

Supply Response to Prices of Selected Crops in Kerala

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Abstract – For efficient allocation of resources supply response to prices is important. Many policy interventions in the agricultural sector take into account this supply aspect. In a market oriented economy price changes are frequent and therefore supply responses has more relevance. This paper examines supply responses of selected crops in Kerala and could conclude that supply response to prices is very limited in the State.

Keywords: Kerala, price, simple linear regression, supply response.

I. INTRODUCTION

The prices farmers receive for their produce has significant impact on development of agricultural sector. It determines level of investment, types of cropping pattern and purchasing power of farmers. Prices give incentives for farmers to continue production. If the farmers are not receiving remunerative return, they may change the cropping pattern, use the land for non agricultural purposes or continue the same if alternatives are not possible. It is noted for efficient allocation of resources farmers need to change cropping pattern according to price changes. The effectiveness of the Government policies on agriculture sector depends to a great extent on the supply response of farmers.

Supply response to Prices is the changes in areas or output according to the prices changes as well as supply curve shifters. Unlike a supply function (which measures an area or output change according to price changes when other factors are held constant) supply response is a long run dynamic concept. If the farmers are cultivating more than one crops supply responsiveness measures changes happening in the allocation of resources among different crops (Thripathi 2008). In the literature regarding supply responses two different Schools of thought are there. The first School of thought says peasants in underdeveloped countries do not respond to the relative price changes. The second school of thought view there is no difference in the producers' response between developed and under developed countries. Some of the reasons identified for low or lack of supply responsiveness are agriculture is considered as a way of life and production are meant mainly for household consumption, the cost involved in agriculture are mainly fixed in nature and variable

proportions are limited, making it difficult to respond to price changes (Kainth and Mehra 1985).

But for the development of agriculture sector and also the national economy it is essential to have a certain level price responsiveness in production. It is only then price policies become successful and interest of national economy can be achieved.

In a market linked economy it is essential for farmers to have supply decisions according to price changes. If price of a particular crop is declining farmers need to change the cropping pattern accordingly and other better returning crops need to be cultivated (Mythili 2010, Thripathi 2014). In the reform period at the aggregate level a general shift in cultivation from food crops to commercial crops are noticed both at the national and state level. The reason for this shift is to take advantage of price changes (Thripathi 2014, Economic Review 2012). Studies conducted to examine supply response are helpful to understand farmers' capability and willingness to respond to price changes. It helps policy makers to understand hindering factors and respond accordingly if absence of such supply responses exists. It is essential to know the supply responses for formulating policies relating to raise the output levels. (Thripathi 2008, Kainth] and Mehra 1985).

II. SYSTEM MODEL

The paper examines whether the area of cultivation of selected crops in Kerala is responding positively to price changes. It also tries to find out the pattern of movement and extent of variation of prices and areas, so that the variables can be understood clearly.

III. PREVIOUS WORK

Economists like Chakravarty, Ashok Mithra and R Thamarajakshi were of the view that there exists price inelasticity with regard to aggregate supply function in the pre reform period. But for the same period itself Raj Krishna and S L Bapna viewed positive role of prices in resource allocation and efficiency. While scholars like Rajbans Kaur had a balance view on supply response (Munish2011, Mehra and Kainth1985). In the reform

period a study by Munish (2011) has shown that price responsiveness in the Indian agriculture is low (Munish 2011). Imai, Gaiha and Thapa (2011) examined supply response of agricultural commodities in selected Asian Countries including India. Their study could conclude a strong supply response to prices. But the study noted significant difference in the extent of variation in the response of selected crops. Mythili(2009) has made a comparative study on the supply response between pre and post reform period. She noted that price response to output is only a limited extent and there could not find any noticeable difference of the same between pre reform and reform period. Mere reform could not create changes in the farmers supply response. It is the availability of infrastructural facilities and other non price factors that determine extent of supply responses in Indian Agriculture. Thripati(2008) examined agricultural supply response. The study found no direct long run relationship between Terms of Trade and agriculture. The non price factors are important in bringing changes in agricultural output. Palanivel (1995) examined aggregate supply response in Indian agriculture. This study concluded both price and non price factors as equally important to raise output levels. It also noted a very strong relationship between elasticity of agricultural output and terms of trade.

IV. PROPOSED METHODOLOGY

To understand the supply response a traditional simple linear regression has been used. The model is $Y_t = a + bP_{t-1} + u_t$, where Y_t is the output in year t , P_{t-1} is the price in year $t-1$, a and b are parameters and U_t is the error term. The parameters are estimated here by using ordinary least square method. r^2 and $F2$ values are estimated to test the significance of the estimated regression equation. Date on price and area of four crops paddy, tapioca, cardamom and banana are studied for the period of 1994 to 2014. Before going into the finding of regression coefficients, an outline on the pattern of movements (graphical representations) and variations (coefficient of variation) of prices and areas are made.

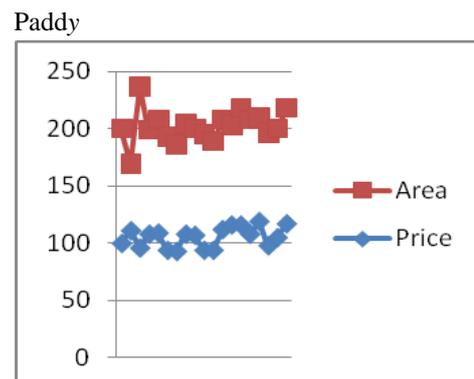
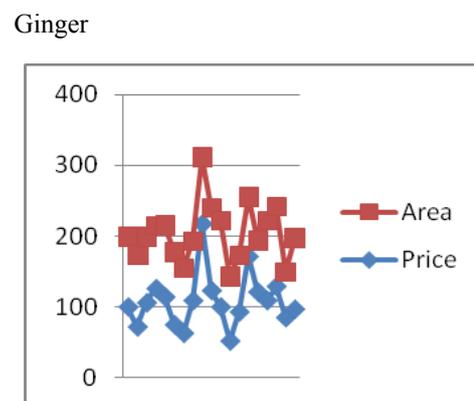
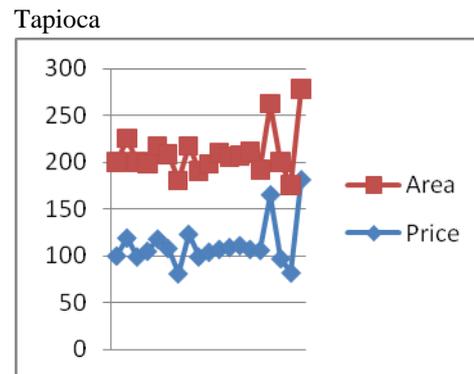
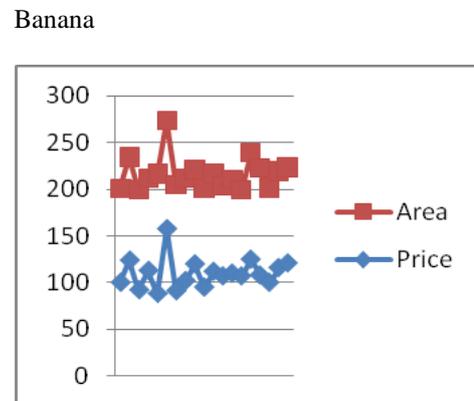
V. EXPERIMENTAL RESULTS

1: Graphical Representations

The graphical representation of index values of price and quantity are made below (graph: 1). For each year, price is depicted corresponding to an area which is of one year lagged value. For all the four crops (banana, ginger, paddy and tapioca) price and area are exhibiting almost a similar pattern of movement (i.e.s when price is rising area is also rising and vice versa), except a few cases. For banana in one year and for paddy three of the initial years the movement of price and corresponding areas are in opposite

directions. Another factor that can be inferred from the graph is significant fluctuations in prices and areas over the years. However the extents of fluctuations are not the same between corresponding prices and areas.

Graph.1. Graphical Representations of Prices and Areas (Index values)



The indexes are constructed from the price and area data (appendix Table1), obtained from different years of Economic Reviews, Price Statistics, (Department of Economics and Statistics, Government of Kerala) Facts and Figures of Agriculture in Kerala, Agriculture Statistics (Department of Agriculture Government of Kerala)

2: Coefficient of Variation

The table: 1 depicts values of coefficient of variation of prices and areas of the selected crops (banana, ginger, paddy and tapioca). A higher value of variation is noted for prices compared to that of areas. This higher variation in prices is noticed for of all the four crops. For tapioca difference between coefficient of variation of prices and area is three times and for banana it is two times. Therefore this study concluded for the period of 1994 to 2014, prices are exhibiting higher fluctuations compared to that of areas. Among the four crops a very closer values of variation (between price and area) are noted for ginger and then for paddy.

Table1. Values of Coefficient of Variation

Crop	R2	F Statistics, 1% significance level	Regression Equation
Banana	0.51	18.79	Area=33142+13.2(P rice)
Ginger	0.3	7.774	Area=13252-613(Price)
Paddy	0.75	23.018	Area=445527-207(Price)
Tapioca	0.55	21.577	Area=116975-45(Price)

The values are computed from the price and area data (appendix Table1) obtained from different years of Economic Reviews, Price Statistics (Department of Economics and Statistics, Government of Kerala) Agriculture Statistics, and Facts and Figures of Agriculture in Kerala (Department of Agriculture Government of Kerala).

3: Regression Results

The graphical representation and values of coefficient of variations gives only the extent of variation and general pattern of movement of prices and area over the years. From the graphical representation it can be inferred that except a few years' areas and price are having the same pattern of movement. But it cannot be inferred that changes in area are happening because of changes in prices. Non price factors can bring changes in areas of cultivation.

Therefore to understand the exact impact of only price changes on area a study by applying regression is essential.

The regression result (Table: 2) shows only for banana the changes in areas are happening according to price changes. For banana on an average 51 per cent changes in area changes are explained by price changes. And for the other crops (ginger, paddy and tapioca) the regression coefficients are negative. This shows farmers cultivating these crops are not making changes to areas of cultivation according to price changes. For these crops it is the non price factors that determine changes in area of cultivation. For all the four crops F value is statistically significant at one per cent level

Table2. Values of Regression Analysis

	Price	Area
Banana	50	25
Ginger	38	31
Paddy	33	25
Tapioca	56	19

The values are computed from the price and area data (appendix Table1) obtained from different years of Economic Reviews, Price Statistics (Department of Economic Agriculture Statistics s and Statistics, Government of Kerala) Agriculture Statistics and Facts and Figures of Agriculture in Kerala (Department of Agriculture Government of Kerala)

VI. CONCLUSION

The study concludes that changes in area of cultivation due to price change are very limited in Kerala. Out of the four crops selected only one crop banana is having positive supply response. Though from graphical representation it can be seen that price and areas are moving in an almost same pattern it is not because of price changes the areas are having the same pattern of movement. Non price factors are a major factor in bringing out changes in area of cultivation. Similarly the values of coefficient of variation show a higher variation in prices over the years for all the crops but the same extent of variation are not happening in the case of areas.

VII. FUTURE SCOPES

The findings of this study are expected to help farmers and agricultural policy makers of Kerala. For example, if the State government is planning to bring changes in areas of cultivation of these crops then a greater incentive should be given to non price factors, though price factors cannot be neglected.

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