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Development of a Scale to Measure the Marketing Behavior of Vegetable Farmers

K. Nadhika[1] and Jayasree Krishnankutty[2]

ABSTRACT

Marketing behaviour is the attitude and/or conduct of a person towards marketing activities. Marketing decisions made by the farmer are based on factors such as commodity, quantity and quality of produce, distance from market, transportation facilities, risk bearing ability, innovativeness, etc. The study of marketing behaviour of the farmer could help in promoting inclusive markets with the direct participation of farmers leading to better profit margins. In the present study a scale was developed to measure the marketing behaviour of vegetable farmers. The items generated rated for relevance by expert judges and after item selection; it was administered to respondents for scoring. This was followed by factor analysis using principal component analysis. The scale was standardized after reliability testing using Cronbach's alpha and scale validation using content analysis. The final scale covered seven dimensions, viz., production oriented decisions, planning orientation, farm enterprise management, enterprise planning, technology oriented marketing, market based production preferences and quality oriented production with 27 statements.

Keywords: *Vegetable farmers; marketing behavior; scale; factor analysis; reliability; Kerala*

INTRODUCTION

In an agrarian economy, efficient marketing is as important as scientific and efficient production (Singh et al., 2014). When it comes to perishable commodities like vegetables, it is important to note that the marketing system is well functioning but still need to be more inclusive of the primary producers. In order to make the marketing system more dynamic, the activities starting from the producer's side till the end consumers should be carried out without any fall back (Patnaik, 2011). Marketing has always been an activity in which the farmers show less savvy. It is hence essential to make the farmers market smart in order to realize better price for their produce (Dev, 2012). Information seeking behavior of

1. Department of Agricultural Extension, Kerala Agricultural University, Thrissur, Kerala
2. Directorate of Extension, Kerala Agricultural University, Thrissur, Kerala

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farmers significantly affects their decision making regarding both production and marketing, which invariably provide them with higher price for their produce (Dhara et al., 2015). But under certain circumstances the degree of marketing participation is diminished by factors such as age of the farmer, size of the household, access to inputs and organizational involvement (Chirwa and Matita, 2012). The decision made by a farmer to market his/her produce may vary with their commodity, quantity and quality of produce, distance from market, transportation facilities, risk bearing ability, innovativeness, etc. Hence it is important to understand and study the marketing behaviour of the producers in order to address the set back of the existing marketing interventions (Maratha, 2015). Marketing behaviour is the attitude or conduct of a person towards marketing activities. Unlike the quantifiable variables, marketing behaviour requires a standardized instrument or tool for measurement (Dulabhai, 2015). However such studies had not been widely carried out in Kerala for any commodity. The existing marketing behaviour scales were either not standardized or specific to a particular marketing intervention like APMC (Agricultural Produce Market Committee). In this context the present study was taken up to develop a scale to measure the marketing behaviour of vegetable farmers. The study of marketing behaviour of the farmer could help in promoting inclusive markets with the direct participation of farmers leading to better profit margins.

METHODOLOGY

The steps involved in the construction of the marketing behaviour scale were as follows:

Item Generation

In line with the literature review and expert panel discussion, 120 statements were formed to measure the marketing behavior covering possible dimensions of the concept, including production orientation, market orientation, risk orientation, decision making and innovativeness (Dulabhai, 2015; Maratha, 2015). The statements were made in a simple and short format and caution was taken while phrasing a reverse scoring item.

Content Assessment Method

In content assessment, the 35 experts were asked to rate the extent to which the statements measure the construct under question (DeVellis and Thorpe, 2021). The rating was done using a five-point continuum, comprising of scores 1, 2, 3, 4 and 5 for not relevant, slightly relevant, moderately relevant, relevant and highly relevant respectively. Kendall's coefficient of concordance (W) and mean rank for the items were worked out to select the statements.

$$W = \frac{12S}{m^2(n^3 - n)}$$

Where, S is the sum of squared deviations; m is the number of judges; n is the total number of objects being ranked.

Therefore, W value close to 1 indicates high agreement among judges. The mean rank obtained through Kendall's coefficient of concordance was used to select the most relevant statements.

Scale Administration

The scale was administered to 150 non-sampled respondents who were small holder farmers who were the beneficiaries of marketing interventions like Vegetable and Fruits Promotion Council Keralam (VFPCK), Ecoshop and Kudumbasree, with a five point Likert rating comprising of 1,2,3, 4 and 5 for strongly disagree, disagree, neither disagrees nor agrees, agree and strongly agree respectively. The rating was scored reversed for reverse scoring items.

Factor Analysis

Factor analysis allows the researcher to group variables into factors and the factors so derived may be treated as new variables and their value derived by summing the values of the original variables which have been grouped into the factor (Panneerselvam, 2016). Factor analysis was carried out using principal component analysis method and factors with Eigen value more than or equal to one were retained. Statistical software SPSS version 21 was used.

Internal Consistency Measurement

Reliability may be calculated in a number of ways, but the most commonly accepted measure in field studies for assessing a scale's internal consistency is Cronbach's alpha which tells how well the items measure the same construct (Drost, 2011).The extent to which the measure of that construct is stable or dependable is defined as scale reliability (Cohen et al., 1996). The internal consistency reliabilities for each of the scales should be calculated after the factor analyses have been completed and all irrelevant items have been removed. Cronbach's alpha is used to determine the scale's reliability. It assesses the scale's internal consistency (Cronbach, 1951). It was worked out as follows:

$$\propto = \frac{N\bar{c}}{\bar{v} + (N-1)\bar{c}}$$

Where,

α: Cronbach's alpha value; N: Number of items; c: Average inter item correlation; v: Average variance.

A Cronbach's alpha above 0.70 is always preferred (Cortina, 1993). The internal consistency was analysed using SPSS version 21.

Validity Measurement

An instrument or a construct is said to be valid if it can measure what is intended or desired to measure (Kothari and Garg, 2014). The validity of the scale was tested through content validation method. Content validity refers to the degree to which an assessment tool is relevant to, and

representative of, the construct it is designed to measure (Rusticus, 2014).

Administration of the Finalized Scale

The finalised scale comprising the selected statements can be administered to the respondents. They were asked to rate on a five point continuum scale and the final marketing behaviour score of each farmer was worked out.

FINDINGS AND DISCUSSION

The mean rank and Kendall's coefficient were used to select the statements for further study. The Kendall's coefficient (W) was found to be 0.65 which shows good agreement among the judges. Forty five statements with the highest mean ranks were finalized and used for administration to the respondents.

Table 1. Mean Rank of Selected Statements from Content Assessment

Dimension	Statement	Mean rank
Planning orientation	Time of cultivation has no importance in vegetable cultivation	45.92
	It is better to plan on the variety, seed rate, fertilizer and other inputs before going for vegetable cultivation	43.02
	One need not consider the cost of production	37.24
	Generally I choose crops which have good market demand	25.01
	I plant the crops which are in practice in my field for a long time	31.17
	Fixing the place of sale before crop cultivation is an efficient way	46.47
	Knowing different market prices is not going to make much difference	44.18
	Irrigation can be done according to water availability only	45.72
Production orientation	Timely planting of crops will give good yield	40.69
	Soil testing helps the application of right amount of fertilizers	41.18
	Fertilizers can be applied as one likes	44.74
	Pesticides can be applied before harvesting	32.74
	Biological control of pests is more effective for vegetables	22.15
	Integrated pest management is not really practical for vegetables	31.77
	Vegetable cultivation require too much labor	31.33
	Vegetables do not require much intercultural operations	46.58
	Cultural operations have to be done properly to get quality produce	42.44

Dimension	Statements	Mean rank
Market orientation	Market news are not practically of any help to farmers	44.95
	Farmers should carryout grading themselves	37.76
	It is better to sell the produce in the nearest market regularly at a fixed price	43.57
	Preference should be given to crops with high market demand	26.70
	One need not require marketing intelligence to get remunerative price	23.79
	One will only get high price for good quality produce	43.72
	No need to go for high quality produce as all grades get marketed	35.23
	Selling to commission agent is hassle free	46.57
	Farmers need not take up any marketing functions on their own	42.67
Decision making ability	I myself estimate the budget for vegetable production	19.04
	I decide whether or not to avail loan	28.90
	I choose the source of financial support myself	26.64
	I decide whether to hire labor myself	22.68
	I myself select the place of sale	20.02
	I myself decide on the mode of transport	22.15
	I personally decide on how to utilize the profit obtained	23.31
	I myself decide on the price of the produce with change in demand	20.18
Risk taking ability	It is preferable to follow multi cropping to avoid losses from mono cropping	21.18
	I'm not ready to make any changes in my farming in order to get more profit	19.93
	It is better to wait for technologies that other farmers found successful	21.18
	Only risk takers will succeed	36.29
Innovativeness	I feel very enthusiastic to try out new technologies	19.69
	I believe that new technologies may not be as good as old ones	42.27
	I would try out technology that is proved to be successful by other farmers	44.74
	Trying out new technologies involve risks which I cannot bear	34.10
	Most of the new technologies available are unsuccessful	40.19
	I'm willing to try out promising technologies	41.76
	I prefer technologies that are easy to adopt	45.16

The selected statements were then administered to 150 non-sampled respondents constituting marginal and small farmers under various marketing interventions and factor analysis succeeds the data collection to assess the items' performance in order to decide if they appropriately comprise the scale.

Factor Analysis

Data screening was done to find the items with low correlation using the inter item correlation matrix (Hair et al., 2003). The correlation coefficients exceeded 0.30, which was acceptable. The determinant of the correlation matrix was 0.00099 which was greater than the threshold value, so it was acceptable. The items with low correlation and showing multicollinearity were eliminated.

Table 2. Sampling Adequacy and Significance of Factor Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of Sphericity	Approx. Chi-Square	3878.998
	df	351
	Sig.	.000

The KMO test indicates whether or not enough items are predicted by each factor (Reddy and Kulshrestha, 2019). KMO measure was 0.83 which was greater than 0.70 indicating sufficient items for each factor. The Bartlett's test is significant (*i.e.*, significance value less than .05) indicating the items are correlated highly enough to provide a reasonable basis for factor analysis.

Table 3. Total Variance Explained by the Factors

SL.No.	Factors	Eigen values	Per cent of Variance	Cumulative per cent
1.	Production oriented decisions	8.271	30.635	30.635
2.	Planning orientation	3.583	13.270	43.905
3.	Farm enterprise management	2.373	8.789	52.693
4.	Enterprise planning	1.805	6.685	59.379
5.	Technology oriented marketing	1.689	6.254	65.633
6.	Market based production preferences	1.315	4.872	70.504
7.	Quality oriented production	1.209	4.478	74.983

Seven factors having Eigen value greater than 1 and accounts for 74.98 per cent of variance were selected namely production oriented decision, planning orientation, farm enterprise management, enterprise planning, technology oriented marketing, market based production preferences and quality oriented production.

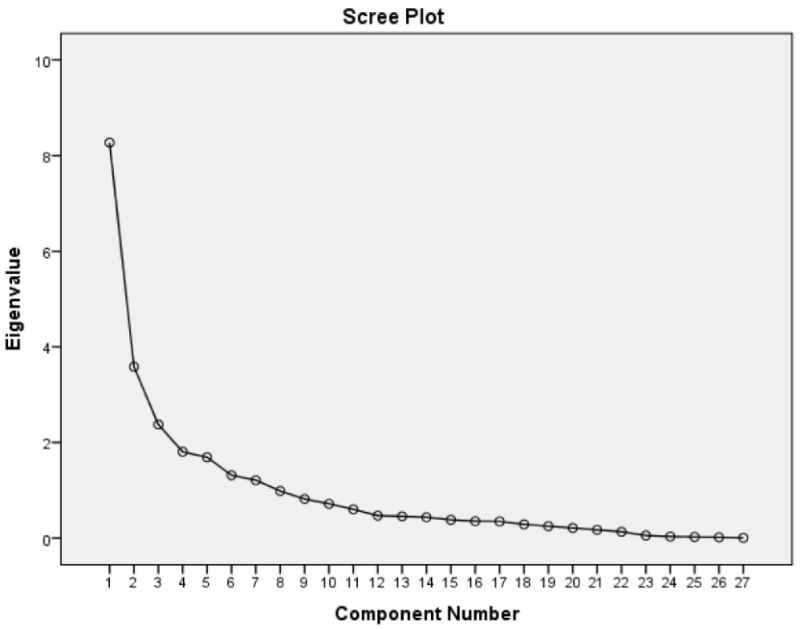

Figure 1. Scree plot indicating the Eigen Value and Factor Number

Table 4. Final Scale with Factor Loadings

Dimension	Statement	Factor loading
Production oriented decisions	Market news are not practically of any help to farmers	.712
	One need not require marketing intelligence to get remunerative price	.819
	One will only get high price for good quality produce	.808
	I myself estimate the budget for vegetable production	.974
	I decide whether to hire labour myself	.945
	I myself select the place of sale	.978
	I choose the source of financial support myself	.963
	I personally decide on how to utilise the profit obtained	.953
	I myself decide on the price of the produce with change in demand	.971

Dimension	Statement	Factor loading
Planning orientation	Time of cultivation has no importance in vegetable cultivation	.910
	It is better to plan on the variety, seed rate, fertiliser and other inputs before going for vegetable cultivation	.750
	Generally I choose crops which have good market demand	.839
	Fixing the place of sale before crop cultivation is an efficient way	.904
	Knowing different market prices is not going to make much difference	.699
Farm enterprise management	Biological control of pests is more effective for vegetables	.831
	Vegetable cultivation require too much labour	.724
	I feel very enthusiastic to try out new technologies	.683
Enterprise planning	Timely planting of crops will give good yield	.755
	Soil testing helps the application of right amount of fertilisers	.879
	Fertilisers can be applied as one likes	.731
Technology oriented marketing	Farmers should carryout grading themselves	-.818
	Trying out new technologies involve risks which I cannot bear	.621
	I'm not ready to make any changes in my farming in order to get more profit	.730
Market based production preferences	I prefer technologies that are easy to adopt	.613
	All grades of produce will get marketed, so going for high quality is not very essential	.906
Quality oriented production	Pesticides can be applied before harvesting	.770
	Cultural operations have to be done properly to get quality produce	.735

Reliability of the Scale

The α value obtained was 0.845 which was greater than 0.7, which indicates good reliability of the construct. Hence, the scale was found to be reliable.

Validity of the Scale

The content validation approach was used to assess the scale's validity. The current scale encompassed all areas of marketing behaviour since the statements were determined following an exhaustive literature search and conversation with professionals in the field. It is presumed that the scale satisfied the content coverage based on this. As a result, the marketing behaviour scale is considered legitimate.

The finalised scale (Table 4) comprising 27 statements can be administered to the respondents under seven dimensions, *i.e.*, Production oriented decision, Planning orientation, Farm enterprise management, Enterprise planning, Technology oriented marketing, Market based production preferences and Quality oriented production. The respondents shall then be asked to express their feelings about the statement in terms of agreement or disagreement on a scale of one to five, with one indicating complete disagreement and five indicating strong agreement. In case of the reverse scoring items, the rating is reverse, *i.e.*, score one indicating strongly agree and score five indicating strongly disagree.

CONCLUSION

A standardized scale to measure the marketing behavior of vegetable farmers was essential to understand the needs of the farmers for addressing the bottleneck of current marketing interventions. The scale was constructed following the reliability and validity testing procedures using Cronbach's alpha method and content validity test respectively. Study of marketing behavior of the farmer will help generate practical information and insights into the knowledge and skill gap the farmers are having. It will also serve as pointer towards farmers' product handling, agents or systems operating in the marketing grassroots level and the role the extension system can play addressing the lacunae.

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