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Identify major cropping pattern followed by farmers in different soil types of Rajnandgaon district

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Abstract
The study analyzed the cropping pattern by farmers in different soil types in Rajnandgaon district of Chhattisgarh state. The result indicates that under rice-based cropping system, chickpea was the most popular second crop grown by 59.72 per cent of the respondents. The use of buds available in their fields by respondents are presented that a maximum 45.83 per cent of the farmers were having babul tree (*Acacia nilotica*) on the bunds of their fields. It was found that more than 46.53 per cent of the respondents were utilizing their land fully for crop husbandry. The study revealed that 42.75 per cent respondents had the intensity of cropping between 101-125 per cent followed by 18.05 per cent of them had up to 100 per cent cropping intensity. Land utilization is also well represented by the cropping intensity hence the Correlation coefficient was worked out between the selected independent variables and cropping intensity.

Keywords: Farmers, crop, land, cropping intensity

Introduction

Agriculture plays a very important role in the economic development of the country where 70% of the population is directly or indirectly depends on agriculture for their survival. Land plays a key role in the determination of man's economic activities as well as social and cultural progress. All agricultural, animal, and forestry productions depend on the quality and productivity of the land. It meets the demand for food, energy, and other needs of livelihood. Scientific cropping patterns can result in increased soil productivity by improving the physical, chemical, and microbiological properties of soils and increasing the fertility status.

In Chhattisgarh rice is the main crop-grown in about covering 77 percent of the net sown area. The cropping intensity is 137 per cent for the state, Mono cropping of rice is predominant while other crops grown are lathyrus, as relay crops (Utera). During rabi season lathyrus, gram, wheat, and linseed are grown. Lathyrus is the main crop during the rabi season covering an area of about and is grown mainly as a relay (utera) crop.

Study area

Rajnandgaon district is situated in the western part of newly created Chhattisgarh state the district lies between latitude 20°70'- 22°29' North latitude and 80°23' to 81°29' East longitude covering an area of 8222 sq.kms. Its greatest length in the north-south is about 185 km. while its width in the east-west extends about 80 km. It is surrounded by Kawardha district in north, Durg district in the east, balod in the east- south, kanker district is the south and Garchiroli, Gondia (Maharashtra), and Balaghat (Madhya Prasesh) districts in the west. Rajnandgaon is the situation in the western part of Chhattisgarh under the Chhattisgarh plains zone. Most papular cropping system of the district is rice, soybean and followed by lathyrus (grown under utera). A sizeable area is under-protected and reserved forests. Topographically, the district can be divided into three parts, plateau, Hilly terrain, an undulating plain.

Method of the data collection

The data were collected by a personal interview with the help of well prepared, structured, and pretested interview schedule. Twelve farmers were selected randomly each village, in this way (12 X 12 = 144) a total of 144 farmers were selected for the present study.

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Result and discussion
Cropping pattern
Regarding the adoption of different cropping patterns by the respondents in their farmlands, the finds complied in Table 1 shows that under rice-based cropping system, chickpea was the most popular second crop grown by 59.72 per cent of the respondents. About 18.05 per cent of respondents were practicing monocropping of rice in their agricultural fields. The farmers having irrigation facilities were adopting rice-summer rice (7.63%) followed rice-wheat (9.72%) cropping systems on their farmland. The table further revealed that the farmers who acquired unbunded Vertisols were also practicing soybean-based cropping system but its per cent was only 4.16.

Table 1: Distribution of respondent according to their cropping pattern

S. No.	Cropping pattern	Frequency	Percentage
1	Rice – fallow	26	18.05
2	Rice - summer rice	11	7.63
3	Rice – chickpea	86	59.72
4	Rice – wheat	14	9.72
5	Soybean- fallow	6	4.16
6	Soybean – chickpea	1	0.69

Use of bund
The data concerning with the use of buds available in their fields by respondents are presented in Table 2 The findings show that a maximum 45.83 per cent of the farmers were having babul tree (*Acacia nilotica*) on the bunds of their fields. Crop production with arhar (9.03%) and til (2.08%) were also found on the bunds of the study area. It was further found that 1.39 per cent of the respondents were using okra production and ber as fruit production in their bunds. It was found that only 0.69 per cent of the respondents were using cauliflower, onion, bottle gourd as vegetable production and mango, guava as fruit production in the bunds of their fields for the efficient use of available land.

Table 2: Distribution of respondents according to Use of bunds by them for crop husbandry

S. No	Use of bund	Frequency	Percentage
1	Crop production		
	Arhar	13	9.03
	Til	3	2.08
2	Vegetable production		
	Okra	2	1.39
	Cauliflower	1	0.69
	Onion	1	0.69
	Bottle gourd	1	0.69
3	Fruit production		
	Mango	1	0.69
	Guava	1	0.69
	Ber	2	1.39
4	Agro- Forestry		
	Babul (*Acacia nilotica*)	66	45.83
5	Forage Crop		
	Barseem	3	2.08

Land utilization pattern
The data regarding land utilization by the respondents is presented in Table 3. The land utilization was calculated based on the use of available land by the respondents for the cultivation of crops in different seasons. It was found that more than 46.53 per cent of the respondents were utilizing their land fully for crop husbandry. About 22 per cent of the respondents reported that they were utilizing their land for at least two crops but not on their full landholding. Further, the table reveals that 20.83 per cent of the respondents were found under medium land utilization category. They were growing one crop on their entire available landholding. Only 9.72 per cent of the respondents were growing one crop but on the part of their available land. Only 1.39 per cent of the respondents were reported that they were not growing any crop on their available land may be because of the poor quality of Entisols type of soil.

Table 3: Distribution of respondents according to their land utilization

S. No	Land utilization	frequency	Percentage
1	High utilization (at least two crop season) ▪ On all the available land ▪ On part of the available land	 67 31	 46.53 21.53
2	Medium utilization (one crop season only) ▪ On all the available land ▪ On part of the available land	 30 14	 20.83 9.72
3	Low utilization (no cropping)	2	1.39

Cropping intensity
The cropping intensity of the available land amongst the respondents were calculated according to different soil types and cropped area. Table 4 show that 42.75 per cent respondents had the intensity of cropping between 101-125 per cent followed by 18.05 per cent of them had up to 100 per cent cropping intensity. Only 13.88 per cent respondents were found to have more than 175 per cent intensity of cropping and 13.19 per cent had the intensity of cropping between 150-175 per cent. Remaining 11.11 per cent respondents were found under 125-150 per cent cropping intensity in the study area. These findings are indicated that the farmers of the selected area were more utilizing their available land for crop husbandry purposes.

Table 4: Distribution of respondents according to cropping intensity

S. No	Cropping intensity	Frequency	Percentage
1	Up to 100%	26	18.05
2	101 – 125%	63	42.75
3	125 – 150%	16	11.11
4	150 – 175%	19	13.19
5	> 175%	20	13.88

Correlation coefficient analysis of independent variables with cropping intensity

Since land utilization is also well represented by the cropping intensity hence the Correlation coefficient was worked out between the selected independent variables and cropping intensity. This analysis between the selected characteristics of the respondents with cropping intensity was worked out and the values of correlation coefficient are presented in Table 5.

It was found from the data that out of all selected 16 characteristics, the three variables viz. land holding, irrigation availability, cropping pattern were found to be positive and highly significant with cropping intensity at 0.01 level of probability. Risk orientation and adoption of rice production technology by the respondents were found to be positively and significantly correlated with the cropping intensity at 0.05 level of probability. Whereas, the occupation had shows negative significantly correlated at 0.01 level of probability.

Table 5: Coefficient of correlation between independent variables and cropping intensity

S. No.	Independent variables	Coefficient of correlation "r" value
1	Age	-0.062
2	Education	0.102
3	Family size	-0.015
4	Social participation	-0.058
5	Farming experience	-0.113
6	Occupation	-0.232**
7	Land holding	0.225**
8	Annual income	0.153
9	Irrigation availability	0.282**
10	Source of information	-0.050
11	Extension contact	-0.003
12	Risk orientation	0.165*
13	Cropping pattern	0.710**
14	Soil types	0.105
15	Extent of knowledge about rice production technology	0.005
16	Extent of adoption about rice production technology	0.169*

** Significant at 0.01 level of probability (0.212)
* Significant at 0.05 level of probability (0.162)
NS = Non significant

The other ten variables viz. age, education, family size, social participation, farming experience, annual income, source of information, extension contact, soil types and extent of knowledge about rice production technology were having non- significant correlation with cropping intensity.

Conclusion

Based on the finding, it was that farmers' cropping pattern under rice-based cropping system, chickpea was the most popular second crop grown by 59.72 per cent of the respondents. Maximum 45.83 per cent of the farmers were having babul tree (*Acacia nilotica*) on the bunds of their fields. More than 46.53 per cent of the respondents were utilizing their land fully for crop husbandry. It is concluded that to increase the knowledge of the farmer they should be made aware of the land used, better irrigation availability, and cropping pattern. In Vertisols of the plan, the area had been rice – chickpea cropping pattern with followed high utilization (at least two crop season). The farmers having irrigation facilities were adopting rice-summer rice and followed rice-wheat cropping systems on their farmland.

References

1. Gowda K Naryan. Land use Present trend and Future prospects ESRI Journal Churu (Rajasthan), 2012, 201-202.
2. Gupta N. A study on utilization pattern of leased forest land by the tribes of bilaspur district of chhattisgarh state. M.Sc. (Ag.) thesis, IGKV, Raipur (C.G.), 2015.
3. Hajare RV, Jaykar T, Patil V, Magdum A. Land use and Cropping Pattern in Kolhapur District. Online International Interdisciplinary Research Journal, {Bi-Monthly}, ISSN 2249-9598, 2014, 4.
4. Kushwaha N. Agriculture in India: Land use and sustainability. I J R S. 2008; 15:1-5.
5. Lawal AF, Omotesho OA, Adewumi MO. Land use pattern and sustainability of food crop production in the fadama of Southern Guinea Savanna of Nigeria. African Journal of Agricultural Research. 2010; 5(3):178-187.
6. Panigrahy S, Ray SS, Patel LB, Parihar JS. analysis of cropping pattern changes in bathinda district, Punjab. Journal of the Indian Society of Remote Sensing. 2004; 32(2).
7. Rahman SA, Imam MH, Wachira SW, Kabir DMH. Land use patterns and the scale of adoption of agro forestry in the rural landscapes of padma floodplain in Bangladesh. Forests, Trees and Livelihoods. 2008; 18:193-207.