2%) or neem cake extract (10%) to control rice thrips. To reduce rice blast in the nursery, they apply $100g/m^2$ rice hull ash. About 51.43 per cent of them grow azolla as green manure before transplanting as it provides nitrogen to growing rice and suppresses weeds.

Table 21. Documentation of good agricultural practices in rice

| Sl. No. | Practices in rice | F(N=70) | % |
|---------|-------------------|---------|---|
| 1. | Soaking of seeds in fresh water in jute sacks for one day and keeping wet seeds for 3 days | 57 | 81.43 |
| 2. | Clipping of the seedlings leaf tips prior to transplantation | 51 | 72.86 |
| 3. | Installation of light traps in the field | 49 | 70 |
| 4. | Application of 2% neem oil or 10 % neem cake extract can control rice thrips | 48 | 68.57 |
| 5. | Application of rice hull ash @ 100 g / m$^2$ to reduce the incidence of blast in the nursery | 37 | 52.86 |
| 6. | Growing azolla as green manure before transplanting | 36 | 51.43 |

4.7.3 Documentation of good agricultural practices followed by awardee farmers in banana

Table 22. Documentation of good agricultural practices in banana

| Sl. No. | Practices in banana | Frequency(N=70) | Percentage |
|---------|---------------------|-----------------|------------|
| 1. | Covering of banana bunches with dried banana leaves | 60 | 85.71 |
| 2. | Smearing of cowdung on banana sucker for speedy bud initiation | 58 | 82.86 |
| 3. | Smearing of cowdung and pseudomonas mixture on sucker followed by sprinkling of water thrice a week | 55 | 78.57 |
| 4. | Application of salt in the leaf axils of banana to control snails | 51 | 72.86 |
| 5. | Inserting of bar soap into the bore holes of pseudostem weevil to reduce its attack | 49 | 70 |
| 6. | Cutting and burning of infected banana leaves for controlling sigatoka disease | 45 | 64.28 |

From table 22, it is clear that the most commonly followed good agricultural practices by awardee farmers were covering of banana bunches with dried banana leaves to increase bunch size (85.71%), smearing of cowdung on banana sucker for speedy bud initiation (82.86%), smearing of cowdung and pseudomonas mixture on sucker followed by sprinkling of water thrice a week (78.57%),application of salt in the leaf axils of banana to control snails (72.86%), inserting of bar soap into the bore holes of pseudostem weevil to reduce its attack (70.00%) and cutting and burning of infected banana leaves for controlling sigatoka disease (64.28%).

4.7.4 Documentation of good agricultural practices followed by awardee farmers in vegetables

Table 23. Documentation of good agricultural practices in vegetables

| Sl. No. | Practices in vegetables | F(N=70) | % |
|---------|-------------------------|---------|---|
| 1. | Spraying of neem oil -garlic emulsion (2%) to control aphids of chilli | 63 | 90 |
| 2. | Spraying of soap-garlic-castor oil emulsion (2%) to control epilachna beetle of brinjal | 51 | 72.86 |
| 3. | Application of neem seed kernel extract 5% against pod borers of cowpea | 49 | 70 |
| 4. | Growing of marigold as a border crop in brinjal to control fruit borers | 45 | 64.29 |
| 5. | Spraying of boiled leaves of neem (4-5 kg in 10 L water) for 2-3 times in a season safeguards the crops from major pests especially *Helicoverpa* at larval stage. | 43 | 61.43 |
| 6. | Cultivation of vegetables in poly house to reduce the pest attack | 16 | 22.86 |

Table 23. shows that the most commonly used good agricultural practices in vegetables were spraying of neem oil -garlic emulsion (2%)  to control aphids of  chilli (90.00%) followed by spraying of soap-garlic-castor oil emulsion (2%) to control epilachna beetle of  brinjal (72.86%), application of neem seed kernel extract 5% against pod borers of cowpea (70%), growing of marigold as a border crop in brinjal to control fruit borers (64.29%), spraying of boiled leaves of neem (4-5 kg in 10 L water) for 2-3 times in a season safeguards the crops from major pests especially *Helicoverpa* at larval stage (61.43 %) and cultivation of vegetables in poly house to reduce the pest attack (22.86%).

4.7.5 Other innovative technologies and enterprises followed by awardee farmers

Awardee farmers use machines like tractors, tillers, seed drills, rotavators etc. apart from human labour used by other farmers. Tractors and tillers help them in ploughing, tilling and clearing bushes. Seed drills facilitate them in sowing to a specific depth. They use improved and hybrid varieties rather than local varieties to get more yield. They test the soil periodically. Soil testing is needed to know about the nutrient status of the soil. If the soil is found to be deficient or excess in any of the nutrients, Integrated Nutrient Management (INM) is followed. When the ordinary farmers adopt any one of the cultural, physical, biological or chemical methods for pest management, awardee farmers go for Integrated Pest Management (IPM), incorporating all these methods. It is a method which is used to solve pest problems without or at low level of risk to the people and environment. Pesticides are only used according to standard guidelines and treatment is done with a goal of removing only the target organisms. In the case of irrigation, awardee farmers use drip, wick or sprinkler irrigation which improves the water use efficiency. Most of them possess vermicomposting and trichoderma enrichment unit in their farm. Subsidiary enterprises like mushroom cultivation, dairy, poultry etc. helps them in increasing their income level.

4.8 Constraints faced by the farmers

Table 24 depicts the constraints faced by the farmers at farm level which was ranked based on Garrett ranking technique.

The major constraints faced by the awardee farmers were pest attack (especially wild animal attack), seasonal variations, fall in market price, cumbersome process in getting loan sanctioned, lack of availability of credit facilities on time, unavailability of timely and skilled labour and absence of good marketing avenues/facilities.

Table 24. Constraints faced by the farmers at farm level

| Sl. No. | Constraints | Garrett score | Rank |
|---------|-------------|---------------|------|
| 1. | Pest attack | 73.58 | 1 |
| 2. | Seasonal variations | 71.48 | 2 |
| 3. | Fall in market price | 68.93 | 3 |
| 4. | Cumbersome process in getting loan sanctioned | 53.36 | 4 |
| 5. | Lack of availability of credit facilities on time | 53.18 | 5 |
| 6. | Unavailability of timely and skilled labour | 43.28 | 6 |
| 7. | Absence of good marketing avenues/facilities | 39.37 | 7 |

4.9 Strategies to overcome the constraints

There should be a proper pest surveillance and crop health management system to identify and control the pests and diseases. Suitable measures like solar fencing should be provided to the farmers to get rid of wild animal attack. To control seasonal variations, vegetables can be cultivated in poly house.

Government should increase the procurement price of agricultural produces to support farmers. Banks should provide adequate credit facilities to farmers on time and the moratorium period should be extended for the agricultural loans taken by the farmers.

Government can organize awareness programmes about the need of agriculture which can attract youth towards agriculture thereby reduce the problem of unavailability of labour.

4.10 Conclusion

To conclude, the agripreneuial behaviour of awardee farmers was highly correlated to adoption behaviour which shows the importance of following the package of practices recommendations of Kerala Agricultural University and other innovative technologies and enterprises by the awardee farmers in receiving the awards.

Plate 3. Empirical model of the study

# *SUMMARY*

## 5. SUMMARY

A farmer who produced more was considered successful in earlier times. But now, a farmer who obtains higher productivity from his fields, who uses resources in an effective and sustainable manner, markets his produce efficiently and is able to maintain quality in line with national and international standards is considered as successful farmer.

A recognition given by central and state government establishments, agricultural departments, Non-Governmental and other organizations to farmers through awards generates interest in them to practice new technologies and improve the quality of the produce. These awardee farmers vary from other farmers in certain ways such as utilization of resources, marketing strategies, adoption of advanced technologies etc.

The objectives of the study entitled "a multidimensional analysis of awardee farmers of department of agriculture development and farmers' welfare in southern Kerala was to study the agripreneurial behaviour of awardee farmers and their adoption behaviour with respect to package of practices recommendations of Kerala Agricultural University (KAU) in major crops. The study also aimed at documenting the good agricultural practices (GAP) followed by awardee farmers in these crops. The constraints faced by the farmers at the farm level and strategies to overcome the constraints was also assessed. The sample comprised of 70 awardee farmers, 35 from Thiruvananthapuram and 35 from Pathanamthitta districts. Twelve independent variables were selected through judge's rating. Agripreneurial behaviour and adoption behaviour were the dependent variables selected.

## 5.1 SALIENT FINDINGS OF THE STUDY

- Majority of the awardee farmers (67.14%) were having medium level of agripreneurial behaviour followed by high (17.14%) and low (15.71%) levels.
- Majority of the awardee farmers (65.71 %) belonged to medium category of adoption behaviour followed by high (18.57%) and low (15.71%) category of adoption behaviour.

- More than half of the awardee farmers (54.28 %) belonged to middle aged group, whereas 44.28 per cent and 1.43 per cent of them belonged to old and young age groups respectively.
- Most of the awardee farmers had education upto high school level (51.42%) followed by collegiate level (27.14%), middle school (14.28%) and primary school (5.71%). None of the awardee farmers were found to be illiterate.
- Over 88 per cent of the awardee farmers possessed medium land holding whereas 8.57 per cent had large land holding followed by small size of land holding (2.86%).
- Sixty per cent of the awardee farmers had medium farming experience followed by high (27.14%) and low(12.85%) farming experience.
- More than half of the awardee farmers (77.14%) belonged to medium category of annual income whereas 15.71 per cent and 7.14 per cent of them belonged to high and low category of annual income, respectively.
- Majority of the awardee farmers (67.14 %) were having medium decision making ability followed by high(17.14%) and low(15.71%) level of decision making ability.
- Most of the awardee farmers (77.14%) had medium level of economic motivation, whereas an equal per cent (11.43%) had low and high level of economic motivation.
- Most of the awardee farmers (75.71%) belonged to medium category of dealing with failure, whereas 17.14 per cent of them belonged to high category and 7.14 per cent belonged to low category of dealing with failure.
- Majority of the awardee farmers (72.85%) were having medium level of aspiration followed by high (20%) and low (7.14%) respectively.
- Majority (71.43%) of the awardee farmers had medium level of creativity, while 17.14 per cent had high level and 11.43 per cent had low level of creativity.
- Majority (64.28 %) of the awardee farmers belonged to medium category of credit orientation whereas 21.43 per cent of them had high level and 14.28 per cent had low level of credit orientation.

- Majority of the awardee farmers (65.71%) belonged to medium category of trainings acquired followed by high (22.86%) and low (11.43%) category of trainings acquired.

- On factor analysis, three factors extracted were having Eigen value more than one and were retained for further analysis. Factor 1 explained 19.34 per cent of total variation present in agripreneurial behaviour of awardee farmers followed by factor 2 (18.59%) and factor 3 (15.98%).

- Correlation analysis of agripreneurial behaviour and profile characteristics of awardee farmers shows that decision making ability, economic motivation, dealing with failure, level of aspiration, creativity, credit orientation and trainings acquired were positively and significantly correlated to agripreneurial behaviour at 1 per cent significant level.

- Correlation analysis of adoption behaviour and profile characteristics of awardee farmers shows that farming experience, decision making ability, economic motivation, dealing with failure, level of aspiration, creativity, credit orientation and trainings acquired were positively and significantly correlated to adoption behaviour.

- Majority of the awardee farmers followed good agricultural practices like application of a mixture of sand, salt and ash in the pit before transplanting of coconut(92.8%), soaking of seeds in fresh water in jute sacks for one day and keeping wet seeds for three days for germination in the case of rice (81.43%), covering of banana bunches with dried banana leaves to increase bunch size (85.71%) and spraying neem oil -garlic emulsion (2%) to control aphids of chilli (90%).

- The major constraints faced by the awardee farmers were pest attack (especially wild animal attack), seasonal variations, fall in market price, cumbersome process in getting loan sanctioned, lack of availability of credit facilities on time, unavailability of timely and skilled labour and absence of good marketing avenues/facilities.

## 5.2 STRATEGIES TO OVERCOME THE CONSTRAINTS

- Pest surveillance and crop health management system

- Construction of poly house to reduce the pest and diseases in the case of vegetables
- Increase the procurement price of the agricultural produces
- Increase the moratorium period of loans taken by farmers

Plate 4. Interaction with farmers

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*Abstract*

# A MULTIDIMENSIONAL ANALYSIS OF AWARDEE FARMERS OF DEPARTMENT OF AGRICULTURE DEVELOPMENT AND FARMERS' WELFARE IN SOUTHERN KERALA

by

**RESHMA R.S.**

**(2018-11-080)**

**Abstract of the thesis**

**Submitted in partial fulfillment of the**

**Requirements for the degree of**

**MASTER OF SCIENCE IN AGRICULTURE**

**Faculty of Agriculture**

**Kerala Agricultural University**



**DEPARTMENT OF AGRICULTURAL EXTENSION**

**COLLEGE OF AGRICULTURE**

**VELLAYANI, THIRUVANANTHAPURAM-695522**

**KERALA, INDIA**

**2020**

## ABSTRACT

The study entitled 'A multidimensional analysis of awardee farmers of Department of Agriculture Development and Farmers' Welfare in Southern Kerala' was undertaken during 2019-2020. The objectives was to study the agripreneurial behaviour of awardee farmers and their adoption behaviour with respect to package of practices recommendations of Kerala Agricultural University (KAU) in major crops. The study also aimed at documenting the good agricultural practices (GAP) followed by awardee farmers in these crops. The constraints faced by the farmers at the farm level and strategies to overcome the constraints was also assessed. The sample comprised of 70 awardee farmers, 35 from Thiruvananthapuram and 35 from Pathanamthitta districts. Twelve independent variables were selected through judge's rating. Agripreneurial behaviour and adoption behaviour were the dependent variables selected.

On analysis, 54.28 per cent of awardee farmers belonged to middle age (35-55), and 51.42 per cent of the respondents had education upto high school level. Majority of the respondents (88.57% ) belonged to medium category of land holding with medium farming experience (60%). More than half (77%) of the awardee farmers had medium level of annual income. Majority of the awardee farmers were in the medium category of decision making ability (67.14%), economic motivation (77.14%), dealing with failure (75.71%), level of aspiration (72.85%), creativity(71.43%), credit orientation (64.28%) and trainings acquired (65.71%).

The distribution of awardee farmers based on their agripreneurial behaviour revealed that 67.14 per cent of them belonged to medium category followed by 17.14 per cent in the high category and remaining 15.71 per cent in the low category. The mean agripreneurial behaviour index was 64.6 with a minimum and maximum value of 50 and 81 respectively. The correlation analysis revealed that decision making ability, economic motivation, dealing with failure, level of aspiration, creativity, credit orientation and training acquired were positively and significantly correlated at 1% level of significance.

The results of adoption index revealed that majority of awardee farmers belonged to

medium category of adoption (65.71%) followed by high (18.57%) and low category (15.71%). The mean adoption index was 59.48 with a maximum and minimum adoption index of 77.20 and 43.25 respectively. Independent variables like decision making ability, economic motivation, dealing with failure, level of aspiration, creativity, credit orientation and training acquired were significant at 1% level of significance whereas farming experience at 5% level of significance.

Majority of the awardee farmers followed good agricultural practices like application of a mixture of sand, salt and ash in the pit before transplanting of coconut (92.8%), soaking of seeds in fresh water in jute sacks for one day and keeping wet seeds for three days for germination in the case of rice (81.43%), covering of banana bunches with dried banana leaves to increase bunch size (85.71%) and spraying neem oil -garlic emulsion (2%) to control aphids of chilli (90%). The study also revealed that the awardee farmers implemented many innovative technologies and enterprises that might be the reason for their high agripreneurial and adoption behaviour which might have helped them in procuring the awards declared by Department of Agriculture Development and Farmers' Welfare.

The major constraint faced by the awardee farmers was pest and wild animals attack. The strategy to overcome this constraint is to develop proper pest surveillance system and crop health management system by the experts in the agriculture field.

To conclude, the agripreneurial behaviour of awardee farmers was highly correlated to adoption behaviour which shows the importance of following the package of practices recommendations of Kerala Agricultural University and other innovative technologies and enterprises by the awardee farmers in receiving the awards.

*Appendices*

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Date: 13-12-2019

Sir/Madam,

Ms. Reshma R.S. (Ad. No. 2018-11-080), the post graduate scholar in the Department of Agricultural Extension, College of Agriculture, Vellayani is undertaking a research study entitled "A multidimensional analysis of awardee farmers of Department of Agriculture Development and Farmers' Welfare in Southern Kerala" 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. G.S.Sreedaya)

**Objectives**

   To study the agripreneurial behaviour of awardee farmers and their adoption behaviour with respect to package of practices recommendations of Kerala Agricultural University (KAU) in major crops. The study also aims at documenting the good agricultural practices (GAP) followed by awardee farmers in these crops. The constraints faced by the farmers at the farm level and strategies to overcome the constraints will also be assessed**.**

 <u>**Personal, Social, Economic and Psychological variables taken for the study**</u>

*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.*

| Sl. No. | Variable | Operational definition | Relevancy rating (R - relevant) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Most R | More R | R | Less R | Least R |
| 1. | **Age** | Operationalised as actual age of the farmer in completed years at the time of interview. | | | | | |
| 2. | **Annual income** | Refers to the total earning of the farmer through farm entrepreneurship per year | | | | | |
| 3. | **Education** | Defined as the level of formal education attained by the respondent. | | | | | |
| 4. | **Total land holding** | Refers to the total extent of land under cultivation possessed by the individual in acres at the time of enquiry. | | | | | |
| 5. | **Social class** | Refers to the position or standing according to a person by others in the society | | | | | |
| 6. | **Dealing with** | Operationalised as the | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **failure** | character of the farmer to deal with failure and being more intended on success | | | | | |
| 7. | **Problem solving ability** | Operationalised as the ability of the farmer to identify the problem, find the solution, select the best one and apply it. | | | | | |
| 8. | **Decision making ability** | Operationally defined as the degree of weighing the available alternatives in terms of their desirability and their likelihoods and choosing the most appropriate one for achieving maximum profit on his farming | | | | | |
| 9. | **Cosmopoliteness** | Refers to degree to which an individual is oriented to his immediate social system outside | | | | | |
| 10. | **Persuasion** | Refers to the use of deliberate strategies to influence others | | | | | |
| 11. | **Self reliance** | Refers to the extent to which a person relies on self for his future. | | | | | |
| 12. | **Level of aspiration** | Defined as the future level of achievement in his job, which he is expecting based on the knowledge about the level of past experience | | | | | |
| 13. | **Mass media exposure** | Refers to the degree to which the different mass media namely television, newspaper, magazines, bulletins, books and films were utilised by the farmer for getting information | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14. | **Economic motivation** | Defined as the occupational excellence in terms of profit maximisation and relative value placed on economic ends by an entrepreneur. | | | | | |
| 15. | **Scientific orientation** | Refers to the degree to which a farmer is oriented to the use of scientific methods in his cultivation | | | | | |
| 16. | **Farming experience** | Total number of years a respondent had been engaged in farming | | | | | |
| 17. | **Environmental orientation** | Operationalised as degree to which a farmer has concern for his environment. | | | | | |
| 18. | **Awareness about agripreneurial opportunities** | Refers to the extent to which the respondents were familiar with the various entrepreneurial opportunities | | | | | |
| 19. | **Risk taking ability** | Operationalised as taking challenge in a given situation, where the respondent is not satisfied with the present outcome and he strives for some additional pay off | | | | | |
| 20. | **Innovativeness** | Degree to which a farmer is relatively earlier in adopting new ideas | | | | | |
| 21. | **Self Confidence** | Extend of feelings about one's own ability and resource fullness to perform any activity which the respondents desires to undertake | | | | | |
| 22. | **Training** | Refers to the kind of exposure | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **acquired** | the awardee farmer had either formally or informally imparted them the knowledge and skills for improving their performance and consequently bringing them accolades in the form of awards. It includes experiential training, formal training and informal training. | | | | | |
| 23. | **Commercialisatio n** | Extend to which a farmer is intensing farming for commercial purpose | | | | | |
| 24. | **Perceived knowledge of the technology** | Defined as the thorough knowledge and understanding of the farmer about the technology so that he can put the technology into practice | | | | | |
| 25. | **Persistence** | Operationalised as the extent to take repeated actions or switches to an alternative strategy to meet a challenge or overcome an obstacle | | | | | |
| 26. | **Risk Perception** | Farmers subjective judgement on the factors that are influencing farming activity. It includes price fluctuation risk and yield fluctuation risk | | | | | |
| 27. | **Orientation towards competition** | Degree to which a farmer is oriented to place himself in a competitive situation with respect to other farmers | | | | | |
| 28. | **Flexibility** | Degree to which respondents manage unforeseen environmental situations | | | | | |
| 29. | **Achievement motivation** | Refers to the desire for excellence of farmer to attain a sense of personal | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | accomplishment | | | | | |
| 30. | **Information seeking behaviour** | Defined as the extent to which the farmer is seeking information from different communication sources | | | | | |
| 31. | **Systematic planning and monitoring** | Defined as planning by breaking large tasks down into time constrained sub tasks | | | | | |
| 32. | **Commitment to the work contact** | Farmer makes a personal sacrifice to expand extraordinary effort to complete a job | | | | | |
| 33. | **Others if any please specify** | | | | | | |

**A MULTIDIMENSIONAL ANALYSIS OF AWARDEE FARMERS OF DEPARTMENT OF AGRICULTURE DEVELOPMENT AND FARMERS' WELFARE IN SOUTHERN KERALA**

Interview schedule

Name :

1.Age:

2.Education :

3.Size of land holding:    Area under cultivation:                 Uncultivated area:

4.Farming experience

5.Annual income:

From agriculture :

Other sources:

Total income:

6.No. of trainings acquired:

7. Agripreneurial behaviour :

Risk taking willingness

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I don't fear investing my money on a venture whose dividends I have calculated | | | | | |
| 2 | I will consider a risk worth taking if the probability for success is 40-60%. | | | | | |
| 3 | I don't mind working under conditions of uncertainty as long as there is a reasonable probability of gains from it for me. | | | | | |
| 4 | I will consider a risk worth taking only if the probability for success is 60-100% | | | | | |

| | | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 5 | I don't care if the profit is small so long as it is assured and constant. | | | | | |

Hope of Success

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1. | I believe problems and barriers can be turned into opportunities that can be exploited | | | | | |
| 2 | I am unprepared for the outcome of my actions. | | | | | |
| 3 | I don't think of negative consequences of decisions that I make. | | | | | |
| 4 | I cannot see the future as bright and promising | | | | | |
| 5 | I meet and solve problems as they are. | | | | | |

Persistence

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | 1 don't allow failures to discourage me. | | | | | |
| 2 | Once I have started on a task I usually carry it to its completion | | | | | |
| 3 | I find myself working harder under stress | | | | | |
| 4 | I work just as hard as most people I know | | | | | |
| 5 | When I fail in a goal, I | | | | | |

| | immediately turn my attention to another goal | | | | | |
|---|---|---|---|---|---|---|

Use of Feed Back

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I don't get upset when given negative feedback about the way I perform | | | | | |
| 2 | I try to know more about the life stories of successful businessmen. | | | | | |
| 3 | Mistakes and failures overwhelm me so much I cannot learn from them. | | | | | |
| 4 | I am unwilling to charge my mind, once it is made up even in the face of new development. | | | | | |
| 5 | I find no reason to consult other people about how to run my business better because I am satisfied with the way I run it. | | | | | |

Self Confidence

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I accomplish most when I am alone, under no direct supervision of any one. | | | | | |
| 2 | I tend to overestimate my capabilities for succeeding in any venture. | | | | | |
| 3 | I doubt my ability to cope under new untested condition. | | | | | |
| 4 | I find difficulty in asserting myself against the opinion of majority | | | | | |
| 5 | Even if I am capable hardworking and ambitious, if I do not have the | | | | | |

| | money, I cannot start a business | | | | | |
|---|---|---|---|---|---|---|

Knowledgeability

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | The knowledge, experience and training I have on my proposed business is good enough. | | | | | |
| 2 | My competence is better than that of the ordinary man *in* my community. | | | | | |
| 3 | I want to have good knowledge of my market before I start my business | | | | | |
| 4 | I need not waste time and money on "market research" if the product sells, I will go on producing | | | | | |
| 5 | I don't see the importance of reading the newspaper every day. | | | | | |

Persuasability

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I don't get discouraged by an initial "No" from a buyer because I am usually able to convince him inevitably to my product | | | | | |
| 2 | I am able to stimulate and direct others | | | | | |
| 3 | I find it hard to beg, that is to ask favours from other people | | | | | |
| 4 | I have difficulties in obtaining | | | | | |

| | loans from people | | | | | |
|---|---|---|---|---|---|---|
| 5 | It is not so easy for me to get people to do what I want them to do. | | | | | |

Manageability

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I find nothing wrong in consulting expert advice regarding how I must manage my business. | | | | | |
| 2 | As an entrepreneur I need to practice basic managerial skills so that my business need not be a one man show for a concerted effort of myself and those who work for me. | | | | | |
| 3 | It is not necessary to be scientific and rational labour management as long as one has the will to do what he wants done | | | | | |
| 4 | I cannot be away too long from my business because no one else but I can manage its activities. | | | | | |
| 5 | I believe the sole proprietorship is the best form of ownership for a business to succeed. | | | | | |

Innovativeness

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | While my product/service may not entirely be new. I am thinking of new and better ways to make it competitive | | | | | |
| 2 | While others see nothing unusual in the surrounding. I am able to perceive in it new opportunities | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | for business | | | | | |
| 3 | I avoid changing the way things are done | | | | | |
| 4 | I have never tried introducing new products to the market and I do     not think I want to try | | | | | |
| 5 | Do you want to earn more money by starting new economic activity | | | | | |

Achievement motivation

| Sl.No. | Statements | SA(5) | A(4) | UD(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|---|
| 1 | I take pleasure on responding to challenges, so completion makes me work harder. | | | | | |
| 2 | In business I am more concerned with growth ( being a success) rather than with profit | | | | | |
| 3 | I want to earn only as much as to attain a comfortable way to live. | | | | | |
| 4 | I do not mind routine unchallenging work if they pay is good. | | | | | |
| 5 | I like people on the basis of friendship and other relations (for their loyalty) rather  than on the basis of competence. | | | | | |

Adoption of practices in coconut

| Sl. No. | Practices | Modified adoption (4) | Full adoption( 3) | Partial adoption( 2) | No adoption( 1) |
|---|---|---|---|---|---|
| 1 | Varieties:WCT,Keraganga, Kerasankara,Kerasree, , | | | | |

| | | Modified adoption (4) | Full adoption(3) | Partial adoption(2) | No adoption(1) |
|---|---|---|---|---|---|
| | Lakshaganga,Kalpamithra,Kalparaksha, Kerachandra,Chandrakalpa | | | | |
| 2 | Size of the pit:1.2m*1.2m*1.2m | | | | |
| 3 | Spacing: 7.6m*7.6m | | | | |
| 4 | Fertilizer application:0.5:0.32:1.2kg/palm/annum | | | | |
| 5 | Apply fertilizers and manures in circular basins at a radius of 2m from the base of the palm and 10 cm deep | | | | |
| 6 | To minimize the sun scorch on the trunk,application of lime solution on the trunk upto a height of 2-3 m is recommended | | | | |
| 7 | Burial of 2 layers of husks in the pits is useful for moisture conservation | | | | |
| 8 | Mulching is an effective method for moisture conservation | | | | |
| 9 | For moisture conservation,lowermost 3-5 leaves may be cut and removed | | | | |
| 10 | Hook out beetles | | | | |
| 11 | Leaf axil filling | | | | |
| 12 | Cut and removal of leaves for management of bud rot | | | | |

Adoption of practices in rice

| Sl. No. | Practices | Modified adoption (4) | Full adoption(3) | Partial adoption(2) | No adoption(1) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | Varieties : Jyothi,Makom,Jaya,Matta Triveni,Prathyasa,Pavizham, Jagannath,Aiswarya,Kanakom | | | | |
| 2 | Seed rate Transplanting:60-85 kg/ ha Broadcasting : 80-100 kg/ha Dibbling :80-90 kg/ha | | | | |
| 3 | Soak seed for 12 to 16 hours in a solution of *P.fluorescens* @10g/litre of water per kg of seed or Carbendazim 2g/kg of seed per litre | | | | |
| 4 | Apply compost or cattle manure @1.0 kg/m$^2$ of the nursery bed and mix well with soil at the time of preparation of field | | | | |
| 5 | Cowpea as intercrop in dry seeded low land (semi dry) rice by sowing 12.5 kg/ha seed along with rice | | | | |
| 6 | Fertilizer recommendation Upland local varieties: 40N:20 $P_2O_5$:30 $K_2O$ kg/ha Wetland high yielding short duration varieties:70N:35$P_2O_5$:35 $K_2O$ kg/ha  High yielding medium duration:90N:45 $P_2O_5$:45 $K_2O$ kg/ha | | | | |
| 7 | Transplant seedlings @ 2-3 seedlings per hill in rows and at a depth of 3-4 cm | | | | |
| 8 | Mass trapping with pheromone traps @ 8 traps/acre for yellow stem | | | | |

| | borer | | | | |
|---|---|---|---|---|---|
| 9 | Release of egg parasitoids *Trichoderma japonicum* for stem borer and *T.chilonis* for leaf folder | | | | |

Adoption of practices in banana

| Sl.no. | Practices | Modified adoption (4) | Full adoption (3) | Partial adoption (2) | No adoption (1) |
|---|---|---|---|---|---|
| 1 | Varieties:Chengalikodan,Robusta,Chenkadali,Poovan,Palayankodan,Njalipoovan,Karpooravally,Nendrapadathy,Batheesa | | | | |
| 2 | Treatment of suckers smeared with cowdung solution and ash and dried in sun for about 3-4 days | | | | |
| 3 | Spacing 2m*2m | | | | |
| 4 | Fertilizer recommendation 190:115:300 NPK g/plant | | | | |
| 5 | Intercropping with cucumber and amaranthus | | | | |
| 6 | Pest & diseases Set traps using pseudostem of approximately 0.5m length, which are split length wise and laid in the field for controlling rhizome weevil Apply quinalphos 0.05% or chlorpyriphos 0.03% for controlling pseudostem weevil Use disease free planting material for controlling viral diseases like banana bunchy top | | | | |

| 7 | Tissue culture banana | | | | |
|---|---|---|---|---|---|
| 8 | Spacing 2m*2m | | | | |
| 9 | Pit size 50cm*50cm*50cm | | | | |
| 10 | Double sucker planting at a spacing 3m*2m | | | | |

Adoption of practices in vegetables
1.VEGETABLE COWPEA

| Sl.No. | Practices | Modified adoption (4) | Full adoption(3) | Partial adoption(2) | No adoption(1) |
|---|---|---|---|---|---|
| 1 | Varieties : Bhagyalakshmy,Anaswara, Kanakamony,Sharika,Malika, Vyjayanthi,Vellayani Jyothika,Geethika | | | | |
| 2 | Seed rate Bush :20-25 kg/ha Trailing :4-5 kg/ha | | | | |
| 3 | Apply Glyricidia @ 4.5 t/ha along with neem cake @ 1t/ha and Trichoderma(1 kg/100 kg FYM) to manage root rot and collar rot | | | | |

 2.SOLANACEOUS VEGETABLES

| Sl.no. | Practices | Modified adoption (4) | Full adoption(3) | Partial adoption(2) | No adoption(1) |
|---|---|---|---|---|---|
| 1 | Varieties Brinjal:Surya,Swetha,Haritha,Neelima,Ponny | | | | |

| | | Modified adoption (4) | Full adoption(3) | Partial adoption (2) | No adoption(1) |
|---|---|---|---|---|---|
| | Chilli:Jwalasakhi,Jwalamukhi,Vellayani Athulya,Keerthi,Vellayani Samrudhi,Vellayani Thejus Tomato:Sakthi,Mukthi,Anagha,Vellayani Vijai,Manulekshmi and Manuprabha | | | | |
| 2 | Seed rate Brinjal:370-500g/ha Chilli : 1 kg/ha Tomato: 400 g/ha | | | | |
| 3 | Soil solarization of nursery beds for 30 days prior to sowing and seed treatment with Trichoderma (5g/kg seed ) is effective in managing damping off | | | | |
| 4 | Uproot and destroy the plants affected by bacterial wilt and mosaic | | | | |

3.CUCURBITACEOUS VEGETABLES

| Sl.no. | Practices | Modified adoption (4) | Full adoption(3) | Partial adoption (2) | No adoption(1) |
|---|---|---|---|---|---|
| 1 | Varieties Bitter gourd: Priya,Preethi,Priyanka Snake gourd:Kaumudi, Baby,Harithasree, Manusree Cucumber:Subhra,Heera Pumpkin:Ambili,Suvarna,Saras and Sooraj | | | | |
| 2 | Seed rate Bitter gourd:5-6 kg/ha Snake gourd:3-4 kg/ha Cucumber:0.5-0.75 kg/ha Pumpkin:1-1.5 kg/ha | | | | |
| 3 | Fertilizer dose recommendation:70:25:25 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | kg/ha | | | | |
| 4 | Setting up of pheromone traps(cue lure trap)@ one trap per 15 cents | | | | |
| 5 | Spray 2% talc based formulation of *Beauveria bassiana*+0.1% teepol at fortnightly intervals for the management of pumpkin caterpillar,leaf footed bugs | | | | |

Decision making ability

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

Economic motivation

| Sl.No. | Statements | SA(4) | A(3) | DA(2) | SDA(1) |
|---|---|---|---|---|---|
| 1 | The farmer should work towards larger yield and economic returns | | | | |
| 2 | The most successful farmer is one who makes the most profit | | | | |
| 3 | A farmer should try new farming areas which may give more money | | | | |

| 4 | A farmer should grow each crop to increase a monetory profit in comparison to growing to food crops for home consumption | | | | |
|---|---|---|---|---|---|
| 5 | It is difficult for farmers children to make good start unless he provides them with economic assistance | | | | |
| 6 | A farmer must earn his living but the most important thing in life cannot be defined in economic terms | | | | |

Dealing with failure

| Sl.No. | Statement | Almost always(5) | Fairly often(4) | About half of time (3) | Occasio nally (2) | Almost never(1) |
|--------|-----------|------------------|-----------------|------------------------|-------------------|-----------------|
| 1 | I try to be understanding and patient towards those aspects of my personality I don't like | | | | | |
| 2 | When something painful happens I try to take a balanced view of the situation | | | | | |
| 3 | When I'm feeling down ,I tend to feel like most other people are happier than I am | | | | | |
| 4 | I try to see my failings as part of the human condition | | | | | |

| 5 | When I'm going through a very hard time,I give myself the caring and tenderness I need | | | | | |
| 6 | When something upsets me I try to keep my emotions in balance. | | | | | |
| 7 | When I fail at something that's important to me,I tend to feel alone in my failure | | | | | |

Level of aspiration

| Sl. No. | Statements | True(2) | False (1) |
|---|---|---|---|
| 1 | Earn higher income through the marketing of different products | | |
| 2 | Develop agricultural land by ensuring sustainability | | |
| 3 | To start small enterprises other than agriculture | | |
| 4 | To run a petty shop | | |
| 5 | Others | | |

Creativity

| Sl. no | Statements | Always (5) | Very often (4) | Some time (3) | Rarely (2) | Never (1) |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | I devise novel methods to improve the quality of work | | | | | |
| 2 | I can develop alternative ways of doing work | | | | | |
| 3 | I can improvise ways to get things done if planned arrangements fail | | | | | |
| 4 | I think of new ways of solving problems | | | | | |
| 5 | I visualise unforseen deviations in planned course of action | | | | | |
| 6 | I use humour to get out of difficult situations | | | | | |

Credit orientation

| Sl.No | Statement | Yes (2) | No(1) |
|---|---|---|---|
| 1 | I should borrow credit for agricultural purpose | | |
| 2 | It is difficult to secure credit for agricultural purpose | | |
| 3 | I am treated badly when I go to secure credit | | |
| 4 | There is nothing wrong in taking credit from institutional sources for increasing farm production | | |
| 5 | I have used the credit in the last two years for crop production | | |

Good agricultural practices:

1.

2.

3.

CONSTRAINTS

| Sl.No. | Constraints | MI(4) | I(3) | LI(2) | NI(1) |
|--------|-------------|-------|------|-------|-------|
| 1. | Lack of availability of credit facilities on time | | | | |
| 2. | Cumbersome process in getting loan sanctioned | | | | |
| 3. | Seasonal factors | | | | |
| 4. | Unavailability of timely and skilled labour | | | | |
| 5. | Absence of good marketing avenues/facilities | | | | |
| 6. | Fall in market price | | | | |
| 7. | Pest attack  Any other (please specify) | | | | |

Strategies to overcome the constraints:

1.

2.