Determinants of brand preference in drip irrigation system with special reference to Coimbatore district

■ R. RAVIKUMAR AND DAVID WINSTER PRAVEENRAJ

SUMMARY : Agricultural sector is the largest water user of the country, the growing challenge for agricultural development is how to grow more food for growing population with less water share for agriculture. The government also implemented subsidy schemes to encourage the farmers to adopt improved irrigation technologies. This gives greater opportunity to drip irrigation companies to market their products by improving their brand image. This study would focus on determinants of brand preference in drip irrigation system by analyzing the data collected from 100 randomly selected farmers from five blocks of Coimbatore district using percentage analysis, factor analysis, Logit regression, Garrett ranking and likert scale analysis. The study reveals that water saving and labour cost were the most influencing factor for the adoption of drip irrigation system. Immediate response by sales executives, market promotion, peer group influence, quality of materials and price were the major determinants of brand preference of farmers. The farmers were satisfied with the price, availability of spare parts and government subsidies but highly unsatisfied with after sales service provided by the marketers of drip system.

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BACKGROUND AND OBJECTIVES

Micro-irrigation technologies (drip and sprinkler based systems) was first perfected in Israel during the 1960's later, it has spread to other parts of the world, especially in the USA and many Asian countries (Anandh and Krishna, 2008). In India, water saving technologies such as drip and sprinkler irrigation systems was introduced in 1970's and these systems are very much useful in reduction of water use compared to traditional field irrigation method (Sivanappan, 1994). The on-farm irrigation efficiency of properly designed and managed drip irrigation system is estimated to be about 90 per cent, while the same is only about 35 to 40 per cent for surface method of irrigation (INCID, 1994). In sprinkler irrigation method, water saving is relatively low (up to 70%) as compared to drip irrigation (INCID, 1998). The water saving technologies is promoted by both Central and State Governments of India by providing more than 70 per cent subsidy on installation costs. Because of the benefit

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water saving and availability of subsidy component, more number of farmers were practicing micro irrigation technologies in their farms to improve the resource use efficiency and also improve the revenue of the farm (Ayanwale *et al.*, 2005).

Even though, it was introduced in 1970's the area under drip irrigation was around 1500 hecaters until 1985 and later it was increased to 6000 hectares in 1988 followed by 66,000 hectares in 1993, which was less than one per cent of the total area under irrigation (Saksena, 2002).In 2008-09, the area covered under micro irrigation was around 5.5 lakes hectares (Indiastat.com); though the drip system gives more resource saving and economic benefits compared to traditional methods, the area brought under micro irrigation is very meagre to the total irrigated area. Keeping this in view the government of India has introduced subsidy scheme to help the adaptors from high initial capital costs. The rate of subsidy recommended by the government of India is 75 per cent of the cost to marginal and small farmers, 40 – 50 per cent of the cost to big farmers, 90 per cent of the cost to marginal and small farmers belonging to women, SC and ST farmers.

The reduced availability of the water and the government intention to promote judicious use of irrigation water through various subsidy schemes leads the micro irrigation industry in to growth phase. Under this condition the company's which markets drip irrigation products were having good scope and also facing tough competition in the industry. So the companies should give special attention on farmers' expectations and their preferences on drip irrigation systems. In this context, a study was undertaken with an overall objective of analyze the farmers' expectations and their brand preferences towards drip irrigation systems.

Objectives of the study :
– To identify the factors influencing the adoption of drip irrigation systems.
– To analyze the determinants of brand preference in drip irrigation systems.
– To study the satisfaction level of the farmers towards drip irrigation companies.

RESOURCES AND METHODS

For this study 100 farmers were selected randomly from the five blocks of Coimbatore district namely Annur, Avinashi, Thondamuthur, Palladam and Udumalpet. The primary data were collected through personal interview method with the help of comprehensive pre-tested interview schedule. The collected data were tabulated and analyzed using percentage analysis, Logit regression, factor analysis, Garrett ranking and likert scale analysis.

OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been presented under following heads :

Demographic details of the farmers :
Most of the farmers were large farmers (46%) coming under the age group of 36 to 45 years (46%), completed high school level of education (40%), doing agriculture (64%) as the main occupation with more than 15 years of experience (37%). Private dealers (37 %) were the major source of information about drip systems, followed by friends and relatives (20%), company representative (17%). Forty six per cent of the farmers were aware about subsurface drip technology and only 66 and 55 per cent of the farmers were aware about the inline drip system and automation technology, respectively and none of the farmer has adopted automation in their drip system

Reason for the adoption of drip irrigation system :
The major factors influencing the purchase of drip

Sr. No.	Reasons	Score	Rank
1.	Water saving	72.29	I
2.	Labour cost reduction	63.79	II
3.	By observing success in neighbour field	49.30	III
4.	Increase in yield	48.24	IV
5.	Large farm size	45.46	V
6.	Availability of subsidy	36.79	VI
7.	Fertigation possibility	35.14	VII

Table 1 : Reason for adoption of drip irrigation system

irrigation system in the study area were collected, analyzed and the results are furnished in Table 1.

Among the various factors identified, water saving was the most influencing factor (72.29) for the adoption of drip irrigation system followed by labour cost reduction with a mean score of 63.79, observing success in neighbour field and increase in yield with the mean score of 49.30 and 48.24, respectively (Table 1). Large farm area operation was a moderate influencing reason with the mean score of 45.46, followed by availability of subsidy and possibility of fertigation were the lowest influencing factors with the mean score of 36.79 and 35.14, respectively.

Factors influencing the adoption of micro irrigation technologies :

The Logit model was used to identify the demographic factors which influenced the adoption of micro irrigation technologies and the maximum likelihood technique was used for the estimation.

From the Table 2, it could be observed that education and type of crop cultivated by the farmer were significantly and positively influenced the adoption of subsurface drip system. The distance between farms and nearest dealer was significantly and negatively influenced the adoption of subsurface drip system. From the modal summary -2 Log likelihood was got as 69.13 which indicated that the model is good fit because higher the value of -2 Log likelihood better the model fit. From the results of logistic regression analysis it could be inferred that with one unit increase in educational status of the farmer, the probability of adoption of was increased by 53 per cent. The change in type of crop cultivated by the farmer from annual to perennial would increase the adoption level upto 64 per cent. If one unit increase in the distance between farms and nearest dealer, the probability of adoption would reduce by 54 per cent.

Table 2 : Factors influencing the adoption of micro irrigation technologies

Variables	Estimated co-efficient	T-ratio	Odds ratio	Probability
Age (years)	0.046	1.138	1.047	0.51
Education (years)	0.122	2.051*	1.129	0.53
Farming experience (years)	-0.045	-1.092	0.956	0.49
Size of land holding (acres)	0.013	0.388	1.014	0.50
Distance between farm and dealer (km)	-0.180	-1.985	1.197	0.54
Occupational status of farmers	0.250	0.503	1.284	0.56
Amount of rain fall (mm)	0.003	0.907	1.003	0.50
Type of crop cultivated	0.590	1.944**	1.803	0.64

-2 log likelihood 69.13 (Note: *, ** and *** indicate significance of values at P= 0.05, 0.01 and 0.1, respectively)

Table 3 : Total variance explained

Component	Initial eigen values		
	Total	% of variance	Cumulative %
1	2.311	19.257	19.257
2	1.815	15.121	34.378
3	1.585	13.209	47.587
4	1.148	9.566	57.153
5	1.121	9.339	66.492
6	0.922	7.684	74.176
7	0.836	6.969	81.145
8	0.731	6.089	87.234
9	0.638	5.317	92.551
10	0.483	4.027	96.578
11	0.404	3.367	99.945
12	0.007	0.055	100.000

(Extraction Method: Principal Component Analysis.)

Determinants of brand preference in drip irrigation system :

The major factors determining the preference of a particular brand of drip irrigation system in the study area were collected, analyzed and the results are furnished in Table 3 and 4.

Factor analysis :

Factor analysis is a multivariate statistical technique used to reduce the large number of variables in to smaller number of variables called factors or components. The twelve variables have been grouped into five factors based on component matrix, Eigen values and communalities.

From the Table 3 it could be observed that first five components explained 66.49 per cent of the variability in the original twelve variables. So we can reduce the original data in to five factors (Eigen values greater than

one) with minimum loss of information (33.6%).

Rotated component matrix :

The factors are rotated with the Varimax with Kaiser normalization rotation method. Principal component analysis method was used for factor extraction and considered only those factors whose values were more than 0.50 for the purpose of interpretation.

The Table 4 shows that factor 1 explained about 19.25 per cent of total variation and heavily loads on price, good quality materials, local manufacturing facility and proper after sales service. The factor 2 explained about 15.12 per cent of the total variation and this factor loads heavily on recommended by government, easy approachability of the sales force and brand image.

The variable market promotion have high loading on factor 3 and it explained about 13.20 per cent of the total variation. From the table it was found that variables

Table 4 : Rotated component matrix

Variables	Components					Communalities
	1	2	3	4	5	h²
Price	-.813	.053	.099	-.034	.209	.718
Proper design	.010	-.104	.376	.560	.353	.591
Brand image	-.165	.622	-.353	.102	.028	.550
Good quality materials	.739	-.126	-.351	.146	.127	.723
Proper after sales service	.520	.172	.238	.043	.450	.562
Guarantee period	.315	-.109	.015	.562	.153	.450
Peer group influence	.087	-.174	.024	-.793	.257	.733
Local manufacturing facility	-.636	.014	-.438	.041	-.117	.612
Market promotion	-.107	-.117	.870	.131	-.134	.817
Easy approachability of sales force	.051	.711	-.140	-.371	-.176	.696
Recommended by Government	.005	-.752	-.191	-.152	-.251	.688
Immediate response	.019	-.064	.173	-.001	-.898	.841
Variance explained	19.25	15.12	13.20	9.56	9.33	66.50 (Total)

(Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization)

Table 5 : Satisfaction level of the farmers towards drip irrigation companies

Sr. No.	Particulars	Mean score	Satisfaction level
1.	Price	3.86	Satisfied
2.	Availability of spare parts	3.44	Satisfied
3.	Govt. subsidies	3.17	Satisfied
4.	Technical assistance	3.13	Satisfied
5.	Quality	1.80	Unsatisfied
6.	Proper installation	1.11	Unsatisfied
7.	Agronomy support	1.05	Unsatisfied
8.	After sales service	1.00	Highly unsatisfied

like peer group influence, guarantee period and proper design have high loading on factor 4 and this explained about 9.56 per cent of the total variation. Factor 5 explained about 9.33 per cent of the total variance and this factor heavily loads on the variable immediate response.

Satisfaction level of farmers towards drip irrigation companies :

The satisfaction was an important factor which played a major role in decision making for the purchase. The details regarding the satisfaction level of the sample farmers were analyzed and the results are presented in the Table 5.

It is evident from the Table 5 that major share of farmers in the study area were satisfied with the price of drip system followed by availability of products, government subsidies and technical assistance. At the same time, the farmers were not satisfied with the quality of materials, agronomy support and proper installation. They were highly unsatisfied with the after sales services offered by the drip marketing companies.

Conclusion and recommendation :

The study concluded that most of the farmers were large farmers (46%) coming under the age group of 36 to 45 years (46%), completed high school level of education (40%), doing agriculture only (64%) as the main occupation with more than 15 years of experience (37%).

Private dealers were the major source of information to the farmers. So the companies should maintain good relationship with the dealers to improve their brand image among the farmers.

Forty six per cent of the farmers were aware about subsurface drip technology and only 66 and 55 per cent of the farmers were aware about the inline drip system and automation technology, respectively and none of the farmer has adopted automation in their drip system. The drip marketing companies should increase the awareness level of subsurface drip system, inline drip system and automation technology among the farmers to improve

their brand image and market share.

Water saving and labour cost reduction were the most influencing factors for the adoption of drip irrigation system among the farmers. So the drip marketing companies must concentrate the areas where the water scarcity and labour shortage was the major problem.

Immediate response by sales executives, market promotion, peer group influence, quality of materials and price were the major determinants of brand preference of farmers.

The farmers were satisfied with the price, availability of spare parts and government subsidies but highly unsatisfied with after sales service provided by the marketers of drip system. The drip marketing companies should improve their after sales services to build brand image among the farmers.

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