

# Evaluation of socio-economic patterns of SHG members in Kerala using clustering analysis

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## Abstracts

In the matter of social development, though Kerala stands ahead of all other states in India, the pattern of distribution of social and economic opportunities within the state is highly inequitable among different social groups. Self help groups (SHG) are vehicles for social, political and financial intermediation of the state. Clustering analysis is one of the main analytical methods in data mining; the method of clustering algorithm will influence the clustering results directly. K-means and Fuzzy C-Means Algorithms are popular methods in cluster analysis. In this paper we have evaluated the socioeconomic developments of SHG in various districts in Kerala state using cluster analysis. The data's were collected by field survey and interviews. The parameters considered for the study include the regularity of the members in attending meetings and training, social and economic benefits gained by the members in personal level, cluster level and society level, rate of employment and earning members in the family and literacy and educational level of SHG members.

**Key words:** *Cluster analysis, K-Means, Fuzzy C-Means, Self help group, Socioeconomic parameters.*

## 1. Introduction

The data mining is a powerful tool permitting the analysis of complex and important data [1, 2]. Its performances are relative to the quality of the data on which it works. Features gathered from the observation of a phenomenon are not all equally informative: some of them may be noisy, correlated or irrelevant. Feature selection aims at selecting a feature set that is relevant for a given task [3,4]. This problem is complex and remains an important issue in many domains.

Data mining process consist of: problem detection, hypothesis formulating, data assembling, data pre-processing, evaluating the model, interpreting the

model and achieving to results. The clustering analysis is an outer-supervised pattern recognition method, each group data is produced by clustering, called a cluster, and in cluster each data is called an object. The purpose of clustering is to make object property as similar as possible in the same cluster, but character diversity as large as possible among different cluster object. At present, the kinds of clustering methods have been widely used in many fields such as data mining, pattern recognition, image processing, radar target sensing, biological engineering, space remote control technique, etc[5-6]. In this paper we have used K Means [7,8,11] and Fuzzy C-Means [9,10,12] to evaluate SHG data's.

## 2. Role of Self Help Group

The broad goals of a self – help group are to bring about personal and social – economic change for its members and society. SHGs are tool to promote rural savings and gainful employment [13]. Through this the rural poverty is reduced considerably. The family expenditure has been increased due to positive change in the SHGs members' income. The incremental income not only enhances the expenditure of the family but also promote the savings of the family after they join in the SHGs. Here the objective of the SHGs is fulfilled [ 14-15].

One of the reasons for joining SHGs is to avails credit, now this is achieved mainly through bank loans which is true in the present study area. The loans can be used by individual group members for their personal needs, sometime the group may invest on any economic activities. Nowadays many SHGs are starting small business, cottage industries, food processing units etc. The SHGs in the study area grant the loan to their member for various purposes. The maximum loan amount per members is decided by the general body meeting. Almost all the members in the study area are availing the loan facilities in their SHGs

If the growth rate of SHG-bank linkage is impressive, its impact, especially economic impact, is amazing. In order to facilitate the confidence building and improve the credit absorption capacity of the SHG, the capacity of its members has to be built up [16,17,18]. The members attend meeting regularly, otherwise they are fined. But training programmes are not attended by members regularly. The purpose of training and other capacity building efforts is to develop skills and encourage behavioral and altitudinal changes in the members. Group members would have to be trained with at the formal, as well as informal levels. It is the responsibility of the SHG's, promoter, institutions and the facilitator to ensure that the trainings take place, as and when required. The purpose of training is to help women improve their performance, which might be achieved by helping them to solve performance problems. The trainer may also act as advisor or promoter to the group. The trainer may leave the decision making to the group members and promote altitudes of self-help and reliance. The trainers need to be good communicators and be familiar with basic technological skills needed for the development of a SHG. They need to have a sound knowledge base of management, planning, accounting, lending etc., and other skills needed for the SHG [19,20,21]. The training to SHG's, members requires participatory methods and focused goals.

Typical functional areas of training for SHG groups include Operational rules development – for group leaders and members, Record keeping and accounting, Preparation of receipts and payments statement, Fund management, Default management, Organization and conduct of meetings etc However, training programmes have great impact on the members of SHG's. They have enabled members to take active part in-group activities, decision-making process, development programmes, enhance confidence building, skill development and income & earnings [22,23].

The present study focuses on the infused dynamism among SHG members to climb up socioeconomic ladder in the development process. The SHG has served the cause of women empowerment, social solidarity and socio- economic betterment of the poor.

Earlier SHG data evaluations were carried out using statistical tools. As research methods, mixes of quantitative and qualitative tools are applied. Through a detailed questionnaire quantitative data are collected. The qualitative information will enable verification of the quantitative findings as well as

give more insight into the reasons behind these findings.

The survey has been conducted through structured questionnaires, related to the socio-economic status of SHG members. Since the purpose of the study is to understand the trends within groups, the survey focused on group level information. At the individual level of members and the following information has been collected.

Data was collected regarding the following aspects:

- Loan taken and purpose of loan
- Savings and credit related activities of the group
- Socio-economic composition of the groups
- Social issues taken up by the groups
- Linkage between the groups and bank
- Assets before and after being a member
- Literacy and education status of group members

There are 14 districts in Kerala state and this study has been restricted to 9 districts namely Kannur, Calicut, Malappuram, Palakkad, Wayanad, Trichur, Kottayam, Alleppy and Trivandrum. The above mentioned data has been collected from 3500 SHG members with 51 attributes/parameters. Majority members are female. For the better understanding of the socioeconomic factors the above parameters are studied in detailed by applying clustering techniques by means of K- means and Fuzzy C-Means algorithm [24] . Among the various clustering algorithms, K-Means (KM) and Fuzzy C-Means are the most popular methods used in data analysis due to their good computational performances. However, it is well known that KM might converge to a local optimum, and its result depends on the initialization process, which randomly generates the initial clustering.

The main objective of the present study is as follows

- To verify whether members attending training gain higher socio-economic benefits' Regularity in attending meeting – state and district wise information's
- To understand the social benefits gained by the members in personal level, cluster level and society level
- To study the average economic benefit gained by SHG members
- Rate of employment in clusters
- Details of children in various clusters
- Details regarding earning members in SHG families
- Literacy and education level of SHG members

The materials and methods adopted for the study are explained as in [24]

### 3. Results and Discussions

We have taken 3500 data with 51 attributes after data cleaning; applying feature selection and consulting with domain experts we have selected 3434 data with 4 attributes for the present study. The attributes selected for the study include regularity in attending meeting, regularity in attending training, economic benefit gained and social benefit gained. Economic benefit means profit or dividend obtained by each member in the group

Social benefits include personnel level, group level and society level. Personal level benefits include capacity building, economic activities, social status, communicability, self-monitoring etc. The cluster level benefits functional linkage, conflict management and transparencies in functioning and the society level benefits include social and economic developments.

The K-Means and Fuzzy C-Means algorithm discussed in [ref sajeev] are applied for the SHG data collected from 9 districts in Kerala. Clusters obtained by K-Means algorithm is dominated by the selection of initial seed or centroid. Hence K-Mean algorithm has been performed by selecting different set of initial seed and the result are tabulated in table I

\*, \*\*, #, ## these symbols indicate that number of pattern in the clusters are same

Table 1 Clusters obtained by applying K- Mean algorithm

<i>Number of runs of K- Means algorithm with different seeds(Ri)</i>	<i>Number of patterns in cluster I (C1)</i>	<i>Number of patterns in cluster II (C2)</i>
R1	3116	318
R2	485#	2949##
R3	460	2974
R4	2975	459
R5	2948	486
R6	486*	2948**
R7	486*	2948**
R8	485#	2949 ##
R9	486*	2948**

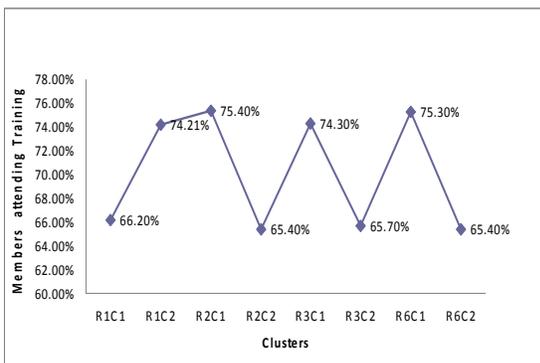
During each run we have obtained two clusters in which one is performing cluster and other is non or less performing cluster. Here performing clusters are identified by the factors like economic benefit achieved, highest regularity in training, regularity in attending meeting and social benefit gained.

We have selected 4 runs namely R1, R2, R3, and R6 with different number of patterns, since the number of pattern in the corresponding clusters are distinct. Te following clusters are selected for further for further studies : R1C1, R1C2, R2C1, R2C2, R3C1, and R3C2, R6C1, R6C2 .Central values of each run is shown in table II.

Table II shows Patterns obtained for different runs of K-Means algorithm

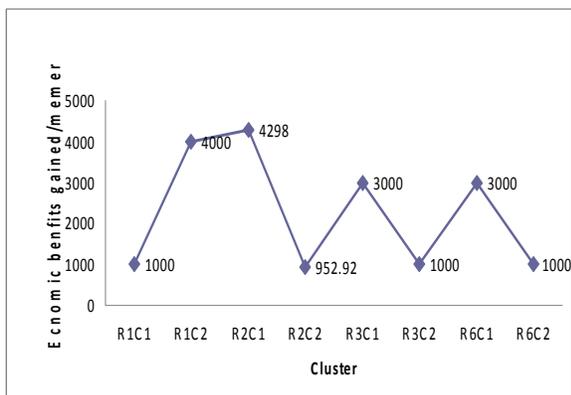
	<i>RUN I</i>		<i>RUN II</i>		<i>RUN III</i>		<i>RUN VI</i>	
	<i>R1C1</i>	<i>R1C2</i>	<i>R2C1</i>	<i>R2C2</i>	<i>R3C1</i>	<i>R3C2</i>	<i>R6C1</i>	<i>R6C2</i>
Regularity in attending meetings	4.9	5	4.9477	4.9395	4.9505	4.9389	4.9505	4.9389
Training attended	3.6	4	3.9803	3.6290	4.0186	3.6183	4.0186	3.6183
Economic benefits gained	1054.9	5056.8	4418.45	962.984	4298.562	952.732	4298.56	952.732
Social benefits gained	5	5	5	5	5	5	5	5

The results in the table show the members those who have attended training properly; can improve their economic benefits or dividend. All members gain maximum social benefits after joining SHG. This is because almost all members attended meeting regularly. The members those who do not attend meetings regularly are heavily fined.



Graph 1 shows the percentage of members attending training in different clusters (K-Means)

Graph 1 shows the percentage of members attending training in different clusters and graph II shows economic benefit gained by the members in the corresponding clusters. The members in the clusters R1C2, R2C1, R3C1, R6C1 shows the regularity in attending training programs and their economic benefit is high. So the authorities should take necessary steps to conduct training programmes for the benefit of SHG members. The results reveal that the training patterns helps SHG's to improve their performance and it helps them to make more economic benefits or dividend. Moreover all of them gain social benefits also.



Graph II shows economic benefit gained by the members in each cluster (K-Means)

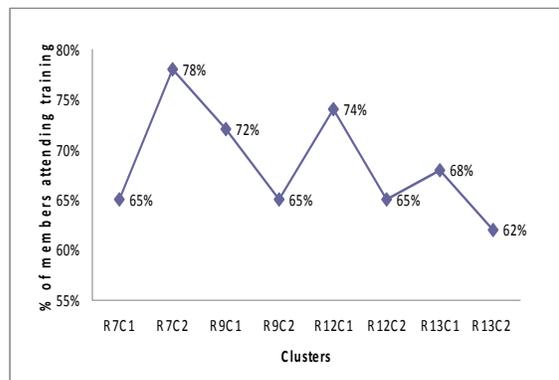
To perform a comparative study we have applied Fuzzy C-means algorithm on the same SHG data

with same attributes for different values on m (weight exponent in the fuzzy membership) and the results are tabulated in table III

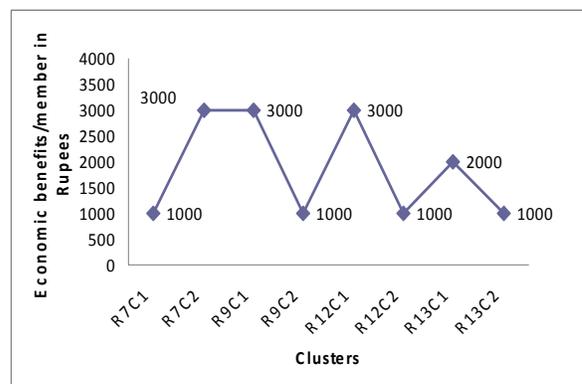
Each time when we apply Fuzzy C-Means we have obtained two clusters of which one is performing and other is non performing. The performing cluster is identified by the factors like economic benefits, regularity of attending meeting and regularity of attending training and social benefit gained.

During analysis we have applied 17 runs and each time two clusters are obtained. The selected runs are R7, R9, R12 and R13 based on maximum number of iterations. The selected clusters are R7C1 R7C2, R9C1, R9C2, R11C1, R11C2, R12C1, and R12C2 for further studies. Table IV shows the patterns obtained for different runs of Fuzzy C-Means

Majority of the SHG members are attending meeting regularly but not training. The results obtained by applying Fuzzy C-Means algorithm coincides with that of K-Means algorithm.



Graph III shows the % of members attending training in each cluster (Fuzzy C-Means)



Graph IV shows the economic benefits gained by SHG members in each cluster (Fuzzy C-Means).

Table III shows the clusters obtained by applying Fuzzy C-Mean algorithm for different values of m

<i>Different runs</i>	<i>Number of iterations</i>	<i>No: of members in cluster I</i>	<i>No: of members in cluster II</i>	<i>m</i>
R1	58	2883	551	1.25
R2	42	2974	460	1.5
R3	44	461	2973	1.75
R4	52	2883	551	2
R5	64	2883	551	2.25
R6	62	2882	552	2.5
R7	66	2882	552	2.75
R8	69	552	2882	3
R9	69	552	2882	3.25
R10	73	581	2853	3.5
R11	66	2852	582	3.75
R12	76	582	2852	4
R13	74	1036	2398	10
R14	62	2398	1036	20
R15	67	2398	1036	30
R16	15	1050	2384	40
R17	3	1228	2206	50

Table IV--Shows the patterns obtained for different runs of Fuzzy C-Means

<i>Features</i>	<i>R7C1</i>	<i>R7C2</i>	<i>R9C1</i>	<i>R9C2</i>	<i>R11C1</i>	<i>R11C2</i>	<i>R12C1</i>	<i>R12C2</i>
Regularity in attending meetings	4.9	5.0	4.9	4.9	4.9	4.9	4.9	4.9
Training attended	3.7	3.8	3.7	3.8	3.7	3.8	3.7	3.8
Economic Benefits gained in Rupees	798	3764	779.9	3625.3	767.8	3505.6	763.7	3460.4
Social Benefits gained	5	5	5	5	5	5	5	5

Graph III and IV clearly shows that good training programmes can improve the economic benefits of SHG members. Members in the clusters R7C2, R9C1, R12C1, R13C1 shows regularity in attending training programmes. Graph IV shows members in the clusters R7C2, R9C1, R12C1, R13C1 have higher economic benefits .A comparative study on SHG data with K-Means and Fuzzy C-Means shows the same trend.

Further studies on the whole cluster reveals that average dividend is Rs 1000/- SHG's in Waynad, Trichur and Kanoore gets an average dividend of Rs 2000. This is calculated from the mode values of economic benefit from each district. Table V shows the average economic benefit of SHG members in different districts in Kerala.

Table V Average Economic benefit SHG members in different districts

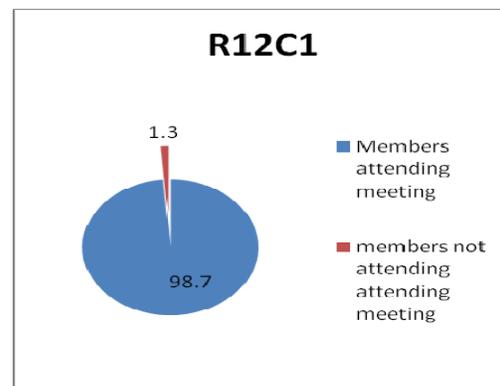
<i>District</i>	<i>Economic Benefits</i>	<i>District</i>	<i>Economic Benefits</i>
Kannore	2000	Trichur	2000
Calicut	1500	Kottayam	1000
Malappuram	1000	Alleppy	1000
Palakad	50	Trivandrum	1000
Wayanad	2000		

Our suggestion is to give latest training techniques for SHG members which can create tremendous change in our country.

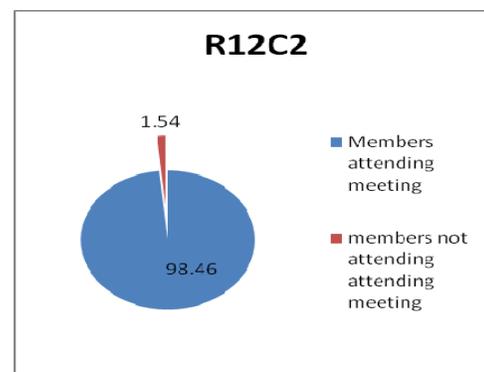
Recently ESAF was selected as the implementing partner for the Central Govt. project Sanchar Shakti, in Kerala and Tamil Nadu along with Sarsen Communication and Technology Group. Sanchar Shakti project was launched by Honorable President Smt. Pratibha Patil in New Delhi on March 07, 2011. The project is a DOT-USOF's 'Scheme for Mobile Value Added Service (VAS) and Information Communication Technology (ICT) related Livelihood Skills for Women's SHGs in rural India.' In this project, products of SHGs in Tamil Nadu and

Kerala would be marketed with the help of NGOs in Delhi. The products include food items like pickles and honey and also medicinal herbs.

The intention of the training programme is to nurture the participants about the concept, feature and benefit of the self help groups. It could make the SHG more efficient in accounts and meeting register maintenance, independent with minimum requirements and activities are concerned and less vulnerable to wrong financial transactions. Correct accounts would make the artisans prevent from being cheated in business or any day to day expenses. It would enable them to apply to banking institution for financial loan/support for furthering investment, as accounts is the back bone of the SHG, so this training ensures their multilevel socioeconomic improvements in future, both skill development and human capital training services to their members in addition to financial services .The training components' includes the account works in a structured way, maintenance of SHG records, accounts and book keeping and rules regulations of internal lending along with the related concepts and practices were presented before the participants Training includes both skill development and human capital training services to their members in addition



Graph V shows the % of members attending meeting regularly in the cluster R12C1



Graph VI shows the % of members attending meeting regularly in the cluster R12C2

Graph V and VI shows 98% of members attending meeting regularly. Here we are considering two clusters R12C1 and R12C2 in which 98.7% in R12C1 and 98.46% in R12C2 are attending meeting regularly. The analysis reveal that majority of members are attending meeting but not training. We have selected the clusters R9C1, R9C2, R12C1, and R12C2 for analysis socio economic characteristics randomly. The following table VI shows the district wise information about regularity in attending meeting

and for the society, and are changed according to the changes in the society. Humiliations of women are reduced, and this created a healthy environment in the family. SHG is not an organization or enterprise, but it is a great concept which lead the nation for its development. It was the vision of Gandhiji's "GRAMASWARAJ". SHGs play a very important role in the community development. Discussions, seminars, camps, training programmers, arts, cultural and sports celebrations, weekly meetings etc of the group level, federation level and

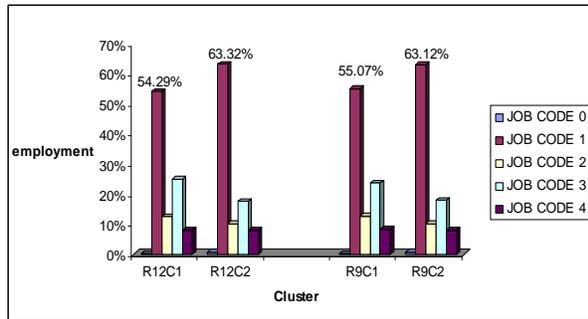
Table VI: District wise information about regularity in attending meeting

<i>District</i>	<i>Regularity in attending Meeting</i>	<i>No Regularity in attending Meeting</i>	<i>Regularity in attending training</i>	<i>No Regularity in attending training</i>
Kannore	95.72%	4.28%	63.64%	36.36%
Calicut	96.14%	3.86%	72.96%	27.04%
Malappuram	98.33%	1.67%	56.27%	43.73%
Palakad	98.10%	1.90%	32.23%	67.77%
Weygand	99.49%	0.51%	79.64%	20.36%
Trichur	98.04%	1.96%	45.49%	54.51%
Kottayam	100.00%	0.00%	86.42%	13.58%
Alleppy	100.00%	0.00%	65.56%	34.44%
Trivandrum	99.87%	0.13%	76.34%	23.66%

This study reveals that maximum regularity in attending meeting by SHG members are from Kottayam and Alleppy and the table shows that in all districts from Kerala almost all members have regular attendance in meetings. Regularity in training is showed by SHG members in Kottayam followed by Wayand. Minimum regular attendance of SHG members are from Palakkad. Now government is openhanded to give more attention to Palakkad for their improvement.

Discussions, seminars, camps, training programmers, arts, cultural and sports celebrations, weekly meetings etc of the group level, federation level and regional level enhances the personality of the group members. Authorities give training for gardening, vegetable cultivation, usage of bio fertilizers, construction of vermin-compost pits, biogas plants, paper bag manufacturing, goat and cattle rearing etcWhen we consider the socioeconomic parameters like occupation, labour force, educational level, rate of unemployment, we can see that their socioeconomic status have markedly improved after joining SHG. In this study we consider SHG which are stable for more than three years.

In Kerala women are proud and they have self confidence and enthusiasm and are aware about their rights. They became more confident from these groups and became the leaders in the local bodies. Their attitudes are now changed, and the attitudes of men towards women also changed. Now they are accepting women and are ready to include their women in the decision making process. These changes reduced social evils to a certain extent. Women, restricted in the four walls in the house came out for doing different activities for their family



Graph VII shows the cluster wise information regarding employment

Job Codes 0, 1, 2, 3, 4 are jobless, coolies, laborers (skilled workers), self employment and employees respectively.

The percentage of jobless members are very few in clusters, their values include 0.17%, 0.77%, 0.18% and 0.76% in R12C1, R12C2, R9C1 and R9C2 respectively. This shows that SHG can reduce

Table VII shows the district wise information on the percentage of members engaged in various employments

District	Job code				
	0	1	2	3	4
Kannore	0.18%	44.03%	26.38%	26.56%	2.85%
Calicut	1.29%	68.67%	6.87%	12.88%	10.30%
Malapuram	0.00%	80.22%	4.74%	12.53%	2.51%
Palakkad	0.47%	53.08%	13.74%	28.44%	4.27%
Wayanad	0.00%	59.03%	5.34%	27.48%	8.14%
Trichur	1.96%	53.33%	19.61%	18.04%	7.06%
Kottayam	3.76%	64.66%	7.89%	11.65%	12.03%
Alleppy	0.51%	53.45%	7.67%	21.74%	16.62%
Trivandrum	0.13%	74.12%	4.05%	12.42%	9.28

The result analysis reveals that

- maximum jobless members in SHG are from Kottayam district
- More than half the group are coolies in all districts
- Maximum number of Coolies are from Malapuram, Trivandrum and Calicut districts
- Skilled laborers are maximum in Kanoore, Trichur and Palakkad

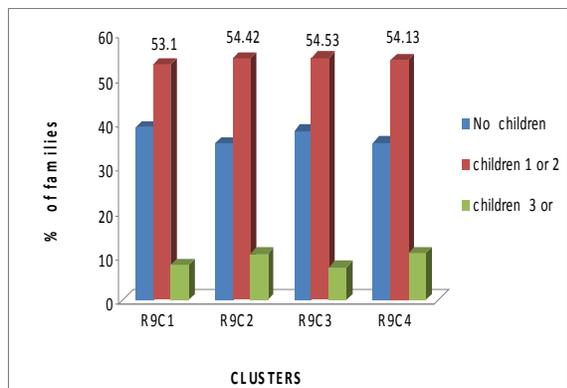
unemployment to a greater extent. Maximum members in each clusters are coolies ( head load workers), their values are 54.29%, 63.32%, 55.7% and 63.12% in R12C1, R12C2, R9C1 and R9C2 respectively. Self employment is gaining its importance among SHG members. Nowadays many SHGs are starting small business, cottage industries, food processing units etc. The study reveals that self employment values have increased to 25.08%, 17.64, 23.73%, 17.79% in the above clusters. 12.54%, 10.64%, 12.63%, 10.17% members in skilled labors, whereas SHG members engaged in regular employments are few in numbers. This may because of the educational level of SHG members in the group.

District wise information (table VII) on the percentage of members engaged in various employments coincides with the above results.

- Self employment is highest in Palakkad, Wayand and Kanoore
- Skilled laborers are higher in Kanoore
- Self employment is higher at Palakkad Wayanad and Kanoore.
- Salaried employed people are higher at Alleppy and Kottayam

Studies on various cluster reveals that majority of SHG members in various districts of Kerala are female (91%) and 9% are male members. More than 50 % of the members in every cluster have one or

two children, which show that family planning is very effective in the lower level also. Graph VIII shows the percentage of children for SHG members in various clusters.



Graph VIII shows the percentage of children for SHG members in various clusters.

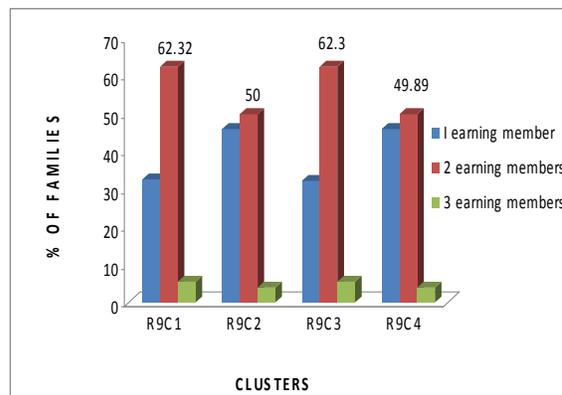
53.1%, 54.42%, 54.53%, 54.13% members in clusters R12C1, R12C2, R9C1, R9C2. Majority of the members have either one or two children and it shows that family planning in Kerala is properly function in the lower level also 91% members are female and 9% members are male. 98% members are married 2% of the members are unmarried.

The other socio economic demographic variables that we included in the analysis are the number of earning members in the family and their education level, an educated female member is more likely to be more inclined to work for income generating activity rather than staying at home. Alternatively an aged female member may prefer to stay at home due to low productivity.

Income is the major determinant of the standard of living of the people. Depending upon the educational qualification, they settle in a particular occupation and accordingly earn income. The income of SHG member income has been increased after joining the SHGs. Hence women members of the groups are independent to meet their personal expenditure, and they contribute more to their household income. Many housewives did not earn anything before joining SHGs, but after becoming a member of the SHGs, they are also earning reasonably. This increases the willingness to participate in the SHGs' activities

The increased income not only enhances the expenditure of the family but also promote the savings of the family after they join in the SHGs. Here the objective of the SHGs is fulfilled. Usually

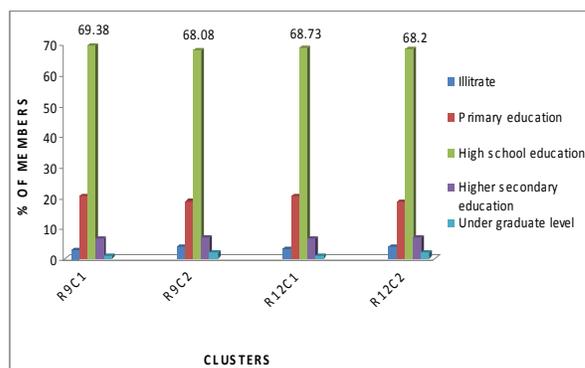
working women are being respected by the household members and the society.



Graph IX shows the relation between number of earning members and clusters under study

Nowadays the women in the SHGs are also respected by the others, because they are independent in earning the income and they are contributing to household income, expenditure and savings. Our study on the number of earning members in the family of SHG members reveals that in all clusters two members are earning in the household. The graphs IX shows the relation between number of earning members and clusters under study. Therefore the above discussion clearly states that after joining the SHGs, the members' well-being has been increased.

The study on the educational level of SHG members reveals that 2.9, 4.03, 3.09, 3.91 percentage are illiterate.



Graph X shows the relation between educational level of SHG members in the cluster.

Whereas 20.29, 18.7, 20.44, 18.65 percentage are primary educated, 69.38, 68.08, 68.73, 68.2% are high school educated and 0.91%, 2.15%, 1.03%,

2.14% are undergraduates in the clusters R9C1, R9C2, R12C1, R12C2 respectively.

Maximum numbers of SHG members are high school educated. Only very few have graduation level education. Graph X shows the relation between educational level of SHG members in the cluster.

Income is the major determinant of the standard of living of the people. Depending upon the educational qualification, they settle in a particular occupation and accordingly earn income. The SHGs member income has been increased after joining the SHGs.

District wise educational level of SHG members is given in table VIII

<i>District wise Educational level</i>	<i>Illiterate</i>	<i>Primary level</i>	<i>High school level</i>	<i>Higher secondary</i>	<i>Under graduate level</i>
Kannore	1.78%	19.61%	67.20%	8.73%	2.67%
Calicut	2.15%	12.02%	75.54%	9.44%	0.86%
Malappuram	1.95%	23.96%	66.57%	5.57%	1.95%
Palakkad	<b>6.64%</b>	17.06%	70.62%	2.84%	2.84%
Wayanad	5.34%	<b>24.94%</b>	59.80%	8.14%	1.78%
Trichur	1.18%	19.61%	65.10%	10.59%	<b>3.53%</b>
Kottayam	1.21%	12.73%	71.52%	<b>13.94%</b>	0.61%
Alleppy	0.00%	9.95%	<b>83.42%</b>	5.10%	1.53%
Trivandrum	9.15%	23.92%	59.48%	5.23%	2.22

District wise educational status of SHG reveals that

- Maximum high school educated members are in Alleppy district
- Maximum members with higher secondary education are from Kottayam
- Members with maximum primary education are from Wayanad
- Illiterate members are present in maximum at Palakkad.
- Members with Degree level education are very few in all districts

So it is necessary that Government should take necessary steps to improve educational status of SHG members. The study reveal that majority of the SHG members have taken loans for educational purposes. It is a fact one of the major demands for loans within the Self Help Groups (SHGs) is for meeting the education expenses of the children of the women members. However, the main demand for education loans is for those clients whose children are in colleges for getting higher education or pursuing

Hence women members of the groups are independent to meet their personal expenditure, and they contribute more to their household income. Many housewives did not earn anything before joining SHGs, but after becoming a member of the SHGs, they are also earning reasonably. This increases the willingness to participate in the SHGs' activities. Many women members independently involve in the economic activities individually and with other group members after joining SHGs. Therefore they are now economically independent and contribute to increase their household income.

courses like nursing, B.Ed courses, and technical diploma courses. Hence, it is important to give concession or free education to the children of SHG members, so that they can utilize the fund obtained for performing well by investing in business which has sufficient returns

The family expenditure has been increased due to the positive change in the SHGs members' income. The increased income not only enhances the expenditure of the family but also promote the savings of the family after they join in the SHGs. Here the objective of the SHGs is fulfilled. Usually working women are being respected by the household members and the society. Nowadays the women in the SHGs are also respected by the others, because they are independent in earning the income and they are contributing to household income, expenditure and savings. Therefore the above discussion clearly states that after joining the SHGs, the members' well-being has been increased.

## 4. Conclusions

The social grouping of the members of SHG is largely decided on the basis of the domicile temperament of the people. One of the outstanding benefits reported by all the SHG members is the development of self-confidence, followed by communication level of members, economic independence, social cohesion, freedom from debt, asset ownership and many more. It is found that only few members had confidence before joining the SHGs but most of the members gained confidence after joining the SHGs. Conventionally statistical methods were used for the analysis for SHG data. In this paper we are introducing data mining method for easy and fast analysis. Based on clustering analysis using K-Means and Fuzzy C-Means, we have analyzed the socioeconomic performance of SHG groups in Kerala State.

Study based on the socioeconomic factors influencing the SHG members reveals that only few members attend training programmes and analysis revealed that those members attending training achieved more economic benefit which shows its importance. Hence Government should take more initiatives to introduce new training programmes which will be beneficial to SHG members. Almost 98 % of the SHG members attend meeting regularly which have greatly enhanced the personality, attitudes and social benefits of the group members. The study reveals that maximum regularity in attending meeting by SHG members are from Kottayam and Alleppy. Cluster analysis on unemployment rates reveals that jobless members are very few in all clusters and SHG has reduced unemployment to a greater extent. Self employment is gaining its importance among SHG members. Nowadays many SHGs are starting small business, cottage industries, food processing units etc. It is found that self employment values have increased in all districts in Kerala among SHG members. Studies regarding earning members in SHG house hold show that in all clusters two members are earning. Analysis on the educational level of SHG members reveal that an average of 3.5 percentages of members is illiterate and maximum is from Palakkad district. Majority of the members are high school educated and highest number of members are from Kottayam district. So it is necessary that Government should take necessary steps to improve educational status of SHG members. Most of the SHG members have taken loans for educational purposes. It is a fact one of the major demands for loans within the Self Help Groups (SHGs) is for meeting the education expenses of the children of the women members

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