



Management of Farm Resource: A Micro-Level Analysis

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ABSTRACT: The paper examines the management of farm (land) resource on the basis of primary data sourced from Shahtalai Valley of Bilaspur district of Himachal Pradesh for the agriculture year 2014-15. A sample of 120 cultivating households was selected for the analysis. The study reveals that there was an inverse relationship between farm size and productivity. Whereas a positive relationship was found between the cost of cultivation and gross returns. The farmers were enjoying increasing returns to scale i.e., productivity is greater than one in relative terms. The highest returns per rupee invested were found in the maize crop followed by wheat and paddy crop. The inverse relationship was found between the output/input ratio and the size of the farm. The study further shows that the intensity of cropping was decreasing with the size of the farm. This reveals that marginal farmers were utilizing their resource (land) relatively more intensively as compared to small and medium farmers. The returns per rupee invested were estimated high in marginal farmers followed by small and medium farmers. It shows that marginal farmers were using their land resource more efficiently than small and medium farmers. The study also reveals that the cost ratio could be reduced by increasing the production by better allocation of variable resources on the farm/land. The farm business income and returns to family labour and management to the net returns indicate rational use of both family labour and owned capital invested on land.

Keywords: Resource, Shahtalai, Farm Size, Productivity, Output/Input, Marginal, Farm/Land, Business, Capital, Cost-Ratio

I. INTRODUCTION:

Management is the process by which the execution of a given purpose is put into operation and supervised. The combined output of various types of human efforts by which the process is affected is also known as management. The

combination of persons who together put forth efforts in any given enterprise is called the management of an enterprise. The management function has occupied an important place in the economic framework. The main function of the manager (farmer) is to maintain efficiency and maximize output within limited resources. Farm management deals with the problems of resource allocation in the agricultural sector and measures the economic efficiency of the farm. It helps the farmer to decide; what to produce? How to produce? How much of each commodity/ crop to produce and when buy and sell? Farm management is generally considered to fall in the field of microeconomics. It deals with the allocation of resources at the level of an individual farm while in the way concerned with the problems of resource allocation in the agricultural sector and even in the economy as a whole. It covers the aspects of farm business which have a bearing on the economic efficiency of the farm. The present paper deals with the farm management of different farm sizes of Shahtalai Valley in Bilaspur District of Himachal Pradesh. A sample of 120 cultivating households was selected for the analysis. The data was pertaining to the year 2014-15. The cost of cultivation was estimated on the basis of standard concepts of cropping pattern, cropping intensity, gross returns, output/ input ratio, gross cost ratio, returns to family labour and management and different costs i.e. Cost A₁, Cost B and Cost C.

CROPPING PATTERN:

The study of cropping patterns is one of the important indicators for measuring the efficient use of farmland. The cropping pattern deals with the nature of crops grown and the percentage of area under each crop. A change in cropping pattern means a change in the proportion of area under different crops. The cropping pattern is determined by natural factors like climate, soil condition, rainfall etc. The economic studies on cropping



patterns normally emphasize two important characteristics of agricultural land i.e. its heterogeneity and the possibility of crop substitution. Heterogeneity arises from the agro-climatic condition of the particular area, which includes the type of soil, temperature and rainfall. The irrigation facilities also contribute to land heterogeneity. Cropping pattern studies reveal the possibility of crop substitution and, assume special importance to the crop that could be grown within that environment. The size of cultivated holding, market situations and prices are other important factors for determining the cropping pattern. Table

1.1 shows the cropping pattern of the sampled farmers. It may be observed from the table that the cereal crops dominated the gross cropped area. In overall farm size maize, paddy and wheat were the major crops accounting for 28.90 per cent, 18.14 per cent and 49.24 per cent of the gross cropped area respectability. It is clear from the table that the highest area falls under wheat followed by maize and paddy. As far as farm size-wise analysis is concerned, it is evident from the table that the area under maize, paddy and wheat was positively related to the size of the farm.

Table 1.1 Cropping Pattern of the Sampled Farmers
(In percentage)

Crops	Marginal	Small	Medium	Overall
Kharif				
Maize	28.74			28.90
Paddy	20.51	17.46	17.89	18.14
Soybean	00.30	00.90	01.10	00.92
Cheri	00.28	02.56	01.76	01.73
Mash	00.10	00.18	00.40	00.28
Sub Total	49.93	49.97	49.97	49.97
Ravi				
Wheat	48.22			49.24
Barley	00.55	00.25	00.17	00.25
Berseem	01.11	00.34	00.21	00.38
Peas	00.06	00.07	00.06	00.06
Mustard	00.13	00.06	00.05	00.07
Maser		00.04	00.03	00.03
Sub Total	50.97	50.03	50.03	50.03
Gross cropped area (hectare)	53.09	118.11	192.28	363.48

Source: Field Survey

CROPPING INTENSITY:

Cropping intensity is the ratio of gross area sown to the net area sown expressed in percentage. This measure gives an idea about the extent of multiple cropping taking place on a farm. It is an important indicator for measuring production efficiency. Higher cropping intensity means farmers utilize their land more efficiently and maximize production per unit of time. The cropping intensity of sampled farmers is given in table 1.2. It can be

observed from the table that the cropping intensity of overall farm size was estimated at 200.13 per cent. Whereas the cropping intensity of marginal, small and medium farmers was observed at 200.26, 200.12 and 200.10 per cent respectively. It is clear from the table that the intensity of cropping was decreasing with the size of the farm. This reveals that the marginal farmers utilized their resource (land) relatively more intensively as compared to small and medium farmers.



Table 1.2 Net Cultivated Area, Gross Cropped Area and Intensity of Cropping of Sampled Farmers
(Area in Hectare)

Farm size	Net cultivated area	Gross cropped area	Cropping Intensity (in per cent)
Marginal	26.51	53.09	200.26
Small	59.02	118.11	200.12
Medium	96.09	192.28	200.10
Overall	181.62	363.48	200.13

Source: Field Survey

PRODUCTIVITY:

The productivity of land is very important for many reasons; it provides food for the growing population and affects the region's growth. An increase in the region's productivity means more efficient use of scarce resource i.e. land Table 1.3 depicts the productivity of sampled farmers in the cultivation of major crops. The highest productivity was found in wheat followed by maize and paddy in overall farm size as well as across the farm sizes. It is evident from the table that the per hectare productivity of maize, paddy and wheat in overall farm size was estimated at 2180 Kgs, 1877 Kgs and

2262 Kgs respectively. It can also be observed from the table that per hectare productivity of major crops was decreasing with the size of the holding. In the cultivation of maize, it was decreased from 2408Kgs of marginal farmers to 2237Kgs of small farmers to 2083Kgs of medium farmers while in the cultivation of paddy it was decreased from 1976Kgs to 1904Kgs to 1830Kgs of marginal, small and medium farmers respectively. However, the productivity of wheat decreased from 2410Kgs in the category of marginal farmers to 2318Kgs in small farmers and 2184Kgs in the category of medium farmers.

Table 1.3 Productivity of Sampled Farmers in the Cultivation of Major Crops
(Kilogram per Hectare)

Farm size	Maize	paddy	wheat
Marginal	2408	1976	2410
Small	2237	1904	2318
Medium	2083	1830	2184
Overall	2180	1877	2262

Source: Field Survey

GROSS RETURNS:

The farm is a multi-product firm. So it may also be desirable to know how are the resources being used in the production of different crops and how are being rewarded. The measures of farm efficiency help to know whether there is any scope for improvement in the use of farm resources on the farm or in certain farm operations or across the farm sizes. This measure shows the size and volume of farm business and can be used for comparing the performance of farmers under similar farm situations and under different farm sizes as well. Table 1.4 shows per hectare gross returns of sampled farmers in the cultivation of major crops. It

may be observed from the table that the gross returns of all the crops together were estimated Rs. 47062/- in marginal farmers, Rs. 44879/- in small farmers and Rs 42513/- in medium farmers. However, in overall farm size gross returns were estimated Rs. 34880/-, Rs. 56310/- and Rs. 40716/- in the production of maize paddy and wheat respectively. The inverse relationship was found between gross returns and farm size. As far as the crop-wise analysis is concerned, it is clear from the table that the highest per hectare gross returns were obtained in paddy followed by wheat and maize in overall farm size and also across the farm sizes.



Table 1.4 Gross Returns of Sampled Farmers in the Cultivation of Major Crops
(Rupees per Hectare)

Farm size	Maize	Paddy	Wheat	All
Marginal	38528	59280	43380	47062
Small	35792	57120	41724	44879
Medium	33328	54900	39312	42513
Overall	34880	56310	40716	43969

Source: Field Survey

COST OF CULTIVATION:

The analysis of cost and returns is imperative for the formulation of a production plan as well as a price policy. The cost data also guide the producer/farmer about, which commodity is more economical to produce. It facilitates the study of the efficiency of various cultivation practices and assists in altering crop plans by providing information regarding their profitability. It also helps to formulate effective farm planning. Per hectare inputs used in the cultivation of major crops by the sampled farmers were estimated in table 1.5, which indicates that per hectare average total cost i.e. Cost C of maize in overall farm size was estimated Rs. 26831/-. The single largest item in cost was observed imputed value of family labour, followed by the rental value of land, fertilizers, manures and tractor charges. The cost A₁, Cost B and Cost C of overall farm size show the inverse

relationship with the size of the farm. None of the farmers was reported to use the insecticides/pesticides for weed control because they undertake it manually for feeding their livestock. While per hectare average total cost of paddy in overall farm size was found Rs. 48128/-. As far as farm size-wise analysis is concerned the table indicated that per hectare average cost was found high in marginal farmers followed by small and medium farmers in the production of major cereal crops. It may be observed from the table that the marginal farmers were using more quantity of farm yard manures and fertilizers as compared to small and medium farmers. The inverse relationship was found between farm size and total cost i.e. cost C. the highest average total cost was found in paddy followed by wheat and maize both in overall farm size and under different farm sizes.

Table 1.5 Per Hectare Input Use in the Cultivation of Major Crops by Sampled Farmers
(In Percentage)

Cost Item	Marginal			Small			Medium			Overall		
	Maize	Paddy	Wheat	Maize	Paddy	Wheat	Maize	Paddy	Wheat	Maize	Paddy	Wheat
Hired human labour	00.42	00.35	---	00.42	00.63	00.24	00.43	01.00	00.58	00.42	00.73	00.39
Bullock labour	10.24	09.49	07.26	08.74	08.72	06.99	08.00	07.67	06.87	08.59	08.27	06.97
Seed	00.88	02.71	06.74	00.85	02.5	06.55	00.88	02.62	06.74	00.87	02.59	06.67
Farmyard Manure	12.63	04.91	12.51	12.36	04.54	11.80	11.13	04.24	10.95	11.77	04.57	11.48
Fertilizers	13.30	05.12	09.78	13.07	04.58	09.82	12.33	04.10	09.26	12.72	04.36	09.52
Insecticide pesticides	--	0.3.85	-	--	03.70	--	--	04.10	--	--	03.87	--
Threshing	03.53	01.56	08.70	02.95	01.57	08.49	03.37	02.01	08.28	03.26	01.77	08.41
Tractor charges	09.23	10.42	07.57	10.27	11.36	08.49	11.67	12.13	09.76	10.83	11.42	09.02
Depreciation	00.63	00.61	00.57	00.71	00.66	00.62	00.78	00.70	00.67	00.73	00.66	00.64
Land revenue	00.07	00.13	00.09	00.07	00.13	00.11	00.08	00.14	00.10	00.08	00.13	00.10
Interest in working capital	01.50	01.14	01.57	01.46	01.13	01.57	01.44	01.13	01.57	01.46	01.12	01.57
Cost A ₁	15188	19729	18283	14014	18816	18107	12946	18694	18133	13717	19006	17834
The rental value of land	17.13	17.16	18.13	16.76	17.04	17.69	16.53	16.66	17.26	16.70	17.76	17.54



Interest in fixed capital	02.06	01.96	02.00	02.62	02.44	12.43	02.85	02.55	02.64	02.65	02.43	02.47
Cost B	20747	29096	25000	19349	28094	24769	17953	27708	24721	18949	28723	24352
Inputted value of family labour	28.30	40.61	25.08	29.72	40.99	25.20	30.51	40.95	25.32	29.92	40.32	25.24
Cost C (Rupees)	28968	48992	33369	27532	47600	33114	25836	46923	33102	26831	48128	32573

Source: Field Survey

OUTPUT/ INPUT RATIO:

In any enterprise, a question is bound to come up how far are the efforts put being rewarded in terms of output/ returns? The measures of the relationship between efforts and returns are necessary to know whether the efforts are being adequately rewarded or not? It can be observed from table 1.6 that per unit output over expenditure on inputs was more than unity in the production of all the major crops in overall farm size and under different farm sizes as well. This reveals that farmers of the study area were enjoying increasing returns to scale i.e. productivity is greater than one

in relative terms. It is also clear from the table that returns, per rupee invested was estimated high in marginal farmers followed by small and medium farmers. The highest returns per rupee invested were found in maize followed by wheat and paddy. It is clear from the table that the output/ input ratio of all the crops together of marginal, small and medium farmers was found at 1:1.29, 1:1.26, and 1:1.24 respectively. The output/ input ratios in overall farm size in the cultivation of maize crops were estimated at 1:1.30, in paddy at 1:1.17 and in wheat, it was estimated at 1:1.25. The inverse relationship was found between the output/ input ratio and farm size.

Table 1.6 Output/ Input Ratios of Sampled Farmers in the Cultivation of Major Crops

Farm size	Maize	Paddy	Wheat	All
Marginal	1:1.33	1:1.21	1:1.30	1:1.29
Small	1:1.30	1:1.20	1:1.26	1:1.26
Medium	1:1.29	1:1.17	1:1.23	1:1.24
Overall	1:1.30	1:1.17	1:1.25	1:1.25

Source: Field Survey

Table 1.7 indicates the gross cost ratios of sampled farmers. It is evident from the table that gross cost ratios in overall farm size were estimated at 0.76 in the cultivation of maize, 0.85 in paddy and 0.80 in the cultivation of wheat. While taking all the crops together, the gross cost ratio was observed at 0.79 in marginal farmers, 0.80 in small farmers and 0.83 in medium farmers. A positive relationship was found

between gross cost ratios and the size of the farm and the same trend was found in the cultivation of maize and wheat crops. The gross cost ratio was found low in maize and paddy in overall farm size and under different farm sizes. The gross cost ratios can be reduced by increasing production and by better allocation of variable resources.

Table 1.7 Gross Cost Ratios of the Sampled Farmers

Farm size	Maize	Paddy	Wheat	All
Marginal	0.75	0.83	0.77	0.79
Small	0.77	0.83	0.81	0.80
Medium	0.78	0.85	0.84	0.83
Overall	0.76	0.85	0.80	0.82

Source: Field Survey

Table 1.8 shows the ratios of farm business income and returns to family labour and management to net returns of the sampled farmers. This ratio may be taken as a measure of efficiency in the use of family labour and own capital

resources on the farm. The low ratio of farm business income and returns to family labour and management to the net returns indicate rational use of both family labour and own capital invested on land. It is evident from the table that there was an



inverse relationship between the rational use of own resources and the size of the farm. It may be observed from the table that the ratio of farm business income to net returns from the cultivation of maize, paddy and wheat in overall farm size was estimated at 1.67, 2.32 and 2.19 respectively. While in the crops together this ratio was estimated at 1.78 in marginal farmers, 1.93 in small farmers and 2.29

in medium farmers. However, the ratio of returns to family labour and management to net returns in overall farm size was estimated at 1.35 in maize, 1.55 in paddy and 1.34 in wheat. It is clear from the table that the marginal farmers were making relatively more productive and rational use of their resources as compared to small and marginal farmers.

Table 1.8 Ratios of Firm Business Income and Returns to Family Labour and Management to Net Returns by Sampled Farmers

(Percent over cost C)

Farm size	Maize		Paddy		Wheat		All	
	Ratio of PBI to NR	Ratio of RFLM to NR	Ratio of PBI to NR	Ratio of RFLM to NR	Ratio of PBI to NR	Ratio of RFLM to NR	Ratio of PBI to NR	Ratio of RFLM to NR
Marginal	1.59	01.36	1.98	1.32	1.83	1.29	1.78	1.32
Small	1.70	01.34	1.98	1.49	2.10	1.33	1.93	1.39
Medium	1.73	01.33	2.34	1.50	2.92	1.45	2.29	1.43
Overall	1.67	01.35	2.32	1.55	2.19	1.34	2.09	1.41

Source: Field Survey

FBI: Farm Business Income, **NR:** Net Returns Over Cost C, **RFLM:** Return to Family Labour and Management

II. SUGGESTIONS:

It is suggested that State Government through regional research stations should undertake a comprehensive study of climatic and soil conditions along with biological and environmental implications. On the basis of such studies, improved strains should be recommended for a particular area, because simply sowing high-yielding varieties of seed hardly solves the complicated problem of, achieving a high productivity target. As a policy matter, the best type of improved varieties of seeds should be recommended. Much attention should be paid to extension work and demonstrations to induce peasants to take up this programme seriously. It should be the responsibility of the regional research station to evolve improved strains of crops for the region. The farmers should have proper guidance from extension officials regarding the time of sowing/ transplanting, fertilizing/ manuring, insecticides and pesticides (time and quantity) and cultural practices as the level of productivity are determined by these factors.

It is well recognised that fertilizer use and irrigation facilities have a positive correlation. In unirrigated areas, fertilized crop fields show higher productivity as compared to unfertilized crops. It is suggested that the effective promotion of chemical fertilizers can be done with technical studies like soil tests to determine the quantum of different types

of fertilizers needed under specific conditions. Soil test summaries and regional research stations should prepare soil fertility maps of each village. Extension officials must educate the farmers about those nutrients, which are deficient in their fields and soil. These soil surveys can also provide a strong foundation for the adoption of a scientific cropping pattern. The staff deputed to collect soil samples should also collect the information regarding those factors which influence fertilizer quantity such as moisture regime, fields' slope, the texture of the soil, variety of crops along with soil tests to arrive at a good fertilizer recommendation. The cultivators should have proper knowledge from extension officials regarding the balanced use of nutrients and the right time of fertilizer (NPK) application. The adoption of recommended practices would increase the efficiency of fertilizer use and raise the return on it. The use of fertilizer depends on whether adequate fertilizers are available at the desired place, time and quality of nitrogen, phosphorus and potash.

A good proportion of the fertilizing ingredients contained in the farm yard manure are allowed to go to waste through improper handling, with the result that farm yard manure prepared by the farmers is of reduced value in increasing crop production. It is suggested that the methods like dry earth boxes, loose boxes, and manure pits affect the maximum conservation of both urine and dung in a



thorough state of decomposition, intermixed with straw and dry earth by practice. The cultivation of green manuring crops must be developed. The village extension workers must popularise these methods among cultivators.

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