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Impact of Minimum Support Price on Agricultural Production in Western India

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A B S T R A C T

The current study focused on how the production, productivity, and paddy yield affected by the MSP and to find out the extent of participation in markets by paddy growers. In developing countries like India, most smallholder farmers are characterized by poor market participation because they lack market information on paddy marketing. Despite paddy market value, its market participation has not been fully studied and quantified results in poor prices among small-scale farmers. The multistage sampling procedure was employed to contact 170 respondents. Semi-structured questionnaires were used to collect data from small-scale paddy farmers through face to face interview. The data were analysed using the descriptive statistics, Heckman two-stage selection model and Multinomial Logit model. SPSS and STATA computer programs were used to process the data. The results showed that age, gender, education level, and paddy yield significantly influenced the decision to participate in paddy marketing. Further, gender, group marketing, paddy yields, price information, marketing under contract and vehicle ownership significantly influenced the choice of paddy marketing outlets. The study recommends that, for holistic market participation among paddy farmers, proper market infrastructure. The government and other policymakers should increase the marketing information and ability of paddy farmers through avenues.

Introduction

Agriculture is the most important sector in the economy of India. It contributes 17-18 percent of the Country's GDP and more than 50 percent workspace of total workspace in India. It is for this reason that the Indian government has identified agriculture as one of the key sectors that are expected to provide the growth necessary for the achievement of the New India Vision 2022. The agriculture sector in India is characterized by the existence of large scale, medium scale, and smallholder farmers. Smallholder agricultural

production is largely characterized by growing of crops like rice and wheat, which are primarily targeted for own consumption with a little marketable surplus. In India, land holdings have become smaller due to population pressure, hence farmers have transformed towards highly market-oriented crops. Therefore, the government of India and state government providing support to agriculture sector through Minimum Support Price (MSP) for selected crops, agricultural finance, subsidized inputs, technology, irrigation facilities, marketing and storage facilities, electricity, and policy awareness to the farmers etc. Agriculture in West Bengal (WB) is the means of livelihood of about 65% of the population of the state living in villages with over 95% as small and marginal farmers and its major cultivated areas has rice, and minor area cultivated with wheat and potato.

The importance of agriculture in the state's economy is reflected by its contribution of about 20.69% to the total net State Domestic Product (SDP). The employment support from the sector is nearly 57% of the rural workforce. It produces more than 15% of the total rice production in the country. It also accounts for 72% of the country's jute, 34% of potato and 22.9% of tea production. The production of rice in West Bengal in 1991 was 10436.5 thousand tonnes and area under rice cultivation was 5812.9 thousand hectares. In the state production was an increase but the area under rice cultivation was decrease. MSP on rice in 1991 was Rs.205/quintal and in 2018 it was Rs.1550/ quintal. MSP is a tool which gives guarantee to the farmers, prior to the sowing season, that a fair amount of price is fixed to their upcoming crop to encourage higher investment and production of agricultural commodities.

The MSP is in the nature of an assured market at a minimum guaranteed price offered by the Government. The MSP is fixed on the recommendations of the Commission for Agricultural Costs and Prices (CACP). The CACP is a statutory body and submits separate reports recommending prices for Kharif and Rabi seasons. The Central Government after considering the report and views of the State Governments and also keeping in view the overall demand and supply situation in the country takes the final decision. The present study was undertaken to find out the impact of agricultural price policy on the income of farmers and cropping pattern followed by them. It also identifies what are the factors are responsible for the success and failure of minimum support price on the microscopic level. These include growth parameters, distribution aspects, decision-making in the allocation of resources, environmental effects and above all as an operational instrument of the price policy. Despite paddy market value, the farmers in the study area are faced with the marketing problem evidenced by low farm-gate prices. These poor prices among small-scale paddy farmers have led to low household income. This study, therefore, filled that knowledge gap by clarifying underpinning drivers of market participation among small-scale paddy farmers in Midnapore district. The project is formulated with the following broad objectives: To find out the impact of MSP on yield, market price, and area under production of paddy in West Bengal, To determine the factors influencing participation and extent of participation in the marketing of paddy at Midnapore in West Bengal, To determine the factors influencing the choice of paddy marketing outlet in at Midnapore in West Bengal.

Materials and Methods

Study area

West Bengal ranks first in area and production in the country. About 78% of the

total area under rice in the State is concentrated under high and medium productivity groups, which accounts for nearly 84% of the total production of rice in the State. The area under high yielding varieties is nearly 85%. The different area in Midnapore was chosen for the study from medium productivity group. Midnapore is located in 22.4° N and 87.38° E. Its total area is 6308 km2. Rice is cultivated in 18 districts of West Bengal. Out of which 4 districts are under high productivity group, 9 districts are under medium productivity group, 3 districts are under medium-low productivity group and 2 districts are under low productivity group.

Sampling procedure

The target population of the study was the small-scale paddy farmers in Midnapore district. The multi-stage sampling procedure was used in the selection of a representative sample. The first step involved the selection of divisions in Midnapore district. Secondly, some locations were selected purposively because of the large number of small-scale paddy farmers in Midnapore district. Finally, 30 farmers in each location were selected randomly using simple random sampling to give a total sample of 120 farmers who were ultimately interviewed. The required sample size was determined by Cochran's proportionate to size sampling methodology (Mugenda and Mugenda, 2003).

Data collection method and data analysis

Before the data was collected, the questionnaire was pre-tested on selected farmers to evaluate the appropriateness of the design, clarity, and relevance of the questions. The appropriate modification was made on the pre-tested questionnaire in order to capture the relevant information related to the study objectives. Two enumerators were recruited and trained on the content of the questionnaire and interviewing process. Primary data were collected through the survey of 170 small-scale paddy growers. Data from the field was edited, coded, and cleaned to ensure consistency, uniformity, and accuracy. Data were entered into computer software for analysis. Both SPSS and STATA computer programs were used to process the data. Two types of analysis, namely: descriptive and econometric were used for analyzing the collected data.

Descriptive analysis and econometric analysis

In order to achieve objective one, descriptive statistics such as means, minimum and maximum values, frequencies, percentages, and standard deviations were used to describe and examine the socio-economic characteristics of small-scale paddy farmers, institutional and market characteristics of paddy marketing in Midnapore district. Heckman two-stage model and Multinomial Logit model, respectively.

Heckman two-stage model

To determine the factors influencing participation and extent of participation in paddy marketing, the Heckman two-stage selection model was used. The decision to either participates in the market or not and the level of participation was dependent variables and was estimated independently. Heckman two-step procedure was identified as an appropriate model for such independent estimation. Heckman two-step model involved the estimation of two equations: First, is whether a household participated in the paddy market or not, and the second is the extent of market participation (proportion of paddy sales). The proportion of paddy sales was conditional on the decision to participate in the market. Heckman procedure is a relatively simple procedure for correcting

sample selection bias with the popular usage of (Hoffman and Kassouf, 2005).

The model consisted of two steps; firstly, the selection equation was estimated using a profit model and secondly, an outcome equation was estimated using OLS regression. A Profit model predicts the probability of whether an individual household participated in the paddy market or not as shown.

$$\Pr(Z_i=1|w_i,\alpha)=\phi(h(w_i,\alpha)+\varepsilon \quad \text{(i)}$$

Where Z_i is an indicator variable equal to unity for small-scale paddy farmers who participated in the marketing, ϕ is the standard normal cumulative distribution function, w_i a is the vector of factors affecting the decision to participate in paddy market, α is the vector of coefficients to be estimated, and ε_i is the error term assumed to be distributed normally with a mean of zero and a variance σ^2. The variable takes the value of 1 if the marginal utility the household i get from participating in the marketing of paddy is greater than zero, and zero otherwise. This is shown as follows,

$$Z_i^*=\alpha w_{i+}u_i \quad \text{(ii)}$$

Where Zi^* is the latent level of utility the small-scale paddy farmers get from participating in the market, $u_i \sim N(0, 1)$ and,

$$Zi=1 \text{ if } Z_i^*>0 \quad \text{(iii)}$$
$$Zi=0 \text{ if } Z_i^*\leq 0 \quad \text{(iv)}$$

In the second step, an additional regressor in the sales equation will be included to correct for potential selection bias. This regressor is Inverse Mills Ratio (IMR). The IMR is computed as:

$$\frac{\square(h(wi,\hat{a}))}{\phi(wi,\hat{a})} \quad \text{(v)}$$

Where ϕ is the normal probability density function? The second-stage equation is given by:

$$E=(Y_I|Z=1)=f(x_i,\beta)+\lambda\frac{\square(h(wi,\hat{a}))}{\phi(wi,\hat{a})} \quad \text{(vi)}$$

Where *E* is the expectation operator, *Y* is the (continuous) proportion of paddy sold, *x* is a vector of independent variables affecting the quantity of paddy sold, and β is the vector of the corresponding coefficients to be estimated. Therefore, *Yi* can be expressed as follows:

$$Y_i^*=\beta' x_i+\gamma\lambda_i+u_i \quad \text{(vii)}$$

Yi* is only observed for those paddy farmers who participate in the marketing. Where ~

$N(0,\sigma_u)$. (Zi= 1), in which case $Yi=Y_i^*$

The model can thus be estimated as follows; in the first step of deciding whether to participate in paddy marketing or not. This can be specified as:

$$P(0,1)=\beta_0X_0+\beta_1X_1+\beta_2X_2+\ldots..+\beta_nX_n+e \quad \text{(viii)}$$

Where participation is denoted by 1 and non-participation is denoted by 0, β0 is a constant, β1…..n are parameters to be estimated are a vector of explanatory variables. The Second step which involves a decision on the extent of paddy marketing is estimated by use of an OLS as follows;

$$Y=\beta_0X_0+\beta_1X_1+\beta_2X_2+\ldots..+\beta_nX_n+e \quad \text{(ix)}$$

Where Y denotes the proportion of paddy sales, β0 is a constant, β1…..n are parameters to be estimated X_{is} are vector of explanatory variables.

Multinomial logit model

To determine the factors influencing the choice of paddy marketing outlet in Midnapore district of West Bengal, the multinomial Logit model was used. The

choice of a given marketing outlet is discrete because it is chosen among other alternative outlets. Let P_{ij} represent the probability of choice of any given market outlet by paddy farmers, then equation representing this will be,

$$P_{ij}=\beta_0+\beta_1X_1+\beta_2X_2+\ldots\ldots\beta_nX_n+e \qquad (x)$$

Where *i* takes values (1, 2, 3), each representing the choice of marketing outlet (rice mill=1, Local market =2, MSP =3). X_1 are factors affecting the choice of a market outlet, β are parameters to be estimated and *e* is a randomized error. With *j* alternative choices, the probability of choosing outlet *j* is given by,

$$\text{Prob (Yi=j)} = \frac{e^{z_j}}{\sum_{k=0}^{j} e^{z_k}} \qquad (xi)$$

Where *Zj* is a choice and *Zk* is an alternative choice that could be chosen (Greene, 2000). The model estimates are used to determine the probability of choice of a market outlet given j factors that affect the choice *Xi*. With a number of alternative choices, the log odds ratio is computed as,

$$\ln\left(\frac{pij}{pij*}\right)=\alpha+\beta_1X_1+\beta_2X_2+\ldots.\beta_kX_k{}^{+ei} \qquad (xii)$$

P_{ij} and P_{ik} are probabilities that a farmer will choose a given outlet and alternative outlet respectively. ln (P_{ij}/P_{ik}) is a natural log of the probability of choice j relative to probability choice k, α is a constant, β is a matrix of parameters that reflect the impact of changes in *X* on the probability of choosing a given outlet, e is the error term that is independent and normally distributed with a mean zero. The parameter estimates of the Multinomial Logit model provide only the direction of the effect of the independent variable on the dependent (response) variable but do not represent either the actual magnitude of change nor probabilities. The marginal effects or marginal probabilities are functions of the probability itself and measure the expected change in the probability of a particular choice being made with respect to a unit change in an independent variable from the mean Marginal effects of the attributes on choice are determined by getting the differential of probability of a choice and it is given by,

$$(\delta)=\frac{\partial P_i}{\partial X_i}=P_i\left(\beta_j-\sum_{k=0}^{j}P_k\beta_k\right)=P_i(\beta_i-\beta) \qquad (xiii)$$

The multinomial Logit model is given below:

$$P_{ij}=\beta_0+\beta_1X_1+\beta_2X_2+\beta_nX_n+\ldots\ldots+\varepsilon_i \qquad (xiv)$$

Results and Discussion

Impact of MSP on yield, market price, and area under production of paddy in West Bengal

In India area of rice cultivation in 1982 were 40.71 million ha and its increase with the passage of time. In 2018 the area of rice cultivation is 42.94 million ha. Fig. 1. show that a similar manner production and productivity of rice in 1982 was 53248.7 thousand tonnes and 1308 kg/ha respectively and in 2018 it is 111000 thousand tonnes and 2585 kg/ha. Production in India is increasing with MSP. Total production of rice in India in 2018 is 111007.8 thousand tonnes in which West Bengal contribute largely then UP, Punjab, Tamilnadu. Fig. 2. demonstration that the contribution of production of rice of different states of India into total rice production of India in 2018. Fig.3. illustrations that the MSP of rice in India in 1982 was Rs.115/quintal. It is increased by 10 times between 1984-85 to 2017-18. In 2018 MSP provided by the government to the paddy growers are 1550. Government of India continuously increasing MSP so that production of a definite crop will increase. Fig. 4. it's clear that the coefficient of

determination is 0.5188 which means with an increase in MSP there is a certain increase in production also with time. In 1991 in the West Bengal area of rice cultivation was 5812.9 thousand ha but in 2018 it is decreased to 5240 thousand ha though MSP of rice was increased. This may be due to the high cost of production and urbanization. Figure 5 shows that the relationship between area and MSP. The productivity of rice is increased from 1991 to 2018 this is due to the use of hybrid seeds, modern technologies, fertilizers, and pesticides, etc. Fig 6 show that the relationship between MSP and productivity. The productivity as well as the MSP of rice is increased from 1991 to 2018 due to the provision and invention of different types of government policy and the market value of the rice. The MSP has increased with different parameters also such as the government budgets related to agricultural and government aim to the farmer income should be double by 2020. And the productivity of rice crop is also increased day by day because of farmers has adopted the new hybrid verities of rice in case of conventional farming systems and as well as SRI systems of rice production.

Econometric results

Heckman two-step procedure was used to determine the factors influencing participation and extent of participation in paddy marketing. The variables included in the model were age, gender, household income, education, occupation, household size, paddy price, price information, vehicle ownership, marketing experience, group marketing, paddy yield, and distance to market. The data were analysed and post estimation of the selection equation results was done to obtain the marginal effects. The marginal effects were used for interpretation since the coefficients of the selection equation have no direct interpretation. The reason is that they are just values that maximize the likelihood function. Marginal effects have a direct interpretation (Heckman, 1979).

Factors influencing market participation

To determine the factors influencing market participation of paddy growers in Midnapore district, a Profit model was estimated in the first step of the Heckman selection equation. The results presented in Table 1. Four variables (age, gender, education, and paddy yield) were significantly found to influence the farmers‟ decision to participate in the paddy market. Gender of the household head significantly and positively influenced market participation. Being a male-headed household increases the probability of participating in the Paddy market by 5.82 %, all other factors held constant. This suggests that male-headed households are more market-oriented than female, hence they participate more in the market for paddy. This finding is in line with the argument by Doss (2001) who argued that men are responsible for providing cash income to the household and to accomplish this they grow cash and export crop. The education level of the household head significantly and positively influenced market participation.

One year increases in the household head’s education, increase the probability of participating in the paddy market by 11%, all other factors held constant. This can be explained by the fact that as individual access more education he/she is empowered with the marketing skill and knowledge that will spur individual to participate in the market. This is in line with Astewel (2010) who illustrate that if paddy producer gets educated, the amount of paddy supplied to the market increases, this suggests that higher level of education provides a greater opportunity for the farmers to participate in the paddy market.

Factors influencing the extent of market participation

To determine the factors influencing the extent of market participation in paddy marketing, OLS regression was estimated in the second step of the Heckman outcome equation. The results are presented in Table 2. Five variables (gender, marketing in the group, price information, marketing experience, vehicle ownership, and contract) were significantly found to influence the extent of market participation. Gender of the household head significantly and positively influenced the extent of market participation. Being a male-headed household increased the proportion of paddy sales by 3.27. The male-headed households are believed to have strong bargaining power which in turn increases the proportion of paddy sales.

Table.1 The Heckman two-step selection equation result

Variables	dy/dx	Std error	p>Z
Gender	0.0582993	0.0448473	0.194
Storage system	0.0826367	0.0370063	0.026
Price information	0.1038589	0.0389423	0.008
Vehicle own	0.2724647	0.0797423	0.001
Education	0.1155177	0.0239442	0.001
Household size	-0.001864	0.0120317	0.877
Farm size	0.0233946	0.0322505	0.468
Marketing experience	0.0055226	0.0026959	0.041
Vehicle number	0.0617788	0.0190987	0.001
Age	-0.0001049	0.0021412	0.961
Distance to market	0.1221193	0.0130322	0.001
Transportation cost	-0.0006618	0.0000528	0.001
Constant	-0.0526484	0.1459929	0.718

Source: Survey data (2019)

Table.2 The Heckman two-step outcome equation results

Variables	Coefficient value	Std error	p>|Z|
Gender	3.278681	5.059718	0.518
Storage system	7.917332	4.174931	0.06
Price information	5.591502	4.393411	0.025
Vehicle own	20.69086	9.023554	0.023
Education	-0.4964256	2.701284	0.854
Household size	-1.556413	1.357362	0.253
Farm size	38.50454	3.63836	0.001
Marketing experience	0.7862338	0.304142	0.011
Vehicle number	3.766146	2.154638	0.082
Age	-0.5424998	0.241566	0.026
Distance to market	-4.115626	1.470241	0.006
Transportation cost	0.0374463	0.005959	0.001
Constant	28.15059	16.4697	0.089

Table.3 Marginal effect from Multinomial Logit on the choice of marketing outlets

Variables	Rice mill (processing unit)			Farm gate (Middleman)			MSP		
Explanatory variable	dy/dx	Std Error	P-value	dy/dx	Std Error	P-value	dy/dx	Std Error	P-value
Age	0.0019	0.0077	0.39	-0.0069	0.007	0.34	-0.004	0.0056	0.477
Sex	0.118	0.215	0.57	-0.162	0.156	0.30	0.043	0.1772	0.805
Edu	0.0729	0.1271	0.44	-0.202	0.128	0.02	0.129	0.0722	0.027
Off-farm income	-0.274	0.0935	0.002	0.1205	0.078	0.09	0.1541	0.0744	0.039
Price information	0.1008	0.1685	0.52	-0.4105	0.150	0.003	0.309	0.0992	0.001
Storage system	0.348	0.1426	0.014	-0.402	0.1515	0.008	0.053	0.0838	0.524
Rice outcome	0.003	0.0023	0.151	-0.0029	0.0015	0.052	0.0059	0.0017	0.001

Fig.1 Rice production of India from 1982-2018

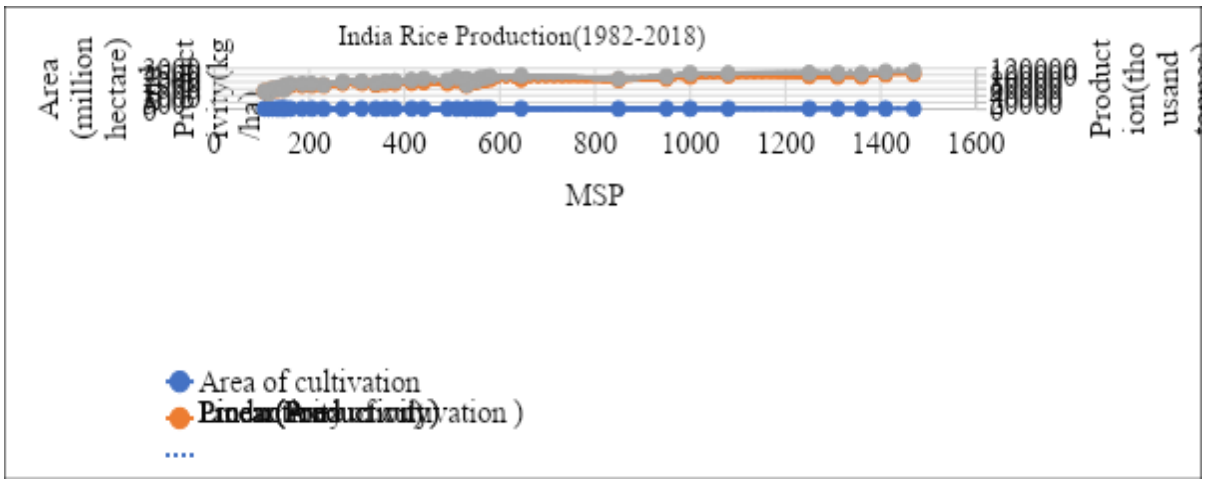


Fig.2 Rice production of different states of India in 2018.

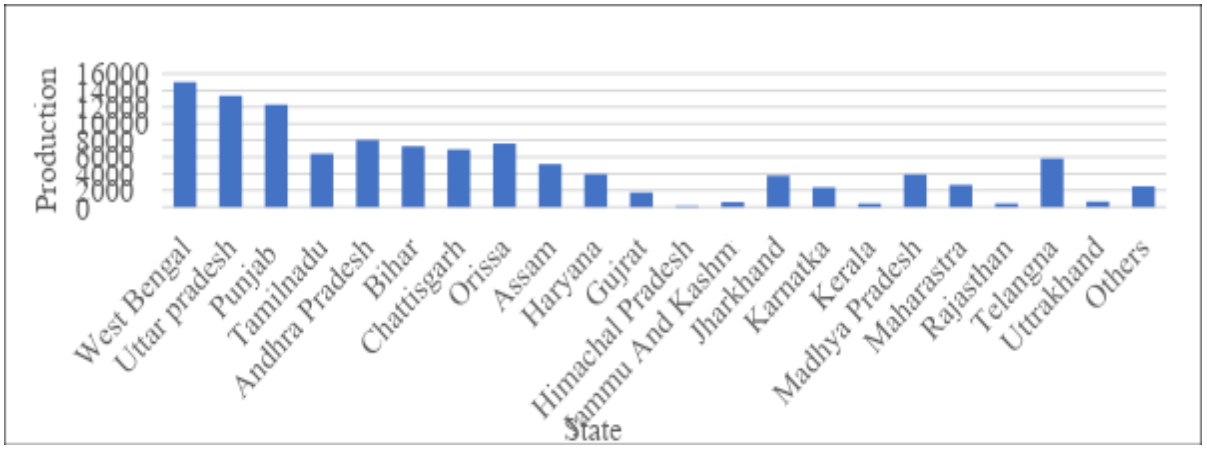


Fig.3 MSP according to year

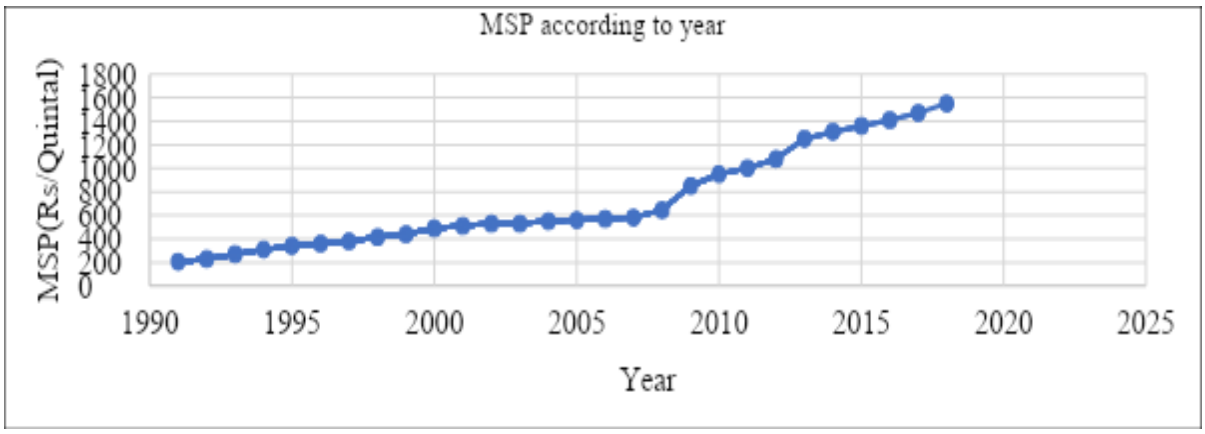


Fig.4 Effect of MSP on production

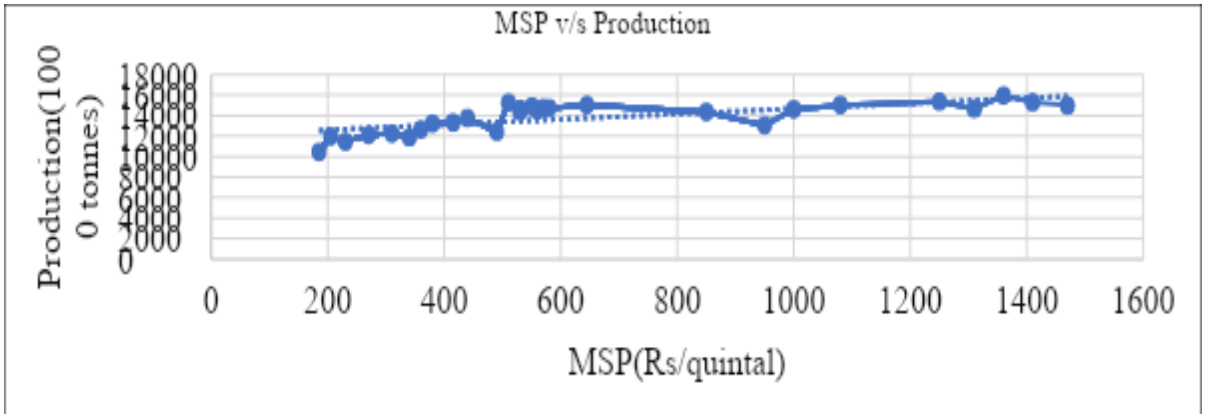


Fig.5 Relation between area of production and MSP

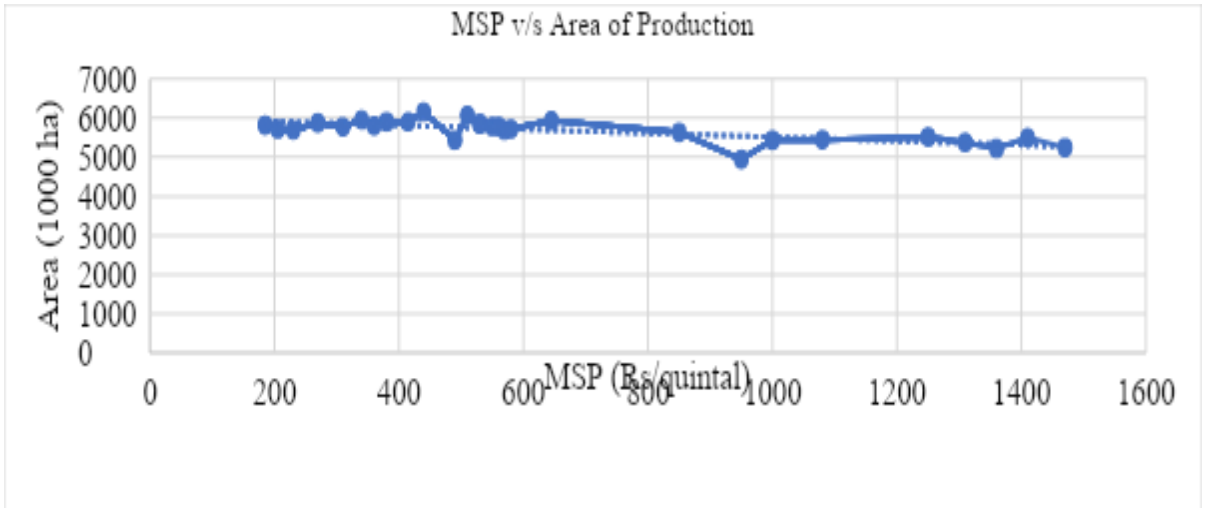
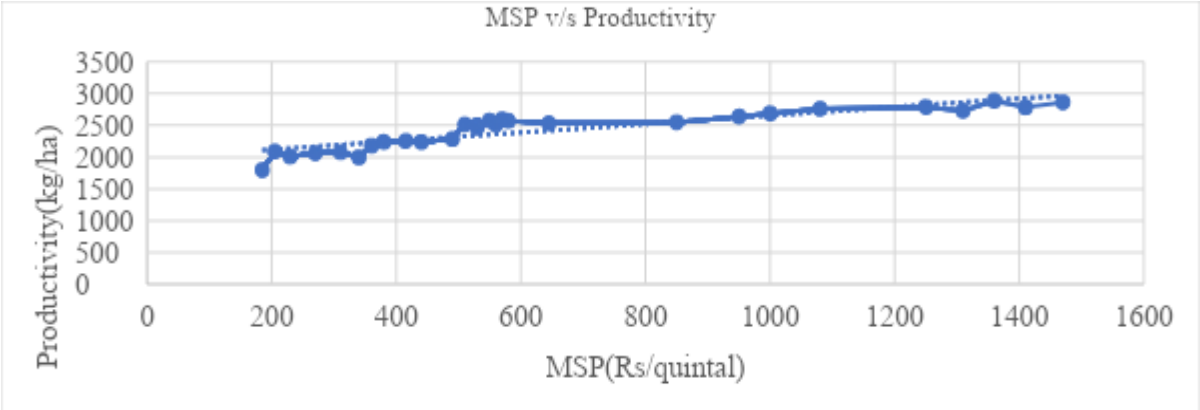


Fig.6 Relationship between MSP and Productivity



The result is consistent with that of Cunningham *et al.,* (2008) who argued that men are likely to sell more due to their acumen in bargaining, negotiating and enforcing contracts. This argument was advanced by Dorward *et al.,* (2004) who concluded that the discriminatory tendencies against women tend to weaken their negotiation prowess and therefore making them less influential in Agro-commodity trade.

The Heckman two-step outcome equation results

Price information significantly and positively influenced the extent of market participation. The result shows that an increase in access to price information by one unit increases the proportion of paddy sales by 5.59. The price information is a vital instrument during marketing because it informs the farmers about marketing conditions. Farmers who have price information prior to marketing tend to sell more of their products than those without. The finding is consistent with economic theory by Key *et al.,* (2000) and Alene *et al.,* (2008) who found the existence of a positive relationship between the price and the proportion of sales and confirm the price to be an incentive to sell. Marketing experience positively and significantly influenced the extent of market participation. An increase in a farmer's marketing experience by one year increase the proportion of paddy sale by 0.78. The marketing experience has a direct relationship with the farmer's level in bargaining prowess and marketing network. This means that farmers with more years in marketing have a higher ability to sell more paddy produce in the market. The finding concurs with that of Abay (2007) who found an increase in farmer's experience resulted in the increases of tomato being supplied to the market in Fogere, South Gonder. Vehicle ownership positively and significantly influenced the extent of market participation.

The result shows that an increase in vehicle ownership by one vehicle increases the proportion of paddy sale by 20.69. Vehicle ownership plays a crucial role in lowering the transport cost as well as boosting the volume of transport and this increases the proportion of paddy sales to the market. The finding concurs with the study by Jagwe (2011) on the impact of transaction cost on the participation of smallholder farmers and intermediaries in the banana market of Burundi, Rwanda and Democratic Republic of Congo who found the ownership of bicycle to increase the banana sales.

Factors affecting the choice of paddy marketing outlets

The multinomial Logit model was used to determine the factors influencing the choice of paddy marketing outlets in Midnapore district. The variables included in the estimation were: age, gender, education, vehicle ownership, paddy outcome, storage system, off-farm income, and price information. Table 3 presents the results of the Multinomial Logit model. The Chi-square value of -63.657 showed that likelihood ratio statistics are highly significant ($P < 0.000$) suggesting that the model had strong explanatory power. The pseudo-R square was 0.6155 indicating the explanatory variable explained about 61.55% of the variable in the choice of market outlets. Thus, the marginal effects from the MNL model, which measure the expected change in the probability of a particular choice being made with respect to a unit change in an independent variable, are reported and discussed. The significant value (also known as p-values) show whether a change in the independent variable significantly influences the Logit at a given level (Gujarati, 2007).

Number of observations = 139
LR chi^2 : 87.42

Prob > Chi^2 = 0.000
Pseudo R^2= 0.6155

Log likelihood = -63.657324

Gender of the household head had a significant influence on the choice of farm-gate MSP, and processing unit. Male-headed household had a higher probability of selling at the processing unit by 11.8%; however, they had a lower probability of selling at the farm gate by 16.2 %. A plausible explanation for this is that male-headed households tend to risk takers thus they are capable of searching markets in the distance and competitive places like the local market. Conversely, female household's head tends to be confined at home by household chores hence hindering them from attending the market places. The finding concurs with that of Morrison *et al.*, (2007), who found that female farmers are faced with gender-specific constraints like a time burden that limit them from accessing the best market for their output. Rice outcome had a significant influence on the choice of farm-gate and MSP. An increase in the weight of rice outcome by one kilogram increases the probability of selling at MSP by 0.5%, while a decrease in one-kilogram weight of Rice outcome increases the probability of selling paddy at farm-gate by 0.2%. This means that the farmers who have more yields have more opportunities for selling their produce at the market places than those with the little produce. The finding is in line with that of Chalwe (2011), who found more of the beans produced are sold to the private traders in the market places than to other households at the farm gate. Price information had a positive influence on the choice of the MSP. An increase in price information by one unit increases the probability of selling the paddy yield in the MSP by 30.9%. Price information informs the farmer on the prevailing pricing condition.

In conclusions, the study was exposed that the Socio-economic characteristics like age, gender, education level, vehicle ownership, and rice outcome were described. Age was negatively significant meaning that more of younger people participated in paddy marketing. The rationale behind this is that younger people tend to be energetic and risk takers. Gender of household head was positive and significant. Male-headed households tend to be more of a market-oriented than female household heads mainly because men are perceived to be more

resource endowed than women. Education level was positive and significant. This can be explained by the fact that as an individual gets more educated, marketing abilities and information also increases. Paddy yield was also positive and significant, implying that more yield leads to marketable surplus spurring the individuals to participate in the market. Four factors were found to be significant in influencing the extent of market participation. Gender, price information, marketing experience, and vehicle ownership had a positive influence on the proportion of paddy sales. A male-headed household was found to increase the proportion of paddy sales due to their acumen in bargaining, negotiating and enforcing contracts. Marketing in groups was found to positively influence the proportion of paddy sales because they enable farmers to pull their resources together and take advantage of economies of scale. Price information positively influences the proportion of paddy sales because it informs the farmers about pricing conditions. For that reason, the farmers will be motivated to sell more of their produces when they found the prices to be higher. Marketing experience positively influences the proportion of paddy sales because it has a direct relationship with the farmer's level in bargaining power and marketing network. This means that farmers with higher marketing experiences have a higher capacity to sell more of their paddy produce. Vehicle ownership positively influences the proportion of paddy sales because it enhances the volume of products to be transported as well as lowering the transport cost. Contract marketing positively influences the proportion of paddy sales since it guarantees the paddy farmers with the ready market.

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