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Integrated Farming System Model for Bhadra Command

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Abstract: *The present study was undertaken in Davanagere district of Bhadra commandin Karnataka with sample size of 120 respondents from 12 villages. Data was collected regarding farming systems adopted by the farmers and the economics of all farming systems with the help of pre structured and pretested interview schedule. It was found that cent percent respondents had adopted agriculture and dairy farming followed by vegetables cultivation (45.00%) and vermicomposting (30.83%).Integration of Agriculture+dairy+banana+vegetables+sheeprearing+poultry+vermicomposting+foragecrop+banana was found beneficial on the basis of B:C ratio combination of complementary enterprises.*
Keywords*: Integrated farming system model.*

I. Introduction

Indian economy is predominantly rural and agriculture oriented where the declining trend in the average size of the farm holding poses a serious problem. In agriculture 84.00 per cent of the holding is less than 2 acres. Majority of them are dry lands and even irrigated areas depend on the vagaries of monsoon. In this context, if farmers concentrated on crop production they will be subjected to a high degree of uncertainty in income and employment. Hence, it is imperative to evolve suitable strategy for augmenting the income of the small and marginal farmers by combining to increase the productivity and supplement the income. In an agricultural country like India, the average land holding is very small. The population is steadily increasing without any possibility of increase in land area.

The income from cropping for an average farmer is hardly sufficient to sustain his family. The farmer has to be assured of a regular income for a reasonable standard of living by including other enterprises. In view of the above facts there is strong need to commercialize agriculture and in order to ensure an all round development of farming families farming should be considered as a system in which crop and other enterprises that are compatible and complementary are combined together.

The study of economics of farming systems and application of farming systems approaches can bring a ray of hope for the betterment of farmers. Keeping all these factors in mind the present study was conducted to study the economics of integrated farming system in Bhadra command of Karnataka state. The total number of farmers in the district is 267420 out of which 80428 (30%) are small 12074 (17%) are marginal and 1694 (2%) are large. Bhadra command area in Davanagere district occupies an area of 597597ha. Out of this Kharif season covers an area of 340000ha, Rabi season 26000ha and summer 60,000ha. The average productivity of paddy is 3500kg/ha. Irrigated area in Davanagere district is about 145578 ha. Majority of the area irrigated by canals (82,300ha) and bore wells (53,187ha) followed by lift irrigation (5806ha) & 2741ha from other sources. The per cent irrigated area in Davanagere district is 38% as against the state average of 28%.

II. Materials And Methods

The present study was carried out in Davanagere district of Karnataka State where, sample of 120 respondents from 12 villages were purposively selected who had been adopted farming system other than agriculture or subsystem of Agriculture.Exploratory research design was used for investigation. For the presentstudy interview schedule was found to be most convenient method for data collection from the farmers. The respondents were categorized with the help of mean and standard deviation. Findings regarding adoption of farming system in relation to selected variables viz. age, education, land holding, farming experience, sources of information, mass media participation, extension participation, organizational participation, economic motivation, innovativeness and risk orientation were included in study.

III. Resultsanddiscussion

ItwasobservedfromtheTable1that, almost alltherespondents haveadoptedagricultureanddairyfarmingfollowed by fodder crops cultivation by 54respondents(45%), vermicomposting by 30.83percentrespondents, poultryby 29.17per cent respondents. Goat rearing adopted byonly22.50percentrespondentsinthestudy. Agriculture and all allied enterprises presented in Table 2 were found beneficial in farmers' situation. It is inferred that among all nine farming systems banana

had given maximum net profit with B:C ratio 4.22. It was followed by sheep rearing (3.49), goat rearing (2.90), dairy (2.84), forage crop (2.17), agriculture (2.06) and vegetables (2.44). All above enterprises were giving more than two rupees on expenditure of one rupee. Below two, poultry and vermicompost were giving 1.46 and 1.75 B:C ratio respectively.

Table 1: Distributionofrespondentsaccording otheiradoptionof Differentfarmingsystems

Sl.No	Farming Systems	Frequency	Percentage
1	Agriculture	120	100.00
2	Dairy	100	83.33
3	Banana	18	15.00
4	Vegetables	15	12.50
5	Foddercrops	54	45.00
5	Sheep rearing	22	18.33
6	Goat rearing	27	22.50
7	Poultry	35	29.17
9	Vermicomposting	37	30.83

Table 2: Correlation co-efficientof selectedindependent variables withintegratedfarmingsystems

Sl.No	Independentvariables	'r'value
1	Age	0.0430
2	Education	0.1494
3	Landholding(ha.)	0.3736**
4	Farming Experience	0.1137
5	Source ofInformation	0.1065
6	MassMedia Participation	-0.0079
7	ExtensionParticipation	0.3518**
8	OrganizationalParticipation	0.2857**
9	EconomicMotivation	0.0242
10	Innovativeness	0.1465
11	RiskOrientation	-0.2414**

**Significant at0.01 percent levelofprobability.

ItisevidentfromTable2that,amongstpersonal,situational andpsychologicalcharacteristics,landholdingwaspositively and significantly correlatedwithintegratedfarming systemadoptedby the respondentsat 0.01 level ofprobability.
It canbeconcludethat therespondentswithlarge sizeofland holdingaretryingtoadoptdifferentfarming systemforget-tingmore monitorybenefitsfromthe integrationofdifferent farmingsystems. Thevariables viz. extensionparticipationand organizational participationwere found positiveand significantcorrelation with adoptionofintegratedfarming systemsrespondentsat 0.01 levelofprobability.High extensionparticipationand organizationalparticipation ofrespondentsleads tomoreadoptionofintegratedfarmingsystem. The respondents at 0.01 level of probability negatively and significantly correlated risk orientation with adoption of integrated farming systems.Itindicatedthattherespondents withhigh inriskorientationmight getfailure ingetting benefitshence,nottaking anyriskofadoptionofintegrated farmingsystems. While, othervariables viz.age,education, farming experience,sourcesofinformation,mass mediaparticipation,economicmotivation, innovativeness hadfoundnon-significantly correlatedwithadoptionofintegratedfarming systemsby therespondents. Theaboveresults indicatethat someofthecharacteristicsof the respondentshad influencedtheiradoption ofintegrated farmingsystems. Thisresults obtainedareinconformity withthefindings ofSinghandBaruah(2012).

Table 3: Economics of different farming system

Sl.No	Farming systems	Cost of cultivation (Rs.)	Gross returns (Rs.)	Net returns (Rs.)	B:C
1	Paddy(Rs./ha)	35255	108000	72745	2.06
2	Dairy (2HF cows)	37403	143638	106235	2.84
3	Banana (Rs./ha)	56300	293700	237400	4.22
4	Vegetables (Rs./ha)	37236	128020	90784	2.44
5	Fodder(Rs./ha)	4250	13454	9204	2.17
6	Goat rearing(15 No's)	6478	25260	18782	2.90
7	Sheep rearing(15 No's)	6727	30200	23473	3.49
8	Poultry(20 No's)	8955	22000	13045	1.46
9	Vermicompost(3 pits)	18256	50275	32019	1.75

The integrated farming system is the combination of various farming systems such as banana (B: C4.22), sheep rearing (B: C3.49), dairy (B: C2.84), goat rearing (B: C2.90), vermicompost (B: C1.75) with agriculture (B:C 2.06)and dairy farming (B:C 2.84) are complementary to each other and helps to generate more income that improves socio-economic status of farmers. Vermicomposting helps to generate income by selling vermicompost and vermiculture, which provide maximum netreturn to the farmers. Labour requirement of vermicomposting was also very low, even women member can manage it very effectively. It also provides manure of high fertility status to their own farms. Therefore, it was complementary to the agriculture enterprise. Sole crop or intercropping of forage crops like sorghum and maize also provide additional benefits in the form of economic produceand by-produce. It was complementary to agriculture and dairy farming. Even though the dairy farming requires more labour and skilled workers, it provides milk, better monitory returnsand family health. It also provides FYM for manuring the crops. It clearly indicatedthat dairy farming was very important in integration of farming systems as a best complementary enterprise to the other farming systems. Backyard poultry was found very effective, supplementary and domestic enterprise which can be handled by even old or child members of family. It could provide egg andmeat, which was like by almost allnon-vegetarians. Backyard poultry provided bound income to the women members of the family which contributed in their economic empowerment, its B:C ratio was also found lucrative. Sheep rearing was also found tobe a good subsidiary occupation in combination with goat rearing. It requires no labour, which can be, manage by any family member with some training. Vegetables areone ofthe farming systems, which provided better returns to the farm family in addition to the Agriculture. Integration of different farming systems were also found beneficial byRamrao et al. (2005), Sharma et al. (2008)and Channabasavanna et.al, (2009) in their research of different States.

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