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A Study on Factors Affecting Marketed and Marketable Surplus of Major Food Grains of Nadia District of West Bengal

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A B S T R A C T

Surplus quantities of farm can stimulate the development of both farm and non-farm sector, which ultimately helps in boosting the economy. Major foodgrain crops like rice, lentil and gram grow extensively in Nadia district of West Bengal. Study on socio-economic status of sample farmers are extensively covered in nadia district. This study reveals that 51 percent of farmer comes under age group of 31 to 50 years, In case of literacy 30 percent of farmer comes under class 10 to 12 years of schooling and sample farmers accounting 72% of the total have family size ranging 3-5 persons. Socio economic study also shows that total operational holding is highest for marginal farmers accounting 88.83 hectare but average size holding is highest for large farmers accounting 2.32 hectare. Study on marketed and marketable surplus in case of rice and lentil depicts that gross marketed surplus is highest for marginal farmers, whereas marketable surplus is highest for large farmers for both of these crop. But for gram both gross marketed surplus and marketable surplus is highest for large farmers. Study on the factors responsible for marketed surplus of foodgrain crop demonstrates that price impact is not prominent in rice and lentil except in case of gram.

Introduction

With the introduction of modern crop production technology, the country has achieved self-sufficiency in food grains production and producing surplus amount, which can be effectively utilized for boosting economy through policy intervention. The surplus quantities of farm output can stimulate the development of non-farm sector in various ways, such as supplying raw materials, capital formation, earning foreign exchange through export and transferring excess farm labour force to industrial sector. Hence, it is important imperative to assess the magnitude of surpluses and identifying the determinants for framing sound policies in respect of marketing, pricing and distribution as well as

imports and exports with a view to achieve overall economic development. The transfer of agricultural surplus to non-agricultural sector is crucial for achievement of self-sustaining economic growth. In a growing economy, the rate of growth of urban industrial sector depends on the cheap availability of food and raw materials for farm sector. Hence, it becomes necessary to understand the behavior of marketed surplus of food crops grown partly for home consumption is of prime importance (Krishna, 1962; Bardhan and Bardhan, 1971). The marketable surplus of a subsistence crop tends to behave in a perverse way to changes in market prices, i.e., it varies inversely with the market price, even though the price elasticity of total output of the crop concerned may be positive (Medani, 1975). One explanation of the perverse behavior is put forwarded by Krishnan (1962) and Oslon (1960) which argues that an increased market price for a subsistence crop may increase the producers' income sufficiently so that the income effect to his demand for consumption of the crop outweighs the substitution effect in production and consumption; the marketable surplus may, therefore, vary inversely with market price. The second one asserts that the farmers of traditional agriculture have relatively fixed demand and, therefore, sell that quantity of the output which is necessary to meet the desired amount of money income. And so, the marketable surplus of the subsistence crop is inversely related to market price (Krishnan, 1965), (Mathur and Ezekiel, 1961). Under this pretext, the present study has been undertaken with the following objectives:

The main objectives of this study for the socio-economic features of the sample farmers of Nadia district of West Bengal and to assess the marketed and marketable surplus of major foodgrains of the study region. Also to identify the factors responsible for marketable surplus of foodgrains at the farm level of the of the study area.

Materials and Methods

Primary data related to assessment of marketed and marketable surplus has been collected from 200 sample famers belonging to purposively selected two cluster of three villages of each of the two purposively selected blocks, namely, Haringhata and Chakdah, i.e. from each cluster, 100 sample farmers growing rice, gram and lentil have been selected following population proportionate to size sampling technique. From each village, the required numbers of sample farmers are selected following Simple Random Sampling without Replacement Technique (SRSWOR) in a pretested schedule by personal interview method. Here it is to be mentioned that only these crops, rice from the category of cereals and lentil and grams from pulses will be taken for the present study to assess the marketed and marketable surplus of foodgrains. To identify the factor influencing marketed surplus, the multiple regression of following form is proposed.

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6 + u$$

Where, a= intercept, Y = dependent variable, X1= total production, X2= size of holding, X3= price of the product, X4= family size, X5= distance from nearest market, X6 = wage payment in kind,

b1- b6's are coefficients.

Results and Discussion

The socioeconomic status of the sample farmers are analyzed with a view to get a comprehensive idea about them which may have some bearing on the decision making regarding crop selection, technology use, marketing decisions and consumption patterns. Enterprise combination, consumption pattern, and employment different farm households could be influenced by their various characteristics as well as some other socio economic aspects of the farm household, such as age distribution, level of education and gender (Ahmed *et al.*, 2012). Table-1 discerns that the majority of the farmers accounting 51% belong to the age group ranging from 31 to 50 years and farmers with age beyond 50 years constitutes 37% of the total sample. Only 24 farmers accounting 12% of the total belong to the category of farmers having age lower than

equal to 30 years. The lowest percentage of farmer's involvement in farming can be attributed to the fact that the new generation young educated people are not interested in agriculture. Education may enhance productivity directly by improving the quality of labour, by increasing the ability to adjust to disequilibrium and through its effect upon the propensity to successfully adopt innovations (Weir, 1999). Hence the sample farmers classified into various groups according to the level of education measured in terms of years of schooling (table-2).

Table-2 indicates that about 30% of sample farmers have formal education within the range of 10 to 12 years of schooling and 26% farmers belong to the group having 4 to 10 years of schooling. Sample farmers with years of schooling less than 4 years comprise 17.5% of the total whereas the share of farmer with year of schooling beyond 12 years constitutes 10.5% of the total. A sizeable proportion of farmers measuring 16% are found to be illiterate without having any formal education. It is expected that the last group of farmers having the highest level of education is likely to adopt more technology faster than dinner counter parts in the lower level. The size of family i.e. the number of members in family has immense economic importance from two viewpoints - (i) increase the earning of the family by supplying labour force and (ii) put pressure on consumption requirement thereby reducing marketable surplus. Classification of sample farmers in to various size groups represented in table-3 reveals that the majority of the sample farmers accounting 72% of the total have family size ranging 3-5 persons and 18.5% of the total respondents have family less than equal to 3 persons. The lowest percentage of sample farmers measuring 9.5% of the total has family members exceeding 5 persons. Increase in family size would lead to increase in the family status of the households, i.e. one percent increase in the family size will increase the households farm and non-farm income by 0.46 percent and 3.68% respectively (Parvin and Akhteruzzaman, 2012). Table-4 discerns that the large proportion of sample farmers belong to the category of marginal farmers having operational holding size less than 1 ha estimating about 72.5% of the total followed by small farmers having holding size ranging between 1to2 ha which comprises 21% of the total respondents. So the marginal and small farmers dominate the sample size claiming about 93.5% of the total sample farmers. Total operational area under the possession of marginal farmers is estimated to 88.83 ha (52.55%) with the average of 0.61 ha whereas the small farmers have a total operational holding of 50.05 (29.61%) with an average of 1.19 ha. Farmers lying in the last category of farm size group with operational holding size more than 2 ha accounts only 6.5% of the total and the total operational area corresponding to this group of farmers are observed to be 30.17 ha (17.84%) with an average of 2.32 ha. The average size of operational holding is estimated to be 0.85 ha when all the sample farmers belonging to various farm size groups are taken together. In West Bengal the percentage of marginal farmers was 80.44% in 2000-01 which are increased to 81.17% and 82.16% during 2005-06 and 2010-11 respectively and the percentage of operated area by marginal farmers has been increased from 49.74% in 2000-01 to 50.65% in 2005-06 which further have increased to 52.47% in 2010-11 (Mondal, 2016).

The gross marketed surplus ratio which is measured by dividing the quantity actually sold by total production is estimated to be 69.59%, when all sample farmers belonging to various farm size groups are taken together (table-6). In case of farmers belonging to the lowest farm size class, the gross marketed surplus is observed to be the highest accounting 73.72% followed by farmers having farm size between 1-2 ha with gross marketed surplus ratio of 69.07% and the lowest of it measuring 58.72% is recorded in case of farmers having holding size greater than 2 ha, i.e. the gross marketed surplus ratio shows a declining trend with the increasing farm size. The decelerating trend in gross marketed surplus ratio may be attributed to the fact that the marginal farmer are compelled to sell greater part of the produce to meet immediate cash requirements resulting higher gross marketed surplus and with the increase in farm size, the retention capacity of farmers increases because of their sound economic condition, thereby low gross

marketed surplus ratio. The net marketed surplus, which is estimated by deducting the purchase made by farmers during the later period of the year from gross marketed surplus and then by dividing the total output is worked out to be 55.46% on an average when all sample farmers are taken together. The net marketed surplus ratio for farmers having holding size less than 1 ha is estimated to be 53.76% and exhibits an increasing trend with increase in holdings and observed to be the highest accounting 58.72%, in case of farmers with holding greater than 2 ha, i.e. a positive relationship between farm size and net marketed surplus ratio exists. Average marketed surplus ratio, taking all farmers together stands at 55.30% of the net availability of paddy and 61.19% of current production of paddy (Sarkar *et al.*, 2013).

The marketable surplus, which is estimated by deducting all family requirements (consumption, seed, feed and others) from total production and then divided by total output, is recorded to be 16.27%, when all sample farmers are taken together. This ratio is found to be very small measuring 6.31% for marginal group of farmers and moves upward with the increasing farm size and becomes 41.28% for farmers with holding size greater than 2 ha. This positive trend in marketable surplus ratio may be attributed to the fact that the relatively higher production from higher land size and more or less same level of average retention has resulted in higher level of marketable surplus.

Table-7 exhibits that farmers belonging to the largest farm size group claim 62.61% of the total marketable surplus although their share in total output is only 18.77%. On the contrary, marginal farmer with largest share in the total output contribute a meager percentage of 9.58% to the total marketable surplus. Farmers with holding size lying between 1- 2 ha have claimed almost an equal proportion of the total output and marketable surplus measuring 28%. It is important to note that the share of total output measuring 53.00% from an area share of 51.00% by the marginal farmer contribute 9.58% to total marketable surplus, whereas the highest group of farmer producing 18.77% of the total output from an area share of 20.00% claim the largest proportion of 62.61% of the total marketable surplus. The small farmers with an area share of 29.00% have produced 28.23% of the total produce and have made a contribution of 27.81% to the total marketable surplus. So, the marginal and small farmers with 80% share of the total operational holding have claimed 81.23% of total output but their share in total marketable surplus is estimated to be only 37.39%. the table also discuss that the market participation measured in terms of percentage of farmers who sold is observed to be the highest accounting 56.14% in case of marginal farmers (<1 ha) followed by the last size group of farmers (>2 ha) with the magnitude of 15.84% of total.

In case of lentil, an important pulse crop in the state, total retention is accounted to be 0.54 q on an average of which 0.38 q has been kept for the consumption and a meager quantity measuring 0.16 q is for meeting after requirements (table-8). The average quantity retained for selling in the market is estimated to be 1.08 q out of a total production of 1.62 q per household. The retention pattern across the farm size group is similar to that of rice.

The lowest quantity of 0.45 q has been retained by farmers with holding size less than 1 ha and increase to 0.66 q for farmers belonging to 1-2 ha farm size group and the maximum retention amounting is 1.11 q observed in case of highest farm size group of farmers. Here it is to be noted that mainly because of small amount of production and also for the fact that it is an important component of diet associated with the food habit of the people of the state, almost 50% of the produce has been retained for meeting domestic needs.

Table.9 demonstrates that the gross and net marketed surplus ratio are worked out to be 66.64% and 65.57% respectively and the marketable surplus is accounted to be 32.30%, when all the sample farmers are considered together. The highest ratio of gross market surplus is recorded in case of farmers

with holding size less than 1 ha and gradually declines with the increase in farm size and the lowest ratio to the tune of 55.41% is noted in case of farmers having land area greater than 2 ha. The net marketed surplus ratio also shows a declining trend starting from lowest to highest farm size groups i.e. 68.38% for marginal farmer and 55.41% in case of large size group of farmers. Here it is to be noted that the gross and net marketed surplus ratio for farmers with operational holding size lying between 1-2 ha and greater than 2 ha remain same as they do not have made any repurchase in the subsequent period.

The marketable surplus ratio also behaves similarly as that of gross and net marketed surplus ratio, i.e. shows declining trend across the farm size group. The marginal size groups of farmers have recorded a marketable surplus ratio of 28.38% and the same for the remaining two groups of farmers are estimated to be 38.00% and 44.59% respectively averaging 32.30% for all farmers across the various farm size groups.

Market participation of sample farmers presented in table -10 demonstrates that the lowest group of farmers share 25.58% of the marketable surplus though the share of total output by this group is accounted to be 65.94% from area share of 56.39%.

Farmers with holding size greater than 2 ha claim the highest share of marketable surplus measuring 40.48% from a small share of total output accounting 9.71% and having only 10.68% of area share under lentil. Farmers belonging to 1-2 ha farm size group contribute 34.24% to total marketable surplus out of an output share of 24.35% produced from an area share of 32.93% of total area. The market participation rate is also found to be the highest for marginal farmers accounting 69.27% followed by farmers having holding sizes ranging from 1-2 ha (22.66%) and subsequently followed by the highest farm size group of farmers which is accounted to be 8.07%. In short, all the parameters considered in the study exhibit an inverse relationship with the farm size.

In case of another important pulse crop, gram, average retention is observed to be only 0.23 q out of total production of 1.22 q per household on an average.

Here again, the retention for family consumption is found to follow the same behaviourable pattern as that of rice and lentil with variation in magnitude as well as across farm size groups. Here it is important to mention that the total retention is almost one- fifth of the total production because of the fact that this pulse crop is consumed occasionally by the household not in regular fashion like lentil.

The gross and net marketed surplus along with the marketable surplus of gram for different categories of sample farmers portrayed in table-10 reveals that 81.12% of the total produce is offered for sell in the market just after harvest as gross marketed surplus. The share of marginal farmers accounting 80.33% is observed to be slightly below the average whereas in case of the remaining two groups of farmers, it is higher than average measuring 82.19% and 83.18% respectively in ascending order off the farm size groups. Net marketable surplus shows a positive relationship with the size of the farm, i.e. moves upward with the rise of farm size starting from the lowest level of 78.65% to the highest level of 83.18% with the average of 80.06% when farmers belonging to different farm size groups are taken together. The marketable surplus for the marginal farmer is the lowest accounting 75.98% and the highest marketable surplus is recorded for the farmers having holding size greater than 2 ha with an average of 77.53% for all farmers irrespective of farm size groups, i.e. it exhibits a direct relationship with farm size. Actually, there is no significant difference between gross and net marketed surplus and marketable surplus, area farm size groups indicating negligible or no repurchase in the subsequent period except lowest farm size groups may be due to forced sale to meet cash requirements. In the case of Madhya Pradesh, marketed surplus was higher (80.40%) than marketable surplus (80.70%) indicating that the farmers in the state had distress sale and sold more

quantities without keeping adequate quantities for home consumption (Sharma and Wardhan, 2015).

Table-13 indicates that the marginal farmers with 62.68% of total operational holding have contributed 34.17% to total marketable surplus of gram from an area share of 62.58% and farmers lying between 1-2 ha farm size group have claimed 33.86% of the total marketable surplus out of total output share of 28.34% from almost an equal proportion of area under the crop. The farmers belonging to the highest farm size group with 9.08% share of total output has contributed 31.97% to the total marketable surplus and their share in the total operational area is accounted to be 8.86%.

Market participation is also observed to be the highest for the lowest farm size group of farmers measuring 61.98% followed by farmers with holding size 1-2 ha (28.71%) and subsequently followed by largest farm size group farmers (9.31%). Here it is to be noted that the relationship between farm size and measuring variables is negative, i.e. the values of variable decreases with the increase in farm size may be due to the disproportionate distribution of sample farmers into various farm size groups.

Factors affecting marketed surplus

Marketed surplus of agricultural commodities depend on several factors such as socio-economic features of the sample farmers, e.g. farm size, family size, volume of production, price, nature of the crops, consumption habit of the farm family etc.; institutional factors, e.g subsidies, credit and above all procurement policy and technological factors. Here an attempt has been made to validate the expected effect of various socio-economic factors of the farmers affecting the market surplus employing statistical tool, more specifically, multiple regression analysis. Table-14 reveals that the regression results of rice for farmer having operational holding size less than 1 ha. It reveals that the R2 value of the fitted regression equation is found to be 94% indicating that more than 94% variation in the marketed surplus is explained by variables considered in case of farmers having holding size less than 1 ha. Here the area under the crop, total production and price is positively and family size and total retention is negatively related with the marketed surplus.

In case of farmers having operational area ranging between 1-2 hectare, only two factors, namely, area and production are found to be positive, but only production and family size are significant at 10% and 1% level. Area and production with the values of 5.43 and 0.72 are positively related, whereas family size with the value of 0.165 is observed to have negative impact on marketed surplus, but non-significant (table-15).

For farmers with holding size greater than 2 ha, only area (0.493) and production (0.834) are observed to be positive and significant at 1% level which implies that 1 % increase in area and production will result in 0.493 and 0.83% rise in marketed surplus (table-15)

When all sample farmers irrespective of farm size groups are combined together, area and production are found to have significant positive impact on marketed surplus with values 14.565 and 1.079 respectively (Table-16). As expected, both the family size and total retention have significant negative influence on marketed surplus with values 0.23 and 0.13 indicating 1% increase of both will result in 0.23 and 0.13% reduction in marketed surplus respectively. Family size and family consumption was negatively, while area and total production have significant relationship with marketed surplus of paddy in Tirunelveli district of Tamil Nadu (Priya *et al.*, 2020).

Table.1 Classification of sample farmers of Nadia district of West Bengal according to age

Sl. No.	Age groups (in Years)	No. of farmers	Percentage of farmers
1	≤ 30	24	12.00
2	31 to 50	102	51.00
3	>50	74	37.00
Total		200	100.00

Table.2 Classification of sample farmers in five groups according to their years of schooling

Sl. No.	Years of schooling (years)	No. of farmers	Percentage of farmers
1	Illiterate	32	16
2	<4	35	17.5
3	4 to 10	52	26
4	10 to 12	60	30
5	>12	21	10.5
Total		200	100

Table.3 Classification of sample farmers in three groups according to their family size group

Sl. No.	Family size group	Family size	Percentage of farmers
1	≤3	37	18.5
2	3-5	144	72
3	>5	19	9.5
Total		200	100

Table.4 Estimation of Total operational holding and average size holding (ha) according to farm size group

Sl. No.	Farm size group (ha)	No. of farmers	Percentage of total	Total operational holding (ha)		Average size of holding (ha)
1	<1	145	72.5	88.83	(52.55)	0.61
2	1 to 2	42	21	50.05	(29.61)	1.19
3	>2	13	6.5	30.17	(17.84)	2.32
		200	100.00	169.05		0.85

Table.5 Estimation of Total retention (quintal) of Rice by sample farmers classified according to size of holding

Sl. No	Farm size	Production (q)	Seed (q)	Feed (q)	Others (q)	Self-consumption (q)	Total retention (q)	Quantity sold (q)
1.	<1	9.03	0.45	0.36	0.09	1.47	2.37	6.65
2.	1-2	15.17	0.76	0.61	0.15	3.18	4.69	10.48
3.	>2	34.92	1.75	1.40	0.35	10.92	14.42	20.51
Total/Average		12.09	0.60	0.48	0.12	2.47	3.68	8.42

Table.6 Estimation of Gross and Net Marketed and Marketable Surplus of rice at the household level

Sl. No	Farm size (ha)	Gross marketed surplus (%)	Net marketed surplus (%)	Marketable surplus (%)
1.	<1	73.72	53.76	6.31
2.	1-2	69.07	56.48	18.33
3.	>2	58.72	58.72	41.28
Total average		69.59	55.46	16.27

Table.7 Estimation of Percentage share in output and Marketed surplus of rice by sample farmers belonging to various farm size groups

Sl. No	Farm size (ha)	Share of output	Share of marketed surplus	Share of operated area	Share of farmer who sold (%)
1.	<1	53.00	9.58	51.00	56.14
2.	1-2	28.23	27.81	29.00	28.02
3.	>2	18.77	62.61	20.00	15.84
Total		100	100	100	100

Table.8 Estimation of Total retention (quintal) of Lentil by sample farmers classified according to size of holding

Sl. No	Farm size (ha)	Production (q)	Seed (q)	Feed (q)	Other (q)	Self-consumption(q)	Total retention (q)	Quantity sold (q)
1.	<1	1.50	0.8	0.06	0.02	0.30	0.45	1.05
2.	1-2	1.75	0.9	0.07	0.03	0.49	0.66	1.08
3.	>2	2.41	0.12	0.10	0.05	0.83	1.18	1.31
Total		1.62	0.08	0.07	0.02	0.38	0.54	1.08

Table.9 Estimation of Gross and Net Marketed and Marketable Surplus of Lentil at the household level

Sl. No	Farm size (ha)	Gross marketed surplus (%)		Net marketed surplus (%)		Marketable surplus (%)
1.	<1	70.00		68.38		28.38
2.	1-2	62.00		62.00		38.00
3.	>2	55.41		55.41		44.59
Total Average.		66.64		65.57		32.30

Table.10 Estimation of Percentage share in output and Marketed surplus of Lentil by sample farmers belonging to various farm size groups

Sl. No	Farm (ha)	size	Share output (%)	of	Share of marketed surplus (%)	Share of operated area (%)	Share of farmer who sold (%)
1.	<1		65.94		25.58	56.39	69.27
2.	1-2		24.35		34.24	32.93	22.66
3.	>2		9.71		40.18	10.68	8.07
Total			100		100	100	100

Table.11 Estimation of Total retention of Gram by sample farmers classified according to size of holding

Sl. No	Farm size (ha)	Production (q)	Seed (q)	Feed(q)	Other (q)	Self-consumption (q)	Total retention (q)	Quantity sold (q)
1.	<1	1.08	0.5	0.04	0.01	0.10	0.21	0.86
2.	1-2	1.54	0.8	0.06	0.02	0.12	0.27	1.26
3.	>2	1.70	0.9	0.07	0.02	0.12	0.29	1.42
Total		1.27	0.06	0.05	0.01	0.11	0.23	0.99

Table.12 Estimation of Gross and Net Marketed and Marketable Surplus of Gram at the household level

Sl. No	Farm size (ha)	Gross marketed surplus (%)	Net marketed surplus (%)	Marketable surplus (%)
1.	<1	80.33	78.65	75.98
2.	1-2	82.19	82.19	80.81
3.	>2	83.18	83.18	82.15
Total		81.12	80.06	77.53

Table.13 Estimation of Percentage share in output and Marketed surplus of Gram by sample farmers belonging to various farm size groups

Sl. No	Farm size (ha)	Share of output	Share of marketed surplus	Share operated	of area	Share of farmer who sold (%)
1.	<1	62.58	34.17	62.86		61.98
2.	1-2	28.34	33.86	28.28		28.71
3.	>2	9.08	31.97	8.86		9.31
Total		100	100	100		100

Table.14 Estimation of Regression results to identify factors affecting marketed surplus of Rice grown by farmers having holding size less than 1 ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	-3.66	-1.074	3.401
2		Area	8.462***	1.747	4.842
3		Family size	-0.192	0.968	0.198
4		Production	0.512*	3.480	0.147
5		Family requirements	-0.096	-0.774	0.098
6		Price	0.003	0.938	0.002
Adjusted	R^2	= 94%			

*, ** and *** indicate significance at 1, 5 and 10% level respectively.

Table.15 Estimation of Regression equation to identify factors affecting marketed surplus of Rice grown by farmers having holding 1-2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	11.027	1.325	8.323
2		Area	5.435***	0.814	4.680
3		Family size	-0.165*	-1.217	0.135
4		Production	0.715*	2.978	0.241
5		Family requirements	0.134	1.209	0.111
6		Price	-0.005	-1.058	0.003
Adjusted	R^2=	74%			

Table.16 Estimation of Regression equation to identify factors affecting marketed surplus of Rice cultivated by farmers having holding size > 2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	30.813	1.458	21.202
2		Area	0.493*	0.052	0.337
3		Family size	0.135	0.257	0.023
4		Production	0.834*	2.519	0.331
5		Family requirements	-0.397	-0.425	0.225
6		Price	0.022	-1.897	0.011
Adjusted	R^2=	83%			

Table.17 Estimation of Regression equation to identify factors affecting marketed surplus of Rice cultivated by all sample farmers of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	4.218	1.04	4.021
2		Area	14.565*	-4.302	3.384
3		Family size	-0.228**	3.385	0.09
4		Production	1.079*	0.116	0.317
5		Family requirements	-0.134*	2.391	0.056
6		Price	-0.091	-0.831	0.022
Adjusted	R^2= 83%				

Table.18 Estimation of Regression equation to identify factors affecting marketed surplus of Lentil grown by farmers having holding size > 1 ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	27.951	7.203	0.385
2		Area	0.125*	-4.512	0.277
3		Family size	-2.815*	0.612	1.452
4		Production	0.401	28.31	0.244
5		Family requirements	-2.565**	-0.531	2.044
6		Price	-0.114	-1.331	0.001
Adjusted	R^2= 94%				

Table.19 Estimation of Regression equation to identify factors affecting marketed surplus of Lentil cultivated by farmers having holding size 1-2 ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	-0.081	-1.464	0.056
2		Area	0.001*	-6.621	0.002
3		Family size	-0.004*	-0.221	0.008
4		Production	1.623	224.97	1.003
5		Family requirements	-0.708**	-0.412	0.058
6		Price	0.201	1.607	1.192
Adjusted	R^2=	79%			

Table.20 Estimation of Regression equation to identify factors affecting marketed surplus of Lentil cultivated by farmers having holding size > 2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	0.710	0.231	0.688
2		Area	0.305	0.065	0.219
3		Family size	-0.391***	2.371	0.165
4		Production	0.557**	2.951	0.188
5		Family requirements	-2.462	-0.336	1.377
6		Price	-0.008	-0.707	0.006
Adjusted	R^2= 88%				

Table.21 Estimation of Regression equation to identify factors affecting marketed surplus of Lentil cultivated by all sample farmers of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	0.964	5.944	0.162
2		Area	0.028*	-2.687	0.011
3		Family size	-0.009	0.817	0.118
4		Production	0.622***	56.788	0.025
5		Family requirements	-0.08***	0.926	0.068
6		Price	0.001**	-6.306	0.001
Adjusted	R^2=	84%			

Table.22 Estimation of Regression equation to identify factors affecting marketed surplus of Gram farmers having holding size > 1 ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	-0.024	-0.934	0.257
2		Area	0.19*	-0.664	0.158
3		Family size	-0.20**	-11.157	0.001
4		Production	0.914**	56.644	0.016
5		Family requirements	0.017	1.69	0.01
6		Price	-2.47	-0.358	0.006
Adjusted	R^2=	84%			

Table.23 Estimation of Regression equation to identify factors affecting marketed surplus of Gram cultivated by farmers having holding size1- 2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	-0.084	0.93	0.090
2		Area	-0.439	-0.580	0.411
3		Family size	0.005**	2.077	0.002
4		Production	0.924*	24.261	0.038
5		Family requirements	-0.221***	1.69	0.124
6		Price	-2.089	-0.883	2.359
Adjusted	R^2=	89%			

Table.24 Estimation of Regression equation to identify factors affecting marketed surplus of Gram cultivated by farmers having holding size > 2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	30.983	1.393	0.028
2		Area	0.493*	1.732	0.181
3		Family size	0.135	-4.438	0.002
4		Production	0.834*	49.902	0.017
5		Family requirements	-0.097	-0.439	0.007
6		Price	-0.022	-3.712	0.005
Adjusted	R^2=	68%			

Table.25 Estimation of Regression equation to identify factors affecting marketed surplus of Gram cultivated by all sample farmers having holding size > 2ha of Nadia district of West Bengal

Sl. No		Variables	Coefficients	t-stat	Std. error
1		Intercept	0.04	1.393	0.028
2		Area	0.313***	1.732	0.181
3		Family size	-0.009*	-4.438	0.002
4		Production	0.865**	49.902	0.017
5		Family requirements	-0.003	-0.439	0.007
6		Price	0.002*	-3.712	0.005
Adjusted	R^2= 81%				

Table-15 discerns that the area under lentil has significant positive influence on marketed surplus with the value of 0.33 and size of the family and total retention has a significant negative impact on the marketed surplus with values 2.82 and 2.5 which is quite understandable.

The results for small farmers are same as that of marginal farmers with minor differences in their magnitudes (Table-18).

In case of farmers having operational holding size greater than 2 hectare, significant positive influence is observed only in case of volume of production (0.56) and family has negatively impacted the marketed surplus (-0.39) and found to be significant at 10% level (Table-19).

When all farmers are taken together, area and the volume of production and price exhibits positive influence on marketed surplus which are found to be significant at 1, 10 and 5% level respectively (table-20).

Table-19 discerns that the area under Gram and volume of production have significant positive influence on the marketed surplus of gram with values 0.19 and 0.91 respectively and as usual family size has negative significant impact with the value of 0.20 in case of farmers with holding size less than 1 ha.

For farmers lying 1-2 ha land size group, family size and total retention have negative impacts which are significant at 5% and 10% level respectively and production has positively influenced the marketed surplus of gram (Table-22).

In case of farmers with holding size greater than 2 ha, only area under gram and volume of production are found to be positive and significant at 1% level (Table-23).

Regression result in case of all sample farmers, as expected, area and production have positive impact on marketed surplus of gram with values 0.31 and 0.87 respectively and are found to be significant at 10% and 5% level respectively. Here it is important to note that sale price is found to have positive and significant impact which implies that the farmers have responded positively with the price, i.e. increase market surplus with the rise in price. Here again, family size has a negative influence on marketed surplus which is significant at 1% level.

The size of holding, family size, income of household, irrigated area were the crucial factors that determine marketed surplus of wheat and maize in Bihar (Prasad, 1989). Kumar (2007) has also identified that the value of output, household size and area were the most significant factors responsible for marketed surplus for wheat, paddy, pulses and oilseeds in Haryana. Among all the independent variables, operational holding and status of the previous year were found to be positive and significant (Sharma, 2014). Lentil being residual crop, getting little attention off market price charges and low productivity level with low cash input use

and high yield risk may make a crop less price sensitive and total area under cultivation was significant and positively influenced marketed surplus of all varieties of rice, wheat, potato, mustard and lentil (Alam, 2002).

From the above analysis, it is quite evident that in case of almost for all crops area and production have direct relationship with marketed surplus and family size and total retention have negatively impacted the marketed surplus and for other variable, namely price though positively Influenced the marketed surplus but not significant except in case of gram when all farmers are considered together. So marketed surplus of foodgrains can be increased through expansion in area and introduction of high-yielding varieties leading to more production as the scope of curtailment of consumption requirement is limited. Though price impact is not prominent except in case of gram, it may play an important in augmenting marketable surplus of foodgrains.

References

Ahmed, N., J.A. Young, M. M. Dey and J. F. Muir. 2012. From production to consumption: a case study of tilapia marketing systems in Bangladesh. Aquaculture International, 20: 51-70

Alam, S., 2002. Marketable and marketed surpluses of some leading crops in Bangladesh: Recent trends and policy implications. Bangladesh Journal of Agricultural Economics, 25(2): 115-132

Bardhan, P. and Bardhan, K. (1971), "Price Response of Marketed Surplus of Foodgrains: An Analysis of Indian Time-Series Data", Oxford Economic Papers, Vol.XXIII, No. 2, pp. 255-67.

Krishna, Raj (1962); A Note on the Elasticity of -the Marketable · Surplus of a Subsistence Crop; lndlan Journal of Agrlcunural Economics: Vol.XVII No.3.

Krishnan, T. N. (1965); The Marketed Surplus of Foodgrains: Is it Inversely Related to Price?; Economic Weekly; Vot.XVII Nos. 5,6 and 7.

Kumar, Parmod (2007), Farm size and marketing efficiency: pre and post lierlization, Concept Publication, New Delhi.

Mathur, P. N and Ezekiel, H. (1 961): Marketable Surplus of Food and · Price Fluctuations in a Developing Economy; Kyklo•; Vol. XIV No.1: Basel; Switzerland.

Medani, A. I. (1975), "Elasticity of the Marketable Surplus of a Subsistence Crop at Various Stages of Development", Economic Development and Cultural Change, Vol.XXIII, No. 3, pp. 421-429.

Mondal, A. (2016) Comparative Study of Marginal Farms in India vis-a-vis West Bengal; Evidences from Last Decade, Economic Affairs, 61(4), pp. 589-598

Parvin M T and Akteruzzaman, M.(2012) Factors Affecting Farm and Non-Farm Income of (Haor) Inhabitants of Bangladesh, Progressive Agriculture, 23 (1-2).

Prasad Jagdish 1989. Marketable Surplus and Market Performance: A Study with Special Reference to Muzaffar Foodgrain Market in Bihar – First Edition, Mittal Publications

Priya, K. S. M, R. Senthilkumar, C. Muralidharan and R. Pangayar Selvi (2020) Analysis of Marketable and Marketed Surplus of Paddy in Tirunelveli District of Tamil Nadu, India, International Journal of Current Microbiology and Applied Sciences, 9(9), 1429-33.

Sarkar, Debashis; Roy, Debajit. (2013) Factors Affecting Marketed & Marketable Surplus of Paddy: A Case Study in Some Districts of West Bengal, International Journal of SocialScience**;** 2(1), 19-28

Sharma, Vijay Paul. 2014. Assessment of Marketable & Marketed surplus of wheat, gram & tur in Madhya Pradesh, Agro- Economic Research Centre For Madhya Pradesh And Chhattisgarh Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.)

Sharma, Vijay Paul and Harsh Wardhan. 2015. Assessment of Marketed and Marketable Surplus of Major Foodgrains in India, Report Submitted to the Ministry of Agriculture, Government of India, Centre for Management in Agriculture, Indian Institute of Management, Hyderadabad.

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