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Determinants of Marketed Surplus of Tomatoes in Telangana State

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Abstract

The present study aim is to identify the factors affecting the marketed surplus of tomatoes in Telangana State, India. Primary and secondary data have used; primary data was collected from tomato growers by using multi-stage random sampling method through structured questionnaire. Descriptive statistics and multiple natural log linear regressions have been employed. The present study revealed that an average production and marketed surplus of tomatoes were 63.69 and 62.89 quintals respectively. Production and total retention are the dominant and significant factors for increase and decreases the marketed surplus of tomatoes respectively in the study area. The hypothesis is rejected. It states that there is significant affect of non-price variables such as; production and total retention in the study area.

Introduction:

India is the second largest producer of vegetables in the world after China. India contributed 10.7 percent of share to the world (included melons). Per capita gross availability of vegetables (gm/day) has been increasing from 2007-08 to 2016-17 (Horticulture Statistics at a Glance, 2015). It seems that production and marketed surplus of vegetables and other horticulture commodities have been increased. Vegetables contribution was more towards development of horticulture sector in India. (Kondal. K, 2016). However, the horticulture sector contributed more than 30 percent to Agriculture Gross Domestic Product in India, and 5.16 percent to Gross State Domestic Product in Telangana State (Kondal. K, 2014 and Socio Economic Outlook of Telangana State, 2014).

Importance of the Tomatoes:

Tomatoes are very important which are used commonly in almost all food items. India is the second largest producer in the World, next to China with the production of 11.1 percent to the World (Horticulture Statistics at a Glance, 2015). It has been cultivating throughout the year to meet the demand from household and industries side, and to maintain the stability in the market. There are major tomato producing states i.e., Odisha, Madhya Pradesh, Karnataka, West Bengal, Andhra Pradesh and Telangana State. Telangana State has been produced 1080.61 (in 000 MT) through 53.19 (000 Hect) in 2014-15. The Telangana State has ranked 6th and 7th in terms of area and production in India respectively. In the state, the major tomato growing districts are Medak and Ranga Reddy (Horticulture Statistical at Glance, TS, 2015). However, by cultivating the tomatoes, the rural and urban growers will go to get more employment and income, and also by exporting to the neighbouring states.

Conceptual Framework

Marketable surplus is means that residual left with the growers after meeting their requirement for home consumption, farm need, kind payment to labours and gifts etc. Marketed surplus implies only that which is actually sold in the market. The entire marketable surplus does not reach to market and sale also due to perishable nature and loss during transport, at the time loading and unloading (Lokeshwar Sahu, 2016). If, commodities did not sale in the market. Growers will not keep with them due to lack of storage facilities in the study area. They can offer commodities at lower price also. (Some times, growers will simply through tomatoes outside the road when they can't get minimum amount of rupees for their product). Specially, vegetable growers can't keep (farm need) vegetables for next sowing season. Therefore, the researcher confined that there is no much difference between marketable and marketed surplus. Marketed surplus is being considered as crucial factor in the process of economic development. Is it for germane to economic development?. **Nicholls** stated that until and unless reached or succeed in achieving food surplus in agrarian economy of the underdeveloped countries. As food is human basic need. Therefore, they cannot fulfill their fundamentals of pre-condition for economic development. As increase in the marketed surplus, rapid economic development takes place in the economy (Upender. M, 1990). Marketed surplus was around the 85 percent of the total production (Rupasena. L. P, 1999). It seems that remaining 15 percent was total retention and post-harvest losses. In the agriculture sector (mainly Paddy) the marketed surplus is very low compared to vegetables due to perishable nature.

Marketed Surplus = Total Production – (Total Retention + Post harvest losses)

Here, total retention includes self-consumption, kind payments and all kinds of Gifts.

Brief Review of Literature:

1. Harris. B (1982) stated that there is a negative relationship between marketed surplus and family size and distance to market whereas farm size was not found as a direct causal variable.
2. Anil Kumar and V.P.S Arora (2003) concluded that Production was significantly influenced the marketed surplus.
3. Deoghoria (2011) found that area and production of potato were positively related to marketed surplus.
4. Prakash Chandra Deogharia (2011) concluded that farm size & production and family size & gross income have positive and negative influence the marketed surplus respectively. Prices of vegetables did not influence significantly.
5. Manan Aslam (2013) found that area under the cultivation, experience of growers, educational level and distance have significant effect on marketed surplus in the Khanewal district of Pakistan.
6. Sashimatsung, Giribabu and Lanusunep (2013 and 2015) estimated marketable and marketed surplus of tomato and cabbage growers. They found that positive association between farm size and home consumption. Production was significantly influenced the marketed surplus.
7. Sumi Dutta & C. Hazarika (2013) revealed that as farm size increased the production also increased. Production was positively and significantly affect the marketed surplus.
8. Mebrat Tola (2014) concluded that price, farm size, distance to the market and access to market information were significantly affected the marketed surplus.

Research Question:

Vegetables play a vital role in our every day meal as they contain more nutrients for balance diet. The vegetable requirement is 280 grams for day for person. As production increases, the availability of

vegetables per person will increase when population is constant. Availability depends upon the marketed surplus. In this connection, what are the major factors affecting marketed surplus of tomato in the study area. Keeping in this backdrop, the researcher is an attempt has been made to indentify the determinants of marketed surplus of tomatoes in Telangana State, India.

Objective of the study:

1. To identify the factors affecting the marketed surplus of tomatoes in study area.

Hypothesis of the study:

1. There is no significant effect of non-price variables of marketed surplus of tomatoes in the study area.

Methodology:
For the purpose of present study, Medak and Ranga Reddy districts have been selected on the basis of high production of vegetables (1142306 MT in 2013-14, Commissioner of Horticulture, Hyderabad). Primary data has been collected by using multistage random sampling method. At first stage two districts have been selected, at second stage two Mandals have been selected from each district. At third stage, two villages have been selected from each Mandal. Total 70 sample data have been collected during the period from April to July, 2015 in the study area. Due to sample error, researcher has been considered 69 sample only. Frequency distribution, multiple natural log linear regression model have been used.

Multiple Natural Log Linear Regression Model: It has been used to identify determinants of marketed surplus of tomatoes in the study area.

Multiple natural log linear regression:

$$\mathbf{lnY_i = \beta 0 + \beta_1 lnX_{1i} + \beta_2 lnX_{2i} + \beta_3 lnX_{3i} + + \beta_4 X_{4i}\, D \ldots\ldots\ldots\ldots\ldots\ldots \beta_n lnX_n + U_t}$$

Where
lnY= Dependent variable (Marketed Surplus)
β0 = Intercept
βs are the regression coefficients of independent variables
X1, X2, X3 are the independent variables (Production, Total Retention, Family Size, Distance, Price, Experience and Access Information)
D = Dummy variable (Access information =1 and otherwise = 0)
U_t= Error term

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Results and Analysis of the study:

Table: 1

Descriptive Statistics of Some Important Variables

Variables	**Minimum**	**Maximum**	**Mean**	**Total**
Family Size	2	7	-	-
Distance (in KM)	1	33	11.8	-
Experience	2	55	20.5	-
Price	1081.3	1392.8	1236.52	-
Area	.25	7.50	1.36	93.85
Total Production	4	500	63.69	4394.62
Home Consumption (a)	.10	1	.40	27.70
Kind payments (b)	0	0	0	0
All kinds of Gifts (c)	.05	2	.38	26.90
Total Retention (a+b+c)	.15	2.20	.79	54.75
Post harvest Losses	0	.15	.0022	.15
Marketed Surplus	3.05	497.80	62.89	4339.87

Source: Primary data

Table 1 shows the descriptive statistics of important variables in the study area. An average tomato growers have 1.36 acres of land under the cultivation of tomatoes. The vegetable growers produce an average of 63.69 quintals of tomatoes. An average of home consumption was 40 kgs (.40), gifts were 38kgs (.38), total retention was 79kgs (.79) and post harvest losses were only 22 grams per quintal. And, kind payments and post harvest losses were zero (0) because now a days, no one is taking kind payments in vegetable sector, at the time of pick up, the producers will give some amount of tomatoes as a gift to the labourers. Some of the growers have been receiving tomato boxes from the wholesalers and commission agents at free of cost and transport facilities were good in some areas. An average of marketed surplus of tomatoes was 62.89 quintals. There are some important variables which can influence the marketed surplus of tomatoes. Thus, Family size of the growers was minimum 2 and maximum 7. An average of the distance from the farm gate to market was (11.8 KM), Experience of grower in the cultivation of tomato crop was (20.5 years), price of tomatoes was 1236.52 per quintal (calculated average of the 4 months) during the study period.

Table: 2

Correlation Matrix of Important Independent Variables

Variables	Production	Family Size	Distance	Experience	Total Retention
Production	-	.297*	-.063	.017	.619**

Family Size	-	-	-	-	.286*
Distance	-	-	-	-	-.225
Experience	-	-	-	-	.101

Source: Primary data

Note: *Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows the correlation matrix of important independent variables in the study area. There was a positive and significant association between production and family size. It shows that as family size increases, the growers would be increased their production. There was a negative association between distance from farm gate to market and production. It seems that distance is more, the growers will not prefer to more production and did not extend their cultivation under the tomatoes as it is a one of the constraint of marketing, and expected transport cost will be high as distance increases. There was positive relation between experience of the farmer and their production. As experience increases, they could able to produce more and more. There was a positive and significant relation between total retention and production & family size. It seems that as production and family size increases, their self consumption and all kind of gifts increase. There was a negative association between total retention and distance. As far as, distance is more, they likely to consume less. They have expected that harvest loss will be more.

Determinants of Marketed Surplus

There are some important variables which can influence the marketed surplus. There are several variables such as area, production, Family size, distance, experience, gross income, prices, educational level, total retention and access information from market officials. Due to multicollinearity problem, few important variables have been considered in the regression model. Some of the variables excluded from the model, which have VIF value 10.

Table: 3

Determinants of Marketed Surplus of Tomatoes

Variables	Coefficient	t-statistic
Constant	-.012 NS (.288)	-.043
Production (In Quintal)	1.034** (.004)	260.77
Total Retention (In Quintal)	-.032** (.006)	-4.926
Prices (per Quintal)	.025NS (.040)	-.622
Family Size (In Numbers)	-.004 NS (.010)	.340
Distance (In KMs)	-.001 NS (.004)	-.172
Experience (In Years)	.002 NS (.004)	.532
Information Access (Dummy)	.007NS (.008)	.898
R^2= 0.999 Adjusted R^2= 0.999 DW statistics = 2.246 (n=69)		

Source: Primary data

Note: ** *significant at the 0.01 level.*
Figures in parentheses indicate standard error of the coefficient.

Table 3 shows the determinants of marketed surplus of tomatoes. The study reveals that the value of constant found to be negative (-.012). It indicates that minimum amount of maintenance when the growers were in deficit (absence of cultivation, due to total crops failure). The productions of tomatoes and total retention have positively and significant effect the marketed surplus and remaining variables have not showing any significant effect. The coefficient of production is 1.034. It indicates that one percent change in production, there will be 1.034 percent increase in marketed surplus. The coefficient of total retention is (-.032). It indicates that one percent increases in total retention, it leads to decrease .032 percent in marketed surplus. There is a positive and negative relationship between these variables respectively, as discussed in table: 2. There is a positive relationship between prices and marketed surplus. As prices increases, the marketed surplus goes up. The coefficient of price is (.025). It indicates that one percent increase in price of tomatoes, there will be increase (.025 percent) in marketed surplus. The coefficient of family size was (-.004). It means one percent increase in family size, there will be decrease (.004 percent) in marketed surplus. The coefficient of distance is (-.001). There is a negative relationship between distance and marketed surplus. It means one percent increase in distance, there will be decrease (.001 percent) in marketed surplus due to lack of good roads. There is a positive relationship between experience and marketed surplus. As experience increases, they will take more care about tomatoes form losses while transporting goods. The coefficient of Experience is (.002). It means one percent increase in experience, there will be increase (.002 percent) in marketed surplus. There is a positive relationship between access information and marketed surplus. If growers will access the information, there would a chance to sale their production in proper way. The coefficient of access information is (.007). It means one percent increase in access the information, there will be increase (.007 percent) in marketed surplus. The hypothesis is rejected. It states that there is significant affect of non-price variables such as production and total retention in the study area.

The coefficient of determinate (R^2) value is .999. It reveals that the model is a best fit and the all explanatory (independent) variables collectively explained about 99.9 percent of the variation in the explained variables (marketed surplus), keeping all other variables are constant in the study area. Remaining percent is stochastic random/error, due to variation is explained by other variables which are not included in the model.

Conclusion:

The present study reveals that an average production of tomatoes was 63.69 quintals. As their production increases, their self consumption, all kinds of gifts increase. It seems that there a positive tendency. An average of marketed surplus of tomatoes was 62.89 quintals. Here there is a less harvesting loss in the study area compared to Sashimatsung and Giribabu, 2015 study in Assam. Production and total retention are the pre-dominant and significant factors for increase and decreases the marketed surplus of tomatoes respectively. Remaining factor are also influencing but not significantly in the study area.

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