DEVELOPING A TEST TO MEASURE THE KNOWLEDGE LEVEL OF FARMERS TOWARDS MARKET INTELLIGENCE

ABSTRACT:

Market intelligence is a method of foreseeing what will occur in the near future. We must proceed from market data to information, and finally to market intelligence, in order to complete this process. This study was attempted to develop a scale for measuring knowledge level of farmers on market intelligence. Relevant items were gathered that covered all aspects of farmer's market intelligence in agriculture. Thirty items were initially selected for this study and administered to 42 non-sample respondents. All of the items have been subjected to item analysis. The current study found that 12 items were chosen for the test administration based on the difficulty index, discrimination index, and point-biserial correlation. This test was found to be both valid and highly reliable (0.65). This may be used by social science researchers to assess farmer's expertise on market information as well as market intelligence.

Key words: Market intelligence, Item analysis, Difficulty index, Discrimination index, Knowledge test, Farmers.

1. INTRODUCTION:

Market intelligence and information are critical for farmers and dealers to make informed decisions about what to grow, when to harvest, where to market the produce, whether to store it or not. Every company's marketing strategy should include market intelligence. It is critical to have market information available at the correct moment and to lead farmers in the proper path. (Angles, 2018). Market intelligence was introduced with the goal of providing valuable information to stakeholders and guiding them in the right direction in decision making in areas such as understanding customers' needs, competitors' actions, triumphs and failures, foreseeing developments, and assisting in decision-making (Anthony, 2005). According to Victoria (2012), market intelligence is more than merely gathering statistics and data. Regardless of audience size, visitor region, or device, market intelligence gives insights into the competitive online scene through impartial, near real-time performance rating and audience demographic profiling of audited web and mobile

sites and video streaming activities. (Nielson, 2009). Market intelligence is data gathered to assist in the making of business decisions. (Harrison & Cupman, 2011). Keeping in view the importance of market intelligence, the present study was attempted to develop a test for the measurement of knowledge of farmers towards market intelligence.

2. METHODOLOGY:

Knowledge was defined as actions and test scenarios that stressed the recognition and recall of concepts, information, and phenomena (Bloom *et al.*, 1956). In this study, knowledge of farmers on market intelligence was focused to develop a standardized test. This study was carried out as part of research at Tamil Nadu Agricultural University in 2021.

Procedures followed for developing this knowledge test:

a) Collection of items:

In the area of research, items concerning market intelligence were acquired from relevant literature, group discussion, personal experience, and pilot projects. Initially 45 items were collected for this research.

b) Selection of items:

After screening it from judges opinion, 30 items were selected for the development of knowledge test. The appropriate measures were taken to ensure that the items were based on farmer's knowledge of market intelligence.

c) Item analysis:

An item analysis can yield three sorts of information: item difficulty index, item discrimination index, and point-biserial correlation. Yadav et al. (Yadav et al., 2009). The item difficulty index measures how difficult an item is, whereas the discrimination index measures how much an item discriminates between persons who are well-informed and those who are not. The internal consistency of each selected item was determined using the point-biserial correlation coefficient. A pilot study was conducted with 42 non-sample respondents who were not included in the administration of the test. The response from

the respondents was two point continuum. Based on the response, for each item it was scored either '0' or '1'. After receiving each respondent's score, they are grouped in six equal groups in descending order from highest to lowest (G1, G2, G3, G4, G5 and G6). G3 and G4 were removed from item analysis since they were in the middle two groups. For the computation of item difficulty and item discrimination indices, only four extreme groups with high and low scores were used. (Bloom *et al.*, 1956).

Item difficulty index:

The percentage of farmers who correctly answered each item was used to generate the item difficulty index. The item's difficulty level is represented by the difficulty index.

$P_i = n_i / N$

Where Pi denotes the difficulty index for the item in question, ni is the number of respondents who correctly answered the item in question, and N denotes the total number of respondents to whom the item in question was administered to the sample (42 respondents). For this investigation, item difficulty indexes ranging from 0.2 to 0.8 were chosen.

Item discrimination index:

The item discrimination index measures how well an item distinguishes between respondents who are well-informed and those who are not. Item discrimination index was calculated by the formula,

$$E^{1/3} = \frac{(S1 + S2) - (S5+S6)}{N/3}$$

Where S1, S2, S5, and S6 are the frequencies of accurate answers given by groups G1, G2, G5, and G6, respectively, and E1/3 is the discrimination index for the ith item. N is the total number of people who were chosen for item analysis. Item discrimination index ranges from 0 to 1. Finally, items with a discriminating index of 0.2 to 0.8 are chosen for the investigation.

Point-Biserial Correlation (r_{Pbis}):

The major purpose of calculating point-biserial correlation was to determine the internal consistency of the items, or the relationship between the overall score and a dichotomized response to any given item. (Garret, 1966)

$$rp_{bis} = \frac{MP - MQ}{SD} \sqrt{pq}$$

rp_{bis} = Point-biserial correlation; MP = Mean of total scores of respondents who properly answered the item; MQ = Mean of total scores of respondents who incorrectly answered the item, SD = Standard deviation of the entire sample; p = proportion of respondents who correctly answered the question; q = proportion of respondents who incorrectly answered the question. Items having significant point-biserial correlation either at 1 per cent or 5 per cent probability was considered for the final selection of study.

3. RESULTS AND DISCUSSION:

The 30 items were subjected to item analysis, and 12 items were chosen based on items with difficulty and discrimination indexes ranging from 0.2 to 0.8, as well as items with substantial point biserial correlation at 1% or 5% probability (Srinivas et al., 2019). Table 1 shows the difficulty index, discrimination index, and point biserial correlation of all items.

Reliability of the test:

The reliability of the knowledge exam is determined using the split half approach. The total of 30 things was divided into two equal halves, one with odd numbered items and the other with even numbered items. Both halves are administered to the same group of 30 respondents who will not be included in the administration of test. The relationship between the two halves was discovered using the Spearman Brown prophecy formula (see below).

$$r_{11} = \frac{2\,(roe)}{1 + roe}$$

Where, r11 is the overall test reliability coefficient, and roe is the odd and even half item reliability coefficient. The knowledge test's reliability coefficient was found to be 0.65. This indicates that the test is reliable.

Validity of the test:

Two methods were used to determine the test's validity. i.e. Content validity and Construct validity. Content validity was first tested by submitting each item to a panel of experts who assessed the test's representation of the universe, as well as its relevance and appropriateness. Point-biserial correlation was used to determine construct validity. It was also used to determine the objects' internal consistency.

Table 1: Difficulty, Discrimination index & Point-biserial correlation of all the items

Item no	Knowledge items	Difficulty Index	Discrimination index	Point-Biserial correlation	Selection (S)/ Rejection (R) of items
1.	Do you know about agricultural market related information?	0.9	0.1	0.202^{NS}	R
2.	Do you know about the prevalent price details of crops in your region?	0.7	0.4	0.312*	S
3.	Do you get agricultural market related	0.3	0.4	0.179^{NS}	R

	information through Domestic and Export Market Intelligence Cell (DEMIC) and Agricultural Market Information System of TNAU?				
4.	Have you subscribed to get agricultural market related information?	0.2	0.4	0.183^{NS}	R
5.	Whether there exist excess intermediate marketing channels in agriculture?	0.8	0.4	0.399**	S
6.	Do you regularly update yourself regarding price of the crops?	0.5	0.8	0.373**	S
7.	Through market intelligence, one will get limited market information.	0.5	0	0.220^{NS}	R
8.	Agricultural prices are very unstable and fluctuate violently	0.9	0.1	0.163^{NS}	R
9.	The increasing instability in prices adversely affect farmer's income	0.9	0	0.075^{NS}	R
10.	The fixation of Minimum Support Price (MSP) is the step to reduce price instability	0.8	0.1	0.176^{NS}	R
11.	Do you have less reliance on price forecasting system?	0.2	0.1	0.299^{NS}	R
12.	Do you cultivate crops based on the market information?	0.4	0.7	0.328*	S
13.	Market Intelligence reduces the level of risks in decision making	0.9	0.2	0.243^{NS}	R
14.	Does market intelligence provide information about when to harvest?	0.7	0.1	0.280^{NS}	R
15.	Market Intelligence helps to establish what products are right for market.	0.8	0.7	0.691**	S
16.	Market Intelligence helps in deciding which channels of distribution is best	0.8	0.6	0.463**	S
17.	Whether market intelligence provides information to store the agricultural produce or not?	0.7	0.2	0.091^{NS}	R
18.	The privatized trade in agriculture is less in country like India	0.5	0.2	0.101^{NS}	R
19.	Market Intelligence helps in identifying areas for improvement as well as risks & opportunities	0.8	0.1	0.111^{NS}	R
20.	The poor market supply chain does not	0.5	0.1	0.203^{NS}	R

	lead to cause high post harvest losses				
21.	Market intelligence isolates performance gaps in relation to competition	0.8	0.3	0.315*	S
22.	There is no need for the farmers to be aware about the varying price in order to prevent from price fluctuations	0.5	0.3	0.308*	S
23.	Market intelligence does not serve as the base of comparison between domestic and international markets	0.4	0.1	0.191^{NS}	R
24.	The information need to be accurate, timely and understandable that may favor the decision	0.9	0	0.075^{NS}	R
25.	People, equipment, and procedures for gathering, sorting, analysing, evaluating, and disseminating timely information make up market intelligence.	0.8	0.3	0.598**	S
26.	Whether farmers needed market led approach to get high income?	0.8	0.2	0.448**	S
27.	It helps in reducing the price risk level at larger extent	0.8	0.3	0.505**	S
28.	Market information plays a vital role in reducing post harvest losses	0.9	0.1	0.037^{NS}	R
29.	Do you have interest to know about the market related information?	0.9	0.1	0.058^{NS}	R
30.	Market intelligence is the critical factor for strategy of getting higher returns	0.8	0.5	0.322*	S

*Significant at 0.05 level **Significant at 0.01 level NS – Non significant

4. CONCLUSION:

Knowing the importance of market intelligence to the farmers, knowledge test was developed to measure the knowledge level of farmers towards market intelligence. Initially 45 items were prepared. After screening it through judges opinion, it was confined to 30. To a group of 42 non-sample respondents, the 30 items were exposed to item analysis (item difficulty index, item discrimination index, and point-biserial correlation). For each item, the correct and incorrect response scores were 1 and 0.After

getting the responses, item analysis was performed. Items with a difficulty and discrimination index ranging from 0.2 to 0.8, as well as items with a substantial point-biserial correlation probability of 1% or 5% were selected for administration of test. A total of 12 items were chosen for the test out of a total of 30. Reliability and validity were used to determine the test's standardisation. To determine the test's reliability, the split half approach was used. It has reliability coefficient of 0.65. To determine the test's validity, both content and construct validity were found out. The test was determined to be both valid and reliable.

5. REFERENCES:

1. Angles, S. and Chinnadurai, M. (2018) Impact and Importance of Market Intelligence in Indian Agriculture. 9(Special) : 117-120

2. Anthony Michail. (2005) Recommendations for an Effective Intelligence Reporting System Marketing Intelligence Dept., A quick market intelligence (qmi) process, Baxi Potterton, 14 January 2005.

3. Bloom, B. S. (1956). Taxonomy of educational objectives: The classification of educational goals. *Cognitive domain*.

4. Garrett, H. E., & Woodworth, R. S. (1966). Statistics in Psychology and Education, David McKay Company. *Inc., New York*, 392-396.

5. Harrison, M., and Cupman, J. (2008). Using Market Intelligence & Competitive Intelligence To Add Value To Your Business. B2B International: .Market Research with Intelligence., 1- 16.

6. Nielsen.(2009) Market Intelligence, Accurate Site Performance, Benchmarking and Competitive Analysis, The Nielsen Company.

7. Srinivas, A., Rani, V. S., & Rao, I. S. (2019). Construction and Standardization of Knowledge Test to Measure the Level of Knowledge of Tribal Farmers on Seed Banking, 35 (2): 1-8.

8. Victoria Kemanian. (2012) Market intelligence: A key to boost export competitiveness Action Guide for Exporters, Latitude.

9. Yadav, D.S., Kumar, A. and Singh, U. (2009). Development of a test to measure the knowledge level of dairy farm women. *J Comm Mob Sustain Develop*, 4(1): 34-38.