

RESEARCH ARTICLE

Analysis of Resource Management by Farmers in Different Farming Situations in Karnataka**Anitha Raj. N¹ and K. Shivaramu²**

1. Ph.D Scholar,
2. Prof. & Head of STU,
University of Agricultural
Sciences, GKVK, Bengaluru,
Karnatak, India
Corresponding author e-mail:
aninanagaraj@gmail.com

ABSTRACT

The study was conducted during 2018-19 in three districts (Mandya, Chikkaballapur and Tumakuru) of Karnataka where two taluks were selected to assess the resource management of assured, protected and rainfed farming situation farmers, 180 respondents were selected using purposive random sampling method. Data was collected using structured interview schedule through personal interview method. The collected data was tabulated and analyzed using percentages, correlation and regression. Ex-post facto research design was employed for the study. The findings revealed that farmers in protected farming situations had obtained relatively higher mean indices (0.0515) followed by rainfed farming situation (0.0151) and assured farming situation (0.0109) respectively. In dimension wise Natural resource management, protected farming situation obtained highest index (0.0388) than the pooled sample (0.0346) followed by rainfed (0.0362). Independent variable farming experience ($r=0.339$) had positive and highly significant relationship with resource management at one per cent level in assured farming situation. Independent variables viz., farming experience, farming commitment, achievement motivation, mass media exposure, innovativeness, scientific orientation, extension participation, extension agency contact, time management, land holding, decision making ability, cosmopolitaness and annual income had significantly contributed to the resource management of farmers.

Key words: Resource management; Farming situation; Relationship; Extent of contribution.

The wealth of a nation depends on the richness of the natural resources it is blessed with. Fortunately, India is favoured with such varied resources viz., climate, soil, fauna and flora, production of all types of crops and tree species. Hence, most of the rural/agricultural development programmes implemented during post-independence period has resulted in increasing the production mainly through vertical expansion with little horizontal expansion. Though India is rich in natural resources yet it suffers from lack of infrastructures, power facilities (Talukdar *et al.*, 2012). As the farm is the basic managerial and decision-making unit by which agriculture is carried on, there is a greater need of resource management studies to help the farmers to improve their level of resource management. Better managing resources could increase the farmers' income (Jerome Kimaro, 2019).

Farmers are losing faith and confidence in agriculture hence many are committing suicide and

few are migrating to other sectors for their living and unforeseen circumstances are bringing loss to the farmers. There is a need to understand the effect of climate change on sustainable agriculture and rural development sector at Global level from the view point of providing food to growing population (Narayana Swamy, 2012). As the farm is the basic managerial and decision-making unit by which agriculture is carried on, there is great need of resource management studies to help the farmers to improve their level of resource management. With a mission to conserve the precious soil and water natural resources by using technologies, in association with people, the Govt. of India, initiated watershed programs (Raghupathi and Venkatesha, 2017). Thus, keeping in above view the study was undertaken with the following specific objectives;

- To find out the extent of resource management practices followed by farmers in different farming situations.

- To understand the relationship and extent of contribution between the characteristics of farmers with the resource management in different farming situations; and

METHODOLOGY

The study was undertaken to analyse the resource management by farmers in different farming situations in Assured farming situation (Mandya), Protected farming situation (Chikkaballapur) and Rainfed situation (Tumakuru) districts of Karnataka state. In each selected district two taluks were selected based on the different irrigation system practiced. From Mandya district based on the assured irrigation system, Srirangapatna and Mandya were selected. And from Chikkaballapura district based on the borewell irrigation system, Gouribidanur and Gudibande were selected. And from Tumakuru district based on rainfed situation, Koratagere and Chikkanayakanahalli were selected. And from each selected taluks two villages were selected randomly and from each selected villages fifteen farmers were randomly selected. Thus, sixty farmers from each district under three different farming situations constituted the sample size. Thus, the total sample constitutes 180 farmers under three farming situations that is assured farming situation (canal), protected farming situation (bore well) and rainfed farming situation (dry land). Twenty independent variables selected for the study were quantified by using structured schedule and standardized scale developed by different authors. Ex-post facto research design was employed for the study. Personal interview method was followed to collect the data. The data was tabulated and analyzed using percentages, correlation and regression.

RESULTS AND DISCUSSION

Extent of Resource Management Practices followed by Farmers in Different Farming Situations : The student “t” test was applied to test the significant difference among the different farming situations of resource management was depicted in Table 1. The test was tuned out to a positive and significant difference among different farming situations viz., assured, protected and rainfed farming situations. The data revealed the mean and standard deviations for resource management between different farming situations. As it is evident that, farmers in protected farming situations had obtained relatively higher mean indices (0.0515) followed by rainfed farming situation (0.0151) and assured farming situation (0.0109) respectively. The

findings are in line with the findings of *Sunitha (2015)* and *Yashodhara (2015)*.

The probable reason for protected situation having high mean score was that, the farmers were more interested to adopt new technologies and are more innovative in nature. Thus, they keep on trying and making constant efforts to make use of limited resources. Further they were constantly consulting technical officers to know the market trends. Thus, the farmers were open to new ways to manage the resources. In rainfed situation farmers were trying to manage the available resources effectively but the outcome is depending on rainfall. Thus, uncertainty prevails. In assured irrigation situation the farmers mostly depend more on hired labours, cultivate either paddy/sugarcane and difficulty in managing water because of poor water management structures and non-adoption of water management on scientific lines.

Distribution of dimension wise mean of resource management index : It could be observed from the Table 2 that, in the dimension Natural resource management, protected farming situation obtained highest index (0.0388) than the pooled sample (0.0346) followed by rainfed (0.0362). On the other hand, the assured situation (0.0266) obtained index less than the overall index value with significant at one per cent. Under the dimension Human resource management, protected farming situation obtained (0.0691), highest index than the overall (0.0646) followed by rainfed (0.0557). On the other hand, assured situation (0.0235) obtained index less than the pooled sample with highest significant category. Under the dimension financial resource management, protected farming situation obtained (0.0525) highest index than the pooled sample (0.0485) followed by rainfed farming situation (0.0392). On the contrary assured farming situation (0.0368) obtained index less than the pooled sample significant at one per cent.

Table 1. Test of significance in respect of mean resource management score between different farming situations

Farming situation	Mean	SD	‘t’ test
Assured (n ₁ =60)	0.0109	0.0064	24.54**
Protected (n ₂ =60)	0.0515	0.0128	
Protected (n ₂ =60)	0.0515	0.0128	9.43**
Rainfed (n ₃ =60)	0.0151	0.0081	
Assured (n ₁ =60)	0.0109	0.0064	9.32**
Rainfed (n ₃ =60)	0.0151	0.0081	

** Significant at 1 per cent.

Table 2. Distribution of farmers based on dimension wise mean of resource management index in different farming situations

Dimensions/ Resource Management	Assured (n ₁ =60)	Protected (n ₂ =60)	Rainfed (n ₃ =60)	Pooled sample (n=180)	χ^2 (P value)
Natural RM	0.0266	0.0388	0.0362	0.0346	15.56** (0.004)
Human RM	0.0235	0.0691	0.0557	0.0646	59.73** (0.000)
Financial RM	0.0368	0.0525	0.0392	0.0485	21.90** (0.004)
Physical RM	0.0586	0.0206	0.0200	0.0342	41.99** (0.000)
Agricultural RM	0.0352	0.0545	0.0488	0.0468	38.92** (0.002)
Social RM	0.0808	0.0352	0.0485	0.0466	22.05** (0.000)
Farm animals RM	0.0379	0.0531	0.0624	0.0394	28.75** (0.000)

**Significant at 1 per cent.

Under Physical resource management, assured farming situation (0.0586) obtained highest index than the pooled sample (0.0342) followed by the protected farming situation (0.0206). On the other hand rainfed farming situation (0.0200) obtained index less than the pooled sample at one per cent. Under Agricultural resource management, protected farming situation obtained (0.0545), highest index than the overall (0.0468) followed by rainfed (0.0488). On the contrary the assured situation (0.0352) obtained index less than the pooled sample with significant at one per cent. Under Social resource management, assured farming situation (0.0808) obtained highest index than the pooled sample (0.0466) followed by rainfed farming situation (0.0485). On the other hand, the protected farming situation (0.0352) obtained index less than the pooled sample and significant at one per cent. Under Management of farm animals, the rainfed farming situation (0.0624) obtained highest index than the pooled sample (0.0394) followed by protected farming situation (0.0531). On the other hand, the assured farming situation (0.0379) obtained index less than the pooled sample and significant at one per cent.

The probable reason for the above findings might be under the dimension natural resource management, the protected situation possessed high index value followed by rainfed situation and assured farming situation the main reason might be that the farmers were facing scarcity of water and marginal land holders

were more thus within the limited land and water were effectively managing to get better output. In assured farming situation, the farmers even though were having better irrigation facilities but with poor management of land and water they were losing the land fertility. Under the dimension human resource management, the protected situation possessed high index value followed by rainfed situation and assured farming situation. The probable reason might be that in protected and rainfed farming situation farmers were employing family members to work in their field to a greater extent where as in assured farming situation farmers were largely depends on hired farmers to carry out the farming activities. Under the dimension financial resource management, the protected situation possessed high index value followed by rainfed situation and assured farming situation. The probable reason might be that the farmers were mostly investing the profit on income generating activities. On the other hand, in assured situation the farmers mostly spend on physical comfort and non-income generating activities.

Under the dimension physical resource management, the assured situation possessed high index value followed by protected situation and rainfed farming situation. The probable reason might be that under the assured situation, the farmers were having better physical opportunities to excel in agriculture than in protected and rainfed situation. Under the dimension agricultural resource management, the protected situation possessed high index value followed by rainfed situation and assured farming situation. The probable reason might be that the farmers are properly utilizing the agricultural resources by planning the crop based on the irrigation facility, market demand, suitability of the land etc., thus they were earning more by effectively managing the agricultural resources. On the other hand, in assured farming situation, the farmers grow crops based on vogue and experience and mostly following mono cropping system. Thus, they were not managing the agricultural resource properly in accordance with recommendations. Under the dimension social resource management, the assured situation possessed high index value followed by rainfed situation and protected farming situation. The probable reason might be that the farmers are participating to a greater extent in social activities in local organisations. Under the dimension management of farm animals, the rainfed situation possessed high index value followed by protected situation and assured farming situation. The probable reason might be that majority of the farmers under rainfed situation rear animals to get regular income in

addition to agriculture since the agriculture is mainly depends on monsoon. Further, farmer's rear animals both for dung and for regular income.

Relationship of profile characteristics with Resource management : Correlation test was applied to know the relationship of profile characteristics with resource management by farmers in different farming situations. An examination of Table 3 indicated that the variable, farming experience ($r=0.339$) had positive and highly significant relationship with resource management at one per cent level in assured farming situation. Similarly, material possession ($r=0.321$), mass media exposure ($r=0.301$), extension participation ($r=0.300$), extension agency contact ($r=0.299$), time management ($r=0.291$), scientific orientation ($r=0.287$), innovativeness ($r=0.286$), farming commitment ($r=0.268$), annual income ($r=0.266$), achievement motivation ($r=0.266$), cosmopolitaness ($r=0.253$), land holding ($r=0.251$) and decision making ability ($r=0.250$) had positive and significant relationship with resource management at five per cent level. The remaining variables viz., age, education, family size, livestock possession, risk orientation and deferred gratification had non-significant relationship with resource management of farmers in assured farming situation.

On the contrary, the profile characteristics namely material possession ($r=0.486$), annual income ($r=0.418$), achievement motivation ($r=0.412$), risk orientation ($r=0.399$), mass media exposure ($r=0.398$), cosmopolitaness ($r=0.392$), farming commitment ($r=0.392$) extension agency contact ($r=0.388$), time management ($r=0.386$), innovativeness ($r=0.368$) and scientific orientation ($r=0.333$), had positive and highly significant relationship with resource management of farmers in protected farming situation at one per cent level. Furthermore, extension participation ($r=0.323$), livestock possession ($r=0.299$), land holding ($r=0.269$) decision making ability ($r=0.268$) and education ($r=0.262$) had positive and significant relationship with resource management at five per cent level. The remaining variables viz., age, family size, farming experience and deferred gratification had non-significant relationship with resource management of farmers in protected farming situation. On the other hand the profile characteristics, annual income ($r=0.381$), livestock possession ($r=0.329$), farming experience ($r=0.318$), risk orientation ($r=0.312$), land holding ($r=0.311$), decision making ability ($r=0.296$), extension participation ($r=0.292$), achievement motivation ($r=0.291$), time management ($r=0.290$),

Table 3. Relationship of profile characteristics with Resource management by farmers in different farming situations

Independent variables	Assured	Protected	Rainfed
	($n_1=60$)	($n_2=60$)	($n_3=60$)
	(r) value		
Age	0.0251 ^{NS}	0.256 ^{NS}	0.268 ^{NS}
Education	0.012 ^{NS}	0.262*	0.036 ^{NS}
Family size	0.011 ^{NS}	0.099 ^{NS}	0.088 ^{NS}
Land holding	0.251*	0.269*	0.311*
Annual income	0.266*	0.418**	0.381*
Farming experience	0.339**	0.198 ^{NS}	0.318*
Livestock possession	0.098 ^{NS}	0.299*	0.329*
Material possession	0.321*	0.486**	0.049 ^{NS}
Mass media exposure	0.301*	0.398**	0.268*
Extension agency contact	0.299*	0.388**	0.251*
Extension participation	0.300*	0.323*	0.292*
Cosmopolitaness	0.253*	0.392**	0.277*
Risk orientation	0.092 ^{NS}	0.399**	0.312*
Scientific orientation	0.287*	0.333**	0.269*
Achievement motivation	0.266*	0.412**	0.291*
Innovativeness	0.286*	0.368**	0.276*
Decision making ability	0.250*	0.268*	0.296*
Deferred gratification	0.092 ^{NS}	0.078 ^{NS}	0.087 ^{NS}
Farming commitment	0.268*	0.392**	0.271*
Time management	0.291*	0.386**	0.290*

**Significant at 1 % level. *Significant at 5 % level.

NS – Non significant

cosmopolitaness ($r=0.277$), innovativeness ($r=0.276$), farming commitment ($r=0.271$), scientific orientation ($r=0.269$), mass media exposure ($r=0.268$) and extension agency contact ($r=0.251$) had positive and significant relationship with resource management of farmers in rainfed situation at five per cent level. Remaining variables viz., Age, education, family size, material possession and deferred gratification had non-significant relationship with resource management of farmers in rainfed farming situation. The findings are in line with the findings of *Smurti Ranjan (2015)* and *Dolli (2006)*.

Extent of contribution of profile characteristics with Resource management : Multiple regression analysis was carried out to know the extent of contribution of profile characteristics with resource management by farmers in different farming situations. Table 4 explained the contribution of independent variables to Resource management of farmers in assured farming situation. The results revealed that thirteen out of twenty independent variables viz., farming experience, farming commitment, achievement motivation, mass media exposure, innovativeness, scientific orientation,

extension participation, extension agency contact, time management, land holding, decision making ability, cosmopolitaness and annual income had significantly contributed to the resource management of farmers. A critical view of the results inferred that farmer’s resource management could be increased by 2.916, 2.601, 2.600, 2.582, 2.490, 2.416, 2.412, 2.388, 2.200, 2.188, 2.188, 2.052 and 2.012units, if one unit increase could be brought about in farming experience, farming commitment, achievement motivation, mass media exposure, innovativeness, scientific orientation, extension participation, extension agency contact, time management, land holding, decision making ability, cosmopolitaness and annual income respectively, if other variables kept constant. The calculated R² value was 0.681 which means that selected variables had contributed to the tune of 68.10 per cent of variation in resource management of farmers in assured farming situation.

Moreover, Table 4 also depicts the contribution of independent variable to Resource management of farmers in protected farming situation. The results revealed that, sixteen out of twenty independent variables viz., extension agency contact,

innovativeness, mass media exposure, annual income, risk orientation, cosmopolitaness, land holding, achievement motivation, extension participation, farming commitment material possession, decision making ability, scientific orientation, livestock possession, time management and education had significantly contributed to the resource management of farmers. A critical view of the results inferred that farmer’s resource management could be increased by 3.417, 3.400, 3.200, 2.810, 2.610, 2.606, 2.461, 2.380, 2.322, 2.311, 2.222, 2.210, 2.180, 2.122, 2.114and 2.010 units, if one unit increase could be brought about in extension agency contact, innovativeness, mass media exposure, annual income, risk orientation, cosmopolitaness, land holding, achievement motivation, extension participation, farming commitment material possession, decision making ability, scientific orientation, livestock possession, time management and education respectively, if other variables kept constant. The calculated R² value was 0.692 which means that selected variables had contributed to the tune of 69.20 per cent of variation in resource management of farmers in protected farming situation.

In addition, Table 4 also depicts the contribution

Table 4. Extent of contribution of profile characteristics with resource |management by farmers in different farming situations (N=180)

Independent variables	Assured (n ₁ =60)		Protected(n ₂ =60)		Rainfed (n ₃ =60)	
	β (SE)	t-value	β (SE)	t-value	β (SE)	t-value
Age	0.582 (0.312)	0.536 ^{NS}	0.375 (0.417)	1.112 ^{NS}	0.130 (0.119)	0.912 ^{NS}
Education	0.269 (0.128)	0.475 ^{NS}	0.347 (0.699)	2.010*	0.200 (0.212)	1.060 ^{NS}
Family size	0.516 (0.444)	0.866 ^{NS}	0.389 (0.386)	0.992 ^{NS}	0.168 (0.222)	1.321 ^{NS}
Land holding	0.279 (0.612)	2.188*	0.329 (0.812)	2.461*	0.324 (0.717)	2.210*
Annual income	0.291(0.586)	2.012*	0.291 (0.818)	2.810**	0.385 (0.812)	2.110*
Farming experience	0.274 (0.799)	2.916**	0.155 (0.297)	1.916 ^{NS}	0.271(0.716)	2.588*
Livestock possession	0.600 (0.666)	1.111 ^{NS}	0.269 (0.571)	2.122*	0.341(0.312)	0.914 ^{NS}
Material possession	0.961 (0.589)	0.612 ^{NS}	0.278 (0.618)	2.222*	0.998 (0.912)	0.913 ^{NS}
Mass media exposure	0.353 (0.912)	2.582*	0.224 (0.717)	3.200**	0.073 (0.192)	2.618*
Extension agency contact	0.371 (0.888)	2.388*	0.268 (0.916)	3.417**	0.434 (0.916)	2.110*
Extension participation	0.284 (0.686)	2.412*	0.127(0.296)	2.322*	0.270 (0.700)	2.590*
Cosmopolitaness	0.349 (0.716)	2.052*	0.122 (0.318)	2.606*	0.342 (0.818)	2.390*
Risk orientation	0.612 (0.596)	0.973 ^{NS}	0.226 (0.591)	2.610**	0.381 (0.861)	2.260*
Scientific orientation	0.236 (0.569)	2.416*	0.363 (0.792)	2.180*	0.277 (0.666)	2.400*
Achievement motivation	0.235 (0.612)	2.600*	0.373 (0.888)	2.380**	0.317 (0.760)	2.390*
Innovativeness	0.366 (0.912)	2.490*	0.240 (0.816)	3.400**	0.277 (0.581)	2.098*
Decision making ability	0.355 (0.777)	2.188*	0.324 (0.716)	2.210*	0.169 (0.444)	2.618*
Deferred gratification	0.912 (0.818)	0.896 ^{NS}	0.103 (0.012)	0.116 ^{NS}	0.154 (0.111)	0.720 ^{NS}
Farming commitment	0.300 (0.781)	2.601*	0.255 (0.589)	2.311*	0.369 (0.781)	2.116*
Time management	0.258 (0.568)	2.200*	0.330 (0.699)	2.114*	0.267 (0.698)	2.617*
Assured R ² = 0.681			Protected R ² = 0.692			Rain fed R ² = 0.712

**Significant at 1 % level. *Significant at 5 % level. NS= Non significant

of independent variable to Resource management of farmers in rainfed farming situation. The results revealed that, fourteen out of twenty independent variables viz., mass media exposure, decision making ability, time management, extension participation, farming experience, scientific orientation, cosmopolitaness, achievement motivation, risk orientation, land holding, farming commitment, annual income, extension agency contact and innovativeness had significantly contributed to the resource management of farmers. A critical view of the results inferred that farmer's resource management could be increased by 2.618, 2.618, 2.617, 2.590, 2.588, 2.400, 2.390, 2.390, 2.260, 2.210, 2.116, 2.110, 2.110 and 2.098 units, if one unit increase could be brought about in mass media exposure, decision making ability, time management, extension participation, farming experience, scientific orientation, cosmopolitaness, achievement motivation, risk orientation, land holding, farming commitment, annual income, extension agency contact and innovativeness respectively, if other variables kept constant. The calculated R^2 value was 0.712 which means that selected variables had contributed to the tune of 71.20 per cent of variation in resource management of farmers in rainfed farming situation. The findings are in line with the findings of *Dolli (2006)*.

The possible reasons may be that profile characteristics of farmers were the deciding factors of resource management. Independent variables have synergic effects on one another, helping each other to have a positive relationship with the resource management of farmers.

CONCLUSION

The study revealed that the resource management under assured farming situation is lower than the protected and rainfed farming situation. Since, majority of the farmers are practicing mono cropping system either they are growing paddy/sugarcane. Thus, the land is losing its fertility status and productivity is decreasing over the years. Hence, the resource management is low. This calls for skill training to the farmers on alternate cropping system and proper water management practices. Under protected situation, the farmers are practicing different cropping systems. Crop rotation is done. They often, effectively utilize the available resources like water to the greater extent thus the land fertility status is maintained. Majority of the farmers are innovative and scientific following new

technologies to obtain more returns and reinvest most of the returns from agriculture to the further agriculture development. This helps them to manage the scarce resources and achieve more returns. Under rainfed situation, majority of the respondents are managing the resources to a medium extent because majority of the farmers are growing cereals, pulses and minor millets. The agricultural operations are mainly dependents on rainfall. They also were growing trees on the bunds and also in the waste lands and earning money with less investment. Due to scarcity of water, they store it in krishi honda and irrigate the crops in critical stages of crops. The farmers are not spending much for their luxury, but saving their returns for future. They judiciously manage the available resources.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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