



Research Article

SOCIO-ECONOMIC PROFILE AFFECTING THE KNOWLEDGE AND ADOPTION AREA OF IGKV RELEASED RICE VARIETIES

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Abstract: The study was carried out in Chhattisgarh plains where 320 respondents were taken for the data collection. Most of the respondents were educated up to high school. A maximum respondent belongs to OBC and family was medium. All respondents were well experienced in the cultivation of rice. Maximum areas of land were irrigated. Respondents were engaged in different occupation but they highly (97.81%) engaged with agriculture occupation as the main occupation. Education, land holding *etc* affected knowledge about IGKV released rice varieties, as well as they, also affected the adoption area of IGKV released rice varieties.

Keywords: Correlation, Education, IGKV rice varieties, Land holding, Occupation, Social Participation

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Introduction

Rice (*Oryza sativa* L.) is the most important staple food in Asia. More than 90 percent of the world's rice is grown and consumed in Asia, where 60 percent of the world's population lives [1]. It accounts for 73 percent of the calorie intake in Bangladesh, 40 percent in Nepal, and 30 percent in India. South Asia has about 37 percent of the world's total rice area and approximately 50 percent of the rice-growing area in South Asia is rainfed. Rice is the only crop that grows well in large areas of wetlands in monsoon Asia. Therefore, improving the productivity of rice through stress-tolerant technologies is a key entry point to enhance the income and livelihood of resource-poor farmers in these stress-prone environments [2]. India has released a lot of rice varieties but only a few varieties are popular amongst farmers due to its characteristic. All released rice varieties are not completely disseminated amongst farmers [3]. Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh is an autonomous non-profit, research and educational organization working for the uplifting of farmers livelihood in Chhattisgarh. Many rice varieties evolved from IGKV, Raipur. Mahamaya was evolved in 1996 from Asha x Kranti parentage, long bold grain with 45-55q ha-1 average yield. Further, year by year researches in rice increased and till 2015 about fifteen rice varieties were evolved *i.e.* Mahamaya, Poornima, Shyamla, Danteshwari, Indira Sugandhit Dhan-1, Bamleshwari, Samleshwari, Jaldubi, Chandrasasini, Indira sona, Indira barani dhan-1, Karma mahsuri, Maheshwari, Durgeshwari, Rajeshwari and Indira aerobic-1 [4]. There is a lot of rice varieties released for India as well as for Chhattisgarh also but only a few varieties have reached amongst the farmers. From IGKV also many rice varieties have been released but only a few varieties are well disseminated amongst the farmers and only a few varieties are popular amongst farmers.

Materials and Methods

The study was conducted during the year 2015-16 to 2016-17 in the Chhattisgarh plains zone, there are total fifteen districts where four districts *i.e.* Raipur, Rajnandgaon, Dhamtari, Mahasamund were purposively selected because of here

maximum newly released rice varieties distributed. Two blocks where maximum rice seed of newly released varieties was distributed were selected purposively from each selected district to make a total of eight blocks in the sample. Four villages where the maximum seed of newly released varieties was distributed were selected purposively from each selected block, thus total villages were thirty-two. Ten respondents were selected randomly from each selected village, thus total respondents were three hundred twenty. The data were collected through well-structured and pre-tested interview schedule; an interview schedule consisting of various types of questions related to the objectives of the study was, therefore developed. Initially, the schedule was developed in English and was then translated to the local language *i.e.* Hindi. The schedule was pre-tested and as per the experience gained during pre-testing the language of some of the questions was suitably worded and was made more understandable and clearer and the schedule was then finalized. The data were collected by personal interview method by contacting the respondents (farmers) at their home. The respondents did hesitate to give the required information in the beginning. To get the authentic information the help of local leaders, sarpanch, member of gram panchayat, Kisan Mitra, and Rural Agricultural Extension Officers (RAEOs) were sought and the rapport was developed with the respondents.

Results and Discussion

Socio-economic profile

Education, caste, size of family, social participation, experience in rice cultivation were considered as socio-personal characteristics of the respondents. These characteristics were analyzed and presented in [Table-1].

Education

Education is the determinant of knowledge, which is associated with adoption and better learning about new technologies in agriculture and allied fields. Education of the respondents was categorized into 7 categories as given in [Table-1], majority

(50.31%) of the respondents were educated up to high school (9th to 10th class) followed by 18.31 percent of the respondents had primary school level education (1st to 5th class), 16.25 percent respondents were educated up to middle school (6th to 8th class), 10.63 percent of the respondents were educated up to higher secondary school (11th to 12th class), 2.50 percent respondents were educated up to graduation level, whereas only 2.19 percent of the respondents had education up to post-graduation level. Overall respondents were well educated and no one was illiterate. It may be due to a number of schools (government & private sector), good education facilities etc in Chhattisgarh plains. Similarly, Saka *et al.* (2005) noted that 93.7 percent of respondents were educated [5].

Caste

The data presented in [Table-1] reveals that the highest (68.13%) respondents were Other Backward Class (OBC) followed by Scheduled Tribes (ST) (17.50%), and Scheduled Caste (SC) (8.75%). only 2.50 percent respondents belonged to General caste category. Whereas, the whole Chhattisgarh has the highest population of Scheduled Tribes (31.80%), followed by Other Backward Class (14.00%) and 12 percent scheduled caste [6].

Size of family

Family size of the respondents were categorized in 3 groups [Table-1], where majority (56.56%) of the respondents belonged to medium family (5 to 8 members) followed by 21.88 percent belonged to small family (1 to 4 members) and 21.56 percent large family (more than 8 members). A probable reason for this may be that still, the small family norm is not acceptable to a large extent by rural people. The other contributing reason might be agriculture which is the main occupation of the families of the respondents. It needs teamwork and requires a number of persons for its labour-intensive work. Whereas, Khan *et al.* (2013) found that the highest proportion of the farmers had medium family size as compared to 36 percent having small and 12 percent large family size [7].

Social participation of the respondents

Social participation refers to an individual's degree of participation in a community of society. With regards to social participation [Table-1], an explicit majority (70.94%) of the respondents participated in two organizations followed by 12.81 percent of the respondents participated in only one organization and 7.19 percent of the respondents participated in more than two organizations. Whereas, Kumar *et al.* (2013) found that more than four-fifths of the surveyed had no membership in any organization, indicating very poor social participation [8].

Table-1 Distribution of respondents according to their socio-economic profile

Particulars	Frequency	Percentage
Education		
1 Illiterate	0	0
2 Primary school (1 st to 5 th class)	58	18.13
3 Middle school (6 th to 8 th class)	52	16.25
4 High school (9 th to 10 th class)	161	50.31
5 Higher secondary school (11 th to 12 th Class)	34	10.63
6 Graduation	8	2.5
7 Post-graduation	7	2.19
Caste		
1 Scheduled Tribes	56	17.5
2 Scheduled Castes	28	8.75
3 OBC	218	68.13
4 General	8	2.5
Size of family		
1 Small family (1 to 4 members)	70	21.88
2 Medium family (5 to 8 members)	181	56.56
3 Large family (more than 8 members)	69	21.56
Social participation		
1 Participation in one organization	41	12.81
2 Participation in two organizations	227	70.94
3 Participation in more than two organizations	23	7.19
Experience in rice cultivation		
1 Up to 10 years	3	0.94
2 11 to 20 years	185	57.81
3 21 to 30 years	89	27.81
4 More than 30 years	43	13.44

Experience of the respondents in rice cultivation

Regarding experience of the respondents in rice cultivation [Table-1], majority (57.81%) of the respondents had 11 to 20 years' experience of rice cultivation followed by 27.81 percent respondents had 21 to 30 years, 13.44 percent respondents had more than 30 years' experience and only 0.94 percent of the respondents had less experience (up to 10 years). The overall experience of rice cultivation was high because rice is the major crop of Chhattisgarh and near about all the respondents totally depended on rice cultivation.

Whereas, Khan *et al.* (2013) found that the highest proportion of the farmers had medium family size as compared to 36 percent having small and 12 percent large family size.

Social participation of the respondents

Social participation refers to an individual's degree of participation in a community of society. With regards to social participation [Table-2], an explicit majority (70.94%) of the respondents participated in two organizations followed by 12.81 percent of the respondents participated in only one organization and 7.19 percent of the respondents participated in more than two organizations. Whereas, Kumar *et al.* (2013) found that more than four-fifths of the surveyed had no membership in any organization, indicating very poor social participation.

Experience of the respondents in rice cultivation

Regarding experience of the respondents in rice cultivation [Table-2], majority (57.81%) of the respondents had 11 to 20 years' experience of rice cultivation followed by 27.81 percent respondents had 21 to 30 years, 13.44 percent respondents had more than 30 years' experience and only 0.94 percent of the respondents had less experience (up to 10 years). The overall experience of rice cultivation was high because rice is the major crop of Chhattisgarh and near about all the respondents totally depended on rice cultivation.

Land ownership, soil type and irrigation availability

Regarding ownership, the data given in [Table-2] reveals that the all 320 respondents had 1015.78 ha cultivable land out of which 85.99 percent land owned by the respondents and 14.01 percent land were under a lease.

Chhattisgarh has different soil orders that widely differ in their production potential and physical characteristics. They are locally called Bhata, Matasi, Dorsa and Kanhar in Chhattisgarh plains. Regarding soil type in Chhattisgarh plains, the data given in [Table-2] reveals that total 1015.78 ha land was cultivable, in which 44.71 percent land was Vertisols (Kanhar), 29.67 percent land was Inceptisols (Matasi), 14.96 percent land was Alfisols (Dorsa) and 10.65 percent land was Entisols (Bhata).

The data given in [Table-2] reveals that out total 1015.78 ha cultivable land amongst 320 respondents, majority of the land (58%) was irrigated, whereas 42 percent land was rainfed [Fig-1], lightened that out of total irrigated land (589.08 ha), more than 50 percent was under Vertisols (Kanhar) followed by 26 percent under Inceptisols (Matasi), 14 percent under Alfisols (Dorsa) and only 1 percent under Entisols (Bhata). [Fig-1], illustrated that out of total rainfed land (426.70 ha) the highest 34 percent was under Inceptisols (Matasi), 26 percent under Vertisols (Kanhar) soils, 24 percent under Entisols (Bhata) soils and only 16 percent under Alfisols (Dorsa).

Table-2 Land ownership, soil type and irrigation availability

Particulars	Area (ha)	Percentage
Ownership of cultivable land		
1 Total owned land	873.47	85.99
2 Total leased in land	142.31	14.01
Total cultivable land	1015.78	100
Soil type		
1 Entisols (Bhata)	108.16	10.65
2 Inceptisols (Matasi)	301.42	29.67
3 Alfisols (Dorsa)	152	14.96
4 Vertisols (Kanhar)	454.2	44.71
Total land holding	1015.78 ha	
Area under irrigation		
1 Rainfed land	426.7	42
2 Irrigated land	589.08	58

Categories of farmers according to land holding

With regards to categories of farmers according to land holding, [Table-3], elaborated that farmers categorized in four categories according to their land holding, whereas, highest respondents were a medium farmer (2.1 ha to 4 ha) followed by 23.13 percent of the respondents were a small farmer who had land ranged from 1.01 ha to 2.0 ha, 16.88 percent respondents were big farmer who had above 4 ha land and only 5.9 percent respondents were a marginal farmer who had up to 1 ha land. Overall results showed that nearly all the respondents had a good size of land for a different purpose.

Regarding range of land parcels the data given in [Table-3], elaborated that majority (33.75%) respondents had up to 5 land parcels or land fragments, followed by 38.44 percent of the respondents had 6 to 10 land parcels, 11.88 percent respondents had 11 to 15 land parcels, though only 10.94 percent respondents had more than 15 land parcels. After the calculation of overall data regarding land parcels, data reveals that the average number of parcels per family was 9 and their average size of per parcel was 0.35 ha.

Table-3 Distribution of the respondents according to their land holding

Particulars	Frequency	Percentage
Category of farmers		
1 Marginal (Up to 1 ha)	19	5.94
2 Small (1.01 ha to 2.0 ha)	74	23.13
3 Medium (2.1 ha to 4 ha)	173	54.06
4 Big (Above 4 ha)	54	16.88
Availability of land parcels (Per family)		
1 Up to 5 land parcels	124	38.75
2 6 to 10 land parcels	123	38.44
3 11 to 15 land parcels	38	11.88
4 More than 15 land parcels	35	10.94
Average number of parcels/family	9.14±9	
Average size of parcel	0.35 ha	

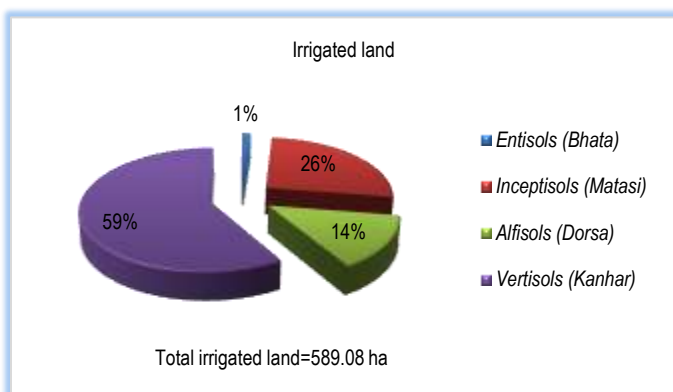


Fig-1 Availability of various soil types in irrigated land

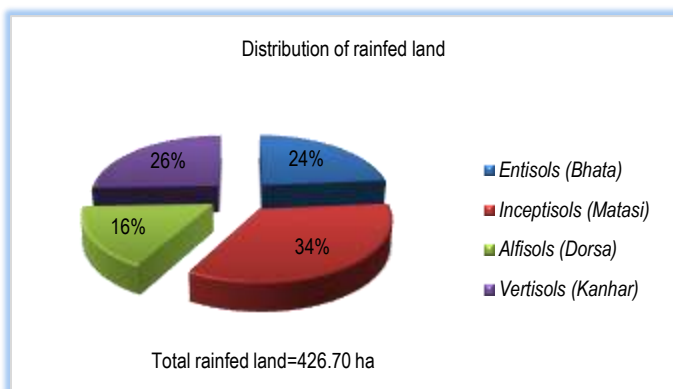


Fig-2 Availability of various soil types in rainfed land

Occupation

With respect to occupation, the data presented in [Table-4]. reveals that the highest (97.81%) respondents were doing agriculture as a major occupation, whereas, only 2.19 percent of the respondents were doing agriculture as a subsidiary occupation. 66.25 percent of the respondents worked as the subsidiary

occupation of other labour i.e. home construction, road construction etc., 60.94 percent of the respondents worked as agriculture labour i.e. sowing, transplanting etc. as a subsidiary occupation, 2.19 percent of the respondents were doing the job as the main occupation, while 12.81 percent of the respondents were doing the job as subsidiary occupation it means that respondents had a small job so that they did not completely dependents on the job. 29.69 percent of the respondents doing business as a subsidiary occupation. 25.31 percent of the respondents were doing animal husbandry as a subsidiary occupation. Results explained that the majority of respondents completely depend on agriculture and doing some other work in the off-season of agriculture farming. An almost similar finding was reported by Meena *et al.* (2012), who found that the majority of respondents were engaged in agriculture [9]. It was also reported by Pradhan (2014) that almost all the respondents were involved in agriculture followed by labour and animal husbandry [10].

Table-4 Distribution of respondents according to their occupation

SN	Occupation	Type of occupation			
		Main occupation		Subsidiary occupation	
		F	%	F	%
1	Agriculture	313	97.81	7	2.19
2	Agriculture labour	0	0	195	60.94
3	Other labour	0	0	212	66.25
4	Job	7	2.19	41	12.81
5	Business	0	0	95	29.69
6	Animal husbandry	0	0	81	25.31

Note: Data are based on multiple responses, F=frequency

Involvement of respondents in occupation

The data presented in [Table-5] and [Fig-3] indicates that the majority (33.75%) of the respondents were involved in one occupation followed by 31.25 percent of the respondents involved in three occupations, 29.69 percent of the respondents were involved in more than three occupations, and only 5.31 percent of the respondents were involved in two occupations.

Table-5 Distribution of the respondents according to their involvement in the number of occupation

SN	Involvement	Frequency	Percentage
1	One occupation	108	33.75
2	Two occupations	17	5.31
3	Three occupations	100	31.25
4	More than three occupations	95	29.69

Annual income

Regarding annual income of the respondents, the data given in [Table-6] reveals that 35.31 percent of the respondents had annual income ₹ 50001 to ₹100000 followed by 33.75 percent had annual income up to ₹ 50000, 18.13 percent respondents had annual income ranged from ₹150001 to ₹ 200000, 5.63 percent respondents had annual income ranged from ₹100001 to ₹150000 and only 7.81 percent respondents had high annual income that was more than ₹200001.

Table-6 Distribution of the respondents according to their annual income

SN	Annual income	Frequency	Percentage
1	Up to ₹ 50000	108	33.75
2	₹ 50001 to ₹100000	113	35.31
3	₹100001 to ₹150000	25	7.81
4	₹150001 to ₹200000	58	18.13
5	More than ₹200001	16	5

Respondents had different sources of annual income [Fig-4], where 50 percent annual income earned through agriculture followed by 28 percent annual income got through business, 10 percent annual income earned from other labour i.e. home construction, road construction etc. 5 percent annual income comes from job, 4 percent income comes from other labour i.e. sowing, transplanting etc. and only 4 percent annual income comes from animal husbandry, which means respondents not well focused on animal husbandry for the collection of annual income. A second large source of annual income was business; because the study area falls under Chhattisgarh plains zone, where most of the people were well educated and had well-transporting facilities. Agriculture labour contribution in annual income was poor because of most of the respondents' used machinery for agricultural practices.

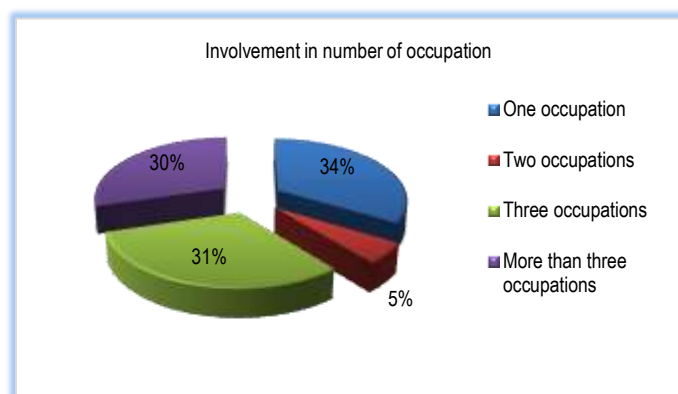


Fig-3 Involvement of respondents in occupation

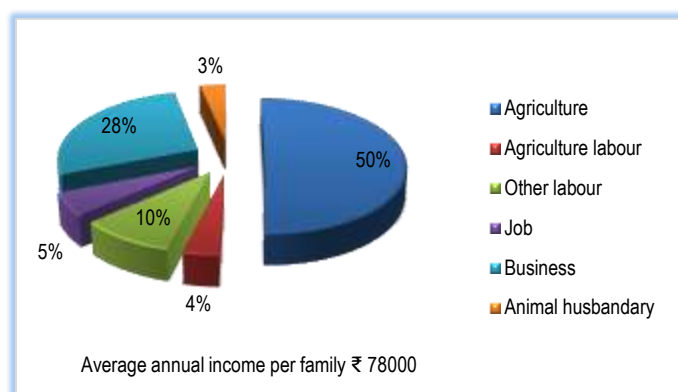


Fig-4 Annual income of respondents from different sources

Correlation analysis

Correlation tells about the relationship between two or more factors. Regarding correlation, the finding given in [Table-7] reveals that two dependent variables taken for the analysis and socio-economic variables indicated some relationship on knowledge of IGKV rice varieties and the adoption area of IGKV rice varieties. Table depicted that education, social participation, landholding positively correlated with knowledge about IGKV rice varieties where occupation negative correlated with knowledge about IGKV rice varieties, further data elaborated that knowledge may be increased when education, social participation and landholding increased whereas when number of occupation increase then knowledge decrease because of person focused on their different occupation less alert with knowledge of IGKV rice varieties. Furth more education, landing holding and income positively correlated with adoption area of IGKV rice varieties mean when this factor increases obviously adoption also increase in a similar direction but when a number of occupations increases that adoption area decreases on the opposite direction.

Table-7 Correlation analysis of socio-economic profile with knowledge about IGKV rice varieties and Adoption area of IGKV rice varieties

S	Variables/Factors	Knowledge about IGKV rice varieties	Adoption area of IGKV rice varieties
1	Education	0.36**	0.29**
2	Cast	-0.05	-0.05
3	Family size	-0.1	0.06
4	Social Participation	0.29**	-0.01
5	Land holding	0.22**	0.84**
6	Occupation	-0.12*	-0.17**
7	Income	-0.01	0.55**

Note: * Significant at 0.05 level of probability, **Significant at 0.01 level of probability

Conclusion

Here concluded that some variables of socio-economic profile effected to Knowledge about IGKV rice varieties and the adoption area of IGKV rice varieties. If we want to change in knowledge about IGKV rice varieties and the adoption

area of IGKV rice varieties, need to increase education level, social participation as well as land holding.

Application of research: Study of socio-economic profile and rice varieties

Research Category: Agricultural Extension

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Research project name or number: Research station study

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Raipur, Rajnandgaon, Dhamtari, Mahasamund

Cultivar / Variety / Breed name: Rice (*Oryza sativa* L.)

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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