RESOURCE USE EFFICIENCY IN MILK PRODUCTION IN REWA DISTRICT OF MADHYA PRADESH

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Abstract

The present study is conducted in Rewa district of Madhya Pradesh. Respondents were selected from five villages on random based on the basis of area under cultivation. Farmer's then grouped them into marginal small, semi medium, medium and large farmers respectively as per the size of land holding. It is well concluded that the size of groups among the milk production is quite favorable for smaller size group due to lower cost incurred per milch animal and efficient working of larger size group. But milk production per annum was higher in case of larger group respectively.

Key words: Milk production, dairy husbandry, livestock sector

Introduction

Livestock sector plays a crucial role in rural economy and livelihood. Livestock sector employs eight percent of the countries labour force, including many small and marginal farmers, women and landless agricultural workers. Milk production alone involves more than 30 million small producers, each raising one or two cows or buffaloes. Among the many livestock enterprises, dairying is the easiest occupation established in the rural setting of our country. Dairy husbandry provides draught power, manure and cash income and augments the crop production. It is increasingly recognized that dairying could play a more constructive role in promoting rural welfare and reducing poverty. Indian agriculture is a diversified farming system in which crop production and animal husbandry devoted for efficient and economic utilization of land, labour and capital " In agriculture sixty-five seventy percent of the population of India is directly or indirectly associated with agriculture and animal husbandry". On the other hand, farmers need to be assured of regular income for a living at least above the poverty line. In the farm economics that are typically characterized by increasing population pressures, declining land-man ratio, small and fragmented holdings, highly iniquitous land distribution structures, etc., the traditional form of agriculture cannot provide a viable solution to the problem of rural unemployment and under-employment. Therefore, diversification in rural employment has gained significant importance over time. Many studies have been carried out in the past on economics of milk production, input-output relationship and resource use efficiency in milk production in different parts of the country. Most of the past studies conducted on resource use efficiency using milk production function analysis showed that green fodder and concentrate affect milk yield significantly [Saini *et al*. (1991) Saini *et al*. (1996), Murthy and Naidu (1992), Kumar and Agarwal (1994), Kairon *et al*. (1995), Shah and Singh (1995), Kumar and Agarwal (1996), Kumar and Singh (2004), Singh *et al*. (2005), Dwaipayan *et al*. (2006), Singh *et al*. (2007)] However, some studies have shown that there are strong possibilities of enhancing labour absorption in the agricultural sector itself through introduction of appropriate technological, institutional and organizational innovations promoting agricultural diversification. These are the characteristics of the farmers which directly and

indirectly affecting the efficiency of farm, level of resource use, income and level of profitability from farm enterprise. Hence, it is very important to study these characteristics of the sample farmers. The present resource use efficiency in milk production in Rewa district of Madhya Pradesh.

Materials and methods

The study is conducted in Rewa district of Madhya Pradesh. In five villages, total strength of 75 respondents were selected from Kachhawara, Beeda, Lainbadhari, Khaira, Ragauli on random based on the basis of area under cultivation. Farmer's then grouped them into marginal small, semi medium, medium and large farmers respectively as per the size of land holding. The primary data were recorded regarding general information of the respondents, cropping pattern, farm resource structure. The specific and detail information on cost incurred and returns obtained in the cultivation of major crop. Secondary data were collected from department of agriculture and other statistical data were year 2010-11 collected from published record of Statistics. The cost of cultivation classified as recommended by, "Special expert committee on cost estimates, GOI, New Delhi", was used in this study. Profitability is find out with help of formula given below: - Milk production is a complex variable, which is influenced by several explanatory variables. In the present study, production function analysis was employed to estimate the resource productivity and resource use efficiency in milk production. The specification of milk production function used in the present study for functional analysis is as follows:

$Y = f (X_1, X_2, X_3, X_4, X_5)$

Where,

Y = Income from milk per animal per day ($-$)

X_1 = Expenditure on green fodder per animal per day ($-$)

X_2 = Expenditure on dry fodder per animal per day ($-$)

X_3 = Expenditure on concentrates per animal per day ($-$)

X_4 = Value of labour used per animal per day ($-$)

X_5 = Miscellaneous expenses per animal per day ($-$)

Result and discussion

The study represents the picture of possible costs of production and return from per unit area of major crops during the period of study with the relationship between inputs and the outputs in the production process.

General characteristics of farm family

Since General characteristics of farm family and farm resource structure reflect the operational, organizational and managerial constraints of the farm business activity. These are the characteristics of the farmers which directly and indirectly affecting the efficiency of farm, level of resource use, income and level of profitability from farm enterprise. Hence, it is very important to study these characteristics of the sample farmers. Age and education level table 1. The majority of the farmers found to about 45 years of age. Regarding literacy position, the illiterate members found to an average 26.67 per cent of total respondents. The result shows that the maximum members (73.33%) are literate. It is also found that level of education increases with the size group of the farmers respectively. The percentage of literate to total respondents in case of large farmer found to highest *i.e.* 93.33 per cent. The maximum illiteracy found in small size of group *i.e.* 46.67 per cent to total respondents. Occupational structure of farm family data reveals that the highest proportion of farmers in all the size groups (accept marginal group) found to engaged in agricultural activities *i.e.* on an average 66.66 per cent. This is due to maximum annual work availability in crop production and other allied agricultural activities.

Milk production analysis

Economics of milk production of cow's and she buffalo's were mixed together and have been worked out for a year on an average per milch animal respectively. The cost of maintenance of animals and its break up like overhead cost and operational cost like expenses on fodder, labour, miscellaneous and other costs during a period of one year on different size of group of farms have been calculated and presented in different tables as below.

Fixed cost on animal production

In addition to the number of sheds and the animals kept in these, it will be of interest to calculate the cost on housing per milch animal in the various groups. The analysis given in the table -2 reveals that the cost incurred by sheds per milch animal is lower in units with marginal small group than the semi- medium, medium and large groups respectively. Average cost of sheds for a milch animal is near about $-.1841$ per year. It is $-$ 965 per animal in the groups of marginal and it is lower than these in case of other size units. The sheds cost per milch animal found to increasing trend with increase of size group subsequently. In addition to sheds, there are equipment and utensils like feeding troughs, chaff-cutters, buckets, milk cans and milk measure which are included in fixed items. It is really surprising that the items number varied in different groups but fixed costs on other then shed, per milch animals is higher in case of large group due to higher

Table 1: Fixed costs per milch animal per year on different size of groups (−).

S. No.	Size of milch animals units	Kachcha Shed + Pakka shed			Cost other then shed					Average fixed cost per milch animal
		Present value of sheds	Total cost of shed per milch animal	Depre-ciation Cost (15%)	Feeding trough	Chaff cutters	Buckets + Milk cane and other	Total cost shared by per milch animal	Depreciation cost per milch animal (20%)	
1.	Marginal	9432	6431	965	300	55	400	755	151	1116
2.	Small	17336	9287	1393	350	75	450	875	175	1568
3.	Semi-medium	19318	12878	1931	400	135	500	1035	207	2138
4.	Medium	20812	13874	2081	400	175	500	1075	215	2296
5.	Large	25220	18915	2837	430	175	530	1135	227	3064
6.	Average	18423	12277	1841	376	123	476	975	195	2036

cost of number of item. The average cost per animals found to near about −195 in the entire five groups respectively.

Labour and Miscellaneous costs:

In study it is found that all the operations in animal

Table 2: Labour and Miscellaneous costs per milch animal per year on different size of group (−).

S. No.	Size of milch animals units	Labour charge	Medicinal cost	Other cost	Total cost per milch animal
1.	Marginal	3340	35	14	3389
2.	Small	3245	32	15	3292
3.	Semi-medium	3160	35	17	3212
4.	Medium	3000	40	20	3060
5.	Large	2800	39	25	2864
6.	Average	3109	36.2	18.2	3163

husbandry were performed by farm family members themselves. The total average cost of labour and other cost per animal, per annum found to − 3163. In maintenance of milch animal some miscellaneous costs like medical costs and others, which must be considered into the units included in the sample of this study. The total labour and miscellaneous costs etc found to highest for the marginal and small size group and subsequently decrease with increase in size groups respectively.

Total costs for milk production

Data shows table 3 Total cost per milch animal per year for milk production was highest in large size group (− 10391) and the lowest was (− 8562) in marginal group respectively. The total cost was found to increases with the increase of the size of the group subsequently. Among the all cost the share of feed and fodder costs found to highest. As per the study it is found that all the operations

Table 3: Total cost per milch animal per year for milk production on different size of groups (−).

S. No.	Size of milch animals units	Average Fixed cost	Feed and fodder cost	Labour and miscellaneous cost	Interest on working capital	Average operation	Total cost
1.	Marginal	1116	3230	3389	827	7446	8562
2.	Small	1568	3348	3292	830	7470	9038
3.	Semi-medium	2138	3395	3212	826	7433	9571
4.	Medium	2296	3432	3060	812	7304	9600
5.	Large	3064	3649	2864	814	7327	10391
6.	Average	2036	3411	3163	822	7396	9432

Table 4: Economics of milk production per animal per year on different size of groups (−).

S. No.	Size of milch animals units	Total cost (−)	Total milk production liters	Gross return (−)	Net return (−)	B.C. Ratio
1.	Marginal	8562	1210	14520	5958	1.70
2.	Small	9038	1226	14712	5674	1.63
3.	Semi-medium	9571	1265	15180	5609	1.59
4.	Medium	9600	1266	15192	5592	1.58
5.	Large	10391	1325	15900	5509	1.58
6.	Average	9432	1258	15101	5669	1.60

Table 5: Cost on feeds and fodder per animal /year different size of groups (‾).

S.No.	Size of milch animals units	Summer Season			Rainy Season				Winter season				Total cost /animal
		Dry fodder	Concent-rate	Total	Dry fodder	Green fodder	Concent-rate	Total	Dry fodder	Green fodder	Concent-rate	Total	
1.	Marginal	1126	106	1232	578	234	60	872	861	172	93	1126	3230
2.	Small	1176	124	1300	588	239	62	889	882	180	97	1159	3348
3.	Semi-medium	1181	148	1329	584	238	76	898	879	186	103	1168	3395
4.	Medium	1188	167	1354	583	237	81	901	876	190	110	1177	3432
5.	Large	1196	243	1439	589	239	105	934	930	198	148	1276	3649
6.	Average	1173	158	1331	584	237	76.8	899	886	185	110	1181	3411

performed by the family members. Hence, expenditure involved in labour charges is net income of family labour itself. Labour charges found to next the highest interms of absolute as well as on percentage base in small size group as compared to other groups.

Economics of milk production

The data on total cost of production of milk and total receipt from milk production is base for economy of milk production per milch animal per year shows in the table 4 The average milk production per milch animal found to 1258 liter per year and it differentiate between the size groups respectively. Average milk production per milch animal in marginal size group (1210 liter per annum) is not only lowest than other groups but it increases with increase in size groups respectively. This is due to efficiency of larger units of farmers. This high milk production per milch animal with larger size group is also due to the fact that the units included in this group gave proper attention, care and supervision towards animals due to sufficient time and limited number of animal with them. With the data on total costs and milk production per milch animal, the average selling price per liter of milk found to ‾ 15. The selling price by different milch animals group farmers as marginal, small, semi-medium, medium and large found no significant different. Hence, on overall average bases the selling price of 1 liter milk considered as average ‾ 15 only. In addition analysis of benefit cost ratio (B.C. Ratio) found to decrease with the increase in the size group. That means it was highest 1.70 in case of marginal group followed by the lowest 1.58 with large group respectively.

Expenses on feeds and fodder

Feeding of animals depends on availability of feeds and fodder and the depth to which the unit considers these on business principles. The details are given in table 5. The costs for various feed and fodders in different seasons of a year are found variation which found to ‾ 3230 per annum in marginal farm followed by ‾ 3649 in large group respectively. It is higher in large units per

animal per annum. The cost on feed and fodder increase with increase in size group but it is nominal and due to better and more care taken by medium and large groups respectively.

Conclusion

Total cost per milch animal per year for milk production was highest in large size group (‾ 10391) and the lowest was (‾ 8562) in marginal group respectively. It is well concluded that the size of groups among the milk production is quite favorable for smaller size group due to lower cost incurred per milch animal and efficient working of larger size group. But milk production per annum was higher in case of larger group respectively. All the inputs were underutilized compared with the optimal values except human labour use in small farms. Hence, farmers can improve the milk yield by additional use of the inputs.

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