

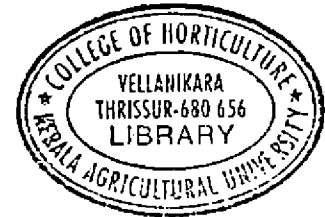
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**IMPACT OF TRAINING PROGRAMMES ON FARM  
MECHANISATION – A CASE STUDY**

**By**

**AKHIL KRISHNAN U**

**(2014-11-190)**



**THESIS**

**Submitted in partial fulfillment of the requirement**

**for the degree of**

**Master of Science in Agriculture**

**Faculty of Agriculture**

**Kerala Agricultural University**



**DEPARTMENT OF AGRICULTURAL EXTENSION**

**COLLEGE OF HORTICULTURE**

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**KERALA, INDIA**

## DECLARATION

I, hereby declare that this thesis entitled “**Impact of training programmes on farm mechanisation – a case study**” is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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Date: 20-04-2017


  
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## CERTIFICATE

Certified that this thesis entitled “**Impact of training programmes on farm mechanisation – a case study**” is a bonafide record of research work done independently by **Mr. Akhil Krishnan U (2014-11-190)** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, associateship or fellowship to him.

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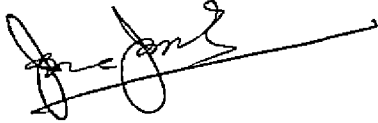
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We, the undersigned members of the advisory committee of Mr. Akhil Krishnan U (2014-11-190), a candidate for the degree of **Master of Science in Agriculture**, with major field in Agricultural Extension, agree that the thesis entitled “**Impact of training programmes on farm mechanisation – a case study**” may be submitted by Mr. Akhil Krishnan U, in partial fulfillment of the requirement for the degree.



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## *ACKNOWLEDGEMENT*

*I thank the God Almighty, for blessing me with health, strength and courage to get through all tedious circumstances and to complete this thesis.*

*With great respect and adoration, I would like to express the deepest gratitude to my major advisor Dr. S. Helen Professor, Communication centre, Mannuthy, for her support and guidance throughout the completion of this work. Without her advice, patience, friendly approach, and encouragement I will not have been able to complete this work. I really consider it my greatest fortune in having her guidance for my research work and my obligation to her lasts forever.*

*I wish to express my sincere gratitude to rest of my advisory committee members Dr. Jose Joseph, Dr. A. Latha and Dr. A. Sakeer Husain for their advice, valuable comments and timely help throughout the research work and course of study. I also thank Dr. Jayasree Krishnankutty Dr. Jiju P. Alex and Dr. M. J. Mercy Kutty for their advice and support during conducting defense seminar. A special note of thanks to Dr. S. Krishnan for his expert guidance during the analysis of data.*

*I take this opportunity to express my heartfelt thanks to all my friends and classmates who supported and helped me in numerous occasions during the course of the work. I am thankful to Vishnu, Sreejith, Sharath, Prince, Anoop, Nikhil Supritha, Jyolsna, Vasavi, Sabira, Seenu, Kusuma, Learou, Aparna, especially for helping me whenever I was in need. I would also like to thank the facilitators and all the Food Security Army members for their cooperation in conducting the survey.*

*I thank all the staff members of Agricultural Research Station and Central Training Institute, Mannuthy for allowing me to collect the secondary data and providing the data for my study.*

*I do not have words to express my gratitude towards my father, mother and sister who supported me by fulfilling all my needs. Their affection and trust was the motivation for me to complete this work on time.*

*I express my deep sense of gratitude to Kerala Agricultural University for financial and technical support for persuasion of my study and research work.*

*I owe special thanks to Central Library (Kerala Agricultural University), and Library (College of Horticulture). Dr. Francis and all other staff members of Library, who guided me in several ways, which immensely helped for collection of literature for writing my thesis.*

*It would be impossible to list out all those who have helped me in one way or another in the successful completion of this work. I once again express my heartfelt thanks to all those who helped me in completing this venture in time.*

  
Akhil Krishnan U

*Dedicated to*  
*My loving*  
*Family*

# *Introduction*

## 1. INTRODUCTION

Kerala, a consumer state heavily depends on neighboring states for its staple food, rice and for the daily consumption of vegetables. At present with much high cost and acute shortage of labour, farming as primary occupation turned non-remunerative. Due to low dignity, low income and more drudgery many farm labourers had moved away from farm sector to non-farm sector. According to the State Planning Board, in Kerala the area sown under paddy had reduced from 34.3 per cent to 7.5 per cent from 1955 to 2014. The harvest almost halved to 630,000 tons during this period, severely threatening Kerala's food security (Devi *et al* 2010). Farm mechanization is one of the important ways to overcome this situation. Adoption of farm mechanization will give farmers the option for raising second crop which would help to increase yield and income of farmers. Farm mechanization will also help to overcome the labour crisis and increase the efficiency of the farm labour force. Rice cultivation requires more labour and therefore mechanization is more important for rice cultivation in Kerala. However, the fragmented agricultural land is a major problem in Kerala for implementing farm mechanization.

Kerala economy is portrayed by general stagnation in farming as proved by fall in the share of agriculture and its allied activities. Gross State Domestic Product was around 32.6 per cent in 1980-81 from agriculture and allied activities; it was decreased to 8.83 per cent in 2013-2014. According to the National Sample Surveys on employment and unemployment, the share of occupational opportunity in agriculture has demonstrated an intense diminishing from 1983 to 2010. In 1983 the job opportunity in farming and associated segment was 57.40 per cent and in 2010 it was decreased to 29.5 per cent in the state. (Harilal and Eswaran 2015). A gigantic fall in the paddy production was seen from 1974-1975 to 2013-2014. In 1974-1975, the area under rice cultivation was 8.81 lakh ha and in 2013-2014 it was decreased to 1.93 lakh ha. Likewise, the production diminished from 13.30 lakh tones to 5.68 lakh tones (GOK, 2014). In 1974-75 the net sown area under food crops in Kerala was 45

per cent: it had reduced to 10 per cent in 2013-2014. A decrease in the area and production of food crops can be seen since 1970s. Kerala is producing only 15 per cent of the total food grain consumption of the state and fully depending on nearby states to meet the consumption needs. The productivity of rice in Kerala is very low compared to the productivity of other states. (Shiji, 2016). In 2008-2009 the productivity of rice in Kerala was 2,519 kg/hectare while that of the other states like Punjab (4,022 kg/hectare), Andhra Pradesh (3,246 kg/hectare) and Tamil Nadu (2,683 kg/hectare) were high (GOI, 2010).

Agricultural mechanization activities in Kerala were keeping a slow pace a decade ago and the extension activities on agricultural mechanization were also too slow. The farmers were constrained due to acute shortage of farm workers and low price of farm produce and several of them abandoned or deferred cultivation. As a result, extent of fallow land expanded and area under paddy cultivation in wet lands reduced. Due to the problems of drudgery, health and life insecurity and lack of social respect involved in farming operations, the younger generation could not be motivated or attracted to farming. Migration of conventional farm workers had taken place to other job areas where remuneration was more and physical drudgery was less. Lack of technically trained and skilled workers and inappropriate service and maintenance of farm machinery resulted in less use of whatever little machinery introduced. There was no focus on the service sector for the operations of farm machinery. Farmers were exploited by middlemen wherever machinery operation was introduced from outside the state.

The farmers were abandoning cultivation and younger generation were not showing enthusiasm for agriculture because of the absence of life security, social accreditation to farming as occupation and lack of social security (Jayikumaran and Joseph, 2012). The labour scarcity and high cost of cultivation were the primary reasons of decreasing agricultural production in Kerala. Mechanization was considered as a remedy to conquer the issue. However, absence of trained workers for



operating the machinery and the upkeep of the machinery, higher expense of machinery and small holdings were the factors which restricted the mechanization in Kerala. To overcome these problems the concept of Food Security Army (FSA) was introduced by Dr. U.Jaikumaran, an Agronomist and Head of Agricultural Research Station, Kerala Agricultural University, Mannuthy.

Since, human resource development in agricultural mechanization sector remained untouched, Agricultural Research Station, Mannuthy took up the Agricultural Human Resources Development Programme and introduced associate innovative concept of 'AMOSC' (Agro Machinery Operation Service Centre) on 2008 along with the concept of Food Security Army. In AMOSC, there are master trainers who had undergone apprenticeship training in the operations, service and maintenance of machinery, they are master trainers for FSA training. They are the Agro Machinery Operation Service Executives (AMOSE). The service of the master trainers is utilized for imparting training through Mobile Agro Machinery Training Unit (MAMTU) to form a new group of Food Security Army.

Mobile Agro Machinery Training Unit (MAMTU) transports their machinery to the operational area of training and provides training to the trainees on the field for a period of 20 days. After completing the training the trainees are enrolled as the members of FSA.

The trainees were provided training for 20 days duration on various aspects of agricultural mechanization. The training schedule included physical training, drill and parade, which was structured on the lines of training in Indian Army.

The trainees are trained on the operation, repair and service of machinery and the field operations utilizing farm machinery. Discipline, punctuality and dress code are maintained during the training programme. After completing the training period, a ceremonial passing out parade is conducted and the certificates are distributed to the trainees at the passing out ceremonial function.

The training for the members are carried out at three-levels, the first level of the classes is purely focused on theoretical knowledge on the machines. At the second and third level, participants are introduced to enterprise based training. This kind of disciplined training attracts more and more youth into agriculture.

At the training period the trainees are provided with uniforms of Food Security Army, cap and a pair of shoes. The trained group can get the Food Security Army's uniform from the Agricultural Research Station, Mannuthy on payment basis as and when they need a set of uniform.

Agricultural Research Station, Manuuthy had completed training under Food Security Army to 236 batch including 5203 trainees, with 2910 males and 2293 females, till 2016 for operating and maintenance of the farm machinery. Each and every group of the trainees who have undergone the training are enrolled as a society, named as AMOSC (Agro Machinery Operation Service Center) according to the draft bye law formulated under 1955, 12<sup>th</sup> Act Travancore Cochin Literary Science and Charitable Trust Registration Act.

One of the successful missions of Food Security Army was 'Operation Ponnamutha; Thrissur. Using twenty four transplanting machines, the force had completed transplanting of 300 acres of land within five days in kole lands. Normally it takes 30 days to transplant 300 acres using 200 farm laborers. Likewise, Food Security Army has done many successful operations of rice transplanting within a short period using minimum trained labourers.

Even though Agricultural Research Station, Mannuthy has conducted 236 training programmes on farm mechanization as on 2016, few studies were conducted to assess the impact of training among the trainees, Food Security Army or Agro machinery service centers on rice production and the farming community. There is no specific case study on the impact of the training programmes on farm mechanization among the trainees.

The trained manpower on farm mechanization throughout the state was developed by ARS, Mannuthy over a period of 10 years. It is high time to assess the impact of training on farm mechanization among the stake holders of farm sector. Therefore, the study was conducted with the following objectives:

### **Objectives**

1. To assess the impact of the training programmes on farm mechanization conducted by Agricultural Research Station, Mannuthy.
2. To conduct SWOC analysis of the training on farm mechanization among the selected trainees.
3. To explore the socio-economic and developmental consequences of the training programmes through a case study method.

### **Limitations**

The Food Security Army has been formed and functions in every district of Kerala. For the study, the samples were drawn from three districts of Kerala and the results may not reveal the entire situation in Kerala. The results of the study are based on the data collected from the trainees through pretested interview schedule. The trainees shared the information from their memory which may not be precise on the exact situation. However, earnest efforts were taken by the researcher to make it free from all sorts of biases and prejudices.

### **Scope of the study**

The assessment of impact of the training programme on farm mechanization will bring out the socio economic changes that happened in the lives of the trainees. The results of the study will help to identify the problems faced by the Food Security Army members and provide information about the current status of the trainees. The findings and conclusion from the present study can be utilized to enhance the effectiveness of the trainings on farm mechanization and improve the performance of the members of the Food Security Army.

# *Review of Literature*

## **2. REVIEW OF LITERATURE**

This chapter is presented with the concepts and findings of the research previously conducted related to the objectives of this study. Literature directly related to the study was very less. However, keeping the objectives of the study in mind, results which are directly or indirectly related to the study are given below under the following sub headings:

- 2.1 Profile characteristics
- 2.2 Achievement motivation
- 2.3 Scientific orientation
- 2.4 Risk orientation
- 2.5 Social participation
- 2.6 Mass media utilization
- 2.7 Innovativeness
- 2.8 Need for farm mechanization
- 2.9 Impact of training programme
- 2.10 SWOC analysis
- 2.11. Case study on farm mechanization

### **2.1 Profile characteristics**

#### **2.1.1 Age**

Sridhar (2002) pointed out that 44.67 per cent of the selected respondents belonged to middle age category, 28 per cent of the respondents were youngsters and 27.3 per cent belonged to old age group.

Raghunandhan (2004) stated that 45 per cent of the respondents were middle aged followed by old aged with 36.25 per cent and the number of youngsters were very less, they constituted only 18.5 per cent.

Kumaran (2008) reported that 59 per cent of the respondents were old aged.

Chavan *et al* (2010) reported that the age and cultivation experience showed negative and significant association with the training need of the respondents.

Lekshminarayanan and Shankaranarayanan (2011) reported that around 36.70 per cent of the farmers were youngsters, followed by old aged with 33.33 per cent and 30 per cent of the farmers were middle aged.

Venkataswarao *et al* (2012) noticed that 50 per cent of the farmers attended farmers field school came under middle age category i.e. more than half of the total participants. He also noticed that 43 per cent of the non-participants in farmer's field schools were old aged.

Singh and Pandey (2012) reported that among the model training 53.12 per cent of the trainees belonged to old age group, 37.53 per cent of the trainees came under middle age and 9.3 per cent of the trainees came under young age.

Ghosh *et al* (2013) reported from his study on the impact assessment of the farmers training that 54.7 per cent of the respondents came under middle age followed by 31.4 per cent with young age and least category came under old age with 13.81 per cent.

Sharma *et al* (2015) reported that 56.67 per cent of the respondents were middle agers followed by 26.67 per cent came under old agers and only 16.67 per cent came under youngsters.

Kavad *et al* (2015) reported that 65 per cent of the respondents came under middle age category followed by 18 per cent under young age and only 17 per cent came under old age category.

Barman *et al* (2016) revealed that majority of the trainees were under young age category (below 35 years) 34.8 per cent followed by middle age category (35-50 years) and only 5.3 per cent of the respondents were old age above 51 years.

Baraiya and Baraiya (2016) noticed that 58.6 per cent of the trainees were middle aged (25-35 years) followed by old age (above 35 years) with 29.3 per cent and only 12 per cent of the them were young aged (18 to 25 years)

### **2.1.2 Education level**

Throat (2005) reported that among the sample selected for study on poultry farmers, around two fifth of the respondents completed their college level education (39.09 per cent) and one third of the respondents (34.55 per cent) had an educational status up to higher secondary level and secondary level and from the total sample size only 7.27 per cent of the respondents were illiterate.

Desmukh *et al* (2013) reported that around half of the respondents (46 per cent) had an educational status up to secondary level, the respondents having higher secondary education qualification was 23 per cent, 13 per cent of the respondents had completed their college level, only 11 per cent of the respondents completed their

primary level education and from the selected respondents only 7 per cent of the respondents were illiterate.

Sharma *et al* (2015) reported that 60 per cent of the respondents completed their high school education followed by 35 per cent completed their primary education and only 5 per cent of the respondents had education above high school.

Kaur and Aulakh (2015) reported that 37.3 per cent of the respondents were metric pass, 25.5 per cent completed their secondary class, 20 per cent were illiterates and only 17 per cent were graduates.

### **2.1.3 Family size**

Nath (2002) reported that around 76 per cent of the laborers had a family size of four to five members.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that forty four per cent of the respondents had four individuals in their families and the vast majority of them lived in nuclear family.

Soni and Soni (2015) reported that 59 per cent of the respondents had family size above 5 members followed by 33 per cent had family size up to 3 to 4 members and only 8 per cent had family size upto 2 members.

Kaur and Aulakh (2015) reported that 58.2 per cent of the respondents had four members in the family and 41.8 per cent of the respondents had family size consisting of five members in the family.



Barman *et al* (2016) reported that 53.33 per cent of the respondents had smaller family with less than five members followed by 44 per cent had medium family (6-10 members) and 2.67 per cent of the respondents had large family (more than 10 members).

#### **2.1.4 Annual Income**

Kumaran (2008) studied with respect to income, almost two-third (66 per cent) of the respondents acquired not as much as Rs. 30000 per annum, in which 32 per cent of them earned Rs. 20000 as household income.

Prabhu (2011) reported that with respect to the yearly income, 54.45 per cent of the respondents earned wage between Rs.30001 and Rs.45000 and 41.11 per cent in the wage range between Rs. 15001 and Rs.30000.

Kaur and Aulakh (2015) reported that 67.3 per cent had one lakh annual income and the remaining trainees had an income ranging from one to two lakhs.

Barman *et al* (2016) revealed that 44 per cent of the respondents had low income (upto Rs 20000 /annum) status followed by 30.67 per cent had very high income (above Rs 50000 /annum) status, 14.67 per cent have higher income status (Rs 30001 to Rs 50000) and only 10.66 per cent had medium level of income (Rs 20001 to Rs 30000).

#### **2.1.5 Land holdings**

Reddy (2005) reported that 64 per cent of the farmers came under semi medium land holders, 22 per cent of the famers had medium sized land holding,

10.67 per cent of the farmers had small sized land holding and 3.33 per cent of the farmers owned big sized land holding.

Lekshminarayanan and Shankaranarayan (2011) reported that 36.7 per cent of the respondents had large sized land holdings followed by medium holders with 33.33 per cent and small holders were 30 per cent.

Desmukh *et al* (2013) reported that 29 per cent of the respondents came under medium category followed by semi medium category with 27 per cent third came small farmers with 22 per cent and only 11 per cent of the respondents came under large and marginal level farmers.

Kumar (2016) noticed that 63.33 per cent of the respondents had a land holding of 1 to 2 hectares followed by 35.83 having a land holding of less than 1 hectare.

Kaur and Aulakh (2015) reported that 71.8 per cent of the trainees were land less, 17.3 per cent were small farmers (up to 1.5 ha), and 10.9 per cent were medium farmers (2-3 ha).

Barman *et al* (2016) revealed that 49.33 per cent of the trainees were small farmers owned 1 to 2 ha followed by semi medium farmers owned 2-4 ha, 18.67 percentage of the trainees came under marginal farmer (below 1 ha) and only 4 per cent of the farmers came under medium level (4-10ha).

#### **2.1.6 Occupational status**

Dalapathi (2010) reported that the main occupation of 58.4 per cent of the respondents was agriculture labour, 19.3 per cent had agriculture and self-

employment, 15.6 per cent went for non-agricultural labour and only 5 per cent were non agriculturally self-employed.

Padhi *et al* (2010) found that the occupation of vast majority of the respondents were farming in all the studied regions and after that they went for casual labour in non-agriculture or self-employed in agriculture.

Shilpa (2013) reported that 36.66 per cent of the respondents depended on agriculture alone for their occupation 36.66 per cent depended on agriculture plus private employment and only 8.33 per cent of the respondents depended on agriculture and government employment.

Biswas *et al* (2014) reported that 58.3 per cent of the respondents engaged in agriculture alone followed by 13.89 per cent engaged in own occupation, 11.1 per cent of the respondents engaged in business and labour, only 5.56 per cent of the respondents engaged in other occupations.

Kaur (2016) reported that 54.1 per cent of the respondents engaged in farming followed by 16.5 per cent engaged in business activities and 8.2 per cent engaged in services.

Barman *et al* (2016) stated that occupation of 44 per cent of the trainees was farming and also worked as skilled labour followed by 33.33 per cent only depended on agriculture alone as occupation and 14.67 per cent depended on agriculture and business activities and 5.33 per cent depended on agriculture and service.

## **2.2 Achievement motivation**

Sreedaya (2000) reported that achievement motivation had a positive and significant relationship with satisfaction of the farmers.

Birajdar (2002) revealed that 47.50 per cent of the respondents showed higher level of achievement motivation followed by 42.50 per cent of the respondents had lower level of achievement motivation and only ten per cent of the respondents showed medium level of achievement motivation.

Nagesha (2005) found that three fourth (80.84 per cent) of the respondents showed medium level of achievement motivation, followed by 11.66 per cent with lower achievement motivation and only 7.50 per cent had higher achievement motivation.

Maraddi (2006) observed that 59.45 per cent of the respondents showed medium level of achievement motivation, followed by 27.22 per cent of trainee showed low level of achievement motivation and only 13.33 per cent of farmers had higher achievement motivation.

Ravi (2007) revealed that 30.00 per cent of the respondents came under higher achievement motivation category, followed 32.50 per cent with lower achievement motivation and only 37.50 per cent had medium level of achievement motivation.

Sushma (2007) stated that 35.39 per cent of the trained women entrepreneurs showed higher achievement motivation, followed by 34.61 per cent with lower achievement motivation and only 30.00 per cent of them had medium level of achievement motivation.

Kumar *et al* (2012) reported that 50.83 per cent of the respondents showed medium level of achievement motivation, followed by 40 per cent with higher achievement motivation and 9.17 per cent of respondents had low achievement motivation.

Naik (2012) expressed that 42.92 per cent of the respondents had medium level of achievement motivation, 23.74 per cent had lower level of achievement motivation and only 33.33 per cent of the respondents had higher level of achievement motivation.

Chandran (2015) reported that the respondents showed medium level of achievement motivation (72 per cent) followed by high level of achievement motivation (28 per cent).

Krishnamurthy *et al* (2016) noticed that majority of the respondents came under medium level of achievement motivation with 38.89 per cent followed by 32 per cent with low achievement motivation and only 28.89 per cent had higher achievement motivation.

### **2.3 Scientific orientation**

Kumar (2003) reported that 68.25 per cent of the cotton farmers who showed medium level of scientific orientation followed by higher level of significance with 16.88 per cent and lower level of scientific orientation with 15 per cent.

Parashar (2004) noticed that among the respondents, around 78 per cent of the respondents showed medium scientific orientation followed by low scientific orientation (20 per cent).

Kher *et al* (2005) noticed that from the selected respondents 42.31 per cent of the respondents showed medium level of scientific orientation, followed by 30.77 per cent having higher scientific orientation and 26.9 per cent of the respondents had lower level of scientific orientation.

Chouhan *et al* (2013) reported that 67.50 per cent of the selected respondents showed medium level of scientific orientation followed by higher rate of scientific orientation with 17.50 per cent and lower level of scientific orientation with 15 per cent.

Kumar (2015) reported that 62 per cent of the respondents had medium level of scientific orientation followed by low (21 per cent) and high (17 per cent) levels of scientific orientation.

#### **2.4 Risk orientation**

Kumar (2003) reported that 75.6 per cent of the farmers raising bt cotton had medium risk followed by low risk takers with 31.67 per cent and higher risk takers with 28.33 per cent.

Throat (2005) found that 66.67 per cent of the respondents were medium risk takers (orientation) followed by high risk takers with 22.73 per cent and low risk takers with 10 per cent.

Rabari (2006) reported that 66.7 per cent of the tomato growers showed a medium level of risk orientation followed by low risk orientation with 20 per cent and 13.33 per cent of the respondents were medium risk takers.

Venkataswarao *et al* (2012) noticed that 47 per cent of the respondents had higher risk orientation and 60 per cent of the respondents showed medium risk orientation.

Rubeena (2015) reported that 63.3 per cent of the selected respondents showed medium level of risk orientation followed by 20 per cent showed higher risk orientation only 16.67 per cent of the respondents showed lower risk orientation.

Barman *et al* (2016) reported that 49.33 per cent of the respondents had higher risk taking ability followed by 40 per cent had lower risk taking ability and only 10.67 per cent had medium level of risk taking ability.

## **2.5 Social participation**

Viju (1985) reported that the farmers showed positive attitude towards the training and visit system and had better social participation.

Sasankan (2004) found that the respondents had medium level of social involvement because of the absence of sound foundations and extension contacts.

Reddy (2003) stated that dominant part of the respondents (60 per cent) showed medium level of social participation.

Milkah (2006) pointed out that around 44.7per cent of the respondents showed medium level of social participation, 41.6 per cent of the respondents had lower level of social participation and 13.5 per cent of the respondents had higher level of social participation.

Manoj (2008) reported that among the KVK adopted villages around 62.5 per cent of the respondents showed a medium level of social participation and the higher and lower level of social participation of the respondents was 18.25 per cent each.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that with respect to social participation, 95 per cent of the respondents took part in gramasabha meeting.

Radhod and Damodhar (2015) reported that 65 per cent of the respondents from Mahila Arthik Vikas Mahamandal (MAVIM) had membership in more than 2 organizations followed by 30 per cent having membership in one organization and only 5 per cent did not have membership in any of the organization.

Barman *et al* (2016) revealed that 44 per cent of the trainees didn't have membership in any of the organization, 22.67 per cent were office bearers in one organization, 20 per cent had membership in one organization, 8 per cent had membership in more than one organization and 5.33 per cent were office bearers in more than one organization.

## **2.6 Mass media utilization**

Sharma *et al* (2014) reported that television (80.71 per cent) was the most favored mass medium among the farmers for getting information about modern agricultural technologies followed by radio (67.85 per cent) and newspaper (55 per cent).



Prabhu (2011) reported that 97.78 per cent of the respondents had exposure to television and 58.89 per cent of them listened radio.

Deshmukh et al (2013) noticed that majority of the respondents selected for the study showed a medium level of mass media exposure.

Beevi (2014) stated that major part (58.34 per cent) of the agriculturists had medium level of mass media exposure.

## **2.7 Innovativeness**

Mukherjee (2003) reported that the innovative intervention played superior implications in enhancing productivity.

Chinchu (2011) reported that 58 per cent of the beneficiary farmers of state horticulture mission Kerala were good innovators and early adaptors of improved agricultural practices.

Rubeena (2015) reported that 56.67 per cent of the respondents showed medium level of innovativeness followed by 23.33 per cent showed low innovativeness and 20 per cent of the respondents had higher innovativeness.

Kumar (2015) reported that 60 per cent of the respondents showed medium level of innovativeness followed by high and low levels of innovativeness 20 per cent each.

## 2.8 Need for farm mechanization

Verma (2006) reported that farm mechanization led to the increase in the productivity of the farm labour and it also increased the agricultural production and productivity. Mechanization increased the job opportunity for the on farm and off farm activities. Mechanization helped to increase overall production with lower cost of production.

Balachandran (2004) reported that the transplanting and harvesting were the most labour intensive and difficult work in rice cultivation followed by threshing, lack of custom hire facilities for farm machinery was the main constraint for mechanization in kule lands.

Pillai (2004) reported that the rice cultivation in Kerala required more labours per hectare than the labours required in other states. In Kerala labour requirement for rice cultivation was 1000-1200 man hours /ha but in other states was as lesser as only 800 man hours /ha. The only way to minimize the labour requirement was by implementing mechanization. He also listed out 23 major farm implements which would help to reduce human labour.

Thomas and Jose (2011) highlighted that the steady decrease in the area under rice and a huge decrease in production noticed in Kerala it could be changed by importing latest technologies. The agricultural mechanization was also in an infant stage in Kerala.

Prabakar *et al* (2011) reported that labour scarcity was the cause for decrease in productivity level of almost all crops, it led to change in cropping pattern. The reasons for labour scarcity in agriculture were high wage rate in other locally

available jobs, seasonal availability of agricultural jobs, and low status for agricultural jobs. The solution for overcoming the labour scarcity is adoption of labour saving implements and technologies.

Das (2012) observed that mechanization was very essential for raising the rice productivity in upland rain fed and low land and to increase the cropping intensity in irrigated farms. Mechanization of small farms played a very important role in increasing the rice production and productivity by completing the field operations at time.

Manimekalai *et al* (2012) revealed that the time saving and perfection were the reasons for the adoption of farm mechanization and that the lack of availability of labour and higher wage rate for the labour were the causes for adopting the machinery for rice cultivation in Thiruvallur in Tamil Nadu.

Biswas *et al* (2014) reported that the sustainable practices which made remarkable change on yield and income level of the respondents were drum seeder, SRI, zero tillage, jute seed drill and IPM practices.

## **2.9 Impact of training programmes**

Kher *et al* (2005) reported that use of new or enhanced inputs and adoptions of technology in agriculture were essential in increasing agricultural productivity.

Kumar (2007) found that the trainings showed a substantial increase in the knowledge and the adoption of beneficiary farmers compared to the non-beneficiary farmers.

Dubey *et al* (2008) found that the trainings from the KVK were successful to bring significant change in the socio economic status and it also increased the knowledge level of the trainees.

Reddy *et al* (2005) conducted a study on the effectiveness of the trainings and found that the trainings were effective. It gave an index of 69.38 per cent which showed that the trainings were moderately successful in all its aspects.

Jaikumaran and Joseph (2012) reported that the Food Security Army training imparted skill and confidence among the trainees for operating agro machinery and its repairing.

Gosh *et al* (2013) reported that impact of training was realized through improvement in awareness, attitude and skill of farmers who had undergone the training. The increase in skill and awareness of trainees was in a rate of range of 65 per cent to 70 per cent and the trainings created positive impact on the farmers about the modern scientific techniques for scaling-up of water productivity in agriculture.

Singh and Singh (2014) found that majority of the trainees who attended training programmes under ATMA increased their skill and knowledge and the trainings had an effectiveness of 54.6 per cent.

Singh *et al* (2015) reported that the respondents of the training programme did not utilize their attained knowledge into actual practice because of high risk involved in it.

Dixit *et al* (2014) stated that the training programs helped the farmers to increase their efficiency and it also educated them to use their resources in a most efficient and balanced way.

Gautam *et al* (2014) reported that the knowledge level of the trained respondents were more than the un trained respondents. Around 64 per cent of the trained respondents had medium knowledge level and 52 per cent of the untrained respondents had low level of knowledge level.

Sharma *et al* (2014) found that the well planned training programmes and its follow up activities not only increased the skill and knowledge it also increased their production and profit.

Dixit *et al* (2014) observed that the training imparted significant gain in knowledge to the goat farmers and it also improved the efficiency of the farmers by educating them about using the resources in an efficient and balanced way. It also exposed them towards the latest goat technologies.

Singh *et al* (2015) indicated that the respondents had attained knowledge in all the fields in which the trainings had been imparted. The trainees revealed that they gained higher knowledge about off season vegetable and flower cultivation and production of vermi compost and its marketing.

Sabharval and Panwar (2015) noticed great difference between pre and post training exposure. He noticed that knowledge and attitude showed higher significance and maximum number of respondents showed higher knowledge about the products, ingredients and its method of preparation.

Singh and Tripathi (2016) reported that out of 511 employees the training had improved the career of 341 respondents. 106 respondents responded that the training was only revision for old known things. For 60 respondents the training was not effective for them and it didn't impart any substantial knowledge for them.

Jors *et al* (2016) reported that the farmers trained on IPM showed considerable improvement in their performance from first evaluation (2002) till the last evaluation (2009). He also noticed that diffusion of knowledge had been noticed from trained farmers to the neighboring farmers. They had performed better compared with a control group on 2009.

Baraiya and Baraiya (2016) reported that the training had imparted higher knowledge gain to the trainees and training had a positive impact on trainees. The data revealed that in the pre evaluation test the knowledge level ranged from 4.00 per cent to 79.33 per cent. In post evaluation the knowledge level was in a range of 22.67 per cent to 94.67 per cent.

Tayade and Chindmaltpure (2016) reported that before training majority of respondents showed lower knowledge level and after the training the respondents showed medium level of knowledge. The training had a positive impact on the trainees.

Thumar *et al* (2016) noticed that the training had positive impact on trainees and the overall knowledge of the trainees had increased after the training.

Dole *et al* (2016) reported that 15 days training had imparted higher knowledge gain for the trainees due to the way of conducting the training. The mean index of knowledge gain was 34.48 before training and after training it had increased to 91.36.

Kaur (2016) reported that the score of pre training knowledge was not satisfactory and the score of knowledge after the training was satisfactory in all aspects.

Schreinemachers *et al* (2016) reported that the training helped the respondents to improve the crop output, land productivity, profitability and net household income.

## **2.10. SWOC analysis**

### **2.10.1. Strengths**

Thomas and Siddayya (2011) reported that the major strengths of labour bank were bringing scattered labour community together, increased the employment opportunities and the working days and setting up of defined organizational structure.

Kumar *et al* (2012) observed that the strengths of mechanization in paddy field were, it provided more work efficiency compared to manual methods, it helped to maintain uniform planting space, number of plants per hill, and provided more yield.

Pandey (2013) reported that the major strength of farm mechanization was more custom hiring of tractor drawn equipment like cultivator and thresher.

Alam (2014) reported that the major strength of farm mechanization in the area was craftsman who could be trained on improved farm equipment and KVKs in the region conducted demonstrations and trained farmers for operating improved farm equipments.

Olaoye *et al* (2014) found that the institution had provided training to farmers, operators and project supervisors on latest technology on farm mechanization practice and an area of 4- 10 ha farm land was allocated for farm settlement. This enhanced mechanization and acted as suitable methods of technology improvement.

Agricultural Engineering Service Directorate (2015) stated that the sowing, transplanting and harrowing services had been increased and improved due to the increase in number of tractors and the services for variety of implements increased like sprayer, sheller and combine harvester.

### 2.10.2 Weaknesses

Thomas and Siddayya (2011) reported that the major weaknesses of labour bank were absence of adequate financial mobilization, high institutional dependency, limited area of operation, lack of managerial experience and lack of social profile of the members.

Kumar *et al* (2012) reported that the weaknesses of mechanization in paddy field were not suitable for light textured soils, required experts for proper operation, better care was required for raising mat nursery a single mistake would cause to failure of the nursery.

Pandey (2013) reported that the major weaknesses was there were no time specific mechanization strategies by state government to accelerate sustainable agricultural development, there were no mechanization in fruits and vegetables and the manufacturers were producing sub-standard implements without use of standard production technique.

Alam (2014) reported that the major weaknesses of farm mechanization in the area were small land holding, lack of credit support, less mechanization in



horticulture sector, poor extension, infrastructure, scattered farms and gender bias in farm mechanization.

Olaoye *et al* (2014) expressed that the farmers followed same amount of manual operations with mechanical operations which caused low productivity as related to their farm mechanization index and they had low income earnings, other weaknesses were lack of modern infrastructural facilities, lack of availability of electricity in some areas and due to the low level education status of the respondents. They were unable to read the operators manual.

Agricultural Engineering Service Directorate (2015) reported that the main weakness was the higher cost of spare parts and decreased profitability because of the break down and repairs.

### **2.10.3 Opportunities**

Thomas and Siddayya (2011) reported that the major opportunities of labour bank were channelization of government funds, initiating agro-industrial ventures increased area under cooperative farming.

Kumar *et al* (2012) reported that the opportunities of mechanization in paddy field were government would provide good subsidy for the machinery farmers could increase their income by lending or custom hiring, it reduced the labour requirement for various operations, provided more employment generation for repair and service.

Pandey (2013) reported that the major opportunities were use of animal drawn puddler, manual cono weeder, manual rice transplanter, manual pregerminated rice seeder, self-propelled rice transplanter and multicrop thresher. The machinery had

tremendous scope for mechanizing different agricultural operations in paddy and thereby they could save a good amount of money from farm operation. Farm mechanization gaps could be reduced by regular supply of improved farm equipments through strong network, and there was high scope for mechanize fruits and vegetable cultivation to eliminate human drudgery.

Alam(2014) reported that the major opportunities of farm mechanization in the area were increased production and productivity, availability of farm power was very low which had to be increased substantially and mechanization could help the people to earn more and made their life devoid of drudgery and attain socio-economic prosperity

Olaoye *et al* (2014) reported that the job opportunities for the youngsters had increased and the public got opportunities for hiring the equipments.

#### **2.10.4 Challenges**

Thomas and Siddayya (2011) reported that the major challenges faced by labour bank were the action of contractor lobbying against labour bank reduced job opportunities migrant laborers worked at lower wages and intra group conflicts.

Kumar *et al* (2012) found that the challenges of mechanization in paddy field were lack of training for raising nursery, lack of training for operationalizing machinery, higher initial cost for machinery and lack of spare parts availability.

Pandey (2013) reported that the major challenges of farm mechanization were fragmented small land holdings limited use of farm machinery and use of traditional hand tools which caused problem of low output capacity, human drudgery and low

yields. There was no mechanization strategy by the State for sustainable agricultural development.

Alam (2014) reported that the major challenges of farm mechanization in the area were: Failure in maintaining the desired level of mechanization and failure in achieving modernization in agriculture

Olaoye *et al* (2014) highlighted that the main challenges faced by the respondents were lack of crop insurance for crop failure which reduced their morale on the effort towards farm mechanization. The reduced cash flow for agricultural machinery, increased cost of technology and inadequate consultant services were also major constraints faced by the respondents.

### **2.11 Case studies on the impact of farm mechanization**

Gosh (2010) stated that the mechanization in his study area was moderate almost all the respondents in the area adopted high yielding varieties and followed mechanized ploughing, familiarized with the usage of sprayer thresher etc. The main problem faced by the respondents was: lack of trainings for utilizing modern machinery. Most of the respondents depended on hired machinery for their field operations. Mechanization in agricultural sector attracted more youngsters towards agricultural sector.

Hormozia *et al* (2012) noticed that in mountain areas the paddling method and the various tillage methods showed a positive result in the production and the role of the machinery in the harvesting stage had huge significance. The mechanization had a strong impact on the technical efficiency of the rice producers.

Padre (2016) reported that in 2009 Food Security Army had their greater achievement in Ponnamutha, 200 Food Security Army members covered transplanting in 300 acres within a period of 6 days normally consumed 30 days for transplanting using 200 labours but the Food Security Army members achieved the target in 6 days using machinery.

# *Methodology*

### **3. RESEARCH METHODOLOGY**

Research methodology is a detailed plan of investigation and the blueprint of the procedure of doing a research work. It reveals the procedure of research implemented for the current study. The search for knowledge towards the direction of the assessment of impact of the training programmes on farm mechanization was done scientifically. Through well-defined steps, this research problem was approached. The methodologies used for this study are listed and described under the following headings:

- 3.1. Research design
- 3.2. Selection of the study area
- 3.3. Description of the study area
- 3.4. Selection of respondents
- 3.5. Selection of variables under study
- 3.6. Operationalization and measurement of independent variables
- 3.7. Operationalization and measurement of dependent variables
- 3.8. SWOC analysis
- 3.9. Constraint analysis
- 3.10. Case study
- 3.11. Statistical tools used for the study

#### **3.1. Research design**

Research design lays the foundation for conducting the research. According to Kerlinger (1986), the research design gave direction and showed how the research

should be planned and carried out. Based on the set objectives, the ex post fact research was conducted among the trainees of the training programmes on farm mechanization conducted by Agricultural Research Station, Mannuthy.

### **3.2. Selection of study area**

The central zone of Kerala was selected purposively for the study as majority of the trainees concentrated in the central zone during the period of study. Thus, Palakkad, Thrissur and Ernakulam districts constituting the central zone formed the area of study.

### **3.3. Description of study area**

Palakkad district is located in the north-eastern part of Kerala. Geographically Palakkad district is rich in midland with valleys, plains, high land with mountainous peaks and dense forests. The climatic condition is tropical humid climate and receives an annual rainfall of 2135 mm. Palakkad district has good irrigation facilities compared to other districts. Palakkad district has the largest share of net irrigated area (GOK, 2014). Palakkad district consists of 40 per cent net area irrigated to net area sown. The cropping pattern of Palakkad district includes food crops such as paddy, groundnut, and pulses etc. Twenty five per cent of the paddy production in Kerala state is contributed by Palakkad district. The gross cropped area in Palakkad district is 3.3 lakhs hectares. Palakkad district had an area of 79201 ha under paddy cultivation and the production was 189229 million tones and productivity was 2389 Kg in 2012-13 (Mukesh, 2015). The main problem faced by the paddy farmers was acute shortage of labour and increased wages for farm workers.

Ernakulam district is located in the Middle of the state geographically; Ernakulam consists of highland, midland and low land (coastal belt). Ernakulam has tropical humid climate. Ernakulam district has a geographical area of 3,068 km<sup>2</sup>. The

average annual rainfall received in Ernakulam district was 3432 mm. Net area irrigated to net area sown was 30.6 per cent.

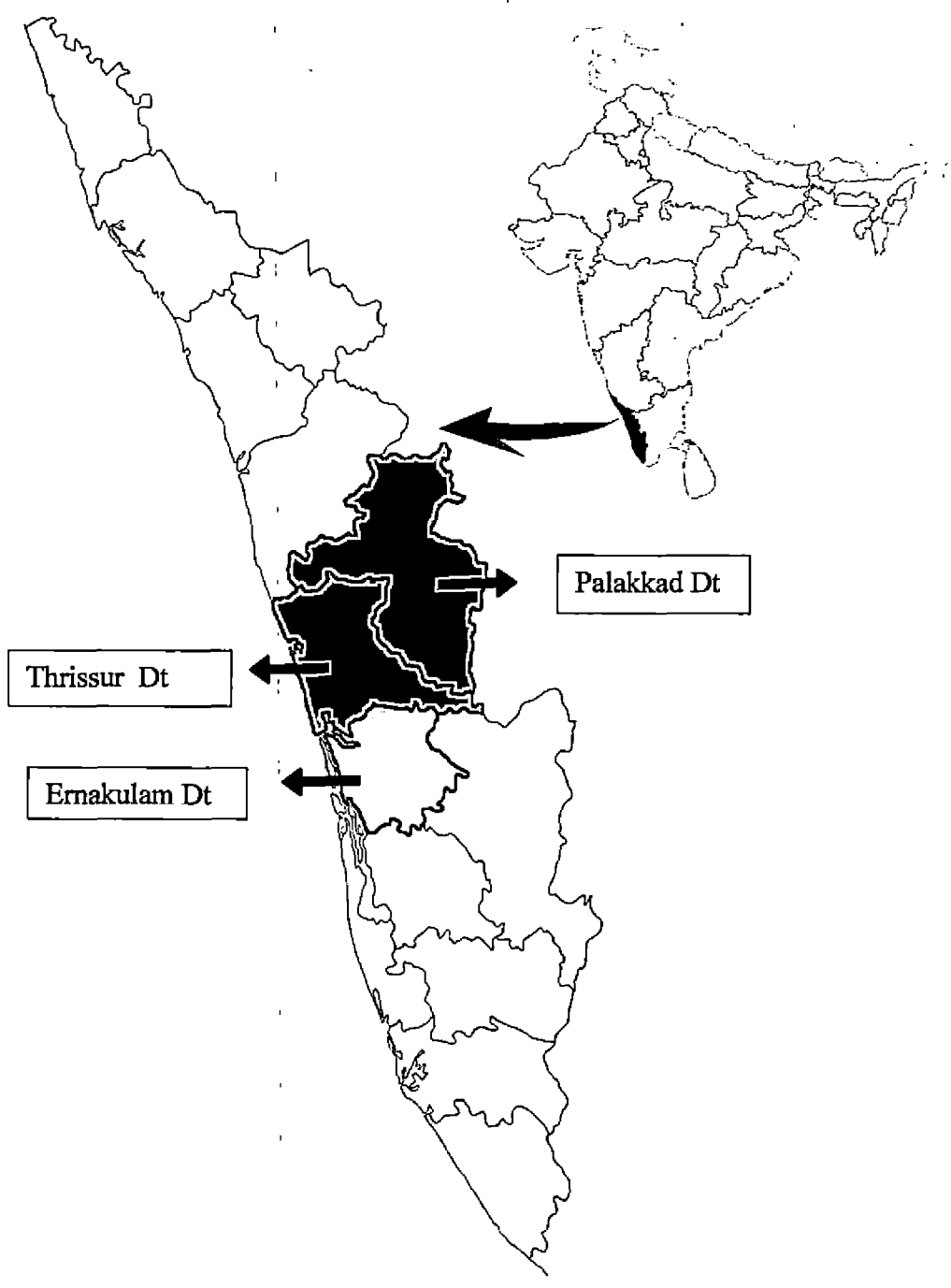
Ernakulam district is dominant with cash crops like coconut and rubber. The total share of paddy production from Ernakulam to the state was 15 per cent. The gross cropped area in Ernakulam was 2.57 lakh hectares. The cropped area covered under paddy included 12343 ha with production of 24407 tonnes. The area sown more than once included 0.66 lakh hectares. Approximately 70617 ha of Ernakulam district was covered by forest area (GOI, 2016).

Thrissur district is located on the north by little parts of Malappuram district, on the east and north by Palakkad area, on the east by little parts of Coimbatore region of Tamil Nadu, on the south by Ernakulam region, and on the west by the Arabian Sea. (54 km). Sliding from the statures of the Western Ghats in the east, the area inclined towards the west framing three particular characteristic divisions - the good countries, the fields and the ocean board. The area has a tropical sticky atmosphere with a severe hot season and abundant regular precipitation. Annual precipitation is around 3000 mm. The hot season from March to May is trailed by the South West Monsoon season from June to September. The period from October and December is the North East Monsoon season (GOI, 2012). Thrissur has a geographical area of 299390 ha with 23098 ha area under paddy cultivation and ranks 3<sup>rd</sup> top position in paddy production in Kerala, with an average production of 67569 million tones and productivity of 2925 kg/ha (Mukesh, 2015).

#### **3.4. Selection of respondents**

The list of trainees of the training conducted on farm mechanization by Agricultural Research Station, Mannuthy was collected from the station. A total of 5023 persons attended the training programme on FSA from all over Kerala during 2008-2016. There were 990 number of trainees who attended the training programme during the study period (2013-2015) from all over Kerala. Among the trainees, a





**Fig.1 Kerala Map showing the study area**

sample size of 60 trainees, belonged to Central Kerala were selected as respondents using simple random sampling technique. Apart from the selected 60 respondents, 5 successful cases of FSA groups were identified for conducting case study based on their area of operation, turn over, leadership quality, area covered under mechanization and services to farmers.

### **3.5. Selection of variables under study**

The variables required for the study were selected based on the objectives, review of literature, discussion with experts and the observations made by the researcher.

#### **3.5.1. Independent variables**

- Age
- Gender
- Marital status
- Educational status
- Type of house owned
- Occupational status
- Family size
- Social participation
- Land owned
- Mass media utilization
- Achievement motivation
- Self confidence
- Innovativeness
- Scientific orientation
- Risk orientation
- Pattern of utilization of credit

### 3.5.2 Dependent variables

- Back home utility
- Impact of the training

## 3.6. Operationalization and measurement of independent variables

### 3.6.1 Age

Age of the respondents is defined as the number of years completed by the respondents at the time of study.

Respondents with age upto 35 years were categorized as young, 35-50 years as middle age and old age category with respondents more than 50 years.

Sl. No.	Category	Score
1	Young (up to 35 years)	1
2	Middle (35-55 years)	2
3	Old (more than 55 years)	3

### 3.6.2 Gender

For this study the gender of the respondents were categorized as male and female as follows:

Sl.No.	Gender	Score
1	Male	1
2	Female	2

### 3.6.3. Marital status

Marital status was operationalised as the state in which a person lived either

as single or as married or as widow/widower. It was documented using the scale developed by Parvathy (2000) with slight modification.

Sl.No.	Category	Score
1	Single	1
2	Married	2
3	Widower	3
4	Widow	4

#### 3.6.4. Educational status

Educational status was considered as the extent of formal education attained by the respondents. They were classified based on their educational status as primary level (the respondents who completed their schooling up to 5<sup>th</sup> standard), high school level (the respondents who completed their schooling up to 10<sup>th</sup> standard), plus two or equivalent and degree. The results were obtained by using frequency and percentage analysis. After modification the scale used by Kumar (2012) was adopted for this study.

Sl.No.	Category	Score
1	Primary level	1
2	High school level	2
3	Plus two or equivalent	3
4	Degree	4

#### 3.6.5. Type of house owned

Type of house owned by the respondents was categorized based on the materials used for the construction of the house or based on the roof type of the

as single or as married or as widow/widower. It was documented using the scale developed by Parvathy (2000) with slight modification.

Sl.No.	Category	Score
1	Single	1
2	Married	2
3	Widower	3
4	Widow	4

#### 3.6.4. Educational status

Educational status was considered as the extent of formal education attained by the respondents. They were classified based on their educational status as primary level (the respondents who completed their schooling up to 5<sup>th</sup> standard), high school level (the respondents who completed their schooling up to 10<sup>th</sup> standard), plus two or equivalent and degree. The results were obtained by using frequency and percentage analysis. After modification the scale used by Kumar (2012) was adopted for this study.

Sl.No.	Category	Score
1	Primary level	1
2	High school level	2
3	Plus two or equivalent	3
4	Degree	4

#### 3.6.5. Type of house owned

Type of house owned by the respondents was categorized based on the materials used for the construction of the house or based on the roof type of the

house. The results were obtained by using frequency and percentage analysis. After modification of the scale used by Nizamudeen (1996) was adopted for the study.

Sl.No.	Type of house	Score
1	Hut	1
2	Tiled	2
3	Terrace	3

### 3.6.6. Occupational status

Occupation is the combination of all the activities in which a person regularly involved and earn income out of it. It was measured using the scale developed by Priya (2011) with slight modifications.

Sl.No.	Occupation	Score
1	Agricultural and allied activities	1
2	Services and business	2
3	Agricultural labourer	3
4	Non Agricultural labourer	4

### 3.6.7. Annual income

Annual income was operationalised as the total income obtained by an individual in a year from both agriculture and non-agricultural activities. The data was analyzed by using the scale developed by Esakkimuthu (2012).

Sl.No.	Category	Score
1	Low ( less than Rs. 50,000 )	1
2	Medium ( between Rs. 50,000 – 1,00,000 )	2
3	High ( more than Rs. 1,00,000 )	3

### 3.6.8. Family size

Family size was defined as the number of members present in the family of the respondent. The family includes husband, wife, children and the dependent members. It was documented using the scale developed by Prabhu (2011) with slight modification.

Sl.No.	Number of members	Score
1	2 members	1
2	3 members	2
3	4 members	3
4	5 members	4
5	6 members	5

### 3.6.9 Social participation

The social participation status of the respondents was analyzed by studying their participation in different organizational activities. Based on their type of participation, they were categorized as non-member, member or office bearer. Their frequency of meeting was also analyzed by documenting whether they attended regularly, occasionally or not attended meetings (Chandran, 2015).

Sl.No.	Social Participation	Category	Score
1	Non-member		1
	Member		2
	Office bearer		3
2	Frequency of attending meetings	Not attending	0
		Occasionally	1
		Regularly	2

### 3.6.10. Land holding

Land holding was the total land area possessed by the respondents. The scale used by Argade (2010) was further modified and used for the study. Frequency and percentage analysis was used for analyzing the data.

Sl.No.	Category	Score
1	Less than 50 cents	1
2	Between 50-100 cents	2
3	Between 1-2 acres	3
4	Between 2-3 acres	4

### 3.6.11. Mass media exposure

Mass media exposure refers to the degree of exposure to mass media like television, radio, newspapers, internet, bulletins and printed materials in the form of farm magazines utilized to gain information on farming and related activities. The scores were given based on the regularity of exposure as shown in the table below. The scale used by Peter (2014) with slight modifications was used for the study.



Sl.No.	Regularity of exposure to mass media	Score
1	Regularly	2
2	Occasionally	1
3	Never	0

### 3.6.12. Achievement motivation

Achievement motivation was operationalized as the desire for achievement or the fulfillment of greatness by the respondents. People fulfill their requirements through various means and are headed to succeed for different reasons. Achievement motivation was measured by using the scale developed by Geetha (2002) with slight modifications. In the study the items were rated in 5-point continuum ranging from strongly agree, agree, undecided, disagree, strongly disagree with weightage of 5,4,3,2 and 1 for the positive statements and 1,2,3,4 and 5 for the negative statements.

Sl.No.	Category	Score for negative statements	Score for positive statements
1	Strongly agree	1	5
2	Agree	2	4
3	Undecided	3	3
4	Disagree	4	2
5	Strongly disagree	5	1

### 3.6.13. Self confidence

Self-confidence can be characterized as feeling of trust in one's abilities, qualities, and judgement. Self-confidence was measured using the scale developed by Mannambeth (2000) with slight modifications. Statements were rated in 5-point

continuum ranging strongly agree, agree, undecided, disagree, strongly disagree with weightage of 5,4,3,2 and 1 for the positive statements and 1,2,3,4 and 5 for the negative statements as done in the case of previous variable.

#### **3.6.14. Innovativeness**

Innovativeness is defined as the behavioral pattern of a person who shows an interest and desire to adopt change in farming techniques and also interested to introduce such improvements into his farm operations. The scale developed by Peter (2014) with slight modification was used for the study.

Sl.No.	Category	Score
1	As soon as it is brought to my knowledge	3
2	After seeing others trying it out successfully	2
3	Prefer to wait and take own time	1
4	Not interested in adopting improved practices	0

#### **3.6.15. Scientific orientation**

It is defined as the degree to which an individual is inclined to use the scientific methods and decision making process. Scientific orientation was measured using the scale developed by Radhakrishnan (2000) with slight modifications. Six items related to scientific orientation of the respondents were rated in 5 point continuum ranging from strongly agree, agree, undecided, disagree, strongly disagree with weightage of 5,4,3,2, and 1 for the positive statements and 1,2,3,4 and 5 for the negative statements as done for measuring the previously given variables, achievement motivation and self-confidence.

### **3.6.16. Risk orientation**

Risk is defined as the degree to which a trainee is oriented towards the risk and uncertainty and the courage he/she develops to face the problems in the implementation of mechanization. The risk orientation was measured using the scale developed by Kumar (2007). The items were measured as done for measuring the variables such as, achievement motivation, self-confidence and scientific orientation in this study.

### **3.7. Operationalization and measurement of dependent variables**

#### **3.7.1 Back home utility**

Back home utility is the extent to which the trainees made use of the skill and knowledge gained from the training for improving their real life situation at home so as to improve their livelihood and the fellow members. The items on the nature of utilization of knowledge and skill gained from the training for the scale on back home utility were identified after having discussion with the representatives of Food Security Army and referring related studies. Based on the pilot study, the most relevant nine items were selected for the scale on back home utility. The selected statements were measured on a three point continuum as given below:

<b>Sl.No.</b>	<b>Category</b>	<b>Score</b>
1	High	3
2	Medium	2
3	Low	1

#### **3.7.2. Impact of the training**

For assessing the impact of the training on farm mechanization among the respondents they were provided with a five-point scale on fourteen identified

statements. Scores were given by the respondents based on their experiences before and after the training which was used for assessing the impact of the training. Willcoxon's paired sign rank test was used for analyzing the impact of the training on farm mechanization.

### **3.8. SWOC analysis**

SWOC analysis was conducted to find out the strengths, weaknesses opportunities and challenges faced by the trainees of the trainings on farm mechanization. A semi structured interview schedule was used to conduct the SWOC analysis. The items under each subheading were rated on three-point continuum as low, medium, high categories with scores ranging from 1 to 3. Index method was used to analyze the data.

### **3.9. Constraint analysis**

Constraint analysis was conducted to find out the various constraints faced by the trainees of the training on farm mechanization conducted by Agricultural Research Station, Mannuthy. The constraints were listed and the respondents were asked to give score based on their importance as felt by the respondents on a four-point continuum as given below:

<b>Sl.No.</b>	<b>Category</b>	<b>Score</b>
1	Very important	4
2	Important	3
3	Slightly important	2
4	Not important	1

### **3.10. Case study**

Singh (2006) stated that the case study method was commonly used for making a detailed description and comparison. The case study included several

modes like interviews, conferences, conversations, dramatic productions, test of abilities, social reactions to frustration, imaginal productions, etc. It was basically a longitudinal approach which studied the unit over a period of time. The case study was an approach which viewed social unit as a whole. Since the case study is a descriptive research no variables were manipulated. In case study the researcher gathered data usually through methods of observation, interview and questioner. The community case study was the one in which the social unit is not a person rather, a family or a social group. Such case study is through observation and analysis of group of people who were living in a particular geographical territory. The community case study tried to deal with different elements of the community life such as location, prevailing economic activity, climate and natural resources, historical development, social structure, life values, health, education, religious expression, recreation, impact of outside world etc. The case study was a mode of organizing data in terms of some chosen unit such as the person's life history, the history of group or society, and social process. This had the advantage of intensive study of the social unit. According to Goode and Hatt (1981) the case study method provided sufficient basal facts for developing a suitable hypothesis regarding the social unit being studied. This was possible because of the in-depth analysis of the concerned social unit. In this study community case study was conducted among five groups who had received training on farm mechanization from ARS, Mannuthy and adopted farm mechanization as their livelihood option.

### **3.10. Statistical tools used for the study:**

The information gathered from the respondents were scored classified and examined by utilizing simple non parametric statistical techniques. The data gathered were entered in an excel sheet and suitable statistical tests were carried out utilizing SPSS version 16.0.

### **3.10.1. Percentage analysis**

Percentage distribution of the respondents on all the independent variables were worked out by dividing the recurrence of responses in every class with the aggregate number of respondents and multiplied by hundred.

### **3.10.2. Rank correlation**

Rank correlation measures the nature of relationship between two variables. The estimation of the correlation coefficient changes from +1 and - 1. At the point when the estimation of the correlation coefficient lies around  $\pm 1$ , then it was said to be a perfect level of relationship between the two variables. As the correlation coefficient goes towards 0, the relationship between the two variables would be weaker. It was done to provide an idea about the relationship between two related variables.

### **3.10.3. Garrett ranking**

To find out the most critical constraints which influenced the respondents in adopting farm mechanization, Garrett ranking was used. According to this method, respondents were approached to rank all the elements furthermore, the result of such positioning was changed over into score with the help of the following formula:

$$\text{Percent position} = 100 (R_{ij} - 0.5) / N_j$$

Where

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

$N_j$  = Number of variables ranked by  $j^{\text{th}}$  respondents

#### **3.10.4. Index**

The scores given by each respondent were summed up and the total score on back home utility and swoc analysis of the training was obtained. The respondent's total scores were divided by the maximum possible score and expressed in percentage.

$$\text{Index} = \frac{\text{Total scores obtained} \times 100}{\text{Total possible scores}}$$

#### **3.10.5 Wilcoxon signed-rank test**

The Wilcoxon signed rank test is a non-parametric statistical hypothesis used to compare two related samples. In this study the Wilcoxon signed rank test is used to analyze the impact of the training programme on farm mechanization conducted by Agricultural Research Station, Mannuthy.



**Plates I : Researcher collecting data from the members of FSA**



## *Results and Discussion*

## **4. RESULTS AND DISCUSSION**

This chapter deals with the results obtained in the study and the various possible reasons behind the results. Keeping the objectives in view, the findings as well as the discussions are presented under the following sub titles:

4.1 Socio personal profile of respondents

4.2 Motivational factors

4.3 Credit utilization

4.4 Back home utility

4.5 Impact of the training

4.6 SWOC analysis

4.7 Constraints

### **4.1. Socio personal profile of the respondents**

This section reveals the distribution of trainees with respect to various social as well as personal profile characters such as age, gender, educational status, occupational status, family size, educational status and farm size. Assessment of the socio personal profile of the respondents provides the general status of the respondents in their personal and social life. It helps the researcher to relate them with the utility of the training on farm mechanization.

#### **4.1.1. Age**

Distribution of respondents according to their age is presented in Table 4.1

**Table 4.1. Distribution of the respondents according to their age (n=60)**

Sl. No.	Age category	Frequency	Percentage
1	Young (upto 35 years)	8	13.34
2	Middle aged (35-55 years)	43	71.66
3	Old (more than 55 years)	9	15.00

It is observed from Table 4.1 that 71.66 per cent of the respondents were middle aged (35-55 years) and 15 per cent were old (more than 55 years). Only 13.34 per cent of the trainees belonged to the young category that is below 35 years. The table clearly shows that majority of the respondents belonged to middle aged. Since trainees after successful completion of the training had to work in the mechanized agricultural labour sector the old aged people might have kept away from the training, on the other hand, the younger generation in Kerala evidently moving away from agriculture sector as reported by many authors (Jayavardhana(2007) and Husain(2005). This may be the reason for more number of trainees in the category of middle age.

#### **4.1.2 Gender**

The respondents were categorized according to their gender and given in Table 4.2. This study revealed that almost equal percentage of males (48%) and females (52%) participated in the training on farm mechanization conducted by Agricultural Research Station Mannuthy during the period of 2013-2015. After receiving the training, they had become the members of Food Security Army. In Kerala, the participation of female is seen in almost all the sectors. In the contest of migration of male labourers to other states and countries, females took charge of farm mechanization locally. (Fig: 2)

**Table 4.2. Distribution of trainees according to gender (n=60)**

Sl. No.	Category	Frequency	Percentage
1.	Male	29	48.00
2.	Female	31	52.00
	Total	60	100

#### **4.1.3. Marital status**

Distribution of the respondents according to their marital status is shown in Table 4.3.

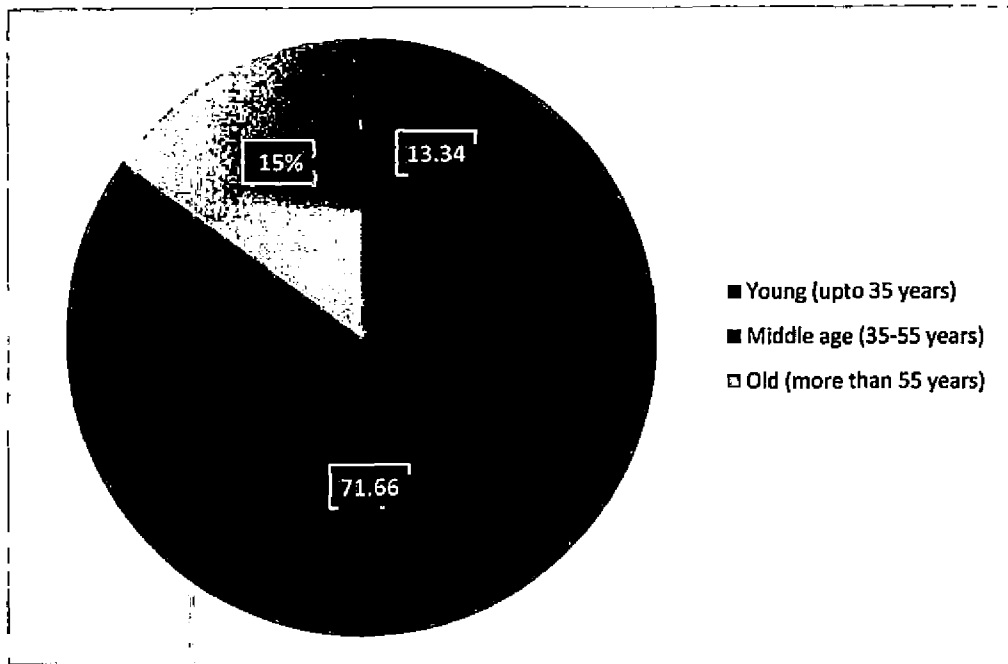
**Table 4.3. Distribution of trainees according to their marital status (n=60)**

Sl. No.	Category	Frequency	Percentage
1.	Single	1	1.67
2.	Married	54	90.00
3.	Widower	2	3.33
4.	Widow	3	5.00
	Total	60	100

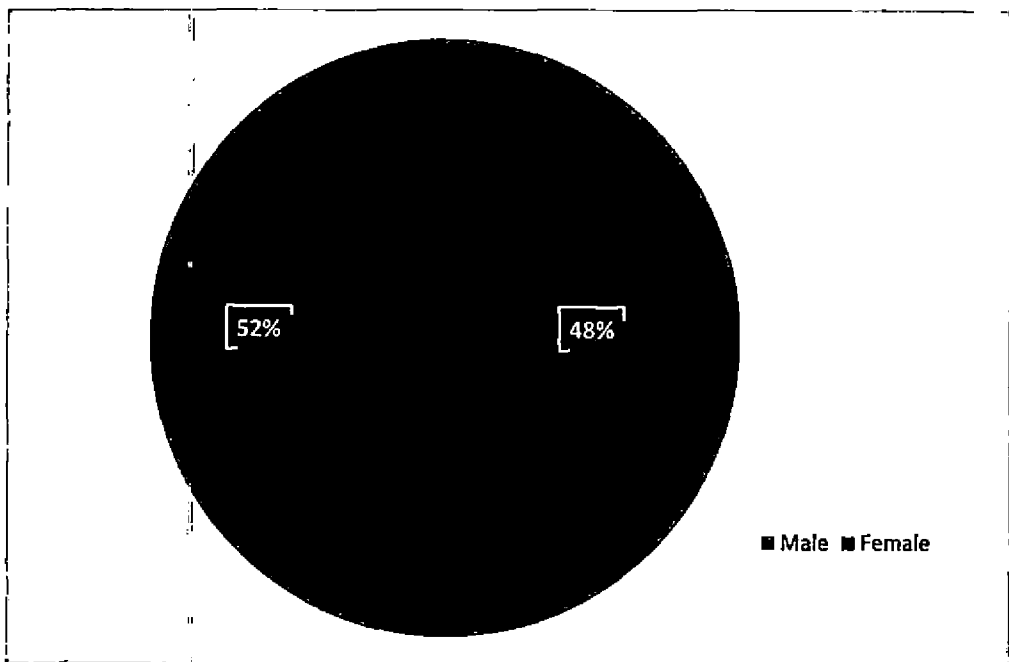
From Table 4.3, it is clear that most of the respondents (90 %) were married and only 1.67 per cent of them remained unmarried/single. Remaining 5 per cent of the respondents were widows and 3.33 per cent of them were widowers. (Fig: 3)

#### **4.1.4. Educational status**

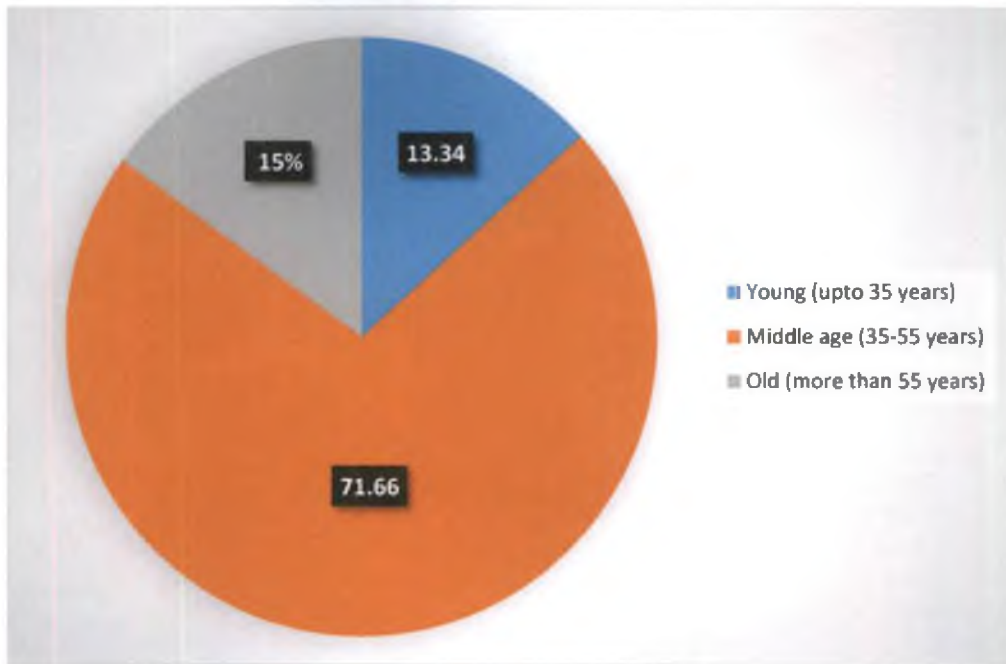
Educational status of the respondents is presented in Table 4.4.



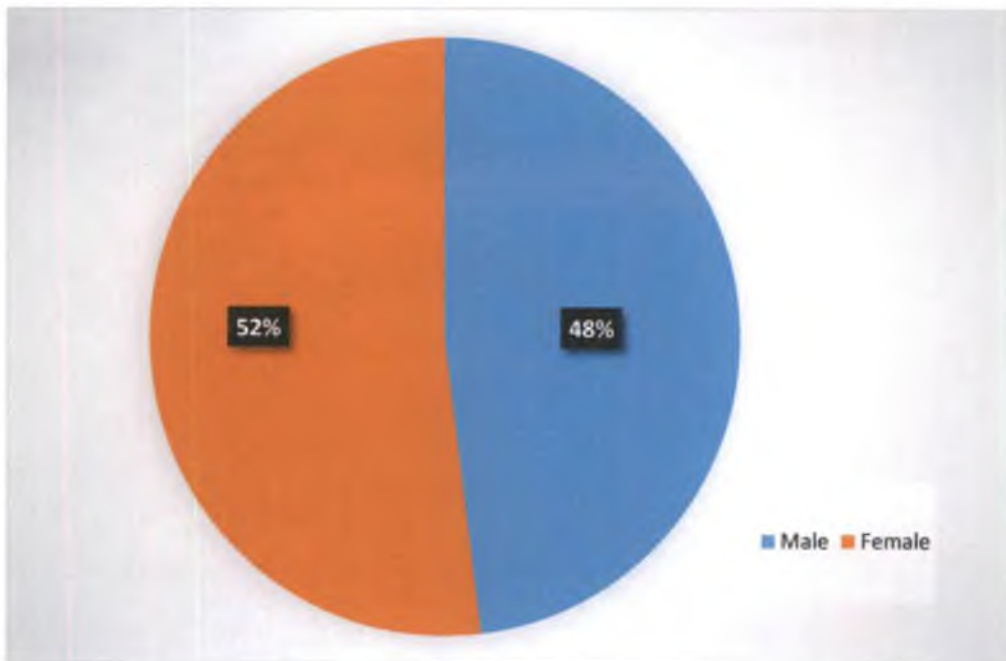
**Fig.2 Distribution of the respondents according to their age**



**Fig.3 Distribution of trainees according to gender**



**Fig.2 Distribution of the respondents according to their age**



**Fig.3 Distribution of trainees according to gender**

**Table 4.4. Distribution of trainees according to their educational status (n=60)**

Sl. No.	Educational level	Frequency	Percentage
1.	Primary level	2	3
2.	High school level	14	23
3.	Plus two or equivalent level	33	55
4.	Degree or equality level	11	18
	Total	60	100

It is observed from Table 4.4 that more than 50 per cent of the trainees had plus two level education followed by 23 per cent of the trainees with high school level educational status. Trainees possessing degree were 18 per cent, whereas 3 per cent, of the trainees had only primary level of education.

Kerala having the highest literacy rate of 93.9 per cent (Government of India, 2010) and Keralites give much importance to formal education and hence majority of the respondents completed their schooling.

#### **4.1.5. Type of house**

The type of house possessed by the respondents is represented below in

Table 4.5.

From Table 4.5, it is clear that 63 per cent of the respondents were living in tiled houses, followed by 37 per cent in terraced houses. It shows that all the trainees owned their house either tiled or terraced, and no one was living in a hut or rented house.

**Table 4.5. Distribution of trainees according to their type of house (n=60)**

Sl.No.	Type of house	Frequency	Percentage
1.	Hut	0	0
2.	Tiled	38	63
3.	Terrace	22	37
	Total	60	100

#### 4.1.6. Occupational status

Occupational status of the respondents is given in Table 4. 6

**Table 4.6. Distribution of trainees according to their occupational status (n=60)**

Sl. No.	Category of occupation	Primary		Secondary	
		Frequency	Percentage	Frequency	Percentage
1.	Agricultural and allied activities	27	45.00	4	6.67
2.	Services and businesses	2	3.33	3	5.00
3.	Agricultural labourer	26	43.33	17	28.33
4.	Non agricultural labourer	5	8.34	6	10.00
5	No occupation	00	0.00	30	50.00
	Total	60	100	60	100

Table 4.6 revealed that 45 per cent of the farmers had 'Agricultural and allied activities' as their major occupation. Almost equal per cent of the respondents possessed their primary occupation as 'Agricultural labourer'. Only 3.33 per cent of



the respondents involved in service and business. The remaining, about 8.34 per cent of them were engaged in 'non agricultural labour, as primary occupation.

As far as secondary occupation was concerned, majority of the respondents worked as 'Agricultural labourer' consisting of 28 per cent followed by 10 per cent 'Non agricultural laborers. It may be noted that 50 per cent of the respondents had no secondary occupation and solely depended on primary occupation.

#### 4.1.7. Annual income of respondents

The annual income of the respondents is given in Table 4.7

**Table 4.7. Distribution of trainees according to their annual income (n=60)**

Sl.No.	Income (in ₹)	Frequency	Percentage
1.	Low (<₹ 50000)	28	46.67
2.	Medium(₹ 50000 - ₹ 100000)	24	40.00
3.	High (>₹ 100000)	8	13.33
	Total	60	100

From Table 4.7, it is understood that majority (46.67 %) of the respondents earned the annual income less than ₹ 50,000 followed by 40 per cent of the respondents with annual income ranging from ₹ 50,000 – 1,00,000. Only 13.33 per cent of the respondents earned an annual income more than ₹ 1,00,000. Thus it is clear that majority of the respondents earned a low income for their livelihood and led a life of hand to mouth existence. It was observed that even though they had assured employment, it was highly fluctuating according to the seasonal requirements. (Fig.4)

#### 4.1.8. Family size

Family size of the respondents is presented in Table 4.8.

From Table 4.8 it is clear that about 51.67 per cent of the respondents had 4 members in their family. This is in tune with the present family system in Kerala. Only 28.33 per cent of the respondents had 5 members in their family. The percentage of respondents having 2, 3 and 6 members in their family were 3.33 per cent, 15 per cent and 1.67 per cent respectively. (Fig:5)

**Table 4.8. Distribution of trainees according to their family size (n=60)**

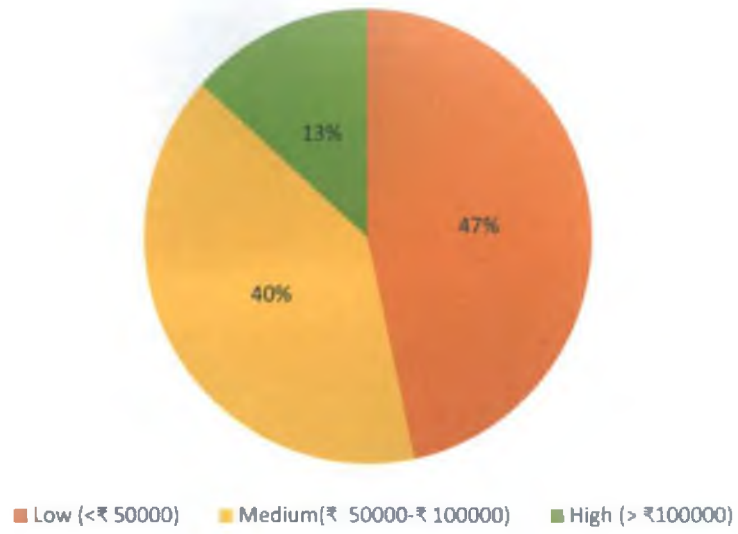
Sl. No.	Category	Frequency	Percentage
1.	2 members	2	3.33
2.	3 members	9	15.00
3.	4 members	31	51.67
4.	5 members	17	28.33
5.	6 members	1	1.67
	Total	60	100

#### 4.1.9 Land holding

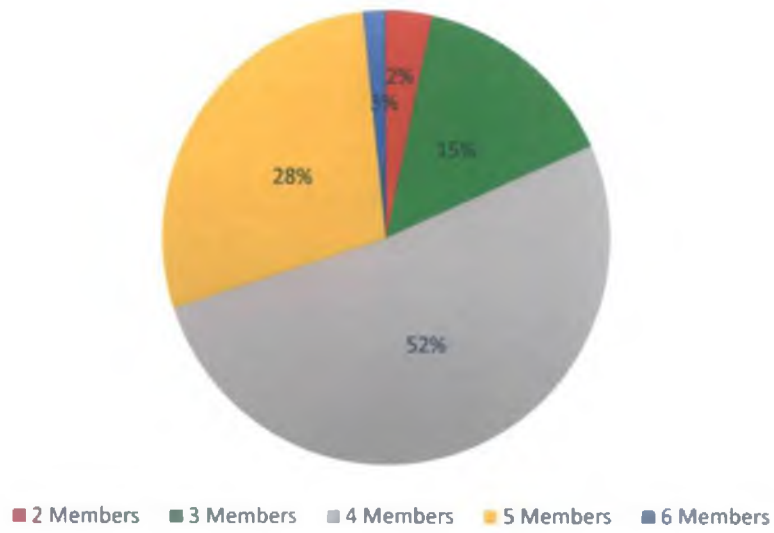
Land holding possessed by the trainees is presented in Table 4.9.

**Table 4. 9. Distribution of trainees according to their land holding (n=60)**

Sl. No.	Area owned	Frequency	Percentage
1.	Less than 50 cents	35	58.33
2.	50-100 cents	12	20.00
3.	1-2 acres	9	15.00
4.	2-3 acres	4	6.67
	Total	60	100



**Fig.4 Distribution of trainees according to their annual income**



**Fig. 5 Distribution of trainees according to their family size**

Table 4.9 reveals that majority of the respondents (58.33 %) possessed land area of about less than 50 cents. Only 6.67 per cent of the respondents owned larger land area of 2-3 acres. The remaining respondents had a land area of 50-100 cents and 1-2 acres accounting about 20 per cent and 15 per cent respectively. Majority of the respondents owned very less area and hence not entirely depended on farming.

#### 4.1.10. Social participation

Social participation was assessed in terms of membership of the farmers in different organizations and their frequency of attending meetings is given below in Table 4.10.

**Table 4.10. Distribution of trainees according to their social participation (n=60)**

Sl.No.	Membership	Member	Percentage	Office bearer	Percentage
1	Member in one organization	20	33.33	2	3.33
2	Member in 2 organizations	37	61.66	5	8.33
3	Member in 3 organizations	3	5	1	1.66

Table shows that 61.66 per cent of the trainees had membership in 2 organizations, 33.33 per cent of the respondents had membership in only one organization and only 5 per cent of the respondents had membership in 3 organizations. Just below one-tenth of the trainees (8.33 %) were office bearers in two organization followed by 3.33 per cent respondents had membership in only one

organization only 1.66 per cent of the respondents were office bearers in 3 organizations.

The Table 4.11 shows that respondents were also been categorized based on frequency of meetings attended by them. Most of the trainees (83.34 %) attended the meetings of FSA regularly. Majority of the respondents regularly attended meetings of service co-operatives (30 %) and 3.33 per cent attended meeting occasionally. Meetings in Mahila mandals, were attended by 28.33 per cent of the members regularly and 5 per cent attended meetings occasionally. About 3.33 per cent of the respondents who actively participated in Milk co-operatives attended the meetings regularly and also 3.33 per cent of the members of village panchayats also attended meetings regularly.

**Table 4.11. Distribution of trainees according to their frequency of attending meetings** (n=60)

Sl. No.	Organization/ institution	Regularly		Occasionally	
		Frequency	Percentage	Frequency	Percentage
1.	Village panchayats	2	3.33	0	0
2.	Service co-operatives	18	30	2	3.33
3.	Milk co-operatives	2	3.33	0	0
4.	Mahila mandals	17	28.33	3	5.00
5.	Food security army	50	83.34	10	16.67

#### 4.1.11. Exposure to mass media

Exposure to mass media of the respondents is tabulated based on the type of mass media and frequency of their use in Table 4.12.

Table 4.12 depicts that 58 per cent of the respondents watched television regularly. Half of the respondents (50 %) listened to radio. Newspapers and magazines were regularly read by only 25 per cent and 3 per cent of the respondents respectively. There were no respondents who used bulletins, books and internet regularly.

Above one-third of the respondents (37 %) listened radio occasionally. More than one-fourth of the respondents (28 %) read newspaper and exactly one-fourth of them viewed television occasionally. It is heartening to note that still more than three-fourth of the respondents (78 %) never used internet in this digital era.

**Table 4.12. Distribution of trainees according to their exposure to mass media (n=60)**

Sl. No.	Mass media	Regularly		Occasionally		Never	
		No	%	No	%	No	%
1.	Radio	30	50	22	37	8	13
2.	Television	35	58	15	25	10	17
3.	News papers	15	25	17	28	28	47
4.	Magazines	2	3	5	8	43	72
5.	Bulletins	0	0	1	2	49	82
6.	Books	0	0	7	12	43	72
7.	Internet	0	0	3	5	47	78

• Multiple responses

#### 4.1.12. Number of trainings attended

**Table 4.13. Number of trainings attended by the trainees (n=60)**

Sl. No.	Number of trainings attended	Frequency	Percentage
1	One training	54	90
2	More than one training	6	10
	Total	60	100

Table 4.13, it is evident that 90 per cent of the trainees attended only one training and 10 per cent of the trainees attended more than one training. After completion of the training on farm mechanization, which was compulsory for all the respondents only 10 per cent of them participated in another training (training on jasmine cultivation), since a few of the trainees cultivated jasmine for an additional income.

#### 4.1.13. Machinery owned

**Table 4.14. Details of the ownership of farm machinery by the trainees (n=60)**

Sl. No.	Ownership	Frequency	Percentage
1	Owned	7	11.67
2	Not owned	53	88.33
	Total	60	100

The study reveals that 88.33 per cent of the respondents did not own machinery and 11.67 per cent of the respondents purchased machinery on their own

after the training. As the members of FSA, trainees used to operate the machinery owned by the service co-operative banks.

**Table 4.15. Details of machinery owned by the respondents (n=60)**

Sl. No.	Name of machinery	Frequency	Percentage
1.	Brush cutter	4	6.67
2.	Garden tiller	1	1.66
3.	Coconut climber	2	3.33
	Total	7	11.67

From Table 4.15, it is clear that only 11.67 per cent of respondents had purchased machinery on their own. The machines like brush cutter, garden tiller and coconut climbers were owned by the trainees. The trainees who bought brush cutters got a subsidy of Rs 5000 from their Krishibhavan (Agricultural Extension unit in Kerala) and a loan was availed at an interest of 6.67 per cent for 5 years. For buying the garden tiller the respondent had availed a loan of Rs. 70000 for 3 years at an interest of 7 per cent. High priced machinery were owned by service co-operative bank and the trainees operated the machinery as members of Food Security Army. Those machinery purchased by the individual, are generally operated by the concerned individual and not by the FSA group.

#### **4.1.14. Institutional support**

The institutions supported the members of Food Security Army in terms of finance and technical guidance were Block panchayaths, Krishi Bhavans, Service Co Operative Banks and ARS, Mannuthy. Krishi Bhavans helped the Food Security Army members for creation and submission of required documents at the time of



registration. They also supported in terms of getting work orders to the members of Food Security Army. Block panchayaths provided machinery to the group at free of cost. Service co operative banks managed their own Food Security Army. The members were paid on daily wage basis for their work. The machinery were under the ownership of the bank. ARS, Mannuthy provided training to the FSA, supplied uniforms and supported for the maintenance of the machinery of the FSA groups. Some of the groups were engaged in marketing of seedlings, for which the seeds were provided by ARS, Mannuthy.

#### 4.2. Motivational factors

Motivational factors are those factors which stimulate the energy level of people to be continually interested and committed in a job to attain specific goals.

##### 4.2.1. Achievement motivation

The level of achievement motivation of the trainees is presented in Table 4.16.

**Table 4.16. Distribution of trainees according to their achievement motivation level (n=60)**

Sl.No.	Category	Frequency	Percentage
1.	High	20	33.33
2.	Medium	31	51.67
3.	Low	9	15.00
	Total	60	100

Table 4.16 reveals that majority of the respondents (51.67%) had medium level of achievement motivation. Almost one-third of them (33.33%) had high level of achievement motivation and 15 per cent were found with low achievement motivation.

#### 4.2.2. Self confidence

The level of self-confidence of the trainees is represented in the Table 4.17.

**Table 4.17. Distribution of trainees according to their self confidence**

(n=60)

Sl.No.	Category	Frequency	Percentage
1.	High	12	20.00
2.	Medium	38	63.33
3.	Low	10	16.67
	Total	60	100

Table 4.17 reveals that majority of the respondents (63.33%) had medium level of self-confidence. Just one-fifth of them (20%) had high level of self-confidence and 16.67 per cent were found with low level of self-confidence.

#### 4.2.3 Innovativeness

**Table 4.18. Distribution of trainees according to their innovativeness (n=60)**

Sl.No.	Items	Frequency	Percentage
1.	As soon as it is brought to my knowledge	22	36.66
2.	After seeing others trying it out successfully	24	40.00
3.	Prefer to wait and take own time	10	16.67
4.	Not interested in adopting improved practices	4	6.67
	Total	60	100

It is clear from the Table 4.18, that 40 per cent of the respondents opined that they adopted innovations only after seeing others trying it out successfully. More than one-third of the respondents revealed that they accepted innovations as soon as it was brought to their knowledge. Among them, 16.67 per cent expressed that they preferred to wait and took their own time in adopting innovations. Only 6.67 per cent of the respondents opined that they were not interested in adopting improved practices.

#### 4.2.4 Scientific orientation

The degree of scientific orientation of the trainees is represented in Table 4.19.

**Table 4.19. Distribution of trainees according to their scientific orientation**

(n=60)

Sl.No.	Category	Frequency	Percentage
1.	High	10	16.67
2.	Medium	39	65.00
3.	Low	11	18.33
	Total	60	100

Table 4.19 reveals that about two-third (65%) of the trainees had medium level of scientific orientation. Almost equal per cent of the respondents had low (18.33%) and high (16.67%) high levels of scientific orientation.

#### 4.2.5 Risk orientation

The extent of risk orientation among the trainees is depicted in Table 4.20

**Table 4.20. Distribution of trainees according to their level of risk orientation****(n=60)**

Sl.No.	Category	Frequency	Percentage
1.	High	9	15.00
2.	Medium	41	68.33
3.	Low	10	16.67
	Total	60	100

Table 4.20 clearly shows that about 68.33 per cent of the trainees were medium level risk takers. Whereas, 15 per cent were highly oriented towards risk taking ability and 16.67 per cent of the total respondents had low level of risk taking ability.

#### 4.3. Credit utilization

**Table 4.21. Credit utilization of the trainees****(n=60)**

Sl. No.	Pattern of utilization of credit	Institutional credit source		Non institutional credit source	
		Frequency	Percentage	Frequency	Percentage
1	Credit utilized	4	6.67	2	3.33
2	Not utilized credit	56	93.33	58	96.67
	Total	60	100	60	100

From Table 4.21, it is clear that most of the trainees (above 90%) did not avail the credit from institutional or non-institutional sources for the purpose of purchasing machinery, because only few trainees had bought machinery of their own. That is

6.67 per cent of trainees utilized credit from institutional sources and only 3.33 per cent of the trainees utilized non institutional sources for the purchase of machinery.

#### 4.4.Back home utility

The distribution of Back home utility of the training programme among the trainees is presented in Table 4.22

**Table 4.22. Distribution of respondents according to back home utility of the training (n=60)**

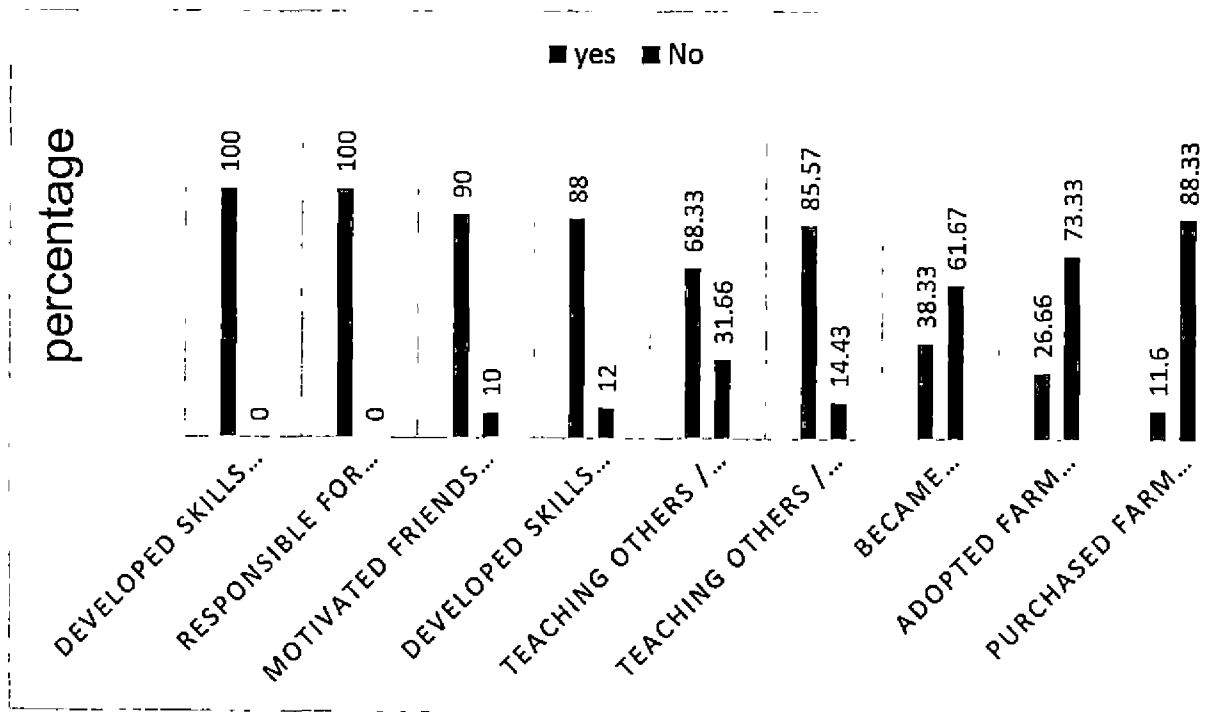
Sl. No.	Nature of utilization	Yes		No	
		No.	%	No.	%
1	Developed skill in operating farm machinery	60	100	-	-
2	Responsible for the increase in area under farm mechanization	60	100	-	-
3	Motivated fellow members to participate in similar training programmes	54	90	6	10
4	Learned repairing farm machinery	52	87	8	13
5	Teaching fellow members, the operation of farm machinery	41	68	19	32
6	Teaching fellow members, the repair of farm machinery	52	87	8	13
7	Became member/leader of SHGs to promote group farming in farm mechanization	23	38	37	62
8	Adopted farm mechanization in own farm	16	27	44	73
9	Purchased farm machinery for my livelihood	7	12	53	88

Table 4.22 clearly shows that all the trainees reported that they learned operating farm machinery which developed the knowledge and skill of the trainees and they became responsible for increasing the area under farm mechanization. Most of the trainees found that the training was very effective and 90 per cent of them stated that they motivated their family and fellow members to participate in similar training programmes. Majority of the trainees (88 %) agreed that they learned repairing farm machinery and it increased the self-confidence of the trainees for repairing the machinery. More than four-fifth of the trainees (87 %) conveyed that they taught fellow members on the operation and repair of farm machinery after attending the training. More than one-third of the trainees (38 %) became members in Self Help Groups (SHG's) to promote group farming in farm mechanization. Just above one-fourth of the trainees (27 %) adopted farm mechanization on their own farm because most of the trainees were agricultural labourers and they had less land holdings and just above one-tenth of the trainees (12 %) purchased farm machinery on their own for livelihood.

From the above results, it can be derived that the main purpose of conducting the training on farm mechanization was achieved by developing skill in operating farm machinery among all the respondents and they were found to be responsible for increasing the area under farm mechanization. The next stage of sustainability of retaining and promoting the trainees of training on farm mechanization in the same field as their livelihood option may be taken care of by the local level institutions and development departments like village panchayats and respective krishi bhavans.

#### **4.4.2 Extent of back home utility**

The extend of Back home utility of the training programme among the trainees is presented in Table 4.23.



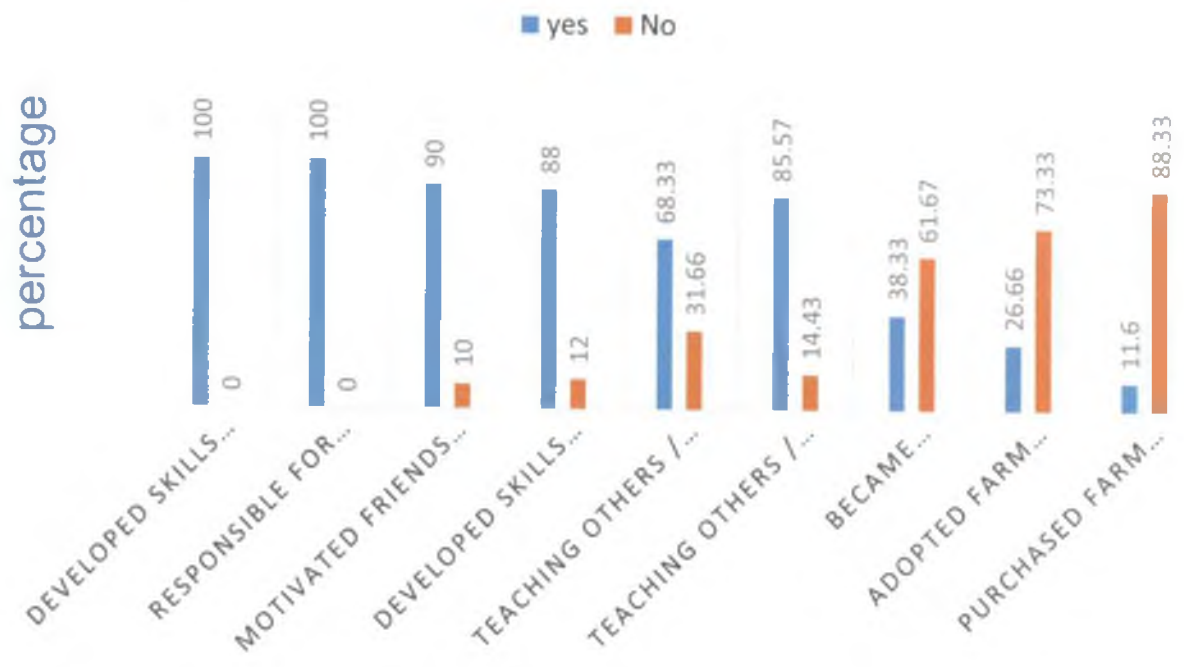
**Fig. 6 Back home utility of the training**

**Table 4.23 Extent of back home utility of the training on farm mechanisation**

Sl. No.	Parameters	Pattern of back home utility						Index
		High		Medium		Low		
		No	%	No	%	No	%	
1	Developed skill in operating farm machinery	20	33	22	37	18	30	67.77
2	Motivated their friends to participate in similar training programmes	7	12	41	68	6	10	60.55
3	Responsible for the increase in area under farm mechanization	11	18	25	42	24	40	59.44
4	Developed skills in repairing farm machinery	17	28	20	33	15	25	58.89
5	Teaching others the repair of farm machinery	6	10	21	35	14	23	52.22
6	Teaching others the operation of farm machinery	11	18	20	33	21	35	41.11
7	Became member/leader of SHGs to promote group farming in farm mechanization	2	3	10	17	11	18	20.56
8	Adopted farm mechanization in my own farm	4	7	7	12	5	8	17.22
9	Purchased farm machinery for my livelihood	3	5	2	3	2	3	6.67

Table 4.23, reveals the extend of back home utility of the training among the trainees. It was seen that ‘developed skill in operating farm machinery’ was the





**Fig. 6 Back home utility of the training**

**Table 4.23 Extent of back home utility of the training on farm mechanisation**

Sl. No.	Parameters	Pattern of back home utility						Index
		High		Medium		Low		
		No	%	No	%	No	%	
1	Developed skill in operating farm machinery	20	33	22	37	18	30	67.77
2	Motivated their friends to participate in similar training programmes	7	12	41	68	6	10	60.55
3	Responsible for the increase in area under farm mechanization	11	18	25	42	24	40	59.44
4	Developed skills in repairing farm machinery	17	28	20	33	15	25	58.89
5	Teaching others the repair of farm machinery	6	10	21	35	14	23	52.22
6	Teaching others the operation of farm machinery	11	18	20	33	21	35	41.11
7	Became member/leader of SHGs to promote group farming in farm mechanization	2	3	10	17	11	18	20.56
8	Adopted farm mechanization in my own farm	4	7	7	12	5	8	17.22
9	Purchased farm machinery for my livelihood	3	5	2	3	2	3	6.67

Table 4.23, reveals the extend of back home utility of the training among the trainees. It was seen that ‘developed skill in operating farm machinery’ was the

parameter, which secured the highest index of 67.77. It was followed by ‘motivated their friends to participate in similar training programmes’ had an index of 60.55, ‘responsible for the increase in area under farm mechanization’, ‘developed skills in repairing farm machinery’, and ‘teaching others the repair of farm machinery were the parameters obtained medium index and ‘purchased farm machinery for my livelihood’ had the least observed index of 6.67.

**Table 4.24. Category wise distribution of trainees according to the back home utility enjoyed by them (n=60)**

Sl.No.	Category	Frequency	Percentage
1.	High	12	20
2.	Medium	37	62
3.	Low	11	18
	Total	60	100

The table 4.24 reveals that almost two-third of the respondents (62%) reported that the trainees enjoyed medium level of back home utility after attending the training on farm mechanization. High level of back home utility was experienced by 20 per cent and low level back home utility was felt by 18 per cent of the respondents.

#### **4.4.1 Factors affecting the back home utility of trainings on farm mechanization**

The factors affecting Back home utility of the training programme among the trainees is presented in Table 4.25.

**Table 4.25 Factors affecting the back home utility of trainings on farm mechanization**

Sl. No.	Factors	Correlation coefficient
1	Age	-0.273*
2	Gender	-0.066
3	Educational status	-0.067
4	Family size	-0.024
5	Type of house owned	0.858
6	Marital status	-0.158
7	Occupational status	0.134
8	Land owned	0.003
9	Self confidence	0.351**
10	Achievement motivation	-0.365**
11	Innovativeness	0.404**
12	Social participation	-0.205
13	Scientific orientation	0.409**
14	Mass media utilization	-0.208
15	Risk orientation	-0.037

\*\* Significant at the 0.01 level (2-tailed).

\*. Significant at the 0.05 level (2-tailed).

From Table 4.25 its clear that out of selected 15 independent variables five variables had significant relationship with the utility of the training. The factors which affected the utility of the training were age of the respondents, achievement motivation, self confidence level of the respondents, scientific orientation and innovativeness.

Among the variables, achievement motivation and age of the respondents were negatively significant and other factors were positively significant. Scientific orientation and innovativeness were highly significant at 0.01 level. Age of the respondent's achievement motivation and self confidence level of the respondent showed significance at 0.05 level. The younger generation was considered as more tech-savvy as compared to the older generation and the older generation would take more time for studying the latest technologies compared to the younger generation. The trainees had higher achievement motivation would migrate from agricultural allied activities to other jobs because they considered agricultural and allied activities as low income generating jobs. When self-confidence and innovativeness increases then the trainings explicitly showed a positive impact among the trainees.

#### **4.2.Impact of trainings on farm mechanization**

From the table 4.26, it was clear that the training created a positive impact among the trainees. All the 14 parameters used for the test proved to be highly influential in creating positive impact on their livelihood of the trainees. They had gained complete knowledge on the operation of machinery, increase in skill and knowledge developed a positive attitude among the trainees towards the mechanization thereby their employment opportunity increased which helped to increase in income level of the trainees. The increase in income level also improved the savings, crisis management, asset creation, recreation, and infrastructure facility of the trainees. By working as FSA, members the trainees got more exposure to society which increased the social participation of the trainees. Due to increased knowledge and skill level the trainees become more confident and they taught the fellow members to operate the farm machinery. The increase in indebtedness of the trainees after attending the training might be because of availing loan for meeting their personal and family needs as their income from farm mechanization was meagre and forced them to subsistence level of living.

**Table 4.26. Impact of the trainings on farm mechanization****(n=60)**

Sl. No.	Parameter	Before	After	Z - value
		Mean rank	Mean rank	
1.	Knowledge level	00.00	30.50	6.827**
2.	Skill level	00.00	30.50	6.827**
3.	Positive attitude	11.00	32.67	6.331**
4.	Employment opportunity	29.27	30.78	4.570**
5.	Income level	27.83	30.97	5.235**
6.	Asset creation	37.75	29.38	4.922**
7.	Teaching fellow members	27.00	31.47	4.553**
8.	Savings	29.00	30.58	6.854**
9.	Repayment of loans	30.00	30.67	3.799**
10.	Indebtedness	29.65	33.29	3.551**
11.	Recreation	23.50	31.74	5.499**
12.	Crisis management of family	33.15	29.77	3.865**
13.	Social participation	19.50	32.70	5.489**
14.	Infrastructural facilities	27.23	31.23	4.849**

**\*\* Significant at 0.01 level (2-tailed)****\*. Significant at 0.05 level (2-tailed).**

#### **4.6 SWOC analysis**

SWOC analysis was done to analyze the Strengths, Weaknesses, Opportunities and Challenges faced by the trainees after attending the training on farm mechanization. SWOC analysis was done among the trainees using index method. The findings are given below:

#### 4.6.1 Strengths

**Table 4.27. Strengths of the trainings on farm mechanization (n=60)**

Sl. No.	Strengths	Index	Rank
1.	Field level hands on training	96.33	I
2.	Disciplined training	94.56	II
3.	Commitment of the training institution	93.33	III
4.	Very good infrastructure and logistics for the training	91.5	IV
5.	Expertise of the trainers	89.88	V
6.	More importance for practical sessions	86.88	VI

As evident from Table 4.27, the major strength of the training on farm mechanization was field level hands on training with an index value of 96.33. Another important strength of this training programme was disciplined training with an index of 94.56. Commitment of the training institution was the third important strength with an index of 93.33. Fourth ranked strength was very good infrastructure and logistics for the training. Expertise of the trainers was fifth ranked strength with an index of 88.88 and the last ranked strength was more importance for practical sessions with an index of 86.88

The ARS, Mannuthy provided field level training to the trainees, which was helpful to identify the field level problems in using the machinery and thereby they developed expertise in operating the farm machinery at the field level. The training for the members are carried out at three-levels, the first level of the classes was purely focused on theoretical knowledge on the machines. At the second and third level, participants were introduced to enterprise based training. The training schedule included physical training, drill and parade, which was structured on the lines of training provided by Indian Army. The training institution showed better commitment

to the training programme and they provided better infrastructure facility for conducting the training. The MAMTU transported the machinery to the site of training and the training was provided by master trainers who had undergone apprenticeship training for 6 months on the operations, service and maintenance of machinery. At the time of training more emphasis was given to the practical session.

#### 4.6.2. Weaknesses

**Table 4.28. Weaknesses of the training on farm mechanization (n=60)**

Sl. No.	Weaknesses	Index	Rank
1.	Duration of the training period is not adequate to develop skill thoroughly	71.37	I
2.	Interpersonal conflicts in group	58.33	II
3.	Lack of continuous organizational support	55.00	III
4.	No credit support/ linkage for individual ownership of machinery	54.44	IV
5.	Could not increase my employment days	52.78	VI

It is clear from Table 4.28 that duration of the training period was not adequate to develop skill thoroughly with index value 71.37, was ranked first weakness and the second weakness was interpersonal conflicts in group with an index value of 58.33. other weaknesses of the training on farm mechanization were: Lack of continuous organizational support with index value 55.00, no credit support / linkage for individual ownership of machinery with index value 54.44, lack of linkage with



financial institutions with index value 53.33, couldn't increase employment days with index value 52.78.

Majority of the trainees were middle aged, not techno savvy and they required more time for getting expertise in using machinery. The trainees also felt that the duration of the training period was low. The interpersonal conflicts within the group during the training period acted as one of the barriers for maximum efficiency of the training programmes carried out by ARS, Mannuthy on farm mechanization. The funding from the organizations was limited to the group alone and no funding was provided for individual ownership of machinery.

#### 4.6.3 Opportunities

The opportunities of the training elicited from the respondents are presented in the Table 4.29.

**Table 4.29. Opportunities of the trainings on farm mechanization (n=60)**

Sl. No.	Opportunities	Index	Rank
1.	Opened avenue for group farming	95.55	I
2.	Reduced the cost of cultivation	83.33	II
3.	Efforts to attract youth towards farming sector	81.11	III
4.	Brought fallow land under cultivation	78.89	IV
5.	Promoted better utilization of human resources	77.22	V
6.	Prevailing social problem was addressed	69.44	VI

From the table 4.29, it is clear that the major opportunity perceived by the trainees of farm mechanization was 'opening avenue for group farming', which secured an index of 95.55. 'Reduced the cost of cultivation' was another important

opportunity with an index of 83.33. Effort to attract the youth and increasing the employment ranks third with an index of 81.11 were the other important opportunities of these trainings with index values of 78.89, 77.22 and 69.44 respectively. Brought fallow land under cultivation (78.89) 'Promoting better utilization of human resources (77.22) and 'addressing the prevailing social problem through the training programmes' (69.44) were ranked as 4<sup>th</sup> 5<sup>th</sup> and 6<sup>th</sup> possible opportunities.

After undergoing the training on farm mechanization the trainees became more organized and they had entered into the group farming activities using the machinery allotted to the group thereby they got additional income from the farming activities. By operating the machinery in the farmers field, the farmers could save reasonable amount from various operations compared to the conventional method. ARS, Mannuthy carried out many innovative approaches to attract youth towards the mechanized farm labor force. The ARS had provided a new face to the farm labour force as FSA so that they could get good social status in the society and they became more organized and it attracted more people towards the agricultural labor sector.

#### 4.6.4. Challenges

Though the training programme had many strengths and opportunities, there were some challenges faced by the respondents. These are represented in Table 4.30.

**Table 4.30. Challenges of the trainings on farm mechanization (n=60)**

Sl. No.	Challenges	Index	Rank
1	Repair and maintenance too difficult	86.67	I
2	Limited availability of spare parts	63.89	II
3	Lack of institutional back up in terms of technical and financial assistance after training	60.00	III
4	Competition of labor contractors	59.44	IV

From the table 4.30, it is clear that repair and maintenance of machines was too difficult, which was the major challenge having index value of 86.67. Limited availability of spare parts was second major challenge reported by the trainees with index value of 63.89. Challenges ranked as 3<sup>rd</sup> and 4<sup>th</sup> were lack of institutional back up in terms of technical and financial assistance after training (60) and competition of labor contractors (59.44).

The trainees found difficulty in getting the repair and maintenance service for the farm machinery, higher cost of spare parts. and their limited availability were the main problems faced by trainees in implementing the farm mechanization. The FSA needed continuous support from the local level institutions for getting the work regularly and for their smooth functioning.

#### **4.7. Constraints**

Major constraints faced by trainees of the training on farm mechanization are tabulated in Table 4.31.

Table 4.30 shows that the most important constraint faced by the trainees was non feasibility of the farm machinery in all the regions with an average score of 63.60. The second important constraint was the non-availability of financial assistance with an average score of 63.25. The third important constraint perceived by the trainees was lack of support after training with an average score of 62.70. Inadequate training period (62.40), high maintenance cost of machinery (59.45) and complication in operating machinery (58.13) were ranked 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> as the constraints faced by the trainees on farm mechanization.

**Table4.31. Constraints faced by the trainees of the training on farm mechanization (n=60)**

Sl. No.	Constraints	Total Garrett score	Average Garrett score	Garrett ranking
1.	Farm machinery were not feasible in the region	3815	63.60	I
2.	Financial assistance was not provided	3795	63.25	II
3.	Lack of support after training	3762	62.70	III
4.	Training period not adequate	3745	62.40	IV
5.	Maintenance cost of machinery was high	3567	59.45	V
6.	Operation of machinery were very complicated	3488	58.13	VI



Inaugural function of FSA training



FSA trainees in practical class



FSA trainees identifying the spare parts



Trainees practising the operation of transplanter



FSA training – valedictory function



Distribution of FSA certificate

**Plates II : Various stages of training on farm mechanisation for the members of FSA**

### Case study: 1

#### FOOD SECURITY ARMY, VENNOR

The Food Security Army, Vennor started working under the Service Co-operative Bank, Vennor of Thrissur district from 2013. The group started with 18 members, which included 12 females and 6 males these members had undergone the training on 'Garden land mechanization' for a period of 20 days.

After attending the training the trainees felt that they gained complete knowledge and skill on farm mechanization and thereby they became masters in using the machinery. The new service group of Food Security Army could sense a better status in the society, when compared to the earlier status as agricultural labourer. The group owned important machinery required for the mechanized labour force, the list of which is given in Table 4.3.2.

**Table 4.32. List of machinery owned by the FSA, Vennor**

Sl.No.	Machinery, owned by the FSA, Vennor	Number
1	Tractor	1
2	Mini tiller	1
3	Digger	1
4	Brush cutter	6
5	Sprayer	2
6	Rotavator	1

All the machinery owned by Food Security Army, Vennor was under working condition. The maintenance was carried out in the service centers and the machinery was under the coverage of guaranty period. The machinery of the group were purchased by the Service Co-operative Bank, Vennor under the fund provided by the

government for setting up of Farmer Service Centre. The bank was provided with ₹ 25 lakhs for the purchase of machinery. Through that funding the bank provided training to selected members and the machinery were provided for use among the members of the group.

### **Socio economic and developmental consequences of the training**

The socio economic and developmental consequences of the training programme was assessed among members of FSA, Vennor the results of which are discussed below:

#### **1. Resulted in the creation of an organized labour force**

The FSA, Vennor acted as the mechanized labour force in Vennor and nearby places of Thrissur district of Kerala State. They mainly undertook mechanization in garden land.

#### ***Increased area under farm mechanization***

During 2016-17, the FSA could cover an area of 140 ha under mechanization. The year-wise area covered by the group is given in Table 4.33.

**Table 4.33 Area covered by the FSA members of FSA, Vennor using farm machinery during the last three years**

Sl.No.	Year	Area covered (Hectare)
1	2014	15
2	2015	94
3	2016	140

From Table 4.33, it is clear that the FSA had been increasing the area under farm mechanization in each year from 2013-2016. The FSA, Vennor had covered an

area of 140 hectares of garden land during last year under farm mechanization. As per the trend, it shows a progressive growth of area covered under farm mechanisation.

***Reduced cost of labour***

As mentioned earlier, the FSA, Vennor had covered an area of 140 ha under mechanization, thereby reducing the cost of labour involved, as manual labour costs more. In some places, machines of other private persons/agencies were being used at higher cost before the FSA, Vennor started functioning. Thus there was a reduction in the cost again due to the comparatively low rate charged by the FSA. The cost difference is presented in Table 4.34. Reduced cost of labour had created a positive attitude among the people of the area towards FSA as well as farm mechanization.

**Table 4.34 Savings earned by farmers from Food Security Army, Vennor**

Sl.No	Name of machinery	Cost involved in using farm machinery (₹)		Savings earned (₹)/ha	Savings earned by farmers during 2016 (₹)
		Before	After		
1	Brush cutter	5250	3675	1575	154350
2	Tractor	2625	2000	625	26250

From Table 4.34, it is clear that the farmers could save an appreciable amount of money after the introduction of FSA for the various agricultural operations using farm machinery. Brush cutter and tractor were the two machinery commonly used by the members of FSA in farmers fields. The members of FSA, Vennor could earn an income after using the farm machinery. At the same time, the farmers' could save an amount of ₹1575/ ha for using brush cutter and ₹625/ha for using tractor. In 2016 the farmers saved a total amount of ₹ 154350 by using brush cutter and ₹26250 by using tractor.



### ***Timely availability of labour***

Before establishing the Food Security Army the farmers depended on panchayath for tractors and other farm machinery. It was difficult to get the machinery on time. This forced them to approach private parties. The private groups charged higher rate for their farm operations using the machinery. The Food Security Army members provided their services to farmers at a reasonable rate, and on time, since they had a battalion of army members, who were organized. Thus the FSA group acted as an organized labour force with timely support to the farmers of nearby areas.

### **2. Increased area under farming by the Food Security Army, Vennor**

During off season, the members of FSA may not get work regularly. To overcome the unemployment problem among members of Food Security Army, the FSA carried out farming in leased land under the supervision of the Service Co-operative Bank. The crops cultivated and the area cultivated during 2016 is presented in Table 4.35.

**Table 4.35 Area under different crops cultivated by the FSA, Vennor during 2016**

Sl.No.	Crops	Area (Ha.)
1.	Vegetables	2.4
2.	Banana	0.4
3.	Tapioca	0.2
4.	Upland rice	0.4
Total		3.4

During 2016, the Food Security Army, Vennor had cultivated a total of 3.4 ha. The group cultivated vegetables in leased area of 2.4 hectares and planted banana suckers in 0.40 ha. They carried out upland rice cultivation in an area of 0.40 ha, and

tapioca in 0.2 ha. In addition to this, the Food Security Army carried out poly house cultivation too. Thus the FSA group, besides acting as a mechanized labour force, involved in farming activities and played a major role in increasing the area cultivation and production of crops.

### **3. Acted as agents of promotional practices in farming**

In addition to acting as a labour force and undertaking farming activities, the FSA Vennor had involved in activities to promote agriculture, which were pivotal in ensuring food security. The FSA mainly involved two types of creative activities.

#### ***Running of agricultural produce marketing outlet***

The FSA, Vennor had been running an agricultural produce outlet named Saravana stores, mainly for selling out their products at fair price. Since the group practiced organic agriculture and they could sell their products easily through the outlet. They could get a fair price for their products by excluding the middle men. They also collected farmers' produces and marketed through the shop there by the farmers received fair price for their produce. Around 10-15 farmers provided their farm produce through the outlet in every season.

#### ***Attracting new generation to agriculture***

The members of the Food Security Army, Vennor promoted farming activities among school students from five schools by cultivating in school premises, with the aim of attracting the children and youth towards agriculture. They established vegetable gardens at the school premises, free of cost, and the management of the gardens was vested with the school children.

Thus the FSA Vennor was actively involved in promoting agriculture too. All the above mentioned activities of FSA, Vennor were made possible because of the training programme, as opined by the FSA members.

#### 4. Benefit to the members of FSA, Vennor

Through the training and the resultant activities of the FSA could achieve positive consequences. It is worthwhile and important to analyse its consequences of the training in terms of employment and income earned by the FSA members, which is critical in sustaining such a mechanism. The average employment days and the income earned by the members of FSA, Vennor is presented in Table 4.36

**Table 4.36 Average employment days and income earned by the members of FSA, Vennor**

Sl. No.	Gender	Average employment days/ month	Daily wages (₹)	Average income of the FSA members/ month (₹)
1	Male	11	550	6000
2	Female	17	350	

The FSA female members could get employment of 17 days per month for females and 11 days for males. Most of the female members were working in the farm managed by FSA hence they got more employment days compared to males. The members were working under the service co- operative bank for daily wages at the rate of ₹ 350 per day for women and ₹ 550 for men. During 2016, the members of Food Security Army Vennor worked and earned an amount of ₹ 20 lakh and the bank, under which the FSA functions used to spend 10 per cent of its profit for promoting agricultural and allied activities. The FSA members earned an average amount of Rs 6000/month. Though it had increased their livelihood security, this alone was not sufficient. That is why the trainees (FSA members) engaged in group farming activities as well as worked in the farm run by the Service Co-operative Bank. Besides, they went for outside work on daily wage basis, when they did not have FSA activities. Thus there was still lot of scope for increasing the labour and other activities of the FSA group, with the available man power. As we saw an

increasing trend over the three years, we could expect further growth of area under farming.

Altogether, the FSA members were elevated from unorganized to organized status, partially assured their employment and increased their social status as a member of the mechanized labour force. The major problem for the FSA group was the lack of regular employment throughout the year and the lack of opportunity in using coconut climbers due to the availability of surplus coconut climbers in their area.



Researcher collecting data from the office bears of FSA



Office of Agro Service Center



Model farm of FSA



Outlet of FSA



Sowing seeds in pot tray by a member of FSA



FSA member operating brush cutter

**Plates III : Case study on Food Security Army, Venoor**

## **Case study: 2**

### **FOOD SECURITY ARMY, PALLIYAKKAL**

The Service Co-operative Bank, Palliyakkal of Ernakulam district had been promoting farming activities in the area of its jurisdiction for more than fifteen years. Members of the bank, interested in farming activities were identified and selected to form a group with 23 members. The group was sent for training on farm mechanization under Food Security Army during 2014 for a period of 20 days at Agricultural Research Station, Mannuthy, through the Central Training Institute, Mannuthy. The expenses for the training were met by the Service Co-operative Bank, Palliyakkal. At present the group functions with 22 members. The trainees were paid with a stipend of ₹ 2000/trainee during the training period and also they were provided with uniform, pair of shoes and a cap. Once they completed the training, they became members of Food Security Army.

#### **Administrative set up**

The administrative structure of the group included a chief executive, bank manager, a chief coordinator and a retired agriculture officer. They were appointed by the bank to look after the agricultural activities of the group. A master trainer and a main advisor would be there in the administration committee and the main advisor was an aged and experienced farmer to give information about the agricultural activities. The meetings of the group would be conducted once in a week and once in a month. The weekly meetings were conducted in the field and monthly meeting was carried out in the office.

After training, machinery were purchased by utilizing the funds allotted by Government of Kerala to the bank for Farmer Service Centre to an amount of ₹ 25 lakhs. The group owned important machinery required for the mechanized labour force, the list of which is given in Table 4.37.

**Table 4.37 List of machinery owned by the FSA, Palliyakkal**

<b>Sl.No.</b>	<b>Name of machinery owned by FSA, Palliyakkal</b>	<b>Number</b>
1	Tractor	1
2	Mini tractor	1
3	Digger	1
4	Brush cutter	5
5	Tata ace	1
6	Rotavator	1
7	Areca nut harvester	1
8	M80 scooter	1
9	Sprayer	3

#### **Institutional support**

As the training was provided by Agricultural Research Station, Mannuthy. hand holding support was rendered by village level institutions like panchayth office and krishibhavan in finding regular employment for the trainees in the farming sector by using farm machinery. In addition the bank used to lease in land for farming, provided all inputs and made use of the trained labour force for farm mechanization. The profit earned after marketing the farm produce was deposited in the account of Food Security Army, Palliyakkal.

#### **Socio economic and developmental consequences of the training**

The socio economic and developmental consequences of the training programme was assessed among the members of FSA, the results of which are discussed below:

### **1. Resulted in the creation of an organized labour force**

The FSA, Palliyakkal acted as the mechanized labour force in Palliyakkal and neighbouring areas of Ernakulam district of Kerala state. They mainly undertook mechanization in garden land.

#### ***Increased area under farm mechanization***

During 2015-16, the FSA could cover an area of 120 ha under mechanization. The year-wise area covered by the FSA is given in Table 4.38.

**Table 4.38 Area covered by the FSA members of FSA, Palliyakkal during the last two years**

<b>Sl.No.</b>	<b>Year</b>	<b>Area covered (Hectare)</b>
1	2015	40
2	2016	80

From Table 4.38, it is clear that the FSA had been increasing the area under farm mechanization in each year from 2015-2016. The FSA had covered an area of 120 hectares of garden land during last two years under farm mechanization.

The members of Food Security Army, Palliyakkal succeeded in bringing an area of 20 hectares of fallow land under vegetable cultivation in 2015-2016. Before establishing the FSA, the farmers of the locality found difficulty in getting the farm machinery in time for various operations. Most of the operations were done manually and hence it consumed more time, labour and drugerous in nature. After establishing, the FSA most of the farmers depended on the Food Security Army for their field operations.



### ***Reduced cost of labour***

As mentioned earlier, the FSA had covered an area of 120 ha under mechanization, for the past two years thereby reducing the cost of labour involved, as manual labour costs more. There was no other private agencies for promoting farm mechanization in the area because of the non-suitability of machinery in pokalli fields. The farmers entirely depended on FSA for farm mechanization.

### ***Timely availability of labour***

The members of Food Security Army, Palliyakkal provided their services to farmers at a reasonable rate, and on time, since they had a battalion of army members, who were organized. Thus the FSA acted as an organized labour force to support farmers in time.

### **Increased area under farming by the FSA, Palliyakkal**

During lean season, the members of FSA, Palliyakkal found difficulty in getting employment. To overcome the unemployment problem among the members of Food Security Army, the FSA carried out farming in leased land under the supervision of the Service Co-operative Bank, Palliyakkal. During 2016, the Food Security Army, Palliyakkal had cultivated a total of 20 ha. Thus the members of FSA, besides acting as a mechanized labour force, involved in farming activities and played a major role in increasing the area under cultivation and production of crops.

### **3. Acted as agents of promoting farming practices**

In addition to acting as a labour force and undertaking farming activities, the members of FSA had involved in activities to promote agriculture, which were significant in ensuring food security. The creative activities of FSA, Palliyakkal are:

### ***Running an outlet for marketing agricultural produce***

The FSA had an outlet through which the farmers and the food security army members marketed their farm produce to the consumers at a fair price by excluding the middlemen. The farmers and the FSA members received reasonable price for their products. They also collected farmers' produce and marketed through the shop there by the farmers received fair price for their products.

### ***Attracting new generation to agriculture***

The members of the Food Security Army, Palliyakkal promoted farming activities among school students by cultivating in school premises, with the aim of attracting the children and youth towards agriculture. They established vegetable gardens at the school premises at free of cost, and the management of the gardens was entrusted with the school children.

The FSA, Palliyakkal provided support to bala karshaka club with 150 students. The students carried out the farming activities during vacation and Food Security Army helped them and gave proper advices to the students about agricultural activities, there by more youngsters could be attracted towards the agricultural sector.

### **4. Benefits to the FSA members of, Palliyakkal**

Through the training and the resultant activities of the FSA made to realise positive consequences. It is worthwhile and important to analyse its consequence in terms of the employment and income earned by the FSA members, which is critical in sustaining the activities of FSA. The average employment days and the income earned by the members of FSA, Palliyakkal is presented in Table 4.39.

**Table 4.39 Average employment days and income earned by the members of FSA, Palliyakkal**

Sl. No.	Gender	Average employment days/ month	Daily wage (₹)	Average income of the FSA members/month (₹)
1	Male	18	500	9000
2	Female	26	350	

The female members of FSA, Palliyakkal could secure employment days of 26 days per month and males could get 18 employment days. Thereby they could earn an average amount of Rs 9000/month. No doubt, the training had increased the livelihood security of the FSA members. The trainees were engaged in group farming activities, they worked in the farm and the outlet run by the Service Co-operative Bank.

**Major activities of the FSA, Palliyakkal are as follows:**

- Production of organic products
- Dairy farm with 25 milking cows
- Poultry along with duck farming
- Jasmine cultivation of 15000 plants in grow bags
- Organizing and setting up of exhibition stalls during festivals
- Seedling production

The members of Food Security Army had conducted an exhibition on farm mechanization. The latest machinery available in the market were displayed and facilities were provided to the farmers for buying the machinery. Also the FSA had carried out vegetable cultivation in the premises of a church nearer to the Service Co-operative Bank. Various categories of visitors used to visit and gathered information about the secret of their success in farming.

The training on farm mechanization helped the trainees to improve their knowledge and skill about agriculture and farm mechanization. The trainees felt that their social status was evaluated as the members of food security army. The trainees stated that they loved the profession of agricultural labour using farm machinery as they get better social status in the society. They also reported that the drudgery of doing farm operations had decreased and they could cover a more area in a short period of time.

The major problem for the members of FSA was lack of regular employment throughout the year, less demand for arecanut harvester in the area, difficulty in using farm machinery in Pokkali fields, some of the trainees did not get expertise in driving the tractor and difficulty in getting tractor license.

#### **Achievements**

The major achievements of FSA, Palliyakkal are listed below:

- The FSA had successfully covered 120 hectares under mechanization during the last two years.
- This group acted as a successful model and act as learning platform for the labourers from other states.
- Farmers were provided with information on latest machinery and created opportunity for purchasing the machinery by organizing exhibitions on farm machinery.
- Many famous personalities like former agricultural minister, Sri K.P.Mohanan, Finance minister, Dr Thomas Isaac, former chief minister, Sri V.S.Achuthanandan, Celebrity Sri Mammooty visited the FSA, Palliyakkal and record their appreciation after realizing the achievements of FSA, Palliyakkal in farm mechanisation.



FSA march



Researcher collecting data from the members of FSA



Cool season vegetable cultivation by FSA



Model plot of FSA



Farmers Service Center maintained by the members of FSA



Office bearers of FSA

**Plates IV Case Study on Food Security Army, Palliyakkal**

### **Case study: 3**

#### **Food Security Army, Kodumbu**

Kodumbu group is one of the successful FSA which is actively functioning in Palakkad district of Kerala.

#### **Initiative**

The group was formed with 43 members in 2011, initiated by the Agricultural officer, Mrs. Sheela. Kodumbu Krishi Bhavan and Malampuzha block panchayath supported for the registration of the group in Palakkad Civil Office under Societies Act.

At present there are 35 members in this group which include 3 males and 32 female members. Kollamkode block provided a tractor and sprayers to the group followed by many government institutions like Malampuzha block panchayath and Kodumbu panchayath provided machinery to the group. The group later divided into 2 groups, named Pulari with 14 members and Ponpulari with 21 members. The group was divided for getting funds for the benefit of schedule caste members for buying machinery.

The group offered their service to the farmers as food security army members for the last two years. The group had given more emphasis on mechanization in farming. Generally, most of the farming practices were very hard. Introduction of farm mechanization reduced the drudgery of work to a certain extent. The operational area of the group is predominantly in the Palakkad district and in some parts of the Thrissur district. Palakkad as the rice bowl of Kerala most of the farmers engaged in rice cultivation and the second most important crop in the area was coconut. The rice was highly labour intensive crop and most of the machinery were used in the rice

fields. From the last two years the group had succeeded in providing their services to more than 100 farmers and around 70-80 coconut farmers per annum.

The wage rate of the trainees didn't improve through the training but the training on farm mechanization helped to reduce the work load of the workers and they could cover more area in less time.

The trainees perceived that the machinery also improved the quality of work too. The trainees also taught others who had interest in learning the operation of various machinery.

**Table.4.40 List of machinery owned by FSA, Kodumbu**

Sl. No.	Name of machinery	Number
1	Tractor	2
2	Reaper	1
3	Coconut climber standing type	18
4	Brush cutter	8
5	Transplanter(2wheel)	1
6	Transplanter(4wheel)	1
7	Tractor attachments	
8	Sprayer	1
9	Thresher	1
10	Other farm tools	

Among the owned machinery one transplanter was under repair and reported as ununserviceable. Since spare parts were not available in the market it was not used by the group. Most of the machinery were provided to the group at free of cost. A transpalnter was purchased by the group members at 50 per cent subsidy rate.

### **Mode of operation**

The group used to conduct 4-5 meetings every year. All the group members used to attend the meetings. The group members deposited 30 per cent of their profit in cooperative bank in Koypulli for the maintenance cost of the machinery. Either the group received major work from krishibhavan or the farmers. The group secretary or the president was directly contacted by the farmers for getting the service of FSA.

### **Socio economic and developmental consequences of the training**

The socio economic and developmental consequences of the training programme was assessed among the members of FSA, Kodumbu the results of which are discussed below:

#### **1. Resulted in the creation of an organized labour force**

The FSA, Kodumbu acted as the mechanized labour force in Malampuzha and neighbourhood of Palakkad district of Kerala State. They mainly undertook mechanization in garden land.

#### ***Increased area under farm mechanization***

. The yearwise area covered by the FSA is given in Table 4.41.

**Table 4.41. Area covered under mechanization by Food Security Army, Kodumbu**

<b>Sl.No.</b>	<b>Year</b>	<b>Area covered under mechanization(hectare)</b>
1	2015	116
2	2016	200



The Food Security Army Kodumbu had brought an area of 116 hectares under mechanization in 2015 and it was increased to 200 hectares in 2016. Table 4.41 depicts that the Food Security Army Kodumbu increased area under farm mechanization over the years. In 2016 the FSA succeeded to bring 2 hectares of fallow land under cultivation and thereby they increased an additional production of 10 tonnes of paddy from the fallow land.

***Reduced cost of labour***

As mentioned earlier, the FSA, Kodumbu had covered an area of 200 ha under mechanization, thereby reducing the cost of labour involved, as manual labour costs more compared to the use of machinery. In some places, machines of other private persons/agencies were being used before the FSA started working. Thus there was a reduction in the cost of labour again due to the comparatively low rate charged by the FSA.

**Table 4.42 Savings earned by farmers from Food Security Army, Kodumbu**

Sl.No.	Machinery	Cost involved in using farm machinery (₹)		Savings earned (₹)/ha	Savings earned by farmers during 2016 (₹)
		Before	After		
1	Tractor	1750	1500	250	20000
2	Transplanter	8750	8250	500	60000

Before starting the Food Security Army, the farmers depended on the private groups for getting machinery and they charged higher amount for their operations. The other source for getting machinery was padashekara samithi, but samithi had only few machinery with them and hence they could not cater to the farmers in time especially during peak seasons. After establishing the group, the Food Security Army

provided service to the farmers at a fair price. The trainees reported that the yield of the crop had increased because of timely operation by using machinery and it also helped the farmers to save an amount of ₹ 10000 from every one acre of compared to old conventional methods.

Because of the activities of FSA, Kodumbu panchayath, farming community earned a savings of ₹ 20000 after using the tractor and ₹ 60000 after using the transplanter during 2016.

### *Timely availability of labour*

Before establishing the Food Security Army the farmers depended on panchayath for tractors and other farm machinery. It was difficult to get the machinery on time. This forced them to approach private parties. The private groups charged higher rate for their farm operations using the machinery. The Food Security Army members provided their timely services to farmers at a reasonable rate, and on time, since they had a battalion of FSA members. Thus the FSA acted as an organized labour force for timely support to other farmers.

## **2. Benefits to the members of FSA, Kodumbu**

Through the training and the resultant activities of the FSA showed positive consequences. It is worthwhile and important to analyse the consequences in terms of employment days and income earned by the members of FSA, The average employment days and the income earned members of FSA, Kodumbu is presented Table 4.43.

The FSA member of FSA, Kodumbu could gain an average employment days of 17 days per month for females and 13 days for males and they could earn an average amount of ₹ 6000/month. The training had increased their livelihood security of the members of FSA.

**Table 4.43 Average employment days and income earned by the members of FSA, Kodumbu**

Sl. No.	Gender	Average employment days/ month	Daily wage (₹)	Average income of the FSA members/ month (₹)
1	Male	13	450	6000
2	Female	17	350	

The members of the FSA, Kodumbu who worked for a day would be given ₹ 450 per day for men and ₹ 350 for women. They maintained the attendance register and at the last day of the contract they conducted meeting and discussed share and the profit based on the attendance. They deposited 30 per cent of the total profit for the maintenance of the machinery. They spent a small portion of the profit for recreation activities. On an average the FSA, Kodumbu earned ₹ 15lakhs per annum by members.

The members of Food Security Army Kodumbu in their uniform felt a better status and high dignity compared to other agricultural laborers. The trainees were of opinion that they developed the knowledge and skill on the use of farm machinery enabled the trainees become more confident in using the machinery and felt much secured and safety in using the machinery. The training helped the trainees to build up punctuality and discipline. The trainees used to conduct march parade before starting the job to stress the importance of discipline in their work.

The major problems faced by the FSA Kodumbu was lack of availability of spare parts, its higher cost, they did not have proper mechanism to measure the area which they worked and the land owners cheated them by providing wrong information of the area after the completion of work, and they found difficulty in getting the tractor license they required more training period for improving their performance in operating the machinery efficiently.



Researcher collecting data from members of FSA



FSA members operating brush cutter



FSA Parade



FSA operating transplanter



Preparation of mat nursery by the members of FSA



Separating the raised seedlings from mat nursery

**Plates V : Case Study on Food Security Army, Kodumbu**

#### **Case study: 4**

##### **FOOD SECURITY ARMY, IRINJALAKUDA**

The group was registered in 2013 under 'Co-operative Societies Act' with register number TSR/TC/76/2013.

The Food Security Army, Irinjalakuda was working under the Service Co-operative Bank, Irinjalakuda with 9 women and 6 men, constituting a total members of 15 members. The FSA had leased in land for cultivation to overcome the unemployment crisis during off season. The main highlight of the FSA, Irinjalakuda was providing tele advising services to the farmers for clarifying their doubts about agriculture and farm machinery.

FSA, Irinjalakuda set stalls for helping the farming community to get premium price for their produce and simultaneously earning margin money for the Food Security Army. During last year, 10 stalls were managed by FSA, Irinjalakuda for selling the products of local farmers. The Food Security Army, Irinjalakuda also had mobile shops for selling the farm produce. Around 25 farmers were getting the benefits through the mobile shops. The farmers received a fair price for their product and thereby they could earn more income by overcome the chance of exploitation by middlemen.

The FSA involved in selling the seedlings to the farmers. The FSA used to buy seedlings from Kerala Agricultural University, planted it in grow bags and sold it to the farmers, thereby the trainees earned an income in the off season and a the same time provided quality seedlings to the farmers locally.

Every day, around 20-25 farmers visited the Food Security Army, Irinjalakuda for various services and the Food Security Army kept a visitors register to get the farmers opinion about the Food Security Army. The visitors register also helped to

identify the problems faced by the farmers in receiving their services so that FSA can modify their operations based on the interest and needs of farmers.

**Table.4.44 List of machinery owned by the FSA, Irinjalakuda**

Sl. No.	Name of machinery	Number
1	Tractor	2
2	Mini tiller	3
3	Power tiller	3
4	Brush cutter	4
5	Transplanter	3
6	Kopra drier	1
7	Paddy harvester	1
8	Rocker Sprayer	3
9	Power Sprayer	5
10	Coconut climber	10
11	Power thresher cum winnower	1

**Activities of FSA, Irinjalakuda:**

The various activities carried out by FSA, Irinjalakuda are as follows:

- Bio-pharmacy
- Upland rice cultivation
- Cultivation in leased lands
- Selling seedlings – the FSA, Irinjalakuda used to buy seeds from Kerala Agricultural University and raised seedlings in pro-trays. Those seedlings were sold to farmers.
- Raising and selling of onion seedlings
- Setting stalls in all the fairs and festivals of the region

- Collection and marketing of farmers' produce
- Setting up of vegetable garden in schools and they supplied their products such as organic manures to those gardens
- 'Njatu vela chantha' a seasonal fair, where the group used to sell their products and also the produce collected from farmers.
- Agro clinics were conducted by the Food Security Army
- For encouraging and promoting agriculture in young minds 'Youth Clubs' were formed by organizing young and interested farmers.
- Vegetable cultivation was done in the premises of available government properties.
- Production and selling of organic manures
- Promotion of kitchen gardens at household level
- Promoting and creating the awareness regarding organic cultivation – it's uses, necessities, demand and benefits.
- Tele-advising: Offering telephone based consultation system for clarifying the queries of farming community regarding farming and farm machinery.

### **Socio economic and developmental consequences of the training**

The socio economic and developmental consequences of the training programme was assessed among members of FSA, Irinjalakuda the results of which are discussed below:

#### **1. Resulted in the creation of an organized labour force**

The FSA, Irinjalakkuda acted as the mechanized labour force in Irinjalakkuda and neighbourhoods of Thrissur district of Kerala State.

### ***Increased area under farm mechanization***

During 2016, The FSA could cover an area of 180 ha under mechanization. The yearwise area covered by the FSA is given in Table 4.45.

**Table 4.45 Area covered under mechanization by Food Security Army, Irinjalakuda during the last 3 years**

Sl.No	Year	Area covered under mechanization (hectare)
1	2014	85
2	2015	140
3	2016	180

The Food Security Army, Irinjalakuda had brought an area of 85 hectares under mechanization in 2014, increased to 140 hectares in 2015 and in 2016 it reached to 180 hectares.

### ***Reduced cost of labour***

The FSA, Irinjalakuda had covered an area of 180 ha under mechanization, thereby reducing the cost of labour involved, as manual labour costs more when compared to the application of machinery. In some places, machines of other private persons/agencies were being used before the FSA was introduced. Thus there was reduction in the cost again due to the comparatively lower rate charged by the FSA. Therefore, this trend had created a positive attitude among the farmers of the area towards FSA as well as farm mechanization.

From Table 4.46 its clear that, after the introduction of Food Security Army, Irinjalakuda, the farming community could earn a saving amount of ₹ 37500 after using tractor and ₹ 60000 after using the transplanter.



**Table 4.46 Savings earned by farmers from Food Security Army, Irinjalakuda**

Sl.No	Machinery	Cost involved in using farm machinery (₹)		Savings earned (₹)/ha	Savings earned by farmers during 2016 (₹)
		Before	After		
1	Tractor	2125	1500	625	37500
2	Transplanter	10500	10000	500	60000

***Timely availability of labour***

Before establishing the Food Security Army the farmers found difficulty in getting machinery on time and its services. The private parties charged higher cost for operating the machinery in farmers field. The main problem faced by the marginal and large scale farmers was the lack of availability of farm machinery for farming operations. The farmers depended on the green army force of Vadakkancheri for getting the farm machinery.

**2. Resulted in increasing area under farming**

During lean season, the members of FSA could not get work regularly. To overcome the unemployment problem among members of Food Security Army, the FSA carried out farming in leased land. The crops cultivated and the area cultivated during 2016 is presented in Table 4.47.

**Table 4.47 Area under different crops cultivated by the FSA in 2016**

Sl.No.	Crop	Area (Ha.)
1.	Paddy	5.20
2.	Vegetables	2.00
3.	Upland rice	0.80
Total		8.00

During last year the FSA leased 8 hectares of barren land under cultivation, out of which the FSA had transplanted rice in 5.2 hectares of wet land, upland rice in 0.80 hectare, vegetable in 2 hectares. For bringing more area under cultivation the FSA cultivated crops in the government lands on rental basis.

During last year FSA, Irinjalakuda brought a total area of 12 ha of fallow land under paddy cultivation and thereby they contributed an additional production of 60 tons of paddy in Thrissur district.

### **3. Acted as agents of promoting farming practices**

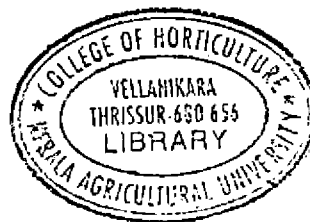
In addition to acting as a labour force for undertaking farming activities, the FSA had involved in activities to promote agriculture, for ensuring food security. The FSA mainly involved two types of following creative activities:

#### ***Running marketing outlet for agricultural produce***

The FSA, Irinjalakuda had been running an outlet, mainly for marketing out their products at fair price. Since the group practiced organic agriculture and they could sell their products easily through the outlet. They could get a fair good price for their products and prevented the usual trend of exploitation by middlemen. They also collected farmers' produce and marketed through the shop thereby the farmers received fair price for their products. Farmers also marketed their farm produce through the outlet in every season.

#### ***Attracting new generation to agriculture***

The Food Security Army, Irinjalakuda had organized a youth club to attract more youngsters towards the agricultural sector. The members of Food Security Army provided their support for setting up of vegetable gardens in schools and they



sold their products like manures, plant protection chemicals etc through their bio pharmacy.

#### 4. Benefits gained by the members of FSA

Through the training and the resultant activities of the FSA, Irinjalakuda created positive consequences. It is worthwhile and important to analyse its consequences in terms of average employment and income earned by the FSA members, which is more important in sustaining their livelihood. The average employment days and the income earned is presented Table 4.45

The members of FSA, Irinjalakuda earned a daily wage of ₹ 500 for males and ₹ 350 for females. On an average a female member got employment for 20 days per month and male member for 14 days. They earned an average amount of ₹ 7000/month. It increased the livelihood security of the members of FSA. The trainees engaged themselves in group farming activities and also worked in the farm owned by the Service Co-operative Bank, Irinjalakuda.

**Table 4.47 Average employment days and income earned by the members of FSA, Irinjalakuda**

Sl. No.	Gender	Average employment days / month	Daily wage (₹)	Average income of the FSA members/ month (₹)
1	Male	14	500	7000
2	Female	20	350	

From the total profit obtained, 25-30 % was saved at Karivanoor Co-operative Society for the maintenance of their machinery and also for other group activities. The entire money obtained as rent of the machinery was saved in bank. At present the FSA had ₹ 3,00,000 as savings.

The Food Security Army got a turnover of about ₹ 12 lakhs per annum from farm mechanization and every year the group used to provide mechanical assistance to 150 farmers and they provided services to the farmers at a cheaper rate.

The major problems faced by the FSA for their better functioning are: mini tillers were not suitable for their area, lack of space for installing copra dryer, competition from the private parties and low quality of the machinery.



**FSA Members operating tiller in wet land**



**FSA Members operating tractor**



**Researcher with office bearers of FSA**



**Preparation of mat nursery by the members of FSA**



**FSA Members operating brush cutter**



**FSA Members operating transplanter**

**Plates VI : Case Study on FSA, Irinjalakuda**

## Case study: 5

### FOOD SECURITY ARMY, PAMPAKUDA

Food Security Army, Pampakuda is the model centre for Ernakulam district offering services to the farmers of Ernakulam district. The Food Security Army was functioning with 4 men and 18 women constituting 22 members in the Food Security Army. Since most of the men folk were migrating to nearby towns and cities in search of regular high paid whitecollar jobs, womenfolk remained in taking care of farm activities. The trained women felt that they received special respect, dignity and status from the society as they were in the uniform dress code and professionally skilled compared to the untrained women.

After attending the training the self-confidence of the trainees had increased in operating the machinery. The trainees felt much secured in using the machinery after getting complete knowledge about the machinery and its repair and maintenance. The training not only developed the knowledge and skill of operating the machinery but also reduced the drudgery and increased the positive attitude of the trainees towards the usage of machinery.

The FSA was running a nursery unit for providing job opportunity for the employees throughout the year. The trainees worked in the nursery unit on rotation basis and they were provided with daily wages so that the trainees could earn regular income throughout the year.

The Food Security Army marketed seedlings to the farmers at normal rate through a nursery unit. They collected seedlings and seeds of the vegetables from Kerala Agricultural University, planted it in grow bags and sold them to farmers by gaining a minimum profit. The Food Security Army also carried out maintenance work of the machinery for 25 farmers every year. An information

kiosk was kept in the office for providing information to the farmers for controlling pest and diseases of various crops and its cultivation practices.

Advanced booking facilities for availing the services of utilizing either machinery alone or along with labour was made available to the farmers. Facilitator was in charge of advance booking.

**Table 4.48 List of machinery owned by the FSA, Pampakuda**

Sl.No.	Item	Number
1.	Paddy transplanter	1
2.	Power tiller	1
3.	Garden tiller	1
4.	Double wheel barrow	4
5.	Single wheel barrow	2
6.	P/K Engine-3Hp(Pump set)	1
7.	Coconut climber	7
8.	Crow bar	5
9.	Generator- 5000w P/K	1
10.	Brush cutter	4
11.	Chain Saw – Oleomac 3Hp	6
12.	Pickaxe	1
13.	High pressure washer	1
14.	Tractor 40Hp Mahindra	1
15.	Tractor 55Hp John	1
16.	Cultivator Mahindra	1
17.	Cage wheel –Mahindra	1
18.	Cage wheel – John Deer	1
19.	Leveller- John Deer Tractor	1

20.	Bund former	1
21.	High Tension Poser Spare 3Hp Honda	1
22.	KAMCO Power Reaper – 120	1
23.	Cage wheel reaper	1
24.	Half cage wheel suitable for Mahindra tractor	1
25.	Coconut Basin Digger	2
26.	Thresher cum Winnower	1
27.	Ace Round Baler Suitable for John Deer Tractor	1
28.	Rotavator with Mahindra tractor	1

### **Socio economic and developmental consequences of the training**

The socio economic and developmental consequences of the training programme was assessed among the FSA, Pampakuda members, the results of which are discussed below

#### **1. Resulted in the creation of an organized labour force**

The FSA, Pampakuda acted as the mechanized labour force in Pampakuda and nearby places of Ernakulam district of Kerala State. They mainly undertook mechanization in garden land.

#### ***Increased area under farm mechanization***

During 2016, The FSA could cover an area of 210 ha under mechanization. The yearwise area covered by the FSA is given in Table 4.49.



**Table 4.49 Area covered under mechanization by Food Security Army Pampakuda**

Sl.No.	Year	Area covered under mechanization(hectare)
1	2014	102
2	2015	132
3	2016	210

The Food Security Army, Pampakuda had brought an area of 102 hectares under mechanization in 2014, it was increased to 132 hectares in 2015 and in 2016 it reached to 210 hectares. From Table 4.49 it is clear that the Food Security Army succeeded in increasing an area of 210 hectares under farm mechanization compared to previous year.

In 2016, FSA, Pampakuda brought an area of 6 ha of fallow land under cultivation and thereby they added a production of 30 tons of paddy from Ernakulam district.

#### ***Reduced cost of labour***

The FSA, Pampakuda had covered an area of 210 ha under mechanization, thereby reduced the cost of labour involved, as manual labour costs more when compared to mechanisation. In some places, machines of other private persons/agencies were used before the FSA came into action. Thus there was a reduction in the cost again due to the comparatively lower cost charged by the FSA, Pampakuda.

Because of the activities of the Food Security Army, Pampakuda, farming community earned a savings of ₹ 52500 after using the tractor and ₹ 62500 after using the transplanter during 2016.

**Table 4.50 Savings earned by farmers from Food Security Army, Pampakuda during 2016**

Sl.No	Machinery	Cost involved in using farm machinery/ha (₹)		Savings earned (₹)/ha	Savings earned by farmers during 2016 (₹)
		Before	After		
1	Tractor	2125	1875	250	52500
2	Transplanter	11250	10000	1250	62500

***Timely availability of labour***

Before establishing Food Security Army, the farmers found difficulty in getting machinery for the field operations and the farmers depended on padashekara samithi for field operations using machinery and some farmers hired machinery from Tamilnadu and carried out the field operations at much higher rate. The Food Security Army succeeded in providing services to the farmers at lower rate compared to the cost charged by the private parties. The Food Security Army had the facility of phone in services to book their services in advance for the benefit of farmers. Thus the FSA group acted as an organized labour force to provide timely support to farmers.

**2. Resulted in increased area under farming**

The members of FSA found difficulty in getting regular employment during lean season. To overcome the unemployment problem among members of Food Security Army, the FSA carried out farming in leased land. Group farming was adopted by the trainees in an area of 6 hectares of barren land. The FSA involved in fully mechanized paddy cultivation in the entire area of 6 hectares of barren land and thereby the FSA added an additional production of 30 tons of paddy from 6 ha of area.

#### **4. Acted as agents of promoting farming practices**

In addition to acting as a labour force they involved themselves in farming activities. The FSA, Pampakuda promoted agriculture in schools and barren lands, for ensuring food security. The FSA mainly involved in:

##### ***Attracting new generation to agriculture***

The Food Security Army provided training to the VHSE students for 14 days about the use and maintenance of the machinery to attract future generation to agriculture sector.

#### **5. Benefits to members of FSA**

Through the training and the resultant activities of the FSA made to experience themselves positive consequences. It is worthwhile and important to analyse its consequences in terms of average employment and income earned by the FSA members, which is crucial in sustaining the activities of FSA. The average employment days and the income earned by the members of FSA, Pampakuda is presented Table 4.51

**4.51 Average employment days and income earned by the members of FSA, Pampakuda**

<b>Sl. No.</b>	<b>Gender</b>	<b>Average employment days / month</b>	<b>Daily wages (₹)</b>	<b>Average income of the FSA members / month (₹)</b>
1	Male	14	500	7000
2	Female	23	300	

The female members of FSA, Pampakuda could secure an average employment days of 23 days per month and male members could get 14 days of employment and they could earn an amount of ₹7000/month. It increased their livelihood security of the FSA members. The trainees engaged themselves in group

farming activities, worked in the farm owned by the Service Co-operative Society and managed a shop to market the farm produce.

The Food Security Army, Pampakuda had attained a turnover of ₹ 1 crore for the last 3 years and an amount of ₹ 25 lakhs was reserved for the welfare of the food security army members. The Food Security Army members were provided with daily wage of ₹ 300 per day for working in the nursery. The food security army members earned an income of ₹ 7000 per month and provided with a bonus during Onam festival season.

The major problems faced by the FSA, Pampakuda were: difficulty in using the mini tillers by the female laborers as they were not easy to start, lack of ITI trained personnel for repairing machinery, and less number of transplanters and more demand for them during the transplanting season of rice crop.



Group meeting



Information KIOSK in the office of FSA



Facilitator with president and secretary



Data collection by researcher from the members of FSA, Pampakuda



Participation of group members in Onam celebration



Facilitator in the office of FSA

**Current status of the trainees of the trainings on farm mechanization held  
during 2013-15**

ARS, Mannuthy had provided training to 50 FSA groups from 2013-2015 which included 862 members and the current status of the trainees was analyzed and presented in appendix II. The members were classified into 3 groups based on their nature of participation in farm mechanization.

**1 AMFSA: Active Member in Food Security Army:** It was observed from the appendix II, 42.92 per cent of the trainees were active in FSA. In this group all the members depended on FSA for their primary income they did not have any secondary source of income and the members were available at any time for farm mechanization.

**2 NMFSA-EA:** Among the trainees 42.52 per cent of the trainees were Non Active Member in Food Security Army but Engaged in Agriculture, utilizing the knowledge and skill received from the training, this group consisted of members who had secondary source of income from agriculture and allied activities they also work as agricultural labourers.

**3 EOTA :** Only negligible per cent of the trainees (14.50%) were found to be Non Active Member in Food Security Army Engaged in Other Than Agriculture. The members belonged to this group were employees in other private or government organizations and the females moved away from their area after marriage.

After undergoing the training programme the trainees formed a group and they registered as FSA group. From 2013-2015, about 50 groups had been registered all over Kerala with 862 members. The trainees were classified based on their performance in the group. Out of the 862 members 370 members were Active Members in Food Security Army and almost equal amount of trainees were Non Active Members in Food Security Army but Engaged in Agriculture (367) and only 125 members were Non Active Member in Food Security Army Engaged in Other Than Agriculture.

# *Summary and Conclusion*

## 5. SUMMARY AND CONCLUSION

Agricultural Research Station, Mannuthy had provided training to 236 groups and about 5203 trainees, including 2910 males and 2293 females, till 2016. They attended the training for learning the operation and repair and maintenance of the farm machineries. Each and every group of the trainees who had undergone the training were enrolled as a society, named as AMOSC (Agro Machinery Operation Service Center) according to the draft byelaw formulated under 1955, 12<sup>th</sup> Act Travancore Cochin Literary Science and Charitable Trust Registration Act.

The list of trainees of the training conducted on farm mechanization in the central zone of Kerala *viz.*, Palakkad, Thrissur and Ernakulam by Agricultural Research Station, Mannuthy was collected from Central Training Institute, Mannuthy. Among the trainees a sample size of 60 trainees belonged to Central Kerala were selected as respondents using simple random sampling technique. Apart from the selected 60 respondents, 5 successful cases of respondent groups were identified for conducting case study.

The five respondent groups selected were Food Security Army, Venoor, Food Security Army, Palliyakkal, Food Security Army, Kodumbu, Food Security Army, Irinjalakuda and Food Security Army, Pampakuda. The data gathered from the respondents were scored classified and examined by utilizing simple non parametric statistical techniques.

Based on the feedback of respondents obtained after pilot study and discussion with the experts in Agricultural Extension, the interview schedule was prepared and finalized. The researcher had collected data from the respondents using the pre-tested interview schedule. Focused Group Discussion (FGD) was conducted in both Panchayaths and Key informant interviews were done for qualitative data collection.



Data was analyzed using percentage analysis, Spearman Rank Order Correlation, Henry garrett ranking method, Wilcoxon ranking method and index method.

Salient findings of the study are presented below:

- ❖ Majority of the respondents belonged to middle age (71.66 %) followed by old age (15 %).
- ❖ Almost equal percentage of males (48 %) and females (52 %) participated in the training on farm mechanization conducted by Agricultural Research Station, Mannuthy during the period of 2013-2015.
- ❖ With regard to educational status of the respondents, more than 50 per cent of the trainees had plus two level of education followed by 23 per cent with a high school education.
- ❖ Occupational status of the respondents revealed that 45 per cent of the farmers had 'Agricultural and allied activities' as their major occupation. Almost equal per cent of the respondents possessed their primary occupation as 'Agricultural labourer'.
- ❖ As far as secondary occupation was concerned majority of the respondents worked as 'Agricultural labourer' consisting of 28.33 per cent followed by 'Non agricultural labourers (10 %).
- ❖ Most of the respondents earned low income (46.67 %) for their livelihood and led a life of hand to mouth existence.
- ❖ Among the different categories of family size, 51.67 per cent of them had 4 members followed by 5 members (28.33 %) in their family.
- ❖ Majority of the respondents owned (58.33%) less than 50 cents of land area. Hence they could not entirely depend on farming, but they involved in group farming activities and agricultural labour.
- ❖ Social participation of respondents showed that all the trainees became members of Food Security Army and 13 per cent functioned as office bearers.

- ❖ Majority of the respondents (30 %) regularly attended meetings of service co- operatives and 28.33 per cent of the members regularly attended meetings in Mahila mandals.
- ❖ Based on the type of mass media and frequency of their usage, 58 per cent of the respondents watched television regularly. Half of the respondents (50 %) listened to radio. And only 25 per cent and 3 per cent of the respondents read regularly news papers and magazines respectively. There were no respondents who used bulletins, books and internet regularly.
- ❖ About 90 per cent of the trainees had attended only one training on farm mechanization. And only 11 per cent of the respondents purchased machinery like brush cutter, garden tiller and coconut climbers on their own after the training.
- ❖ The institutions supported the members of food security army in terms of finance and technical guidance were Block panchayaths, Krishi Bhavans, Service Co Operative Banks and ARS, Mannuthy.
- ❖ Besides, ARS Mannuthy provided training to the FSA, supplied uniforms and supported for the maintenance of the machinery of the FSAs. Some of the groups were engaged in marketing of seedlings and the seeds were provided by ARS, Mannuthy.
- ❖ Considering motivational factors, the level of achievement motivation of the trainees and level of confidence was medium among majority of the respondents.
- ❖ Majority of the respondents (40 %) adopted the innovations after seeing others trying it out successfully.
- ❖ The degree of scientific orientation and extent of risk orientation was medium among the trainees. Regarding the utilization of credit, most of the trainees (above 90%) did not utilize it from institutional or non-institutional credit sources. The increase in indebtedness of the trainees after attending the training might be because of availing loan for meeting their personal and family needs as their income from farm mechanization was meagre and forced them to subsistence level of living.

- ❖ Majority of the trainees (88 %) agreed that they learned repairing farm machineries after training. With regard to back home utility after attending the training on farm mechanization, majority of the respondents were under medium category.
- ❖ The parameters studied for assessing back home utility revealed that the training created a positive impact among the trainees.
- ❖ SWOC analysis explained the major strength of the training on farm mechanization was field level hands on training with an index value of 96.33 and weakness of the training was less duration of training with an index value 71.37. The major opportunity perceived by the trainees of farm mechanization was 'opening avenue for group farming', which secured an index of 95.53 and the major challenge was repair and maintenance of machines with an index value of 86.67.
- ❖ Most important constraint faced by the trainees was non feasibility of the farm machinery in all the regions with an average score of 63.60.

#### **Case study:**

1. The Food Security Army, Venoor started working under the service co-operative bank at Venoor of Thrissur district from 2013. Many types of machinery were purchased and a few were hired at reasonable rate. The trainees had received the training at free of cost from ARS, Mannuthy. The bank met the training expenses and provided support for group farming in leased land. Besides, an outlet named Saravana stores was established for selling out their products at fair price. The major constraints was lack of regular employment and additional benefits as savings. Further Food Security Army wanted to establish a tissue culture laboratory as well as a unit for collection and processing of coconut.

- ❖ The major activities of the Food Security Army were
  - Distribution of free seedlings to the participants of the seminars organized by them.

- Ammayum adukalathotavum programme was implemented for promoting the kitchen gardens in the households of nearby areas and the group members planted 3000 mango trees in various locations at free of cost.
- The Food Security Army was running a farm for securing an income for all the members throughout the year.
- Promoted farming in schools to create interest in farming among school children.
- Outlet for marketing the farm products.
- Services to farmers at reasonable cost to prevent the exploitation of farmers by middlemen.

2. The Food Security Army, Palliyakkal started working under the Service Co-operative Bank, Palliyakkal of Ernakulam district was promoting farming activities in the area of its jurisdiction for more than fifteen years. The group attended a training on farm mechanization under Food Security Army during 2014 for a period of 20 days under Agricultural Research Station, Mannuthy. The rental charges received from hiring of machineries maintained in the respective account and the monthly salary was credited to the members from this account. The socio economic and developmental consequences after attending trainings are listed below:

- The group members were elevated from unorganized to organized status, turned from unemployment to assured employment in farming sector and drudgery in performing farm operations were reduced due to mechanization.

The major constraints faced by the group were the difficulty in using farm machineries in Pokkali fields, less demand for arecanut harvester in the area. They required an extended training to hone their skill in driving the tractor as well as appropriate assistance from the organizations for getting tractor license. In short the group was planning to purchase more

machinery, searching profitable farming methods to increase the employment opportunities and setting up of processing unit for Pokkali rice.

- ❖ Major activities of the FSA were:
  - Production of organic products, collection and selling of products from other farmers and outlet for selling the products.
  - Dairy farm with 25 milking cows, poultry along with duck farming and pisciculture as well as processing of fish products.
  - Fruit and vegetable cultivation in 40 acres as well as jasmine cultivation of 15000 plants in grow bags, cultivation of medicinal plants, setting up of school gardens and seedling production.
  - Organizing and setting up of exhibition stalls during festivals especially onam season.

3. Food Security Army, Kodumbu was one of the successful groups established in 2011, which was actively functioning in Palakkad district of Kerala with 35 members. The main objective of the group was to attract youth towards agriculture through farm mechanization. The Food Security Army deposited 30 per cent of their profit in cooperative bank for the maintenance cost of the machinery. The area covered by the group under mechanization was 500acres. The group deposited their savings of ₹ 5 lakhs in the co operative bank for the maintenance of the machineries.

The major constraint faced by the group was lack of availability of spare parts for the machinery and higher cost of spare parts. In future, the group is planning to purchase a combine harvester and to obtain tractor license for all the members. This group bagged “Best Thozhil sena” award for last 3 years and also received award in “South Indian Agri Fest” held in Kannur.

4. Food Security Army, Irinjalakuda working under the service co-operative bank with 15 members was established during 2013. The group had leased in land for

cultivation to overcome the unemployment crisis at the time of off season. The main highlight of this FSA was providing tele-advising services to the farmers for clarifying their doubts about agriculture and farm machinery. The constraints faced by the group were poor quality of few machinery, lack of space for installation of copra drier and storage of copra. Non suitability of mini tillers for the local condition and competition from other private parties. Their future plans are to purchase a rocker sprayer for coconut gardens, installation of copra driers and collection of coconuts from farmers for copra and oil.

Their major activities are given below

- Bio-pharmacy
- Upland rice cultivation
- Selling of seedlings – the group used to buy seeds from Kerala Agricultural University and raised seedlings in pro-trays. Those seedlings were sold to farmers.
- Laying out and setting up of drip and sprinkler irrigation systems
- Raising and selling of onion seedlings, tapioca and banana
- For selling the produces and products of the farmers they used to organize ‘Onam Chantha’ during the occasion of Onam.
- ‘Njatu vela chantha’ a seasonal fair, where the group used to sell their produce and also the products collected from other farmers.
- Agro clinics were conducted by the agro service center
- For encouraging and promoting agriculture in young minds ‘Youth Clubs’ were formed by organizing young and interested farmers.
- Vegetable cultivation along with mulching was practiced
- Production and selling of organic manures
- Promotion of kitchen gardens at house hold level
- Promoting and creating awareness regarding organic cultivation.
- Tele-advising: Offering telephone based consultation system for clarifying the queries regarding farming and farm machinery.

5. Food Security Army, Pampakuda located in Ernakulam district was offering services to the farmers of Eranakulam and Kottayam districts. The agro service center was functioning with 22 Food Security Army members. The group had succeeded in covering an area of 550 acres under farm mechanization for the last three years.

This group had achieved state level award for the best march-past during 2013 at Kottayam and 2014 at Calicut. This group got machinery at free of cost through Rashtriya Krishi Vikas Yojana. Out of their total savings 20% was used for the maintenance of machinery. Till now they had covered 700 acres of land under various operations. They served as master trainers and conducted training to others regarding the usage of farm machinery.

The constraints faced by the group was lack of ITI trained personnel for repairing machinery, less number of transplanter as well as mini tillers. The future plans of the Food Security Army are establishment of soil testing laboratory, mixed nursery, processing unit for fruits and vegetables, coir pith composting and eco shop.

## **Conclusion**

The training created a positive impact among the trainees, leading them to become organized as Food Security Army. The training programme developed knowledge, skill and positive attitude towards farm mechanization. The respondents improved self confidence in using machinery and few respondents even acquired own machinery. The training had improved the livelihood security of the trainees. This was evident from the fact that all the trainees turned from unemployment to assured employment status. Because of the effectiveness of the training programme on farm mechanization, majority of the trainees could be retained in the farming sector itself preventing the migration of labourers to other sectors. FSA could achieve the progressive increase in area covered under farm mechanization year after year. Most importantly, members developed a sense of

belongingness and satisfaction for playing a significant role in the food security of the country.

### **Implications of the study**

- Farm mechanization is the need of the hour to combat the problems of labour scarcity, high cost of cultivation and migration of agricultural labourers to non-farm sector. The efforts initiated by Kerala Agricultural University on Human Resource Development in farm mechanization sector, no doubt created a positive impact among both the livelihood of the trainees as well as farming community. The results of the study exhibit clearly on the positive outcome of the training on farm mechanization.
- Even though the trainees were elevated from unemployment to assured employment status, their income was found to be meagre and seasonal. They were found to lead a subsistence level of farming. Location specific suitable off seasonal subsidiary vocational options may be found out for the enhanced and stable income of the trainees to retain them in farming sector.
- The study reveals that even after the completion of training, hand holding and follow up activities must be strengthened to increase their self-confidence of being in an organized sector.
- As the trainees had taken up the role of service providers in farm mechanization, assistance for strengthening infrastructural facilities required for repair and maintenance must be enabled through technical and credit institutions.
- Research and development activities must be geared up to find multiple options in a single machinery to work in various agro-ecological situations as most of the machinery served for single operation and remained idle during rest of the season.
- Options must be probed to include all the trainees in insuring their lives, who were engaged in farm activities.



- The results can be used for future improvisations in the training programme carried out by ARS, Mannuthy according to the feed back from all the stakeholders involved in agricultural development.

#### **Future line of study**

- The study was confined to 3 districts keeping in view of the time and resources available to the researcher. Therefore, a more comprehensive studies covering the entire state will lead to the conformation of results and more appropriate to present the performance of the trainees of Food Security Army.
- Impact of Food Security Army among the farming community can be studied.
- Comparative studies may be undertaken to assess the regional differences of the impact of the training on farm mechanization.
- Studies among the trainees on the application of available machinery will provide input to the research and development organizations for further refinement.
- Conducting a study on possible options for enhancing the livelihood security of the trainees will be useful for preventing their migration to other sectors and thereby they can be retained in farming sector.

**Summary of case studies conducted for the study**

FSA	Area covered under mechanization in 2016 (ha)	Barren land brought under farming (ha)	Increased rice production (tonnes)	Savings earned Rs /ha		Total Savings earned by farmers during 2016 Rs/year		Average employment days/month		Average income earned Rs/month	Members	Encaged in group farming
				Tractor	Transplanter	Tractor	Transplanter	Male	Female			
Venoor	140	3.6	Vegetable			26250	-	11	17	6000	18	Yes
Kodumbu	200	2	10	250	500	20000	60000	13	17	6000	35	No
Palliyakkal	80	8	Vegetable	-	-	-	-	18	26	9000	22	Yes
Irinjalakuda	180	12	60	625	500	37500	60000	14	20	7000	15	Yes
Pampakuda	210	6	30	375	1250	52500	62500	14	23	7000	22	Yes

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# *Appendices*

**Appendix 1**  
**KERALA AGRICULTURAL UNIVERSITY**  
**COLLEGE OF HORTICULTURE**  
**Department of Agricultural Extension**  
**Impact of Training Programmes on Farm Mechanisation – A Case Study**  
**Interview schedule**

Date:

- 1) Name of the respondent :
- 2) Age :
- 3) Gender M/F :
- 4) Marital status : Single / Married /Widower
- 5) Education :

Sl.No.	Category	Response
1	Illiterate	
2	Primary level	
3	High school level	
4	Plus two or equivalent	
5	Degree or equivalent	
6	Postgraduate &above	

6) Type of house a)Hut/ Tiled /Terrace

b) Owned /Rented

7) Occupational status of the respondent

Occupation	Monthly income (Rs.)	
	Primary	secondary
a) Agricultural and allied activities		
b) Services and business		
c) Agricultural labourer		
d) Non Agricultural labourer		
e) Others (specify)		

8) Details of members of household

Sl.No.	Name	Sex		Age	Educational qualification	Main occupation	Monthly income(Rs.)
		Male	Female				
1							
2							
3							
4							
5							

9) Socio-economic status:

a) Social participation

Do you participate in the activity of any organization : Yes / No

if yes please tick mark( ✓) the relevant column

Organization / institution	Not member	Member	Office bearer	How often you attend meetings of organization		
				Regularly	occasionally	Never
Village panchayats						
Service co-operatives						
Milk co-operatives						
Youth clubs						
Mahila mandals						
Others (specify)						

b) Land –owned/ Leased in cultivated and uncultivated

- i. Less than 50 cents
- ii. 50-100 cents
- iii. 1-2 acres
- iv. 3 acres

10) Exposure to mass media

Sl.No.	Mass media	Regularly	Occasionally	Never
1	Radio			
2	Television			
3	News paper			
4	Magazines			
5	Bulletins			
6	Books			
7	Internet			

11) Achievement motivation

Please give your response on the following statements:

Sl.No.	Statements	SA	A	UD	DA	SDA
1	One should enjoy work as much as play					
2	One should work hard at everything one undertake until he/she is satisfied with the result					
3	One should succeed in his occupation even if one has been neglectful of his family					
4	One should have determination to achieve certain things in life					
5	Work should come first more than rest					
6	Even when one's interest are in danger one should concentrate one his job and forget his obligation to others					
7	One should set difficult goals for one self and to try to reach them					

12) Self confidence

Please give your response on the following statements:

Sl.No.	Statements	SA	A	UD	DA	SDA
1	I feel no obstacle can stop me from achieving my final goals					
2	I am generally confident in what ever I do					
3	I am not interested to do things at my own initiative					
4	I usually work out things myself rather than to get someone to show me					
5	I get discouraged easily					
6	Life is a struggle for me most of the time					
7	I find myself worrying about something or the other					

13) Innovativeness

When will you like to adopt an improved practice in farm

- a) As soon as it is brought on my knowledge
- b) After I had seen others trying it out successfully
- c) I prefer to wait and take my own time
- d) I am not interested in adopting improved practises

14) Scientific orientation

Please give your response on the following statements:

Sl.No.	Statements	SA	A	UD	DA	SDA
1	New methods of farming give better result than the old method					
2	The way of farming by own fore fathers is the best way of farming today					
3	Even a farmer with a lot of farming experiences should use new methods of farming					
4	A good farmer experiments with new ideas of farming					
5	Though it takes much time for a farmer to learn new methods in farming it is worth the efforts					
6	Traditional methods has to be changed in order to raise the standard of living of the farmer					

15) Risk orientation:

Please give your response on the following statements

Sl.No.	Statement related to risk factors	SA	A	UD	DA	SDA
1	A farmer adopting farm mechanization should take greater risk					
2	A farmer should try farm mechanization practices only after the same have been successfully used by other farmers					
3	Trying an enterly new practice in farm mechanization involves risk but it is worth					
4	Management of farm mechanization is full of risk					
5	As an entrepreneur in farm mechanization should keep improved machines instead of old/country machines					
6	Farmers find risk in adopting farm mechanization in the farm					

16) Pattern of utilization of credit

Types of loan availed: ST/crop loan/MT/LT/KCC/others (specify)

Have you ever availed institutional loans ? Yes/ No

Have you ever availed non –institutional source of finance ? Yes/No

If yes details of availed non –institutional finance

Source	purpose	Loan amount sanctioned	Date of sanction	Interest	Term	Security	Overdue	Fully repaid/ outstanding

Details of present institutional source of finance (including micro-finance institutions)

Source	purpose	Loan amount sanctioned	Date of sanction	Interest	Term	Security	Overdue	Fully repaid/ outstanding

Details of facilities/subsidies from other sources( krishibhavan, panchayaths,etc)

In cash (amount):

In kind (if any specify):

17) Please list out training programmes attended by you during 2013-2014 and 2014-2015

Sl. No.	Title of training programme	Duration in days	Name of institution	Cost spent		Name of the skills/machinery/implement you Learnt to operate		
				By you(Rs.)	Institution (Rs.)	Full y	Partiall y	Nil
1								
2								
3								
4								

18) Back home utility

a) After attending the training of farm mechanization, did you purchase any farm machineries? Yes / No

If yes, what are they and please mention the cost of farm machineries

Sl no	Cost (Rs.)	Name of the machinery	Details of financial assistance received					Repairs and maintenance cost incurred / month (Rs.)	Income received after using farm machinery / month (Rs.)	Annual area covered by each machinery (Ha.)	Source of repair of each machinery
			Name of institution machinery was purchased	If subsidy received what is the amount of subsidy	If availed loan,						
		Name of the institution			Year of availing loan	Amount (Rs.)	Repaid amount (Rs.)				

b) After attending the training on farm mechanization, in what way the training was useful in your back home situation? Please tick mark (✓) in the appropriate column

Sl no	Nature of utilization	Yes/No	If yes			If No why?
			High	Medium	Low	
1	Purchased farm machinery for my livelihood					
2	Adopted farm mechanization in my own farm					
3	Learned operating farm machinery					
4	Learned repairing farm machinery					
5	Teaching others / fellow members ,the operation of farm machinery					
6	Teaching others / fellow members ,the repair of farm machinery					
7	Responsible for the increase in area under farm mechanization					
8	Became member/leader of SHGs to promote group farming in farm mechanization					
9	Motivated family/fellow members to participate in similar training programmes					
10	Any other please mention.....					

19) Please give your feedback by writing the score on a five point scale in the appropriate column before and after training on farm mechanization : 1....2....3....4....5

Sl.No.	Nature of impact	Before training	After training
1	Knowledge level		
2	Skill level		
3	Positive attitude		
4	Employment opportunity		
5	Income level		
6	Asset creation-Purchase of land Purchase of machinery New house construction Renovation of house Purchase of gold ornaments Purchase of household accessories Purchase of recreational items Purchase of communicational gadgets Purchase of vehicle Any other ?		
7	Teaching fellow members		
8	Savings		
9	Repayment of loans		
10	Indebtedness		
11	Recreation		
12	Crisis management of family		
13	Social participation		
14	Infrastructural facilities –Housing Water accessibility Fuel accessibility Electrification Any other?		

20) SWOC Analysis

1. Please tick mark (✓) in the appropriate column related to strengths of the training on farm mechanization that you have undergone:

Sl.No.	Strengths	Low	Medium	High
a.	Disciplined training			
b.	Very good infrastructure and logistics for the training			
c.	Commitment of the training institution			
d.	Field level hands on training			
e.	Expertise of the trainers			
f.	More importance for practical sessions			
g.	If any please mention.....			

2. Please tick mark (✓) in the appropriate column related to the weakness of the training on farm mechanization that you have undergone:

Sl.No.	Weakness	Low	Medium	High
a.	Duration of the training period is not adequate to develop skill thoroughly			



b.	No credit support/ linkage for individual ownership of machinery			
c.	Lack of continuous organizational support			
d.	Could not increase my employment days			
e.	Interpersonal conflicts in group			
f.	If any other ,please mention.....			

3. Please tick mark (✓) in the appropriate column related to the opportunities of the training on farm mechanization that you have undergone:

Sl.No.	Opportunities	Low	Medium	High
a.	Efforts to attract youth towards farming sector			
b.	Reduced the cost of cultivation			
c.	Prevailing social problem was addressed			
d.	Brought fallow land under cultivation			
e.	Promoted better utilization of human resources			
f.	Opened avenue for group farming			
g.	If any other please mention			

4. Please tick mark (✓) in the appropriate column related to the challenges of the training on farm mechanization that you have undergone:

Sl.No.	Challenges	Low	Medium	High
a.	Lack of institutional back up in terms of technical and financial assistance after training			
b.	Limited availability of spare parts			
c.	Repair and maintenance too difficult			
d.	Competition of labor contractors			
e.	If any other please mention			

21. Please tick mark (✓) in the appropriate column related to the constraints of the training on farm mechanization that you have undergone:

Sl.No.	Constraints	Very important	Important	Slightly important	Not important
1.	Operation of machinery were very complicated				
2.	Training period not adequate				
3.	Lack of support after training				
4.	Financial assistance was not provided				
5.	Maintenance cost of machinery were high				
6.	Farm machinery were not feasible in the region				
8.	Any other? Please mention .....				

## Appendix II

### Current status of the trainees of the trainings on farm mechanization held from 2013-15:

Current status of the trainees of the trainings on farm mechanization held from 2013-15 was collected and the same is tabulated below. The abbreviations used to describe their current status are as follows:

**AMFSA:** Active Member in Food Security Army; **NMFSA-EA:** Non Active Member in Food Security Army but Engaged in Agriculture; **EOTA :** Non Active Member in Food Security Army Engaged in Other Than Agriculture.

Sl. No.	Name of the FSA	Status					
		AMFSA		NMFSA-EA		EOTA	
		No.	%	No.	%	No.	%
1	Pullikkal Service Co-Operative Bank, Malappuram	3	21.42	10	71.42	1	7.16
2	Chungathara Service Co-Operative Bank, Malappuram	15	75.00	4	20.00	1	5.00
3	Service Co-Operative Bank, Pariyaram	10	40.00	15	60.00	0	0.00
4	Wandoor Service Co-Operative Bank, Thrissur	2	13.33	10	66.67	3	20.00
5	Ambalappad Service Co-Operative Bank, Thrissur	8	32.00	13	52.00	4	16.00
6	ADA, Parakod Block Panchayath Pathanamthitta	2	7.69	23	88.46	1	3.85
7	<u>Mannur Krishi Bhavan, Pathiripala, Palakkad</u>	11	84.62	2	15.38	0	0.00
8	Mankara Krishi Bhavan, Mankara, Palakkad	7	35.00	12	60.00	1	5.00
9	Perambra Block Panchayath, Kozhikode	11	47.84	7	30.43	5	21.73
10	Pramadam, Konni Block Panchayath, Pathanamthitta	3	15.78	16	84.22	0	0.00
11	Mariyappuram Block Panchayath, Idukki	9	50.00	3	16.66	6	33.34
12	Karimkunnum, Thodupuzha Block Panchayath, Idukki	10	66.67	3	20.00	2	13.33
13	Mariyappuram, Parassala Block Panchayath,	11	47.84	2	8.69	10	43.47

	Thiruvananthapuram						
14	Thekkumkara Krishi Bhavan, Wadakkanchery Block, Thrissur	7	43.75	4	25.00	5	31.25
15	Kalpetta, Wayanad	16	64.00	6	24.00	3	12.00
16	Kavumpuram, Valanchery Block, Malappuram	12	63.16	3	15.78	4	21.06
17	Rars, Pattambi Block, Palakkad	10	40.00	8	32.00	7	28.00
18	Perambra Block Panchayath, Kozhikode	13	59.09	4	18.18	5	22.73
19	Cheruvanchery, Kuthuparamba Block, Kannur	18	85.71	2	9.52	1	4.76
20	Kalpetta, Wayanad	17	65.38	7	26.93	2	7.69
21	Manjeswaram Block, Kasargode	4	20.00	15	75.00	1	5.00
22	Service Co- Operative Bank, Alanallur	6	54.54	3	27.27	2	18.18
23	Service Co-Operative Bank, Attapady	5	62.50	0	0.00	3	37.50
24	SCB, Edamulakkal	10	100	0	0.00	0	0.00
25	Krishi Bhavan, Erumapetty	7	100	0	0.00	0	0.00
26	Service Co- Operative Bank, Kalikavu	9	40.91	11	50.00	2	9.09
27	SCB, Kayippuram	4	33.33	8	66.67	0	0.00
28	Krishi Bhavan, Keralassery, Palakkad	19	95.00	0	0.00	1	5.00
29	SCB, Kizhathadiyoor	0	0.00	15	75.00	5	25.00
30	Kodumbu Krishi Bhavan	20	100	0	0.00	0	0.00
31	Krishi Bhavan, Kongad	11	64.72	4	23.52	2	11.76
32	Service Co- Operative Bank, Nanniyode	0	0.00	17	73.91	6	26.08
33	Service Co- Operative Bank, Pazhayakunnummel	3	18.75	7	43.75	6	37.50
34	Kudumbasree District Mission, Thrissur	0	0.00	20	83.34	4	16.66
35	Krishi Bhavan, Mundur	3	50.00	2	33.34	1	16.66
36	Malappattam Service Co- Operative Bank, Kannur	2	14.28	10	71.44	2	14.28
37	Ollukkara Regional Kera Karshaka Service Co-Operative Bank, Thrissur	0	0.00	8	66.67	4	33.33
38	Service Co-Operative Bank, Panayal, Kasargode	4	100	0	0.00	0	0.00
39	Panniyannur Service Co-	7	100	0	0.00	0	0.00

	Operative Bank, Kannur						
40	Office Of The Asst. Director Of Agriculture, Thodannur, Kozhikode	0	0.00	4	57.14	3	42.85
41	Service Co-Operative Bank, Trithala, Palakkad	0	0.00	5	83.34	1	16.66
42	Vellamunda Service Co-Operative Bank, Wayanad	5	50.00	5	50.00	0	0.00
43	RARS , Ambalavayal, Wayanad	9	60	5	33.3	1	6.66
44	Service Co-Operative Bank, Velur, Thrissur	8	50.00	7	43.75	1	6.25
45	M.S. Swaminathan Research Foundation, Wayanad	3	15.78	12	63.17	4	21.05
46	Ramapuram Service Co-Operative Bank, Malappuram	4	20.00	14	70.00	2	10.00
47	Krishi Bhavan, Varandarapilly	9	50.00	7	38.89	2	11.11
48	SCB, Mulamthuruthy	0	0.00	20	80.00	5	20.00
49	Parakodu Block Panchayath	18	64.28	7	25.00	3	10.72
50	RARS, Ambalavayal, Wayanad	5	33.34	7	46.66	3	20
	Average	370	42.92	367	42.58	125	14.50

# *Abstract*

## **Abstract**

Agricultural Research Station, Mannuthy took up the Agricultural Human Resources Development programme in farm mechanization and introduced innovative concept of AMOSC (Agro Machinery Operation Service Centre) along with the concept of Food Security Army. The selected members were provided training for 20 days on various aspects of the agricultural mechanization. Agricultural Research Station, Mannuthy has conducted 236 training programmes on farm mechanization as on 2016. Few studies were conducted to assess the impact of Green Army or Agro machinery service centers on rice production and the farming community. Therefore the study on 'Impact of Training Programmes on Farm Mechanisation – A Case Study' was conducted with the objectives of assessing the impact of the training programmes on 'Farm mechanisation conducted by Agricultural Research Station, Mannuthy, conducting SWOC analysis on the effectiveness of the training among the selected trainees and exploration of sociological and developmental consequences of the training programmes among the trainees through a case study.

Three districts from the central zone of Kerala, viz; Palakkad, Thrissur and Ernakulam were selected for the study. A total sample size of 60 trainees was selected for the study and in addition 5 FSA were selected for case study.

The results showed that majority of the respondents were female under middle age group of 35 – 55 years. More than 50 per cent of the respondents had an educational level of plus two. The annual income of majority (46.67 %) of respondents was less than Rs. 50000/annum. More than half of the respondents were marginal farmers having less than 50 cents of area.

Block panchayath, Krishibhavans, Service Co-operative banks and ARS, Mannuthy were the organizations supported the respondents. ARS Mannuthy provided training to the groups while Service Co-operative bank and block panchayath provided credit support and krishi bhavans provided linkage with the needy farmers.

The study on motivational factors showed that majority of the respondents had medium level of achievement motivation, self-confidence, innovativeness, scientific orientation and risk orientation. The utilization of credit was very low with less than 10 per cent from institutional or non-institutional sources.

Almost all the respondents recorded that the training was effective and helped in increasing their knowledge and skills. Almost two-third of the respondents (62 %) reported that the trainees had medium level of back home utility after attending the trainings on farm mechanisation. All the trainees reported that they learned operating farm machinery and became responsible for increasing the area under farm mechanization. Most of the trainees (90 %) stated that they motivated their family and fellow members to participate in similar training programmes. Majority of the trainees (88 %) agreed that they learned repairing farm machineries.

Among the 14 parameters of the back home utility of the training knowledge level, skill, positive attitude, educational level of family members, employment opportunity, income level, asset creation, teaching fellow members, savings, repayment of loans, recreation, crisis management of family, social participation and infrastructural facilities for the test proved to be highly influential in creating an impact on the livelihood of the trainees.

The SWOC analysis showed that field level hands on training and disciplined training were the major strengths of the training while less duration of the training period was the main weakness. Reduced cost of cultivation and opportunity for group farming were the main opportunities while difficulty in getting repair and maintenance of machinery was the main constraint faced by FSA members.

From the case studies, it was clear that the FSA members played an important role in increasing the production through cultivating barren lands and the training improved the knowledge, skill and positive attitude of the respondents towards farm mechanization. After attending the training, the group members were elevated from unorganized to organized status. All members turned from unemployment to assured employment in farming sector and enhanced their livelihood security. Because of the trained man power in farm mechanization, the drudgery in performing farm operations was reduced. The group members derived a sense of belongingness and satisfaction for playing a significant role in the food security of the country.

The Food Security Army need continuous support from all the organizations involved in agricultural development to keep them update in farm mechanization, to face the competition from private parties and to ensure availability of credit at the time of financial crisis.

