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### Diffusion and adopter categorization of home science technologies

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#### Abstract

Women in rural areas suffer from many grave disadvantages and are subjected to great deal of hardship and drudgery. The jobs done by them are often physically arduous, time consuming and repetitive, resulting in fatigue and drudgery. So, women need new technologies and practices to improve upon the old ones. The transfer of technology is a very complex process. For a technology to be transferred it needs to be diffused in the social system. Both diffusion and adoption process of home science technologies go on simultaneously. Diffusion is the spread of ideas from a source to clients. Whereas, adoption signifies the decision to put on an idea into practice. The present research was carried out during 2016-17 in the purposively selected villages of Dharwad taluk of Dharwad district of Karnataka state. Eight technologies from each department of home science were selected and diffused among the social system. The total sample size was 80 rural women who have adopted the diffused home science technologies. Personal interview schedule was prepared and the data was collected. The collected data was analyzed by using suitable statistical tools. The research findings of the study revealed that maximum diffusion was observed for health and safety practices for women (31.65%). Care and storage practices of clothing was diffused to the extent of 19.27 per cent. In case of balanced diet, stain removal techniques and weaning foods the diffusion percent were 14.68, 11.47 and 10.69 per cent respectively. Low diffusion was observed in the technologies namely toys for stimulating cognitive development and boiling water and water softening methods and the diffusion percent were 7.80 and 1.83 per cent respectively. The study also observed that the categorization of adopters was made only for the two technologies namely health and safety practices for women and care and storage practices of clothing.

**Keywords:** diffusion, adoption, rural women, adopter categories, technology

#### Introduction

Home science is a science that co-ordinates the scientific and practical knowledge drawn from different fields and utilizes it in a suitable way for the development, welfare and happiness of individual, family, community and nation at large. The science of home comprises of Food Science and Nutrition, Family Resource Management, Textile and Clothing, Human Development and Home Science Extension. According to Patil (2016) <sup>[3]</sup>, the home science technologies are a complex blend of scientific information, materials, technical methods and processes that require the art of systematically using them for improving skill and task performance. However, the development of new home science technologies does not end by itself. Dissemination of the technologies by competent persons is equally important. The technologies need to be reached the end users.

The transfer of technology is a very complex process. For a technology to be transferred it needs to be diffused in the social system. According to Rogers (1983) <sup>[4]</sup>, diffusion is a special type of communication in which an innovation is communicated through certain channels over a period of time among the members of the social system. Adoption is a decision to make full use an innovation at the best course of action available. Diffusion and adoption process of home science technologies go on simultaneously. Srivastava and Chandrakumari (2011) <sup>[5]</sup> carried out a study on awareness and health seeking behavior of adolescent girls on menstrual and reproductive health problems in Rajasthan. The study identified that major sources or channels of transfer of 23 information regarding menstruation were television (10.20%), radio (13.30%), peer group (24.30%), mothers (52.20%) and about reproductive health problems girls preferred to consult parents (59.20%) and doctors (34.60%). Khambra *et al.* (2011) <sup>[2]</sup>

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conducted a study on adoption feasibility of clothing related technologies in Hisar district of Haryana state. The total sample size was 30 rural women. The study showed that the adoption feasibility index was highest for stitching (88.60%) followed by worth out of waste (88.80%), hand knitting (85.60%), tie and dye (77.60%), embroidery (72.40%) and crochet (48.70%). Uplap *et al.* (2012) [6] conducted study on knowledge and adoption of food grain storage practices by the farm women in Pune. The total sample size was 170 farm women. Results of the study indicated that 95.82 per cent of the respondents adopted the method of sun drying, 94.11 per cent of them adopted the method of sieving of food grains and 50.42 per cent adopted the method of separation of broken grains. Patil (2016) [3] carried out a study on adoption of selected home science technologies in Northern Karnataka on a sample size of 120 women. The findings of the study revealed that majority (45.83%) of the rural women had medium level of adoption score on developmental mile stones and stimulating play materials followed by food and food pyramid (45.00%), consumer education (43.33%) and stain removal technology (45.00%). The above reviews show how agricultural and home science technologies diffused and adopted among members of social system.

In a social system the innovations are not adopted at the same time, but at different times by the members of the social system. Hence, these adopters were classified as innovators, early adopters, early majority, late majority and laggards. Brar and Sindhu (2013) [1] studied the level of interest in new fashions and opinion leadership behavior of working and non-working middle-aged women of Punjab. The total sample size was 320 urban women. The study categorized the respondents based on their new clothing styles as fashion innovators (4.00% working and 4.50% non-working), early adopters (26.00% working and 16.90% non-working), early majority (44.10% working and 46.30% non-working) and laggards (6.00% working and 3.10% non-working). Environmental changes and technological advancements have accelerated the living conditions both at home and outside the home. Balancing both domestic and professional tasks has increasingly becoming a challenge for women folk. She has to find ways to face these challenges by efficiently combining technological advancement with traditional practices. Rural women face many responsibilities with little or undervalued knowledge and poor outdated tools and equipment compared to urban women. With this brief introduction the present research study was carried out with an objective of,

1. To study the diffusion process of the introduced home science technologies.
2. To understand classification of adopters into adopter categories.

### Methodology

The study was carried out in two purposively selected villages of Dharwad district of Northern Karnataka state, India during the year 2016-2017. The experimental design was selected as an appropriate research design for the present research study. Structured interview schedule was developed to collect data on diffusion and adoption of home science technologies. Collected data was analyzed by using suitable statistical methods. Diffusion was operationalized as the process by which the home science technologies spread over time among the communities of selected villages. The home science technologies were introduced through lecture-cum-demonstration and exhibition in the selected villages. The diffusion process of each home science technology was

studied by taking counts of women who had not attended the intervention but accepted the technologies. After the intervention of home science technologies, a period of three months was given for the acceptance. Further, these three months were divided into 12 weeks to study the pattern of adoption in the present study. The information regarding the number of respondents accepting home science technologies in each week was recorded. Further, these adopters of home science technologies were classified into five categories as given by Rogers *i.e.*, the respondents coming under the area lying to the left of the mean time of adoption minus two standard deviation ( $x - 2s$ ) would come under the first category of adopters *i.e.*, 1-2 weeks. The next group of adopters between ( $x - 2s$ ) and ( $x - 1s$ ) constitute the second group (2-4 weeks). The respondents lying between ( $x - 1s$ ) and  $x$  form the third group (4-6 weeks), the respondents lying between  $x$  and ( $x + 1s$ ) form the fourth (6-8 weeks) group and the remaining respondents included under the fifth group (more than 8 weeks). After the diffusion of home science technologies 80 rural women who accepted the home science technologies among the two villages were considered as sample size for the present study.

### Results and Discussions

Table 1 shows the diffusion of home science technologies. It is seen that maximum diffusion was observed for health and safety practices for women (31.65%). Care and storage practices of clothing was diffused to the extent of 19.27 per cent. In case of balanced diet, stain removal techniques and weaning foods the diffusion percent were 14.68, 11.47 and 10.69 per cent respectively. Low diffusion was observed in the technologies namely toys for stimulating cognitive development and boiling water and water softening methods and the diffusion percent were 7.80 and 1.83 per cent respectively. Whereas no diffusion was observed in case of dust mite control technology. In the present study the maximum diffusion was found in case of health and safety practices for women. These technologies are simple to understand and use and compatible with existing norms. Today's women are aware about infections and related issues. So, they are more conscious about their health and safety aspects. Intervention programme on these technologies by the experts might have created interest among the rural women and thus leading to increased diffusion. Care and storage practices of clothing has diffused more among the rural women, since these practices are simple to practice, inexpensive and household materials can be used in practicing this technology. Similarly, balanced diet can be prepared with the available materials in the kitchen of the household easily. These might be the reasons for more spreading of these technologies.

### Adopter categories of home science technologies

Any technology when diffused in a social system is not adopted by all members. While some adopt it early, the others are late. The adopters of an innovation can be categorized based on the earliness or lateness in adoption. Rogers has classified the adopters as explained here. In a *social system innovator* are eager to try new ideas. This interest in new ideas leads them out of a local circle of peer network and into more cosmopolite social relationship. Persons with such characteristics made only 2.5 per cent of the social system. Similarly, *early adopters* who are also called as 'respectable' constitute 13.5 per cent in a social system. Also, *early majority* and *late majority* were the people who adopt before

and after the average members of the social system, making up one third of all members of a system. Lastly *laggards* who were the last to adopt the technologies constitute 16 per cent. In the present study we see that the categorization of adopters was made only for the two technologies namely health and safety practices for women and care and storage practices of clothing (Table 2) which followed normal distribution pattern and was in conformity with that of Rogers (1983) [4] categorization.

For the other technologies considered in this study, namely balanced diet, weaning food, stain removal techniques, toys for stimulating cognitive development, the adopter categorization was not possible because the acceptance did not follow the normal ‘S’ shaped curve. With regard to boiling water and water softening methods and dust mite control technology, it could be said that the technologies were not at all accepted by the members of the social system. According to Rogers (1983) [4], the time taken by the adopters of different adopter categories, to adopt the innovation vary. This is evidenced by the ‘F’ values in the present study which showed significant differences among the adopter categories of the two technologies namely care and storage practices of clothes and health and safety practices for women. Table 3 shows there is a significant difference between the adopter categories of care and storage practices of clothing (F=159.885\*\*). The mean values found for innovators are (1),

early adopters (3.56), early majority (5.50), late majority (7.38) and laggards (9.50). Table 4 identifies there is a significant difference between the adopter categories of health and safety practices of women (F=231.11\*\*). The mean values found for innovators are (2), early adopters (3.78), early majority (5.61), late majority (7.57), and laggards (10.5). The null hypothesis has been rejected as the categorization followed Rogers curve only for care and storage practices of clothing and health and safety practices for women. While, for other technologies the curves were highly scattered.

**Conclusion**

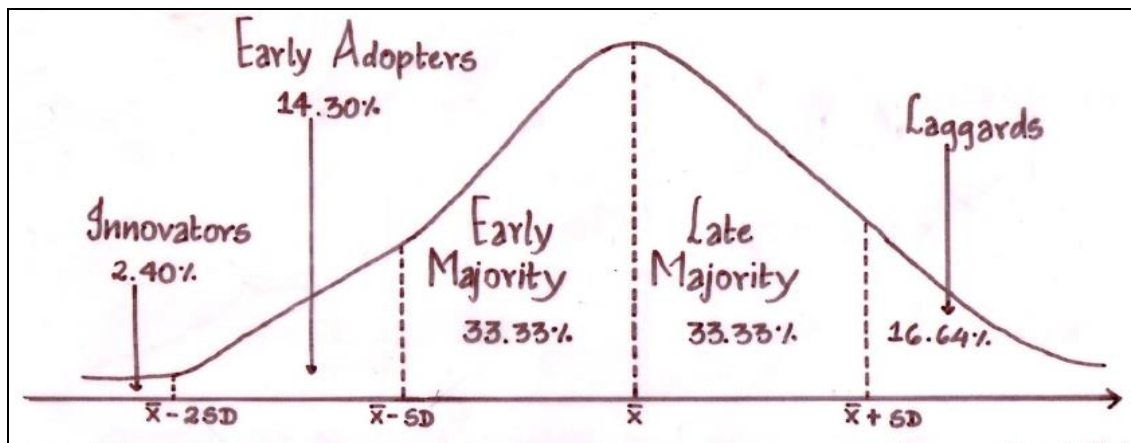
Among the eight home science technologies, health and hygiene practices, care and storage practices of clothing and balanced diet were diffused in large scale by the rural women. This implies that the technologies which are need based, perceived relatively advantageous, compatible, less complex, trailable and observable are accepted high by the rural women. The technologies namely boiling water, dust mite control was clearly rejected by the rural women since they are not compatible and need based. Thus, the diffusion is a complex process and time taking process. Hence, the research study concludes that technology transfer is a complex process which involves the inter linked subsystems viz., research, extension, clients, inputs and social system.

**Table 1:** Distribution of respondents in the diffusion process of home science technologies (n=80)

Sl. No.	Technologies	Acceptance (n)	Trained (n)	Diffusion (n)	Diffusion percent
1	Balanced diet	32	20	12	14.68
2	Weaning foods	22	10	12	10.09
3	Stain removal techniques	25	15	10	11.47
4	Care and storage practices of clothing	42	25	17	19.27
5	Boiling water and water softening methods	04	12	04	1.83
6	Dust mite control technology	00	00	00	0.00
7	Toys for stimulating cognitive development	17	07	10	7.80
8	Health and safety practices for women	69	20	49	31.65

**Table 2:** Adopter categories of home science technologies

Sl. No.	Adopter categories	Adopter categorization			
		Care and storage practices of clothing		Health and safety practices for women	
		F	%	F	%
1	Innovators ( $\bar{x}-2SD$ )	01	2.40	02	2.90
2	Early adopters ( $\bar{x}-1SD$ and $\bar{x}-2SD$ )	06	14.30	09	13.04
3	Early majority ( $\bar{x}-1SD$ )	14	33.33	23	33.33
4	Late majority ( $\bar{x}$ and $\bar{x}+1SD$ )	14	33.33	23	33.33
5	Laggards ( $\bar{x}+1SD$ )	07	16.64	12	17.40



**Fig 1:** Adopter categorization for care and storage practices of clothing

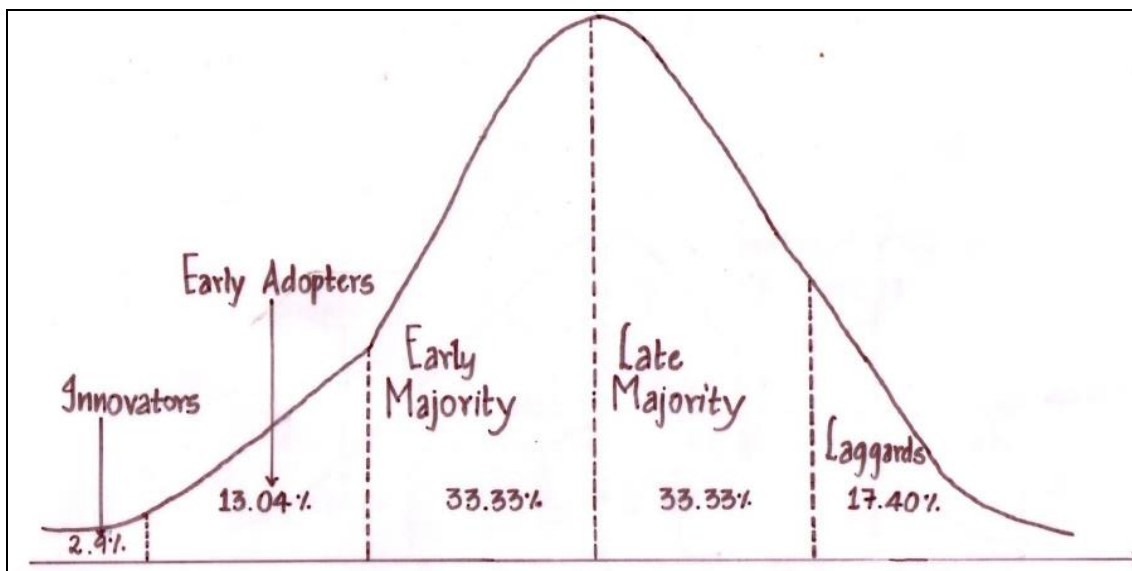


Fig 2: Adopter categorization for health and safety practices of women

Table 3: Comparison of adopter categories of care and storage practices of clothing

Adopter categories	Mean ± S. D.	CD ± SEM	'F' value
Innovators	2 ± 0	0.014 ± 0.006	159.88**
Early adopters	3.56 ± 0.51		
Early majority	5.50 ± 0.53		
Late majority	7.38 ± 0.52		
Laggards	9.50 ± 0.71		

\*\* Significant at 1% level

Table 4: Comparison of adopter categories of health and safety practices for women

Adopter categories	Mean ± S. D.	CD ± SEM	'F' value
Innovators	2 ± 0	0.011 ± 0.005	231.11**
Early adopters	3.78 ± 0.44		
Early majority	5.61 ± 0.50		
Late majority	7.57 ± 0.51		
Laggards	10.5 ± 1.12		

\*\* Significant at 1% level

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