A STUDY OF SOCIO-ECONOMIC STATUS OF SWARNA *SUB1* RICE VARIETY GROWERS IN CHANDAULI DISTRICT OF UTTAR PRADESH

Abstract

The study reveals the socio-economic status of Swarna sub1 rice variety growers in Chandauli district of Uttar Pradesh. The study was based on a survey of 60 farmers and the selection of farmers was targeted to only those who cultivated swarna sub1. The present study was conducted in Chandauli district of Uttar Pradesh by collecting primary data. An in-depth household survey based on purposively developed and pre-tested survey instrument was used. Simple descriptive statistics were employed, to understand the socio-economic characteristics of households. The average operational holding was 1.45 ha, and the average size of family was 5.80. The literacy was observed, 75%. More than 86% of cultivable land was engaged in rice cultivation in kharif season. Wheat and rice were the two major crops grown in the study area. The main source of irrigation was tube well and canal. Among livestock, the highest number was of calves contributes about 40% of a total number of livestock.

Keywords: Swarna *SUB1* Rice, Chandauli district, Uttar Pradesh, kharif season, irrigation

INTRODUCTION:

Flash-flooding and submergence adversely affect at least 16% of the rice lands of the world (~22 m ha) (Kheim et al., 2000). The problem is grave in flood-prone areas of Thailand, Bangladesh, Indonesia, Vietnam, and Myanmar and India because of the extensive heterogeneity in flood-prone ecosystems, coupled with submergence hazards, farmers still grow many different types of traditional rice varieties to withstand the flood situation (Atibudhi, 1993; Abdelbagi, 2018). The rainfed lowland rice-growing environments are highly variable both over time and location. Submergence annually, however, affects more than 7 million ha of rice in India. Of the total of 2.3 million ha of flood-prone rice lands in eastern India, eastern Uttar Pradesh alone has 0.39 million ha (Maurya et al., 2018, Atibodhi and Sahoo, 2000). These areas are located in the low-lying areas adjacent to rivers in different districts—Basti, Mahrajganj, Gorakhpur, Deoria, Ballia, Chandauli, Ghazipur,

Varanasi, Gonda, Faizabad, Barabanki, and Bahraich—and are subject to various types of uncontrolled flooding ranging from 50 to 400 cm water (Boiling, 2000). Four major rice cultural types are grown in the flood-prone ecosystem to reduce the yield losses of rice: (1) submergence-tolerant, (2) stagnant deep, (3) floating, and (4) boro rice. Crops are submerged for a short duration because of heavy monsoon rain. Such areas are located in Barabanki, Bahraich, Gonda, Basti, Vanarasi, Gorakhpur, Santkabair Nagar, Chandauli, and Kushinagar districts. About 200,000 ha are submerged for a short period annually. Stagnant flooding is associated with deepwater rice where water stagnates in the field for at least 30 days during the crop season. About 140,000 ha of deepwater rice is grown on the flood-prone of major rivers in Deoria, Gorakhpur, Basti, Santkabir Nagar, Ballia, and Bahraich districts. Flood water commonly rises at 2–3 cm per day depending on the rainfall coupled with river flows. About 50,000 ha of land are flooded from 1 to 3 m annually in eastern Uttar Pradesh. Floating rice is grown in this situation. Such rice possesses the ability to elongate under submergence, around 5 cm per day, to maintain its foliage above the flood water (Chakia-59, Manhar).

In the above situations which exists and variations depending on whether behaviour, land type soil type and environment.In general, farmers are not tuned to adopt location specific and environment-friendly technologies to overcome or mitigate these stresses (Dash, 1995). The most popular varieties of rice grown in these regions like Swarna, Samba Mahsuri and some hybrids though high yielding but do not have tolerance to continuous submergence for more than 5-6 days (Joshi and Pal, 2000). Farmers of the above situations have the risk of uncertainties in rice production and due to this, they use little inputs also. The present study reveals the socio-economic status of farmers who cultivate swarna *sub1* in their land.

METHODOLOGY:

The present study was conducted in Chandauli district of Uttar Pradesh. The study was mainly based on primary data. The required primary data were collected from selected farmers. The primary data were collected personally by survey method through an intensive household survey. For the collection of primary data, an in-depth household survey based on purposively developed and pre-tested survey instrument (well-structured schedule) was used. The district comprises of nine development blocks, viz. Barahani, Chandauli, Niyamtabad,

Chahaniya, Sakaldeeha, Dhanapur, Chakiya, Shahabganj and Naugarh. The selection of farmers is targeted to those farmers who grow Swarna sub1 rice variety on their farms. Therefore, scanty nature of farmers over a large number of villages was available for this study. A sample of 60 farmers belongs to 15 different villages of Chandauli block selected for detail study. Census method was followed for data collection for the study (Dutta et al., 2006). To fulfil the objective, data on various socio-economic variables like age, family size, their composition, educational status, operational land holding possessed by a farmer, farm income were analysed using simple descriptive statistical tools like average, percentage etc.

Table1: 15 different villages of Chandauli block selected for detail study

S.No.	Villages	Number of farmers
1.	Bhaderpur	2
2.	Bisauri	5
3.	Footia	2
4.	Godhara	5
5.	Gorai	1
6.	Halwa	2
7.	Hinauti	4
8.	Lauda	1
9.	Majhwar	2
10.	Masauni	13
11.	Negura	10
12.	Phesura	1
13.	Seruka	9
14.	Sirsi	2
15.	Tiron	1
Total		**60**

RESULT AND DISCUSSION

1. Socioeconomic status of sample farm

It provides an insight of socioeconomic status of sample household in terms of education level, family size, occupational pattern, irrigated area, size of operational holdings, cropping pattern, sources of irrigation, livestock population, fixed assets and different sources of income.

1.1 Characteristics of sample farms

The main feature of the sample farmers is summarised in table 1.1. The average operational holding of sample farmers in Chandauli district was 1.45 ha. And they do not left any fallow land so their operational holding is the same as their land holding (1.45 ha) (Hondrade, 2003). The area is basically flooded prone in the rainy season. About 91.00% area is covered under irrigation through canal and shallow tube wells. The average age of the household head is 51.63 years. Rice is the important crop in the rainy season and covered about 86.85% area to total cropped area. The share of swarna *sub1 rice* is 36.15% and swarna is 42.69% of total cropped area. So it can be concluded from the table that rice is a most important crop of *kharif* season on selected farms which supports livelihood of farm families. The average yield of rice was 50.80qtl/ha, of swarna was 50.29 qtls and swarna sub1 was 51.30qtls/ha on sample farms.

Table 1.1: Characteristics of sample household

Characteristics	
No. of households	60.00
Average age of household head (years)	51.63
Average operational holding (ha)	1.45
Irrigated area (%)	91.66
Source of irrigation	Canal, tube well
Share of total rice area in total cropped area in *kharif* (%)	86.85
Share of swarna in total rice area in *kharif* (%)	42.69
Share of swarna *sub1* in total rice area in *kharif* (%)	36.15
Average yield of rice (qtls/ha)	50.80

Average yield of Swarna (qtls/ha)	50.29
Average yield of Swarna *sub1* (qtls/ha)	51.30

1.2 Composition of family members on sample farms

The size of the family and its composition decides the contribution of family labour and use of hired labour employed for various rice cultivation practices. Therefore, family size also plays an important role in agrarian economy (Badal, 2001). In the context of agriculture sector particularly in rural areas, this affects much more to the level of income and employment for the rural masses. With the increasing pressure of population, the per capita availability of agriculture land is continuously declining.

Table 1.2: Composition of family members on sample farms

Particulars	**Average number**	**Share (%)**
Male	1.76	30.34
Female	1.61	27.75
Child male	1.33	22.93
Child female	1.10	18.96
Total	**5.80**	**100.00**

Table 1.2 shows that the number of males, as usual, was higher than female in the study area. The average family size in the study area was 5.80. An average number of an adult male was 1.76 that was 30.34% of total family size and number of an adult female was 1.61 contributed 27.75% to total family size. In case of child male and female average number were 1.33 and 1.10 respectively.

1.3 Educational status of sample households

Table 1.3 represents the education level of households on sample farms. Small proportions (25%) of family members are illiterate on sample farms. Table indicates that a higher proportion of population educated up to higher secondary level accounted 55.00% to total population, family members educated up to senior secondary level was being 16.66% and above graduation was only 3.30%.

Table 1.3: Education status of sample household

Characteristics	Number	Share(%)
Illiterate	15.00	25.00
Up to higher secondary	33.00	55.00
Up to senior secondary	10.00	16.66
Graduation and above	2.00	3.30
Total	**60.00**	**10.00**

1.4 Distribution of operational holding and area under rice

The concept of operational holding indicates that the land wholly belonged to the household for agriculture production. The size of operational holding and area allocated under rice on the sample farms was described under table 1.4, shows that total size of operational holding was 87.00 hectares of 60 farmers. In this area, all land was cultivable land. No land belonged to any tenure system in the study area. Average own land and cultivable land was 1.45 ha per farm.

Table 1.4: Distribution of operational holding and area under rice

S. No.	Particulars	Area (ha)	Area(ha/farm)
1.	Own land	87.00	1.45
2.	Leased-in-land	0.00	0.00
3.	Cultivable land	87.00	1.45
4.	Uncultivable land	0.00	0.00
5.	Area under rice	75.55	

1.5 Cropping pattern on selected farms

The proportion of different crops grown by a farmer in a year on his farm determines the level of input use, production, pattern of income and importance of crops on farm. In the farm, rice occupied 86.82 % area to total cropped area. The next crops after rice were maize and bajra accounted for 5.20% and 2.30% area to total cropped area, respectively. Other crops were jowar (1.30%), arhar (2.10%) and urd (1.10%) which has minor importance in terms of acreage in kharif season. In rabi season major area was occupied by wheat (86.20%) followed by gram (6.30%), pea (5.40%), potato (2.40%) and mustard (1.25%).

Table 1.5: Cropping pattern on sample farm

Seasons/ crops	Area under crop (ha)	Productivity (qtls/ha)	Share in area (%)
Kharif			
Rice	75.54	50.80	86.82
Maize	4.61	14.58	5.20
Jowar	1.21	10.59	1.30
Bajra	2.03	15.37	2.30
Urd	0.95	6.69	1.10
Moong	0.78	4.24	0.90
Arhar	1.82	9.56	2.10
Sub-total	**87.00**		**100.00**
Rabi			
Wheat	75.00	29.70	86.20
Gram	5.56	8.82	6.30
Pea	4.78	9.37	5.40
Mustard	1.08	11.12	1.25
Potato	2.17	200.00	2.40
Sub-total	**87.00**		**100.00**
Grand total	**174.00**		

1.6 Distribution of livestock on sample farms

The livestock possession in this area is very low due to the availability of non-farm employment in nearby urban and city areas. Table 1.6 indicates the average livestock population on sample farm was only 99.00 (nbs.) comprising cows, buffaloes and calves. It was shared by 26.05% cows, 33.06 % buffaloes and 40.88 % calves.

Table 1.6: Distribution of livestock on sample farms

Particulars	No.	Share (%)
Cow	26.00	26.05
Buffalo	33.00	33.06
Calf	40.00	40.88
Total	**99.00**	**100.00**

1.7 Investment on farm machinery and fixed assets

Table 1.7 shows the average investment on fixed assets on sample farms which was Rs.3,08,717.00. In total investment, more than half of share being 64.90% invested on the purchase of tractor for agricultural uses. The share of investment on cattle shed and farm storages were 6.50% and 15.11% to total investment, respectively. Whereas on trolley and small implements gave 13.05% and 0.32% investment to the total investment on sample farm, respectively.

Table 1.7: Investment on farm machinery and equipment

S. No	Particulars	Investment	Share (%)
1.	Cattle shed	20317.00	6.50
2.	Farm building storage structure	46,667.00	15.11
	Tractor		
3.	Trolley	200417.00	64.90
4.	Minor implements	40317.00	13.05
	Total	1000.00	0.32
		308717.00	**100.00**

1.8 Average annual income of sample households

The average annual income from all sources of the household is presented in table 1.8. It is clear from the table that the sources of income of rice growing farmers were highly diversified. Diversified sources of income help in households' income stabilization and to mitigate adverse consequences, if one or more source becomes failure in income generation (Senthilkumar and Alagumani, 2003). The major share of income contributed by non-farm

sectors which accounted for 67.00% while remaining 33.00% income generated from farm sectors. The average annual income of the sample household was Rs.2,95,953.00. Major share of income was generated through a teaching job (Shiksha mitra) which contributes 27.62% of total annual income on sample farms. A significant proportion of income comes from government jobs that was 19.73% of total annual income. Self-employment and private sector contribute 9.65% and 9.82% to the total annual income respectively. The second part of income comes from agriculture in which rice and wheat were the major economic activity of households and contributed 14% and 14.36% to total annual income, respectively. The income contributions by other crops were negligible on sample farms. Maurya and Singh (2018) endorsed that in swarna cultivation seed, fertiliser, plant protection chemical, hired labour and machine labour were the resources found to be under-utilised by the farmers and their level could be increased in order to increase the yield level of the rice.

Table 1.8: Average annual income of sample household (Rs per household)

Source of income	Income (Rs.)	Share (%)
Non-farm income	**197845.00**	**67.00**
Government jobs	58416.00	19.73
Teacher (Govt. & private)	81766.00	27.62
Self employed	28583.00	9.65
Private services	29080.00	9.82
Farm income	**98108.00**	**33.00**
Rice	41438.00	14.00
Wheat	42500.00	14.36
Other crops	14170.00	4.70
Total	**2,95,953.00**	**100.00**

SUMMARY AND CONCLUSION:

The average operational holding was 1.45 ha in the study area in which the average area under rice was 1.25 ha, particularly under swarna *sub1* was 0.45 ha. and under swarna

0.53ha/farm. There was no land found fallow and uncultivable. No leased-in and leased-out land tenure system were present in the study area. The average size of the family members was almost 6. The average adult male was 30.34% and adult female were 27.7%, child males were 22.9% and child females were18.9%. More than 50% of the head of households were educated up to higher secondary. Share of rice was 86.82% that of and wheat was 86.20% to total cropped area in respective seasons. The absolute number of animals in the study area was 99, in which the share of calves was maximum that was 26.052% followed by buffalo 33.066% and cows 26.052%. In the study area, average annual income of household from all sources of income was Rs. 295953.00. Teaching job was major source of income. Income from rice cultivation was 14%, wheat 14.36% and from other crops 4.7% to total income. Farmers' planted high yielding rice varieties like Swarna, Samba mahsuri, Jalpriya, Barh avrodhi and Saket 4 and recently introduced submergence tolerant rice variety Swarna *sub1* on their field. The share of swarna was maximum to the total area under rice that was 42% and share of Swarna *sub1* was 36% to the total area under rice. It could be suggested that through effective extension activities and policies related to subsidies on fertilisers and discount in the rate of interest of machine should be provided to increase the fertiliser and machine labour use with a view to enhancing the rice yield level.

REFERENCES:

Abdelbagi M. Ismail, Singh Uma S., Sudhansu Singh, Manzoor H. Dar, David J. Mackill 'The contribution of submergence-tolerant (Sub1)rice varieties to flood security in flood-prone rainfed lowland areas in Asia'. *Field Crops Research* **30**(2-11)

Atibodhi, H.N. and Sahoo, S. 2000. 'Effeect of education on productivity of HYV of rice in Sambalpur district, Orissa', *Indian journal of Agricultural Economics*, 55(2):231-238

Atibudhi, H.N. 1993. 'An economic analysis of rice based cropping system'. *Agricultural situation in India,* **47 (12):** 71-77.

Badal, P. S. and Singh, R. P. 2001. Technological change in maize production : A case study of Bihar. *Indian Journal of Agricultural Economics*, **56**(2): 211-219.

Boiling,A (2000), ‘ Effect of climate, agrohydrology, and management on rainfed rice production in central Java, Indinesia :a modeling approach’, Characterising and Understanding Rainfed Environments.pp.57-75

Dash, J.K., Singh, R.P. and Pandey, R.K. 1995. ‘Economic analyses of summer rice production in Bhangra block of Singhbhum district of Bihar- a case study’. *Journal of Research, Birsa Agriculture University,* **7**(2): 131-135.

Dutta, K.K.; Mandal, S. snd Singh, S. B. 2006. ‘Rice in the north eastern hilly region: its scope, opportunity and challenges’, Presented in 2nd international rice congress 2006 October 9-13, New Delhi.

Hondrade 2003. ‘Upland rice varietal access ,test and multiplication (ATM) Philippine Journal of Crop Science (Phollipines)’, **28** supplement (1) p.26

Joshi, P.K and Pal, S. 2000. ‘The role of characterization in ex ante assessment off research programs :‘a study in the rainfed rice production system’, characterizing and Understanding rainfed environments p 291 303

Kheim, N.T.; Pandey, S. and Hong H.N. 2000. ‘agricultural commercialization and land-intensification : a microeconomic analysis of uplands of northern Vietnam’, Characterizing and Understanding rainfed environments.pp71-391

Maurya, A., Singh, H. N., & Choudhary, H. 2018. Comparative study of Cost and Returns of Swarna Sub1 Rice Variety Cultivation in Chandauli District Of Uttar Pradesh. Research Journal of Chemical and Environmental Sciences, 6(4), 8-14.

Maurya, A., and Singh, H.N., 2018. Resource Use Efficiency of Swarna and Swarna Sub1 Rice Variety Cultivation in Chandauli District of Uttar Pradesh , India, International Journal of Current Microbiology and Applied Sciences, 7 (9), 2552-2557.

Senthilkumar. C and Alagumani. T. 2005. “Resource Use Efficiency of Paddy in Lower Bhavani Project Command Area in Tamil Nadu”, Indian Journal of Agricultural Economics, 60(3): 515 - 516.