Journal of Crop and Weed, 18(2): 272-279 (2022)
ISSN- O : 2349 9400 ; P : 0974 6315
http://cwssbckv.org
www.cropandweed.com

An assessment of marketable and marketed surplus of major foodgrains of Nadia district of West Bengal

***M. MONDAL, [1]A. JHA CHAKRABORTY AND B. K. BERA**

Department of Agricultural Economics, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia-741252, West Bengal, India

[1] School of Agriculture and Allied Sciences, The Neotia University, Sarisa, 24 Parganas (South)- 743368, West Bengal, India

Received : 17.03.2022 ; Revised : 25.04.2022 ; Accepted : 10.05.2022

DOI: https://doi.org/10.22271/09746315.2022.v18.i2.1600

ABSTRACT

Producer's surplus plays a key role in a country's economic development, which stimulate the development of non-farm sector in various ways. Rice, lentil and gram being major foodgrains crop, are grown extensively in Nadia district of West Bengal. Study on compound growth rate of area, production and productivity reveals that the total foodgrain production has accounted at the rate of 1.24% in spite of deceleration in area at a rate of 1.00% mainly depending on the performance of yield registering a growth of 2.21%. Study on cropping pattern during the period of 2000-01, 2010-11 and 2014-15 indicate that the share of area under total foodgrain in all three period is observed to be below 50% and also the share of total pulse is estimated to be more or less 7%. Study on total retention shows that the lowest size group of farmers have retained minimum amount and gradually increase with the increase in farm size in rice, lentil and gram. The positive retention pattern is also observed in case of seed, feed and others for rice, lentil and gram. Marketed and marketable surplus is estimated in all three crops. The performance of the district in production of food grains is not satisfactory, but the district has made remarkable progress in production of cash crops, particularly high valued fruits and vegetables which is also reflected in the measure of marketable surplus of the crops taken under the study.

***Keywords*:** Marketable surplus, marketed surplus, food grains

Producer's surplus of farm commodities plays an important role in economic development of a country as these 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. Increased production of farm products is also necessary for food security of the country, but for the process of economic development, the growth in surplus production is more important. Increasing agricultural production loses its significance in relation to national economy unless it is accompanied by an increase in marketable surplus of agricultural production (Mandal and Ghosh, 1968). An increase in the marketable and marketed surplus both from the quantitative and qualitative point of view is one of the derived means for rapid economic development of an agrarian economy (Natarajan, 1961).The knowledge of the quantum of marketable surplus helps in farming sound price policy, more specially for implementation of price support programme, procurement policy adopted by government for feeding the public distribution system, designing export-import strategies *etc*. Although the terms marketed and marketable surplus are sometimes used interchangeably,but theoretically, these two terminologies are quite distinct and have been defined in a variety of ways. The empirical literature on this subject does not often make the distinction clear, the terms are used interchangeably (Chattopadhyay and Sen, 1988). Marketed surplus is generally defined as that portion of the output which is actually marketed by the farmer-producers irrespective of the consumption need of the farm family, requirement for seeds, feed, wage payment in kinds *etc*. Distress sale which are frequent in case of marginal and small farmers to satisfy their immediate cash obligations and then repurchased in the later period to meet family consumption requirements are subtracted from the gross quantity sold that give rise to another concept of net marketed surplus. Marketable surplus can be defined as the surplus which the producer-farmer has made available with himself for disposal once the genuine requirement of the farmer for family consumption, payment of wage in kind, feed, seeds and wastages have seen met (Sadhu and Singh, 2002).Under this pretext the present study has been undertaken with the following specific objectives:

- To study the present scenario of agriculture of Nadia district of West Bengal.
- To assess the quantum of marketed and marketable surplus of foodgrains produced by the sample farmers of Nadia district of West Bengal.

Email: mridulmondal002@gmail.com

- To suggest some measures to augment marketable surplus in district considered for the study.

MATERIALS AND METHODS

The study is based on both the primary and secondary data. Secondary data related to area, production and productivity of major crops of Nadia district of West Bengal has been collected from statistical abstract published by Bureau of Applied Economics and Statistics, Department of Agriculture, Govt. of West Bengal covering period 1991-2018. 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 number of sample farmers were selected following Simple Random Sampling without Replacement Technique (SRSWOR) in a pre-tested schedule by personal interview method.

Analytical tools: Exponential growth function of the following form will be employed to estimate the of Compound Annual Growth rate of area, production and productivity of major crops grown:

$Y_t = ab^t$, or, $\log Y_t = \log a + t \log b$, or, $\log Y_t = A + Bt$

Where, Y_t = Area/Production /Productivity, A= log a and a indicates intercept,B= log b, where, b = regression co-efficient, and t is the time period.

So, CAGR = (Antilog of b -1) × 100

Mainly tabular and percentage analysis technique was employed for estimation of marketed and marketable at the households level.

RESULTS AND DISCUSSION

Present status of agriculture in Nadia district of West Bengal

The district of Nadia offers congenial agro climatic condition favourable for the cultivation of a wide range of crop including high valued horticultural crops like fruits, vegetable and flowers. Here, an attempt has been made to measure the performance of agriculture sector of the district in terms of growth in area, production and productivity of major crops and change in cropping pattern over the study period.

Table1 discerns that the foodgrains production has grown up at the rate of 1.24% in spite of deceleration in area at a rate of 1.00% mainly depending on the performance of yield registering a growth of 2.21%. Among foodgrains, total cereals have witnessed an output growth of only 0.11% due to rise in productivity at a rate of 1.01% which has compensated the effect of fall in area at rate of 0.89%. Again among cereals, yield growth of 1.12% is observed to be sufficient to overcome the negative effect of area setback to help total rice to register a positive output growth of 0.75%. Expansion in area at a rate of 1.16% in combination with 1.06% yield rise is instrumental to register an output growth of 1.9% for *aman* whereas *aus* rice has performed badly in respect of growth in area, production and productivity *i.e*. negative growth in all fronts. The resultant effect of 1.63% positive yield growth and deceleration in area by 3.41% has forced the output of *boro* rice to record a negative output growth of 2.67%. Despite of yield rise at the rate of 2.37%, fall in area at a rate of 0.61% has registered the production of total pulses to grow at 1.82% rate. Marginal expansion in area at the rate of 0.42% in association with 2.15% rate of increase in yield has helped the output of lentil to grow at the rate of 2.62%. The combined effect of rise in area and yield to the tune of 1.49 and 1.41% respectively is responsible for output growth 2.93% of the total oilseeds. Mainly expansion in area at the rate of 4.15% under sesame along with acceleration in yield at the rate of 0.70% is responsible for outstanding output growth of 4.95%. Mustard has also registered positive rate of increment in area and yield accounting 0.95% and 1.31%, which has influenced the production to rise at the rate of 2.39%. The district has made remarkable growth production of potato at the rate of 5.52 % as a result of combined effect of positive growth in area and yield measuring 3.06 and 2.58% respectively. Productivity of total vegetable has grown at the rate of 1.70% in association with area expansion to the tune of 0.85% has helped the district to record an output growth of 2.58%. The total fruit has achieved a tremendous success by registering an output increment of 11.90% mainly depending on rise in area and yield at the rate of 6.64 and 5.04% respectively. Summarily, the district has performed moderately in production of food grains but the progress in case of cash crop, particularly in production of oilseeds, potato and total fruits and vegetables is highly appreciable.

Cropping pattern

Cropping pattern refers to the proportion of land under cultivation of various crops at different points of time.The cropping pattern of Nadia district of West Bengal is characterized by the dominance of crops other than foodgrains *i.e*. the agriculture of the district has been transformed into commercial sector as the share of area under foodgrains in all three sub-periods is observed to be below 50%, even in food grains, the share of total pulses is estimated to be more or less than 7%. In 2001-01, foodgrains claim only 45.18% of GCA, marginally dip to 44.7% in 2010-11 and again reach to 45.54% in 2014-15, *i.e*. remains almost unchanged. The share of

Table 1: Estimation of compound annual growth rate of area, production and productivity of major crops of Nadia district during the period 1990-91 to 2017-18

Crops	Area	Yield	Production
Aus	-1.23***	-1.11*	-0.13
Aman	1.16	1.06	1.9*
Boro	-3.41*	-2.67*	1.63**
Total rice	-0.97*	1.12	0.75
Wheat	-0.65	1.44*	0.60
Total cereal	-0.89*	1.01*	0.11
Lentil	0.42**	2.15*	2.62*
Gram	-1.40**	1.18***	-0.20
Total pulses	-0.61	2.37*	1.82**
Total Foodgrains	1.00	2.21	1.24**
Sesame	4.16*	0.70*	4.95*
Mustard	0.95*	1.31	2.39
Total oilseed	1.49*	1.41*	2.93*
Potato	3.06	2.58*	5.52*
Total Vegetable	0.83**	1.70**	2.58
Total Fruits	6.64*	5.04*	11.90*

Table 2: Change in cropping pattern of Nadia district of West Bengal during the period 2000-01, 2010-11 and 2014-15

Crops	Nadia		
	2000-01	2010-11	2014-15
Aus	6.95	6.70	6.42
Aman	3.66	12.29	12.30
Boro	19.22	13.65	12.73
Total Rice	29.83	32.63	31.45
Wheat	7.86	5.36	5.63
Total Cereals	37.77	38.37	37.76
Gram	2.37	0.84	1.28
Lentil	2.82	2.87	3.12
Total Pulses	7.42	6.34	7.78
Total Foodgrains	45.18	44.71	45.54
Rape and Mustard	10.62	10.08	10.22
Total oilseeds	14.17	13.87	14.40
Jute	16.96	15.86	15.14
Potato	0.46	0.98	0.70
Total Vegetables	10.62	11.55	11.07
Total Fruits	1.99	2.94	2.94
Total	100.00	100.00	100.00

Table 3: Estimation of total retention (q) 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		**12.09**	**0.60**	**0.48**	**0.12**	**2.47**	**3.68**	**8.42**

Table 4: Estimation of gross and net marketed and marketable surplus of rice at the household level

Sl. No.	Farm size	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 avg.		**69.59**	**55.46**	**16.27**

Table 5: 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 6: Estimation of total retention 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 7: 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 8: Estimation of percentage share in output and marketed surplus of lentil 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	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 9: 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 10: 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 11: 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 of operated 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**

total cereals and pulses has remained almost same in all the study period around 38 and 7% respectively. Area under total rice as a percentage of GCA fluctuates around 30% in all periods. The share of *aman* is gradually moving upward from 3.66% in 2000-01 to 13.65% in 2010-11 and sliding marginally to 12.73% in 2014-15. Although area under *aus* has remained stable with minor variationsacross sub-periods i.e. at 6.5%, the share of *boro* has reduced perceptibly from 19.22% in 2000-01 to 13.65% in 2010-11 and subsequently came down to 12.73% in 2014-15. Deceleration in the share of area under gram from 2.37% in 2000-01 to 1.28% in 2014-15 is found to have fully compensated by the increment in area under lentil from 2.83% 2000-01 to 3.12 per cent in 2014-15 resulting more or less unchanged in area share under total pulses which has revolved around 7%. Small fluctuation in area share of mustard around 10% has kept the share total oilseeds around 14% with minor variations across the period.

Total fruits have occupied 1.99% of GCA in 2000-01 and increased to 2.94% in 2010-11 and remained unaltered in the next sub-period. Total vegetable is observed to be the third crop group after total rice and total oilseed in terms of share of area as a percentage of GCA in Nadia district, which have claimed 10.62% in 2000-01 and gone up in the next period by 0.93% to attain a share of 11.55% and marginally reduced by 0.48% in 2014-15 to reach to 11.07% of GCA of the district.

Estimation of marketed and marketable surplus ratio of selected crops

Table 3 reveals that out of an average production of 12.09 q per household, the largest portion accounting 2.47q has been retained by the sample farmers for meeting consumption requirement and for seed purpose 0.60 qand feed and others accounts 0.48 and 0.12 q respectively when all sample respondents are taken together. The average retention for own consumption is found to be lowest in case of farmer belonging to the lowest farm size group having operational holding size less than 1ha accounting 1.47 q and increases with the increase in farm size and has attained the highest level accounting 10.92 quintal, on an average for farmers having holding size greater than 2 ha, *i.e*. retention for family requirement increases with the increase in farm size. So, the lowest farm size group of farmers have retained minimum amount and gradually increased with

the increase in farm size. The positive retention pattern is also observed in case of seed, feed and other for rice crop.

The gross marketed surplus ratio which is measured by dividing the quantity actually sold by total production is estimated to be of 69.59%, when all sample farmers belonging to various farm size groups are taken together (Table 4). In case of farmers belonging to the lowest farm size class, the grossmarketed 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% was 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. The net marketed surplus is however, lower than gross marketed surplus as all farm size may be due to the fact that small and marginal farms sell their produce just after harvest to meet credit requirement of the next crop and then buy back at a later date (Sharma, 2016). 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.

Table5 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 of 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. 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 7 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 7 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 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).

Table11 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.

CONCLUSION

The performance of the district in production of foodgrains was not satisfactory, but the district has made

remarkable progress in production of cash crops, particularly high value fruits and vegetables which was also reflected in the measure of marketable surplus of the crops taken under the study. One reason may be the dominance of marginal and small farmers in the farm sector the district resulting low production which has exhausted to meet the family requirements. To increase the production and marketable surplus of foodgrains, there was an urgent need of developing high-yielding varieties and extensive training programme for rapid adaptation by the farmers.Government should take up the responsibility of educating the farmers about pricing policy, fertilizers, machineries, manures, centrally sponsored schemes, credit facilities, *etc* by organizing awareness/training programmes at regular intervals in nearby areas (Kumar *et al*.,2013). To encourage farmers to grow more foodgrains, adequate incentives must be provided through various price support schemes.

REFERENCES

Chattopadhyay, M. and Sen, I. 1988. Marketable surplus and size-classes of holdings. *Econ. Polit.Wkly.*, A151-A156.

Kumar, P., Kannan, E., Chaudhary, R. and Vishnu, K.2013. Assessment of Marketed and Marketable surplus of foodgrain crops in Karnataka.Agricultural Development and Rural Transformation Centre.

Mandal, G.C. and Ghosh, M.G. 1968.Study of marketed surplus of paddy at the farm level in four east Indian villages. *Indian J. Agric. Econ.*, **23**(3): 21-29.

Natarajan, B. 1961. Problems of marketable surplus in Indian agriculture. *Indian J. Agric. Econ.,* **16**(1): 55

Sarkar, D., Sinha, A. and Roy, D. 2013. Assessment of marketable, marketed surplus and post-harvest losses of paddy in West Bengal, Agro-Economic Research Centre, VisvaBharati, Santiniketan, West Bengal.

Sharma, V.P. and Wardhan, H. 2015. Marketed and marketable surplus of major food grains in India, Centre for Management in Agriculture (CMA), Indian Institute of Management (IIM)(Research Report).

Sharma, V. P. 2016. Marketed and marketable surplus of rice and wheat in India: Distribution and Determinants, *Indian J. Agric. Econ.,* **71**(2): 137-159.