Original Research Article

Study of the Farm Structure, Cropping Pattern and Cropping Intensity, on Maize Growing Sample Farm in Bahraich District of Uttar Pradesh, India

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A B S T R A C T

A sample study on farm structure, cropping pattern and cropping intensity was conducted in Tejwapur block of Bahraich district of U.P. One hundred sample respondents were selected through purposive cum proportionate random sampling technique and categorized as marginal, small and medium size of holding. Data were collected through survey and tabular analysis was done to present the result more than 50% of the sample farmers were found from marginal categories where as 48% come under small and medium size of farms. Per farm investment was inversely related with size of holding. The rice, wheat and maize, and sugarcane were the main crops of cropping pattern, cropping intensity was highest on marginal farms followed by small and medium size of farms. It shows that marginal farmers were more attentive about better utilization of their tinny land holding.

Introduction

Maize is a one of the most important cereal crop in the world agricultural economy both as food for man and feed for animals. It is a miracle crop having high yield potential. There is no cereal on the earth which has so immense potentiality and that is why it is called 'Queen of Cereals'. Maize is the only cereal which can be grown throughout the year in all three season of kharif, rabi and zaid.

Maize crop is utilized in many ways like other grain crop. Over 85% of maize produced in the country consumed as human food. Several food dishes including 'Chapattis' are prepared out of maize flour and grains. Green cobs are roasted and eaten by people with great interest. The special variety called 'Popcorn' the grains of which are converted into the popped form which is the favorite's food for children's in cities. It is also a good source of feed and fodder for cattle, Poultry and piggery. The green fodder can be fed to milch cattle to boost the milk production to a considerable extent; "South African Maize" is a best suited variety for fodder. The crop has to be harvested when the grains are in milky stage, this variety is supposed to have Lactogenic effect hence especially suited for milch cattle. The digestibility of maize fodder

is higher than sorghum, bajra and other non-leguminous forage crops. Maize plant does not have any problem of poisoning due to hydrocyanic acid, hence if necessary crop can be harvested and fed to cattle at any stage of its growth.

The high carotene content of yellow maize is considered to be very useful in importing yellow colour to egg yok and yellow tinge to the milk. No other concentrate is yet known to substitute maize in this respect.

Maize stand on second place among all the kharif crops after rice, and on third place after rice and wheat among the food grown crops. Seeing the importance of the crop, it seems necessary to study position of maize crop among other cereals and its suitability at farmers' field.

For the purpose a study of farm structure, cropping pattern and cropping intensity in Bahraich District was conducted with the following specific objectives:

To study the distribution of cultivable land in study area.

To study the per farm and per hectare investment on different size of sample farms.

To study the cropping pattern and cropping intensity, on the different size of sample farms.

Materials and Methods

Sampling Technique

Purposive cum random sampling techniqe was used to select the 100 respondents, from 5 villages of Tejwapur block of Bahraich district. For the further study all selected sample farmers were grouped in three categories of marginal, small and medium. To justify the representation of all category of farmers' proportionate random sampling technique was applied.

Analytical tools

The data collected from the sample farmers through personal interview with the help of pre structured scheduled were analysed and estimated with certain statistical technique like:

Average

The simplest and important measures of average which have been used into statistical analysis were the simple mean and weighted average. The formula used to estimate the average is:

$$\bar{X} = \frac{\sum X}{N}$$

$$W.A. = \frac{\sum W_i X_i}{\sum W_i}$$

Where,

W. A. = Weighted average
X_i = Variable
W_i = Weights of X_i

Cropping intensity

The intensity of cropping refers to the number of crops grown on a farm during the year with land as a fixed resource. It is calculated as:

$$C.I. = \frac{\text{Gross cropped area (ha)}}{\text{Net cultivated area (ha)}} \times 100$$

Results and Discussion

The result of the presents study as well as relevant discussion has been presented under following sub heads:

Average holding size on sample farms

Land is the most important resources from the stand point of crop production. The details of land holding on different size group of sample farms are given in Table: 1. It is revealed from the table that the average size of holding of marginal, small, and medium, farms were found 0.745, 1.440, and 2.613 hectares respectively, and on an overall average size of land holding was estimated as 1.231 hectare.

Distribution of cultivated land owned by different size group of sample farms revealed that 31.46 per cent of cultivated land was owned by 52.00 per cent of sample farm belong to marginal category.

Whereas 40.94 and 27.60 per cent of this area were owned by 35.00 and 13.00 per cent of small and medium size group of farms. It show that land and human labour combination on sample farm are not appropriate.

Farm asset structure on sample farms

Per farm investment on sample farms

The structure of farm resources refers to their distribution in different group according to farming system with the different level of mechanization. The success of farming mostly depends on the availability of fixed capital on the farm. The type of enterprises and system of farming is influenced by the availability of capital. Thus the fixed capital is an important factor of production, which varies from, farm to farm depending upon size of business. Per farm investment on farm structure is presented in Table: 2. it is evident from this table that major components of farm asset structure are Buildings, live-stocks and Machinery and implements which constituted 63.50 per cent, 10.14 per cent and 26.36 per cent of total asset value respectively on the basis of overall average.

Per farm investment on buildings, machinery and implements, and on livestock came to Rs. 300080.00, Rs. 47943.18 and Rs. 124572.40 respectively.

It is revealed from the table that per farm investment on farm structure was highest on medium size group of farm i.e. Rs. 799670.98 followed by small and marginal size group of farms which faced the money value of Rs.569846.46 and Rs. 325369.41 respectively.

It is concluded that per farm investment on sample farm were of direct relationship with size of holding.

Whereas component wise investment on marginal small and medium farm did not show any definite trend.

Per hectare investment on different size group of farms

Investment on different size group of farm on per hectare basis is presented in Table-3.

On an overall average per hectare investment was found Rs. 383911.90, which was recorded higher on marginal farms Rs. 436737.50, followed by small Rs. 395726.70 and was lowest on medium farms i.e. 306035.60 respectively. It may be concluded that per hectare investment on farm assets at different size group of farms had inverse relation with holding size.

Cropping pattern

Cropping pattern presents the area devoted to the various crop during the given period, conventionally in a single year. It indicates the yearly sequence and arrangement of crops grown by farmer as per need of farms, consumption etc. Information regarding cropping pattern are presented in Table: 4.

Table.1 Average size of holding on different size group of sample farms (ha).

Sl. No.	Size groups of farmers	No. of farmers	Net cultivated area	Average size of farms
1.	Marginal	52	38.742 (31.46)	0.745
2.	Small	35	50.407 (40.94)	1.440
3.	Medium	13	33.984 (27.60)	2.613
Grand Total		100	123.133 (100)	1.231*

(Figures in parentheses indicate percentage to total.)

Table.2 Per farm investment on different size group of sample farms (Rs.)

S. No.	Particulars	Size of farms			
		Marginal	**Small**	**Medium**	**Overall average**
1.	**Buildings**	**207721.15 (63.84)**	**349699.98 (61.37)**	**535923.07 (67.02)**	**300080.00 (63.50)**
I.	Residential	194865.39 (59.89)	336199.99 (59.00)	520461.53 (65.08)	286660.00 (60.66)
II.	Cattle shed	12855.76 (3.95)	13499.99 (2.37)	15461.54 (1.93)	13419.99 (2.83)
2.	**Live stock**	**45082.67 (13.86)**	**47857.70 (8.40)**	**59615.38 (7.45)**	**47943.18 (10.14)**
I.	Milch Animals	44980.75 (13.83)	47759.99 (8.38)	59615.38 (7.45)	47855.99 (10.12)
II.	Poultry	**101.92 (0.03)**	**97.71 (0.02)**	**00.00 (00.00)**	**87.19 (0.02)**
3.	**Machinery and Implements**	**72565.59 (22.30)**	**172288.78 (30.23)**	**204132.53 (25.53)**	**124572.40 (26.36)**
I.	**Minor Implements**	365.37 (0.11)	415.99 (0.07)	491.35 (0.06)	399.46 (0.09)
II.	**Major Implements**	72200.22 (22.19)	171872.79 (30.16)	203641.18 (25.47)	124172.90 (26.27)
4.	**Grand total**	**325369.41 (100)**	**569846.46 (100)**	**799670.98 (100)**	**472595.6 (100)**

(Figures in parentheses indicate percentage to total.)

Table.3 Per hectare investment on different size group of sample farms (Rs.)

S. No.	Particulars	Size of farms			
		Marginal	**Small**	**Medium**	**Overall average**
1.	**Buildings**	278820.30 (63.84)	242847.20 (61.37)	205098.80 (67.02)	243769.30 63.50)
2.	**Live stock**	60513.65 (13.86)	33234.51 (8.40)	22814.92 (7.45)	38946.53 (10.14)
A.	**Milch Animals**	60376.85 (13.83)	33166.66 (8.38)	22814.92 (7.45)	38875.70 (10.13)
B.	**Poultry**	136.81 (0.03)	67.85 (0.02)	00.00 (00.00)	79.96 (0.02)
3.	**Machinery and Implements**	97403.48 (22.30)	119645.00 (30.23)	78121.90 (25.53)	101196.10 (26.36)
A.	**Minor Implements**	490.43 (0.11)	288.88 (0.07)	188.04 (0.06)	324.50 (0.09)
B.	**Major Implements**	96913.05 (22.19)	119356.10 (30.16)	77933.86 (25.47)	100871.60 (26.27)
5.	**Grand total**	436737.50 (100)	395726.70 (100)	306035.60 (100)	383911.90 (100)

Table.4 Cropping pattern under different size group of sample farms (ha)

Sl. No.	Crop	Average size of sample farms			Overall Average
		Marginal	**Small**	**Medium**	
A.	**Kharif**	**0.745 (48.82)**	**1.392 (49.47)**	**2.536 (52.03)**	**1.204 (49.93)**
1.	Paddy	0.346 (22.67)	0.512 (18.19)	1.127 (23.12)	0.506 (20.96)
2.	Maize	0.204 (13.37)	0.499 (17.74)	0.720 (14.77)	0.374 (15.53)
3.	P. Pea	0.039 (2.56)	0.053 (1.88)	0.098 (2.01)	0.052 (2.14)
4.	Banana	0.116 (7.60)	0.240 (8.53)	0.439 (9.01)	0.201 (8.35)
5.	Chari	0.015 (0.98)	0.038 (1.35)	0.100 (2.05)	0.034 (1.41)
6.	Vegetable	0.025 (1.64)	0.050 (1.78)	0.052 (1.07)	0.037 (1.54)
B.	**Rabi**	**0.590 (38.66)**	**1.096 (38.95)**	**1.941 (39.82)**	**0.943 (39.08)**
1.	Wheat	0.346 (22.67)	0.509 (18.09)	1.127 (23.12)	0.505 (20.92)
2.	Mustard	0.156 (10.22)	0.334 (11.87)	0.389 (7.98)	0.249 (10.31)
3.	Lentil	0.048 (3.15)	0.107 (3.80)	0.191 (3.92)	0.087 (3.61)
4.	Pea	0.00 (0.00)	0.068 (2.42)	0.142 (2.91)	0.042 (1.75)
5.	Berseem	0.015 (0.98)	0.038 (1.35)	0.040 (0.82)	0.026 (1.09)
6.	Vegetable	0.025 (1.64)	0.040 (1.42)	0.052 (1.07)	0.034 (1.40)
C.	**Zaid**	**0.191 (12.52)**	**0.326 (11.58)**	**0.397 (8.15)**	**0.256 (10.99)**
1.	Urd	0.074 (4.85)	0.121 (4.30)	0.100 (2.05)	0.094 (3.89)
2.	Sugarcane	0.082 (5.37)	0.160 (5.68)	0.248 (5.09)	0.131 (5.43)
3.	Chari	0.010 (0.66)	0.022 (0.78)	0.027 (0.56)	0.016 (0.68)
4.	Vegetable	0.025 (1.64)	0.023 (0.82)	0.022 (0.45)	0.024 (0.99)
Total (A+B+C)		1.526 (100)	2.814 (100)	4.874 (100)	2.412 (100)

(Figures in parentheses indicate the percentage to the total cropped area.)

Table.5 Cropping intensity on different size group of sample farms

S. No.	Size group of farms	No. of farms	Net Cultivated area (ha)	Gross Cropped area (ha)	Cropping intensity (%)
1.	Marginal(below1ha)	52	0.745	1.526	204.83
2.	Small(1-2 ha)	35	1.440	2.804	195.42
3.	Medium(2-4 ha)	13	2.613	4.874	186.53
	Overall Average	100	1.231	2.412	195.93*

It is depicted from the Table: 4 that on an average the highest area was covered under paddy 20.96 per cent followed by wheat 20.92 per cent, maize 15.53 per cent, mustard 10.31 per cent, banana 8.35 per cent, sugarcane 5.43 per cent, vegetable 3.93 per cent, urd 3.89 per cent, lentil 3.61 per cent, pigeon pea 2.14 per cent, chari 2.09 per cent, pea 1.75 per cent, berseem 1.40 per cent of total cropped area on sample farm. Maize crop was allotted a considerable area by the sample farmer after two major food grain crops i.e. paddy and wheat.

The gross cultivated area was higher (49.93 %) in the kharif followed by rabi season (39.08) and that is minimum in the Zaid season (10.99) on all farm situations.

Maize as an important food grain crop have occupied 15.53 per cent of gross cropped area on over all farm which was alloted with the area as 17.74 per cent on small farms 14.77 per cent on medium farms and 13.37 per cent on marginal farms respectively of their total cultivated area. It may be concluded that maize have been accepted as an impotant unit of the cropping system by all categories of the sample farmers.

Cropping intensity

The details of cropping intensity are given in the Table 5. It is revealed from the Table: 5 reveals that the overall average cropping intensity on sample farms was 195.93 per cent which was found highest on marginal farms 204.83 per cent followed by small 195.42 per cent, and medium 186.53 per cent respectively. Cropping intensity was inversely related to size of farms. Highest cropping intensity on marginal sample form supported the engagement of family labour in their own crop production on keeping in view the better utilization of their tinny land holding.

Farm structure, cropping pattern and cropping intensity at any farm engaged in crop production enterprises are inevitable feature and are directly related with socio-economic development of the farm family. Because farm structure helps to fallow the cropping pattern constitute by various cash crop and also offer the better employment opportunity to the family members.

The per unit of area and time as well as farm enterprises on overall average achieve the better position in direction of profit maximization in the light of cropping pattern. Along with cropping intensity presents the real picture of crop rotation, and cropping schemes adopted by a practicing farmers. It indicates, if there is any possibility to change the combination of farm resources or various products, to maximise the net farm income.

This study shows that majority of the farmers come under marginal category (52%). Less than fifty percent of the farmers constitute the small and medium categories of the sample respondents.

At second step per farm and per hectare investment on different size group of farms were studied. Three major components *i.e.* farm building, machinery & implements and livestocks were considered. It was found that maximum investment was done on the farm building followed by machinery implements and livestock. On overall farm per farm investment was positively related with holding size but per hectare investment was inversely related. In the cropping pattern rice in kharif, wheat in rabi and sugarcane in zaid season stood on first rank among all the crops. Overall it was found that among all the crops maize stands on third after rice and wheat. Cropping intensity was highest on marginal farms followed by small and medium size of farms.

Thus it is concluded that marginal size group of farmers were more aware about their efficient crop production on limited land holding. As they invest maximum amount on farm structure per unit of area their cropping intensity was also highest.

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