



STATUS OF INPUT USE IN VARIED CROPS ACROSS FARM- SIZE IN BHOPAL DISTRICT

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Abstract: This paper explores the status of input use in varied crops across farm-size in Bhopal District. The study is based on primary- data (2021-22). The status of Input use in varied crops comprises of labour use, machine-use, fertilizer- use, seed-use, irrigation-use and farm yard manure use. As the small and marginal farmers used more labours as compared to other farmers they used their own family members as labours because they cannot afford. They receive less profitability because they are not aware from the Government Schemes. Large farmers use less labours by using new technological machines, used for sowing, cultivation and for irrigation purposes.

Keywords: Input, crops, farm-size, Bhopal District

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Introduction

As the Indian context, the agriculture sector is the predominant source for occupation of enormous number of peoples. Workforce dependency on agriculture in Madhya Pradesh was also observed (60.59 % of total workforce) very high (Singh *et al.*, 2020). Even the productivity of the state agriculture is still low (Singh *et al.*, 2018) and the regional disparity also existed (Singh *et al.*, 2019; Singh, Singh & Yadav, 2021). With such adverse circumstances, Madhya Pradesh is the only State who ranks first regarding production of Soyabean, gram, urad, tur, masoor, linseed and 2nd in the production of maize, sesame, moong and third in the production of wheat, sorghum, barley in rabi season. 72% of the rural population is dependent on agriculture. Before independence the agricultural production and productivity was not good it was due to worse rate of return on factor of production which leads to poor infrastructure, lower use of modern technology but after independence the reverse was the condition it

was due to green revolution that not only helps in removing poverty but also increasing the farm size productivity Punjab, Haryana, Uttar Pradesh, West Bengal took the best advantage of Green revolution but some States lagging behind Madhya Pradesh was among them. No doubt the state performed the outstanding growth during the last two decades in Agricultural production and productivity

G R Saini (1969) According to Saini Indian agriculture is characterized by constant returns to scale the more the output per acre more will be the input of labour. Saini (1971) the inverse relationship between farm size and productivity is a confirmed phenomenon in Indian agriculture. (Krishna Bharadwaj 1974) according to him it is the relationship between utilization of inputs and farm size which leads to unequal and diverse nature of market involvement of different groups of peasants.) Small farmers can compete with large farmers for this modern technology is not only responsible (G.K Chadha 1978). Farm size is the main factor which determines the land productivity the main purpose is to identify the relationship between farm size and the yield per hectare (pol Barbier 1984).

S Mahendra (1991), The Author evaluates the properties of poor yielding Districts and non-poor yielding Districts to bring out the limits on agricultural productivity. Status of Input use in varied crops across farm-size in Bhopal District comprises of labour use, machine-use, fertilizer- use, seed-use, irrigation use and farm-yard manure use. Small and marginal farmers use more labours for cultivation of crops as compared to semi-medium, medium and large farmers. Productivity of small and marginal farmers is more in some crops while as profitability is less as compared to other farmers. Because small farmers used their own family members as labours while large farmers use more machines and other equipment's for cultivation. As cotton, gram and maize are labour intensive crops Rapeseed, mustard and wheat such crops use more working hours as compared to other crops. While for irrigation use marginal farmers take no working hours for cultivation of cotton, semi-medium and large farmers take more working hours for irrigation use in cotton crop. Use of irrigation in gram among marginal and large farmers is more as compared to other farmers. Use of irrigation in masur among small farmers is more as compared to other farmers, irrigation use in rapeseed and mustard among semi medium and medium farmers is more as compared to other farmers. In cultivation of wheat use of irrigation among marginal and semi medium farmers is more as compared to other farmers. Seed use in cultivation of gram among small and semi medium farmers is more as compared to other

farmers. Seed use in cultivation of soyabean among marginal and medium farmers is more as compared to other farmers. In cultivation of wheat seed use among marginal and small farmers is more as compared to other farmers. While in soyabean and urad crop there seems no use of irrigation, Wheat is the only crop where all farmers use more working hours for irrigation use as compared to other farmers. Farm yard manure use in varied crops show that in cultivation of cotton marginal and small farmers take no use of farm yard manure use, medium and large farmers take less use of farm yard manure use. In cultivation of gram marginal and small farmers take more use of farm yard manure use. Masur, rapeseed and mustard and wheat take no use of farm yard manure use.

Data and Methodology

The present study is based on primary data collected for the period of 2021-22 in Bhopal- District of Madhya Pradesh. The primary data collected for both inputs and output for the agriculture production. The study is based on input use in varied crops across farm- size. The inputs data consists of labour use, machine use, fertilizer use, seed use, irrigation use and farm yard manure use and high yield variety of seeds from the respondents directly a sufficiently large sample was taken, 300 farmers using stratified random sampling method), so as to draw authentic results, simple and relevant statistic technique is used to analyse the data to draw the conclusions. The data collected from various source will be transforming to make them comparable by the use of descriptive Statistics. This includes the calculation of percentage, ratios, indices etc.

Results and Discussion

During the period of 2021-22 it has been observed that cotton is labour intensive, in cultivation of gram marginal farmers take more working hours in labour use as compared to other farmers. In cultivation of maize marginal farmers take more working hours as compared to other land holding size groups.

It is clear from the Table (1) that small and semi medium farmers took more working hours of labour use in cultivation of masur as compared to other farmers.

In cultivation of masur small and semi medium farmers take more working hours of labour use as compared to other farmers. Small and semi medium farmers take more working hours in cultivation of masur as compared to other farmers. In cultivation of paddy marginal and small farmers take more working hours of labour use as compared to other farmers. while as marginal, small and

Table 1: Labor Use in varied crops across farm size Labor use (whr.\ ha)

Crop	Land Size Group					
	Marginal	Small	Semi-Medium	Medium	Large	All
Cotton	825.86	853.36	869.99	793.25	962.33	877.84
Gram(Bengal-Gram)	329.07	290.43	274.63	280.30	272.28	281.01
Maize	507.62	385.49	361.54	360.62	374.28	381.56
Masur (lentil)	246.91	273.09	267.01	255.77	256.57	258.61
Paddy	289.21	385.88	282.37	186.76	259.78	265.79
Rapeseed and mustard	288.68	272.20	282.42	249.42	249.91	260.35
Soyabean	237.45	240.65	242.00	222.64	208.34	224.96
Urad (Black gram	279.94	227.12	207.49	260.95	254.50	249.57
Wheat	314.32	308.76	330.32	272.52	278.86	294.93

Source: Estimates based on primary data (2021-22)

semi medium farmers take more working hours of labour use in cultivation of Rapeseed and mustard. For cultivation of soyabean small and semi medium farmers take more working hours of labour use as compared to other farmers. Marginal and medium farmers take more working hours in cultivation of urad as compared to other farmers. In cultivation of wheat marginal and semi medium farmers take more working hours in cultivation of wheat.

Table 2: Machine use in different crops across farm size Machine use (whr.\ ha)

Crop	Land Size Group					
	Marginal	Small	Semi-Medium	Medium	Large	All
Cotton	8.00	8.87	10.33	7.91	7.92	8.41
Gram(Bengal-Gram)	11.69	10.83	10.85	10.80	11.55	11.16
Maize	11.16	12.36	14.50	13.69	12.55	13.04
Masur (lentil)	9.63	10.36	10.59	10.79	9.78	10.22
Paddy	10.52	17.05	19.35	18.39	17.03	17.48
Rapeseed and mustard	12.77	21.00	13.72	14.06	15.26	14.58
Soyabean	11.12	11.24	12.04	11.64	11.86	11.69
Urad (Black gram	10.94	10.71	10.77	10.71	10.83	10.80
Wheat	14.12	14.33	15.42	14.32	14.86	14.68
All	12.29	12.57	13.30	12.58	12.98	12.82

Source: Estimates based on primary data (2021-22)

It is clear from the table 2 that in cultivation of cotton all land holding size groups takes less working hours of machine use. Marginal and large farmers take more working hours of machine use in cultivation of gram as compared to other farmers. For cultivation of maize semi medium and medium farmers take more working hours of machine use as compared to other farmers. Medium

and large farmers take more working hours of machine use in cultivation of paddy as compared to other farm size groups. Small and large farmers take more working hours of machine use in cultivation of Rapeseed and mustard as compared to other farmers, For cultivation of soyabean semi medium and large farmers take more working hours of machine use as compared to other farmers. For cultivation of urad marginal and large farmers take more working hours of machine use as compared to other land holding size groups. Semi medium and large farmers take more working hours of machine use in cultivation of wheat as compared to other farmers.

Table 3: Fertiliser use in varied crops across farm size Fertiliser use (kg/ha)

Crop	Land holding size group					
	Marginal	Small	Semi-Medium	Medium	Large	All
Cotton	132.23	153.07	194.08	196.97	207.13	184.77
Gram(Bengal-Gram)	47.74	290.43	274.63	280.30	272.28	54.13
Maize	148.64	385.49	361.54	360.62	374.28	85.95
Masur (lentil)	63.68	273.09	267.01	255.77	256.57	58.37
Paddy	164.15	385.88	282.37	186.76	259.78	130.74
Rapeseed and mustard	94.14	272.20	282.42	249.42	249.91	97.54
Soyabean	49.62	240.65	242.00	222.64	208.34	54.09
Urad (Black gram	44.62	227.12	207.49	260.95	254.50	49.51
Wheat	136.04	308.76	330.32	272.52	278.86	136.18
All	89.36	90.52	89.21	86.71	86.52	87.81

Source: Estimates based on primary data (2021-22)

The Table 3 shows fertilizer use among varied crops across land holding size groups. Semi medium, medium and large farmers show more use of fertilizer kg per hectare in cotton cultivation as compared to other farmers. For cultivation of gram small and medium farmers take more use of fertilizer as compared to other land holding size groups. Small and large farmers take more use of fertilizer in maize cultivation as compared to other farmers. In cultivation of masur small and semi medium farmers take more use of fertilizer as compared to other land holding size groups. Small and semi medium farmers take more use of fertilizer in cultivation of masur as compared to other farmers. In cultivation of paddy small and large farmers take more use of fertilizer as compared to other farmers. Small and semi medium farmers take more use of fertilizer for cultivation of Rape seed and mustard. In cultivation of soyabean small and semi medium farmers take more use of fertilizer as compared to other land holding size groups. Medium and large farmers take more use of

fertilizer in urad cultivation, semi medium and large farmers take more use of fertilizer in cultivation of wheat as compared to other land holding size groups.

Table 4: Seed use in varied crops across farm size (seed use kg/ha)

Crop	Land holding size group				
	Marginal	Small	Semi-Medium	Medium	Large
Cotton	1.13	1.13	1.13	1.13	1.13
Gram(Bengal-Gram)	98.25	99.97	101.24	96.45	99.62
Maize	17.86	16.67	19.82	17.98	18.21
Masur (lentil)	42.11	42.82	42.63	43.74	42.60
Paddy	52.33	63.01	70.52	79.21	81.03
Rapeseed and mustard	6.49	6.00	6.57	6.82	6.59
Soyabean	98.48	95.40	97.01	97.78	96.75
Urad (Black gram	27.86	27.96	27.80	27.67	28.93
Wheat	120.51	120.44	120.26	119.51	120.51

Source: Estimates based on primary data (2021-22)

The table above shows seed use in different crops across farm size. Marginal farmers take 1.13 kg/ha of seed use for cultivation of cotton, it has been noticed that seed use of cotton is same across all land size groups. Marginal farmers take 98.25 kg/ha of seed use for cultivation of gram (Bengal gram), small farmers take 99.97 kg/ha of seed use for cultivation of gram. Semi medium farmers take more use of seed 101.24 kg/ha of seed use for cultivation of gram, medium farmers take 96.45 kg/ha of seed use for cultivation of gram, large farmers take 99.62 kg/ha of seed use for cultivation of gram.

Similarly, marginal farmers take 17.86 kg/ha of seed use for sowing of maize. Small farmers take 16.67 kg/ha of seed use for sowing of maize, semi medium farmers take 19.82 kg/ha of seed use for sowing of maize, medium farmers take 17.98 kg/ha, large farmers take 18.21 kg/ha. Marginal farmers take 42.11 kg/ha of seed use for growing of masur (lentil), small farmers take 42.82 kg/ha of seed use for growing of masur, semi medium farmers take 42.63 kg/ha of seed use for growing of masur, medium farmers take 43.74 kg/ha of seed use for growing of masur, large farmers take 42.60 kg/ha of seed use for growing of masur. Marginal farmers take 52.33 kg/ha of seed use for sowing of paddy, small farmers take 63.01 kg/ha of seed use for sowing of paddy, semi medium farmers take 70.52 kg/ha of seed use for sowing of paddy. Medium farmers take 79.21 kg/ha of seed use for sowing of paddy, large farmers take 81.03 kg/ha of seed use for sowing of paddy. Marginal farmers take 6.49 kg/ha of seed use for sowing of rape seed and mustard, small farmers take 6.00 kg/ha, semi medium farmers take 6.57 kg/ha, medium farmers take 6.82 kg/ha, large

farmers take 6.59 kg\ha of seed use for growing of rape seed and mustard. For cultivation of soyabean marginal farmers take 98.48 kg\ha of seed use, small farmers take 95.40 kg\ha of seed use for cultivation of soyabean, semi medium farmers take 97.01 kg\ha, medium farmers take 97.78 kg\ha, large farmers take 96.75 kg\ha of seed use for cultivation of soyabean. Marginal farmers take 27.86 kg\ha of seed use for sowing of urad, small farmers take 27.96 kg\ha of seed use for sowing of urad, semi medium farmers take 27.80 kg\ha of seed use for sowing of urad, medium farmers take 27.67 kg\ha of seed use for sowing of urad, large farmers take 28.93 kg\ha for sowing of urad. For cultivation of wheat marginal farmers take 120.51 kg\ha of seed use, small farmers take 120.44 kg\ha of seed use for cultivation of wheat, semi medium farmers take 120.26 kg\ha of seed use for cultivation of wheat. Medium farmers take 119.51 kg\ha of seed use for cultivation of wheat.

Table 5: Farm yard manure use in varied crops across farm size, farm yard manure (Qtl.ha)

Crop	Land holding size group					
	Marginal	Small	Semi-Medium	Medium	Large	All
Cotton	0.00	0.00	6.25	9.09	7.05	5.36
Gram(Bengal-Gram)	329.07	290.43	274.63	280.30	272.28	281.01
Maize	25.00	0.00	0.00	0.00	1.88	2.83
Masur (lentil)	0.00	0.00	0.00	0.00	0.00	0.00
Paddy	0.00	11.79	9.74	7.01	3.73	6.39
Rapeseed and mustard	0.00	0.00	0.00	0.00	0.00	0.00
Soyabean	4.26	8.14	11.85	5.22	4.66	6.52
Urad (Black gram	4.68	6.56	3.82	3.51	1.56	3.29
Wheat	0.00	0.00	0.00	0.00	0.00	0.00
All	89.36	90.52	89.21	86.71	86.52	87.81

Source: Estimates based on primary data (2021-22)

Table 4.3.6 shows farm yard manure use in different crops across farm-size, it has been observed that marginal farmers and small farmers take zero farm yard manure for sowing of cotton, semi- medium farmers take 6.25 Quantil\ha, medium farmers take more 9.09 Quantil\ha and large farmers take 7.05 Quantil\ha of farm yard manure use for sowing of cotton. For sowing of gram (Bengal gram) marginal farmers take 329.07 quantil\ha, small farmers take 290.43 Quantil\ha, semi medium take 274.63 Quantil\ha, medium farmers take more 280.30 Quantil\ha and large farmers take 272.28 Quantil\ha of farm yard manure for cultivation of gram. Marginal farmers take 25.00 Quantil\ha of farm yard manure use for cultivation of maize, small, semi medium farmers

take no use of farm yard manure use for cultivation of maize, Large farmers take 1.88 Quantil\ha of farm yard manure use for cultivation of maize. For cultivation of paddy marginal farmers take zero farm yard manure use, small farmers take 11.79 Quantil\ha of farm yard manure use for cultivation of paddy, semi medium farmers take 9.74 Quantil\ha of farm yard manure use for cultivation of paddy, medium farmers take 7.01 Quantil, large farmers take 3.73 Quantil\ha of farm yard manure use for cultivation of paddy. Marginal, small, semi medium, medium and large farmers take zero use of farm yard manure use for cultivation of rapeseed and mustard.

Conclusion

During the study period of 2021-22 it has been observed that marginal farmers use more labours as compared to other farmers, they cannot hired the labours from outside because they cannot bestow they used their own family members as labours. Also the marginal and small farmers use less machines because of higher cost of cultivation they are not able to bestow new technological machines and other equipments from the market. While large farmers made less use of labours they are able to bestow new machines and other equipments from the market they used high yield of variety of seeds, fertilisers and other pesticides for growing of crops and they are aware about the new schemes and Agricultural Producing marketing scheme thus we conclude that input use in varied crops is not equal across all land holding size groups.

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