

Management Efficiency of Redgram Growers in North-Eastern Karnataka

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ABSTRACT

Management is a logical discipline that furthers the pursuit of efficient production of a firm. Therefore an attempt is made to construct a scale and measure the management efficiency of redgram growers. The management efficiency scale developed was administered to 180 farmers of Bidar, Kalaburgi and Yadgir districts of North-Eastern region of Karnataka state during 2017-18. The developed scale was found to be reliable (0.8797) and valid (0.9379). The results revealed that 45.00 per cent of redgram growers belonged to medium level of category followed by high (33.89 %) and low (21.11 %) level of category of management efficiency, respectively.

Keywords: Relevancy, Reliability, Validity, Management efficiency, Production

PULSES are the important source of protein, vitamin and minerals and are popularly known as 'Poor man's meat' and 'rich man's vegetable', which contributes significantly to the nutritional security of the country. India is the largest producer and consumer of pulses in the world accounting for about 29 per cent of the world area and 19 per cent of the world's production (Anon, 2016). At the same time, India is also the largest importer and processor of pulses in the world. After bengal gram, redgram is the second most important pulse crop in the country. It is mainly eaten in the form of split pulse as 'dal'. India ranked first in area and production of redgram in the world with 79.65 per cent and 67.28 per cent of world's acreage and production respectively (Singh, *et al.*, 2015). Redgram is mainly grown in Maharashtra, Madhya Pradesh, Karnataka, Andhra Pradesh, Rajasthan and Uttar Pradesh and it occupies an area of 3.88 million hectares with the production of about 3.29 million tonnes, having an average yield of 849 kg per hectare (Anon, 2016). In Karnataka redgram occupies an area of about 0.82 million hectares with the production of 0.60 million tonnes, having an average productivity of 733 kg per ha. Redgram is largely grown in northern parts of Karnataka, especially in Kalaburgi, Vijayapur, Bidar and Yadgir districts. North-Eastern region of Karnataka is called as 'Pulse Bowl of Karnataka'. The productivity can be increased with the increase of the level of adoption of recommended technology and with proper management techniques. There has

been a growing awareness that only a part perhaps a very small part of the differences in farm income and efficiency can be explained by the differences in quality and quantity of land, labour and capital. The rest of the variation has been explained mainly by the management factor. It is, therefore, observed that some farmers obtain distinctively higher yields and income over others for the same level of resources available on the farm.

Management is a logical discipline that furthers the pursuit of efficient production for a firm. Managers study and use the relationships of money, men, materials, facilities and equipment to produce a product in the most economically efficient way. Farmers all over the world are working as managers of their farms. Irrespective of their economic, social, cultural, physical and technological environment, farmers manage a production system to get maximum returns from it. Returns from the farm, may be in the form of produce or money which is very crucial for the farmers, as it depends on the extent of meeting the goals of the family. Augmenting management efficiency or improving the quality of human factor is of paramount importance and will open up new vistas for farmers and make possible for them to achieve substantial gains in farm income. The quality of human factor is the fundamental problem which needs to be carefully tackled, if permanent solution to the problem of under developed farming has to be worked out. Hence, the

present study was taken up with the following objectives.

1. To develop and standardize a scale to measure the management efficiency of redgram growers
2. To analyse the management efficiency of redgram growers

METHODOLOGY

The present study was carried out during 2017-18 to develop and standardize a scale to measure the management efficiency of redgram growers. The developed scale was used to analyse the management efficiency of redgram growers in Bidar, Kalaburgi and Yadgir districts of North-Eastern region of Karnataka state. Redgram growers (180) were personally interviewed using the scale developed to measure their management efficiency. The collected data was scored and analyzed using frequency, percentage, mean and standard deviation.

Development of scale to measure management efficiency of redgram growers

Management efficiency is the totality of farmers behavior consisting of skill acquired, ability in planning, decision making, mobilizing resources, coordinating activities, rational marketing decision, innovative ideas and their competence on crop technology to increase the productivity. The method of summated rating scale suggested by Likert (1932) and Edwards (1969) were followed in the development of the scale through six stages *viz.*, identification of components, collection of items/statements, relevancy test, item analysis, reliability and validity.

Identification of components: Eight major components related to farmers' management efficiency were identified based on review of literature and discussion with agriculture extension experts and agronomists. The identified components were: skill acquired, ability in planning, decision making, mobilizing resources, coordinating activities, rational marketing decision, innovative ideas and their competence on crop technology.

Collection of items: The first step in the construction of management efficiency scale was to collect

exhaustive statements/items pertaining to the topic. Tentative list of 128 statements/items pertaining to the management efficiency of redgram growers was prepared based on the available literature and discussion with agriculture extension experts and agronomists.

Editing of the items: The statements were edited as per the 14 criteria enunciated by Edwards (1969) and Thurstone & Chave (1929). As a consequence, 20 statements/items were eliminated and the remaining 108 statements were included for the study.

Relevancy analysis: 108 statements/items were mailed to 120 experts in agricultural extension and other related fields working in State Agricultural Universities and Indian council of Agricultural Research institutions to critically evaluate the relevancy of each statement *viz.*, Most Relevant (MR), Relevant (R), Somewhat Relevant (SWR), Less Relevant (LR) and Not Relevant (NR) with the score of 5,4,3,2,1, respectively. The judges were also requested to make necessary modifications and additions or deletion of statements, if they desire to do so. A total of 60 judges returned the questionnaires duly completed were considered for further processing. From the data gathered, 'relevancy percentage' and 'mean relevancy score' were worked out for all the 108 statements/items. Using these criteria individual statements were screened for relevancies using the following formulae.

i) Relevancy Percentage (RP)

It was obtained by the formula which is given below.

$$R.P. = \frac{MR \times 5 + R \times 4 + SWR \times 3 + LR \times 2 + NR \times 1}{\text{Maximum possible score (60} \times 5 = 300)} \times 100$$

ii) Mean Relevancy Score (MRS)

Mean relevancy score was calculated by using the following formula.

$$M.R.S. = \frac{MR \times 5 + R \times 4 + SWR \times 3 + LR \times 2 + NR}{\text{No. of judges responded}} \times 1$$

Where,

MR = Most Relevant

R = Relevant

SWR = Somewhat Relevant

LR = Less relevant

NR = Not relevant

Accordingly statements having 'relevancy percentage' of 75 per cent (Table 1) and above mean relevancy score of 3.75 and above were considered for final selection. Ninety one statements/items were retained after relevancy test and these statements were suitably modified and written as per the comments of the judges wherever applicable.

TABLE 1

Statement wise score of relevance percentage, relevance weightage and mean relevance score of management efficiency of redgram growers

Item	RP	RW	MRS
1. Skills acquired			
Techniques of seed treatment	89.33	0.89	4.46
Techniques of transplanting	83.66	0.83	4.18
Techniques of weed management	85.00	0.85	4.25
Techniques of fertilizer application	87.33	0.87	4.36
Identification of diseases in redgram	89.33	0.89	4.46
Identification of pests in redgram	87.66	0.87	4.30
Preparation of desired concentration of spray mixture to control diseases	89.00	0.89	4.45
Preparation of desired concentration of spray mixture to control pest	89.00	0.89	4.45
Techniques of IPM control measures	87.33	0.87	4.36
2. Ability in planning			
Set an objective of production target	87.33	0.87	4.36
Set an objective of profit target	85.66	0.85	4.28
Prepared a plan for timely operations	88.00	0.88	4.40
Forecasting various operation in redgram production	78.00	0.78	3.90
Forecast input requirements for redgram production	83.66	0.83	4.18
Listing the different sources of credit availability	75.33	0.75	3.76
Estimation of cost of production of redgram production	85.00	0.85	4.25
Plan well in advance the irrigation schedule	84.33	0.84	4.21
Estimation of the requirements of fertilizers well in advance.	85.00	0.85	4.25
Work out the labour availability for carrying out various operations for peak and off seasons.	82.66	0.82	4.13

Item	RP	RW	MRS
Work out the cost of labour for carrying various operation	83.66	0.83	4.18
Work out farm implements availability for various intercultural operations	82.66	0.82	4.13
Work out the cost of farm implements for various intercultural operations	81.00	0.81	4.05
Estimation of cost of mechanization	79.33	0.79	3.96
Plan in advance the place of marketing	83.66	0.83	4.18

3. Rationality in decision making

Type of fertilizers to be used	86.00	0.86	4.30
Quantity of fertilizers used	85.33	0.85	4.26
Plant protection measures against pest and diseases	89.00	0.89	4.45
Place of purchase of inputs	83.33	0.83	4.16
Harvesting period	83.66	0.83	4.18
Number of hired labourer to be engaged	77.66	0.77	3.88
Estimating cost of production and profit realization	82.33	0.82	4.11
Use of machinery to harvest the crop	81.33	0.81	4.06
Place of marketing of redgram	86.33	0.86	4.31
Post-harvest management at storage	90.66	0.90	4.53

4. Ability to mobilise resources

Seed	75.33	0.75	3.76
Availability of Farm yard manure	85.33	0.85	4.26
Bio-fertilizer	86.33	0.86	4.31
Chemical fertilizers	71.00	0.71	3.55
Plant protection chemicals	81.33	0.81	4.06
Labourers (Men, Women, Bullock pair)	88.00	0.88	4.40
Implements	85.33	0.85	4.26
Irrigation/Rainfed	87.33	0.87	4.36
Financial resources	85.33	0.85	4.26

5. Ability to co-ordinate activities

Land preparation	87.33	0.87	4.36
Transplanting stage	85.33	0.85	4.26
Weed management	86.66	0.86	4.33
Nutrient management	89.00	0.89	4.45
Disease management	89.66	0.89	4.48
Pest management	89.33	0.89	4.46
Moisture conservation practices	86.66	0.86	4.33
Post-harvest linkage- grading, packaging and transportation	86.00	0.86	4.3

Item	RP	RW	MRS
Obtaining necessary guidance from extension workers/experts	85.66	0.85	4.28
Reading literature for taking suitable control measures	79.33	0.79	3.96
6. Rational marketing decision			
Collecting information about various marketing channels	89.33	0.89	4.46
Collecting information about various places for selling produce	88.00	0.88	4.40
Collecting information about cost and marketing practices in different market	77.00	0.77	3.85
Collecting information about mal-practices, delayed payment of money and other pilferages if any, at different market outlets	86.33	0.86	4.31
Select a market outlet where competitive price for redgram was ensured	86.66	0.86	4.33
Collecting information on e-tendering process	84.00	0.84	4.20
Ensured that the price offered for redgram was not less than cost of production	86.66	0.86	4.33
Mode of transportation	82.66	0.82	4.13
Proper packaging of redgram to avoid transportation losses.	84.66	0.84	4.20
Proper storage of redgram to avoid spoilage	87.33	0.87	4.36
Maintenance of market records	84.00	0.84	4.20
7. Innovative ideas			
Organic farming	82.66	0.82	4.13
Seed treatment with bio-fertilizer	86.66	0.86	4.33
Transplanting	82.00	0.82	4.05
Nipping	82.33	0.82	4.11
Dibbling method	78.66	0.78	3.93
8. Competence on crop technology			
Identification of nutrient deficiency symptoms	87.66	0.87	4.38
Estimation of nutrients available and their cost in different fertilizer	85.66	0.85	4.28
Identification of pest and diseases	87.00	0.87	4.35
Identifying causes for poor yield & quality	87.00	0.87	4.35
Estimation of yields	85.33	0.85	4.26
Estimation of cost of production	86.33	0.80	4.31
Seeking help of professionals in maintaining records	77.66	0.77	3.88

RP=Relevancy Percentage, RW=Relevancy Weightage, MRS= Mean Relevance Score

Item analysis: To delineate the statements/items based on the extent to which they can differentiate the statements about management efficiency of redgram growers, item analysis was carried on the statements/items selected in the first stage. After analysis items were arranged in ascending or descending order based on relevancy score. 25 per cent with the highest scores and 25 per cent with the lowest scores were selected as 'high group' and 'low group', respectively. These two groups provided the criterion group for which item analysis was conducted and critical ratio was calculated. The critical ratio, that is the 't' value which measures the extent to which a given statement differentiates between the high and low groups of the respondents for each statements was calculated by using the formula.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\left(\sum \bar{X}_H^2 - \frac{(\sum \bar{X}_H)^2}{n}\right) \times \left(\sum \bar{X}_L^2 - \frac{(\sum \bar{X}_L)^2}{n}\right)}}{n(n-1)}$$

Where,

X_H = The mean score on given statement of the high group

X_L = The mean score on given statement of the low group

ΣX^2_H = Sum of squares of the individual score on a given statement for high group

ΣX^2_L = Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

Σ = Summation

t = The extent to which a given statement differentiate between the high and low group.

Based on the item analysis with t-value 2.04 and above (0.05 per cent level of probability), 76 statements/items which were statistically significant at 5 per cent were finally retained in the scale to measure the management efficiency of redgram growers.

Standardization of Scale

a) *Reliability of the scale:* Pilot study was conducted among 32 respondents in non-sample area comprising

TABLE 2
Values of item analysis of management efficiency of
redgram growers

Item	't' value
1.Skills acquired	
Techniques of seed treatment	6.74
Techniques of transplanting	3.42
Techniques of weed management	3.09
Techniques of fertilizer application	3.81
Identification of diseases in redgram	3.95
Identification of pests in redgram	4.62
Preparation of desired concentration of spray mixture to control diseases	2.99
Preparation of desired concentration of spray mixture to control pest	3.33
Techniques of IPM control measures	4.38
2.Ability in planning	
Set an objective of production target	5.19
Set an objective of profit target	2.61
Prepared a plan for timely operations	2.84
Forecasting various operation in redgram production	7.67
Forecast input requirements for redgram production	4.17
Listing the different sources of credit availability	5.57
Estimation of cost of production of redgram production	2.86
Plan well in advance the irrigation schedule	3.25
Estimation of the requirements of fertilizers well in advance	2.49
Work out the labour availability for carrying out various operations for peak and off seasons	3.69
Work out the cost of labour for carrying various operation	3.15
Work out farm implements availability for various intercultural operations	5.44
Work out the cost of farm implements for various intercultural operations	3.09
Estimation of cost of mechanization	2.10
Plan in advance the place of marketing	3.20
3.Rationality in decision making	
Type of fertilizers to be used	5.44
Quantity of fertilizers used	2.73
Plant protection measures against pest and diseases	3.09
Place of purchase of inputs	2.10
Harvesting period	3.20

Item	't' value
Number of hired labourer to be engaged	2.59
Estimating cost of production and profit realization	4.07
Use of machinery to harvest the crop	4.00
Place of marketing of redgram	5.44
Post-harvest management at storage	3.98
4.Ability to mobilise resources	
Seed	6.50
Availability of Farm yard manure	4.38
Bio-fertilizer	2.96
Chemical fertilizers	2.50
Plant protection chemicals	2.10
Labourers (Men, Women, Bullock pair)	2.73
Implements	2.11
Irrigation/Rainfed	6.50
Financial resources	4.38
5.Ability to co-ordinate activities	
Land preparation	3.82
Transplanting stage	2.73
Weed management	6.12
Nutrient management	3.33
Disease management	2.37
Pest management	6.74
Moisture conservation practices	8.83
Post-harvest linkage- grading, packaging & transportation	5.50
Obtaining necessary guidance from extension workers/experts	4.38
Reading literature for taking suitable control measures	6.24
6.Rational marketing decision	
Collecting information about various marketing channels	3.98
Collecting information about various places for selling produce	2.24
Collecting information about cost and marketing practices in different market	4.78
Collecting information about malpractices, delayed payment of money and other pilferages if any, at different market outlets	2.80
Select a market outlet where competitive price for redgram was ensured	4.43
Collecting information on e-tendering process	3.41
Ensured that the price offered for redgram was not less than cost of production	6.21
Mode of transportation	2.11

Item	't' value
Proper packaging of redgram to avoid transportation losses	5.19
Proper storage of redgram to avoid spoilage	6.04
Maintenance of market records	2.94
7. Innovative ideas	
Organic farming	3.39
Seed treatment with bio-fertilizer	5.09
Transplanting	4.78
Nipping	2.78
Dibbling method	2.57
8. Competence on crop technology	
Identification of nutrient deficiency symptoms	4.12
Estimation of nutrients available and their cost in different fertilizer	4.07
Identification of pest and diseases	6.74
Identifying causes for poor yield and quality	3.86
Estimation of yields	3.50
Estimation of cost of production	5.11
Seeking help of professionals in maintaining records	2.21

76 statements/items. Split-half method developed by Brown prophecy was employed to measure the reliability of the tools (Anastasi and Urbina, 2002). The reliability co-efficient of the tool was found to be 0.8797 which is higher than the standard of 0.70, indicating reliability of the scale. It was concluded that the management efficiency of redgram growers scale constructed was reliable.

b) Validity of the scale: The data was subjected to statistical validity, which was found to be 0.9379, which is greater than the standard requirement of 0.70. Hence, the validity coefficient was also found to be most appropriate and suitable for the tool developed. Thus, the developed scale to measure management efficiency of redgram growers was feasible, appropriate and was reliable.

1) Half test reliability formula

$$r_{1/2} = \frac{N(\sum XY - (\sum X)(\sum Y))}{\sqrt{(N\sum X^2 - (\sum X)^2)(N\sum Y^2 - (\sum Y)^2)}}$$

Where,

$\sum X$ = sum of the scores of the odd number items

$\sum Y$ = sum of the scores of the even numbers items

$\sum X^2$ = sum of the squares of the odd number items

$\sum Y^2$ = sum of the squares of the even number items

The Half test reliability which was found to be 0.7853

2) Whole test reliability formula

$$r_{11} = \frac{2 \cdot r_{1/2}}{1 + r_{1/2}}$$

Where,

$r_{1/2}$ = half test reliability

The Whole test reliability which was found to be 0.9379

Administration of management efficiency of redgram growers' scale and method of scoring: The final scale consisted of 76 statements/items. The response were collected on a three point continuum and assigned score of 3, 2, and 1, respectively. Thus, the minimum and maximum score one could get was 76 and 228, respectively. Higher score on the scale indicates that the respondent has higher level of management efficiency.

RESULTS AND DISCUSSION

Overall management efficiency of redgram growers

A Bird eyes' view of Table 3 shows that, 45 per cent of the redgram growers were having the medium level of management efficiency followed by high (33.89 %) and low (21.11 %). The results indicates that a majority of the growers were having medium level of efficiency so that they can obtain higher income. The probable reason for this trend would be that the redgram growers were more cosmopolite, having more extension contact, contact with innovative farmers as well as they were having good knowledge about redgram cultivation. The results of the study are corroborated with the findings of Manivannan and Hema (2007), Birajdar (2012), Basavaraj (2014) and Pawar (2015).

TABLE 3
Overall Management Efficiency of Redgram Growers (n=180)

Particulars	Categories	Criteria	Respondents	
			No.	%
Management efficiency	Low	<158.89	38	21.11
Mean= 166.35	Medium	158.89-173.81	81	45.00
SD= 14.92	High	>173.81	61	33.89

Management in agriculture necessarily is a combination of various functions *viz.*, planning, decision making, organizing, efficient use of resources, innovative idea and co-ordination of activities to improve profits. Past research studies have highlighted that a manager is not working according to the classical functions of management such as planning, decision making and controlling. Management is entirely concerned with getting things done and determining how to get things accomplished. To improve management ability or efficiency requires an understanding of the components or competencies of the managerial tasks. To achieve improvement in management efficiency, training programs can be considered as the most effective method. Training programs may involve relatively formal course work and/or discussions in collaboration with management experts or progressive growers.

Dimension wise management efficiency of redgram growers

A keen observation of Table 4 reveals the dimension wise distribution of the redgram growers. Thirty eight per cent of the growers were having high level of skills, followed by medium (38.88 %) and low (25.56 %). The reason might be that they were exposed to demonstration and contact with experts about new technique of crop management and adopted the technology. In case of ability in planning, 47.78 per cent of the redgram growers were in medium category, 33.89 per cent were having high ability and 18.33 per cent low ability. Planning necessarily is a decision making process in every activities of farming. The difference in planning ability among the growers could be attributed to the nature of risk involved in maintaining the redgram production. Other factors

which might have contributed would be the medium experience of growers and small area under redgram cultivation.

With respect to rationality in decision making, 36.11 per cent, 34.44 per cent and 29.45 per cent of the redgram growers were in low, medium and high category, respectively. Decision making concept is highly influenced by close interaction among co-growers, family members and friends. Most of the decisions are influenced by close members of group dynamics as well as experts which in turn effect the decision making process of an individual. Similarly, in ability to mobilize resources, 35.56 per cent, 33.33 per cent and 31.11 per cent were having high, medium and low ability. Reasons for high ability to mobilize resources would be that now-a-day's every Government as well as private companies makes effort to supply the seeds to grower on time. Farmers are having some amount of implements in their home for their crop production and management and also having knowledge about bio- fertilizer. They also consult experts and fellow farmers about use of bio-fertilizer and new techniques about redgram cultivation. Plant protection measures are taken care by maximum growers to protect their crop by pest and disease and other natural calamities.

In respect of ability to coordinate activities, 38.33 per cent were in medium level, followed by 34.44 per cent high and 27.23 per cent low level of ability to coordinate activities. Redgram management also requires timely coordination of different activities in order to get maximum returns. Tasks are interrelated and need to be performed in tandem with one another. Activities such as control of pests and diseases, maintaining

TABLE 4
Dimension wise Management Efficiency of Redgram Growers (n=180)

Aspects	Categories	Criteria	Respondents	
			No.	%
Skills required Mean = 20.35 SD = 2.38	Low	<19.16	46	25.56
	Medium	19.16-21.54	64	35.56
	High	>21.54	70	38.88
Ability in planning Mean = 30.86 SD = 3.28	Low	<29.22	33	18.33
	Medium	29.22-32.49	86	47.78
	High	>32.49	61	33.89
Rationality in DM Mean = 23.86 SD = 2.95	Low	<22.38	65	36.11
	Medium	22.38-25.33	62	34.44
	High	>25.33	53	29.45
Ability to mobilize resources Mean = 22.48 SD = 2.23	Low	<21.37	56	31.11
	Medium	21.37-23.60	60	33.33
	High	>23.60	64	35.56
Ability to coordinate activities Mean = 20.74 SD = 2.30	Low	<19.60	49	27.23
	Medium	19.60-21.89	69	38.33
	High	>21.89	62	34.44
Rational marketing decision Mean = 25.13 SD = 3.74	Low	<23.27	52	28.89
	Medium	23.27-27.00	59	32.78
	High	>27.00	69	38.33
Innovative ideas Mean = 7.20 SD = 1.23	Low	<6.59	15	8.33
	Medium	6.59-7.81	88	48.89
	High	>7.81	77	42.78
Competence in evaluation on crop technology Mean = 15.73 SD = 2.51	Low	<14.47	27	15.00
	Medium	14.47-16.98	80	44.44
	High	>16.98	73	40.56

proper moisture, temperature and water requirement are interrelated. Nearly, 48.89 per cent of the redgram growers were in medium level of innovative ideas, 42.78 per cent were highly innovative and only eight per cent were less innovative.

In respect of competence on crop technology, 44.44 per cent of the redgram growers were under medium category, followed by 40.56 per cent were in high category and 15.00 per cent were in low category. In

most of the dimensions, more number of redgram growers were found in medium category. The probable reason for this might be due to the cosmopolitanness, innovative nature of the redgram growers as well as their knowledge level. The results of the study are corroborated with the findings of Birajdar (2012), Basavaraj (2014) and Pawar (2015).

The management efficiency scale developed is found to be reliable (0.8797) and valid (0.9379); hence, it

can be used to measure the management efficiency of redgram growers. The results of the study revealed that majority (45.00 %) of redgram growers belonged to medium level management efficiency category followed by high (33.89 %) and low (21.11 %) level category of management efficiency, respectively. It can be concluded that the scale developed is useful in explicitly measuring the management efficiency.

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