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# Analyzing Technology Adoption - The Case of Kerala Home Gardens

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*Homegardens are traditional agroforestry system with a unique structure and function. It is the predominant farming system in Kerala. The study was undertaken in Thiruvananthapuram district covering a sample of 100 homegardens farmers from all the five agro-ecological units with an aim to assess the level of adoption of selected Kerala Agricultural University (KAU) production practices in homegardens. Results of the study identified that majority of the farmers (63%) belonged to medium level of adoption. Adoption quotient was worked out and compared with standard Rogers curve. Correlation analysis of the independent variables with the dependent variable viz., level of adoption indicated that age, farming experience, knowledge, evaluative perception, mass media contribution, livestock possession and extension contribution had direct significant effect on level of adoption of KAU production practices by homegarden farmers.*

Kerala state, which accounts for a mere 1.18 per cent of the total land area of India, accommodates 3.1 per cent of the Indian population. The state spreads over an area of 38,863 $Km^2$ has a population density of 860 people per $Km^2$. The per capita size of the farm holding works out to be less than one hectare. Increased population pressure, emerging nucleotide family structure and decreased area under agriculture has resulted in fragmentation of land area which makes homegarden the 'next generation farming system' unique. Intensive farming activities are undertaken by farmers on the limited area in order to obtain food, fuel, fodder, timber and cash from the sale of produce. Homegardens are traditional agroforestry systems with complex structure and multiple functions where there is constant interaction and interrelation between various components. This type of farming system enables the farmers to cultivate annual and perennial crops in available limited space to satisfy the basic home requirement and market preferences if surplus is produced.

Ability of a country to attain the full potential of agricultural production depends upon the innovativeness and adoption of new technology by the stakeholders of agriculture. The capacity of farmers is based on the availability of various production technologies. A large number of need based agricultural production technologies have been developed by KAU. Generation, transfer and adoption of these developed technologies is influenced by the needs of farmers. The relevance of generated and disseminated technologies should be probed for further research in order to bridge the technology gaps. Hence the present study was undertaken with the objective to measure the level of adoption of KAU technologies for the production practices in homegardens and to assess the relationship

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between adoption quotient and the selected independent variables.

## METHODOLOGY

The study was conducted in Thiruvananthapuram district owing to the wide variability in the structure and cropping pattern of homegarden systems in the southern zone of Kerala which is predominantly the *erstwhile* Travancore state. 20 homegarden farmers with holding size not less than 0.1 ha were selected through simple random sampling from each of the 5 Agro Ecological Units (AEU) thus making a sample size of 100.

Data were collected using a well-structured interview cum data enumeration schedule prepared for the purpose. A draft interview schedule was prepared for conducting a pilot study in a non sample area and suitable modifications were made in the final data enumeration schedule which was finally administered to the homegarden farmers by the researcher and the responses were recorded at the time of interview.

Level of adoption of various production practices were calculated using the general form:

$$AQ = \frac{\sum_{i=1}^{n} \frac{ei}{pi} \times 100}{N}$$

Where,
AQ = Adoption quotient
ei = Extent of adoption of each practice
pi = Potentiality of adoption of each practice
N = Total number of practices selected.

Different scoring procedures were undertaken for measuring the adoption quotient of various practices. The original numerical data was given as extend of adoption (ei) for quantifiable data like seed rate, pit size, spacing, quantity of fertilizers applied etc and the recommended practice was considered as the potentiality of adoption of that practice(pi). A few practices were measured in terms of different stages of adoption. Level of adoption of each farmer was indicated on a 15 point adoption scale. The response categories and weighted values were non- adoption (0), awareness (1), interest (3), evaluation (5), trial (10) and adoption (15). For example, if the farmer was placed in the evaluation stage his extend of adoption (ei) will be 5 and the potentiality of the adoption (pi) will be the maximum possible score *i.e.* 15.Practices which could not be quantified were scored dichotomously as 'Yes' or 'No' with the maximum possible score '1' for 'Yes' and '0' for the response 'No'. If the practice is not followed by the farmer, the response will be 'No' and the extent of adoption (ei) will be '0' and potentiality of adoption will be '1'.

After calculating the adoption quotient for the various production practices the adopters were categorised and compared with the standard Rogers curve. The collected data were scored, tabulated and analysed using different statistical methods like mean, frequency, percentage analysis and correlation analysis.

## FINDINGS AND DISCUSSION

Study was aimed to categorise homegarden farmers into different level of adoption *viz.*, high, medium and low category of adoption.

The distribution of homegarden respondents based on extent of adoption is presented in table 1.

Table 1 revealed that majority of farmers (63%) belong to medium category of adoption followed by 20 per cent of farmers coming under high category of adoption and 17 per cent of farmers under low category of adoption

An attempt was made to categorise the homegarden respondents to different adopter categories as put forward by Rogers, 1982. After identifying the level of adoption, adoption quotient (AQ) was delineated using measures of mean and standard deviation. The obtained curve was compared with standard Rogers curve. The distribution on homegarden respondents into different adopter categories are shown in Fig. 1.

**Table 1.**
**Distribution of Respondents Based on the Extent of Adoption of Scientific Production Practices in Homegardens**

N=100

| Sl.No. | Category | Class limits | No. | % |
|---|---|---|---|---|
| 1. | High (Mean + Standard deviation) | >71.60 | 20 | 20 |
| 2. | Medium (Between mean and Standard Deviation) | 31.16– 71.60 | 63 | 63 |
| 3. | Low (Mean – Standard Deviation) | <31.16 | 17 | 17 |

Adopter categorisation of homegarden respondents shown in Fig. 1 revealed that there are no innovators in homegardens but the percentage of early adopters (17%) is higher than the standard Rogers curve which was only 13.5 per cent. Percentage of early majority is 34 per cent which is equivalent to that of standard normal curve which points towards the fact that 51 per cent of the homegarden respondents are fairly adopting KAU production technology practices. Though the respondents coming under early majority are less that Rogers curve *i.e* 29 per cent, the percentage of laggards is 20 per cent which should be 16 per cent according to Rogers innovation curve. The findings indicate that there is a need for effective and meaning full extension advisory and service supports so that the percentage of laggards and late majority can be further reduced which will invariably improve the percentage of respondents either under early majority, early adopter or innovators. Thus the extent of adoption of KAU production practices can be improved. The reason for the absence of innovators in the overall adoption curve could be due the extreme values assigned to the different and multiple selected production practices by the 100 respondents for seven different crops.

In order to analyse the influence of independent variables on extent of adoption of farmers simple correlation analysis was done. Correlation results between extent of adoption of scientific production practices by homegarden respondents and the

**Table 2.**
**Correlation Results between Extent of Adoption of Scientific Production Practices by Homegarden Respondents and the Independent Variables**

| Variable | Independent variable | r |
|---|---|---|
| $X_1$ | Age | 0.271** |
| $X_2$ | Education | -0.189 |
| $X_3$ | Occupation | 0.099 |
| $X_4$ | Effective homegarden area | -0.123 |
| $X_5$ | Family size | -0.035 |
| $X_6$ | Farming experience | 0.264** |
| $X_7$ | Rational orientation | -0.099 |
| $X_8$ | Irrigation potential | 0.168 |
| $X_9$ | Knowledge | 0.516** |
| $X_{10}$ | Evaluative perception | 0.426** |
| $X_{11}$ | Mass media contribution | 0.295** |
| $X_{12}$ | Extension contribution | 0.210* |
| $X_{13}$ | Livestock possession | 0.284** |

** - Significant at 1 per cent level; *- Significant at 5 per cent level

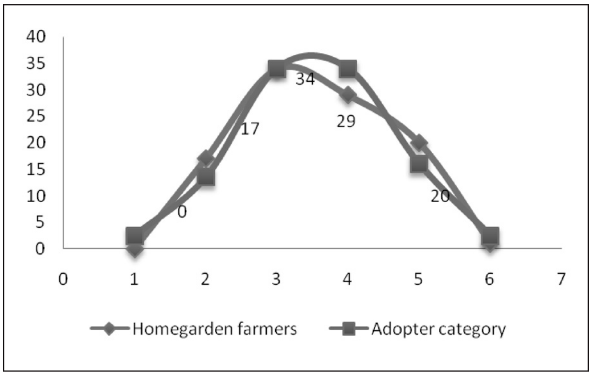
independent variables are shown in table 2.

The results of correlation analysis which is presented in table 2 reveals that out of 13 independent variables seven variables showed positive and significant correlation with extend of adoption of scientific production practices. Variables namely age, farming experience, knowledge, evaluative perception, mass media contribution and livestock possession were significantly related to extend of adoption irrespective of crop or practices at one per cent level of probability and extension contribution was significant at five per cent level of probability. Hence it is inferred that all the seven variables mentioned above are directly influencing the adoption of scientific production practices or technologies in homegardens.

Age, knowledge and farming experience showed a positive significance to the level of adoption. It can be inferred that as age increases farming experience increases and hence it directly influences the knowledge level of the farmer. The higher level of education shows the developed educational system in the state and the literacy rate of people in the sample. Majority of the homegarden farmers had high level of evaluative perception which states that farmers are following practices like mulching, resource recycling, judicious use of external inputs, soil and water conservation practices, use of ITK practices, etc., in their farm which aids in maintaining sustainability of homegardens.

Mass media or the information support contribution has positive influence on level of adoption and it means that for easy dissemination of technology to farmers different mass media and information sources should be utilized to the maximum so as to increase the level of adoption. The wide range of technology be it visual or multimedia might have an influence in their adoption and hence the variable mass media or the other information support services had a positive and significant relationship with level of adoption of homegarden farmers. Homegarden farmers consider homegardening as a source of income in addition to their other vocations. The extension contribution showed a positive significance to the level of adoption and an improvement in the extension services offered to the farmers can increase the level of adoption of scientific production practices.

**Fig 1. Distribution of homegarden respondents into adopter categories**




## CONCLUSION

The study which was conducted to identify the level of adoption of KAU production technology in homegardens revealed that 63 per cent of the farmers belong to medium category of adoption. On categorizing and comparing the farmers to different adopter categories as explained by Rogers (1982) it was found that 17 per cent of respondents fell in the category of early adopters which was higher than that of standard Rogers's value (13.5%) and 29 per cent of respondents fell under the category of late majority that was lower than that of standard Rogers's value (34%). The findings indicates there is a need for effective and meaningful extension advisory and service supports particularly focusing on adopter categories viz., laggards and late majority which will enable improved adoption. Also, it will indirectly help other categories as well, for further adoption. Thus the extent of overall adoption of KAU production practices can be still improved. The study thus validate that rapid technology progress and the increased rate of obsolescence of technologies, necessitate not only technology generation, but also, its dissemination and adoption. Thus for any planning process in agricultural extension programmes, aimed for the socio-economic prosperity of the homegarden farming community, analyzing technology adoption becomes imperative.