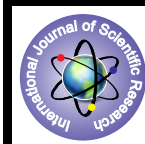


Performance of Horticulture sector in India



Economics

KEYWORDS : Performance, Growth, Exports, Imports, Horticulture

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ABSTRACT

India is the second largest producer of fruits and vegetables in the world. During the 2011-12, its Contribution in the world production of fruits and vegetables was 11.84% and 13.36% respectively. The main objectives of this paper are to analyze the performance of horticulture sector in India and to identify the impact factors on horticulture exports/imports in India. To fulfill the objectives of the study, the secondary source data were collected from various sources namely Directorate General of Commercial Intelligence and Statistics (DGCI&S), National Horticulture Board (NHB) and State Horticulture Mission, books, journals, etc. In this study, percentages, annual growth rate, Coefficient of Correlation and Regression analysis employed. The period of analysis ranged from 2001-02 to 2010-2011. The major finding of the study; The percentage of horticulture exports increased in total agriculture exports from 2001-02 to 2009-10. Data analysis revealed that there is a positive and significant impact of horticulture production and exchange rate on horticulture exports and imports in India. There is a positive significant relation between horticulture exports, imports and Total agriculture exports, import. There is positive relation between horticulture exports, imports and Total national exports, imports. However, the good performance of horticulture sector contributed positively to agriculture development in India.

Introduction:

India enjoys a rich diversity of horticultural crops covering large groups of fruits, vegetables, mushrooms, flowers, plantation and spices. This is possible because of the agro-climatic variations, enormous bio-diversity, fertile soil, large cultivable area and above all, a long history of crop husbandry (G.L. Kaul, 1986). Several fruit crops have proved to be most remunerative for replacing subsistence farming in the rainfed, dry land, hilly, arid and coastal agro-eco systems. An important diversification that has been taking place during last two decades is in favour of horticulture crops like fruits, vegetables, flowers, etc (Bhattacharya, 2008). Horticulture crops are characterized by high productivity per unit area, much higher returns, higher potential for employment generation and exports, comparatively lower requirement of water, and easy adaptability to adverse soil and wasteland situations. Horticulture crops occupy an important position in terms of providing livelihood options, mitigating to some extent the excess demand for cereals and contributing to food and nutritional security (Srijana Rai, 2013). The performance of the Indian horticultural sector in the last decade has provoked dramatically differing assessments. Some have described it as a 'golden revolution', presumably to distinguish it from the earlier 'green revolution' (Bannerjee, 2005). Ghosh said some of the factors affecting to enhance the growth of horticulture and agriculture. These factors like;

- 1) Increase in cropping intensity of land.
- 2) Shift in cropping pattern in favour of crops with higher returns.
- 3) Improving the technique of cultivation.

The values of floriculture, spices, fresh fruits, fresh vegetables, processed vegetables, processed fruit juice, cashew and cashew nuts shell liquid are included in the horticulture exports and imports in India.

Need for the Study: Horticulture sector plays a significant role in agriculture sector and for economic development. It is also contributing to agriculture sector through mostly foreign exchange in India. Mainly horticulture sector produce fruits and vegetable. The demand for fruits and vegetables are increasing in terms of area and production due to improvement in the quality of lives of the people in rural and urban areas. There is need to know the performance of horticulture sector, it's positive and negative impact on agriculture sector in India.

Objective of the study:

1. To analyze the performance of horticulture Sector in India.
2. To identify the impact factors on Indian Horticulture exports/ imports in India.

3. To examine the relationship between horticulture sector and agriculture sector in India.

Methodology:

To fulfill the above objectives of the study, the secondary source of the data were collected from various sources namely Directorate General of Commercial Intelligence and Statistics (DGCI&S), National Horticulture Board (NHB), Books, journals and magazines etc. the period of analysis ranged from 2001-02 to 2010-2011. In this study the simple growth rate, Coefficient of Correlation and Multiple Regression Analysis were employed.

Multiple Regression Equation

$$Y = b_0 + b_1X_1 + b_2X_2 + U_t$$

Where

Y= Horticulture Exports/imports

b₀ = Intercept

b₁ and b₂ are coefficients

X₁= Production

X₂= Exchange Rate

U_t= Error term

Results and Analysis:

Table: 1 Annual Growth Rate of Horticulture Exports and Imports in India (Values in Percentage)

Year	Annual Growth Rate of Horticulture Exports	Annual Growth Rate of Horticulture Imports
2001-02	-	-
2002-03	14.13	45.67
2003-04	0.32	11.12
2004-05	19.92	27.79
2005-06	15.74	19.09
2006-07	28.19	7.32
2007-08	7.30	1.65
2008-09	40.91	34.64
2009-10	3.63	20.11
2010-11(p)	4.98	2.31

P-Provisional

Source: Authors calculations based on DGCI&S, Ministry of Commerce, Kolkata.

Above table; 1 shows Annual Growth Rate of Horticulture Exports and Imports from 2001-02 to 2010-11(p) in India. The Annual growth rate of horticulture exports are highest recorded 40.91 percent in the 2008-09 followed by 28.19 percent in 2006-07, 19.92 percent in 2004-05, 15.74 percent in 2005-06 and lowest recorded 0.32 percent in 2003-04. The Annual growth rate of horticulture imports are highest recorded 45.67 percent in the 2002-03 followed by 34.64 percent in 2008-09, 27.79 percent in 2004-05, 20.11 percent in 2009-10 and lowest recorded 1.65 percent in 2007-08.

Table: 2 Performance of Horticulture exports in Total Agriculture & Total National exports in India (Values in Percentage)

Years	% share of horticulture exports in agriculture exports	% share of horticulture exports in National exports
2001-02	17.44	2.48
2002-03	17.07	2.32
2003-04	15.93	2.02
2004-05	17.11	1.90
2005-06	16.74	1.81
2006-07	16.92	1.85
2007-08	14.34	1.73
2008-09	18.58	1.90
2009-10	18.52	1.96
2010-11(p)	14.45	1.51

P-Provisional

Source: Authors calculations based on DGCI&S, Ministry of Commerce, Kolkata.

Above table; 2 shows performance of horticulture exports in agriculture and National exports from 2001-02 to 2010-11(p) in India. The horticulture exports were highest recorded 18.58 percent in 2008-09 followed by 18.52 percent in 2009-10, 17.44 percent in 2001-02 and lowest recorded 14.34 percent in 2007-08 in agriculture exports. The performance of horticulture exports increased from 2001-02 to 2009-10 in agriculture exports. The horticulture exports in national exports were highest recorded 2.48 percent in 2001-02 followed by 2.32 percent in 2002-03, 2.02 percent in 2003-04 and lowest recorded 1.51 percent in 2010-11(p) in Total National Exports in India. However, the contribution of horticulture exports increased in total agriculture exports and decreased in total national exports.

Table: 4 Impact of Horticulture production and Exchange rate on Horticulture Exports in India

R square	Adjusted R Square	F Change	Durbin-Watson	VIF		P values		t-statistic		
				Production	Exchange rate	Production	Exchange rate	Constant	Production	Exchange rate
.982	.977	188.22	1.507	1.154	1.154	.000*	.002*	-7.048	19.273	4.713

Note: * at 5% significance level.

Dependent variable: Horticulture Exports

$$Y = -41207.49 + 1.055(X_1) + 0.258(X_2) + Ut$$

The impact of production and exchange rate on horticulture exports was investigated by using linear regression method. The estimated coefficients values are presented in the equation. The table: 4 shows that, the value of R², the coefficient of determination is 0.982 which implies that 98.2 percent of variation in horticulture exports are explained by production and exchange rate. The coefficient of production is positive and significant at 5 percent of level of probability. The coefficient value of 1.055 implies that 1 percent increase in production, the horticulture exports increases by 1.055 percent. This is the expected result because increases in production, its results in increases in exports which is increases foreign income.

Table: 3 Performance of Horticulture imports in Total Agriculture & Total National imports in India (Values in Percentage)

Year	% share of Horticulture Imports in agriculture Imports	% share of Horticulture Imports in National Imports
2001-02	10.41	0.69
2002-03	14	0.83
2003-04	12.46	0.76
2004-05	15.34	0.7
2005-06	19.38	0.63
2006-07	15.09	0.53
2007-08	15.2	0.45
2008-09	16.46	0.45
2009-10	12.35	0.54
2010-11(p)	13.39	0.47

P-Provisional

Source: Authors calculations based on DGCI&S, Ministry of Commerce, Kolkata.

Above table; 3 shows performance of horticulture imports in agriculture and National imports from 2001-02 to 2010-11(p) in India. The horticulture imports were highest recorded 19.38 percent in 2005-06 followed by 16.46 percent in 2008-09, 15.34 percent in 2004-05 and lowest recorded 10.41 percent in 2001-02 in agriculture imports. There were fluctuations of horticulture imports in agriculture imports from 2001-02 to 2010-11(p). However the share of imports increased from 10.41 percent to 13.39 percent, in 2001-02 and 2010-2011(p) respectively. The horticulture exports were highest recorded 0.83 percent in 2002-03 followed by 0.76 percent in 2003-04, 0.7 percent in 2004-05 and lowest recorded 0.45 percent in 2007-08 and 2008-09 in national exports. The performance of horticulture imports decreased in national imports from 2002-03 to 2010-11(p).

Empirical Analysis of Horticulture Exports/Imports in India

Mainly, the area under the cultivation of horticulture crops, production, productivity, exchange rates and other factors are affecting the horticulture exports in India. Due to multicollinearity problem the study has considered the important factors like production and exchange rate are as an independent variables and horticulture exports/imports is as a dependent variable.

The coefficient of exchange rate is also positive and significant at 5 percent of level of significant. The coefficient value of 0.258 indicates that 1 percent increases in exchange rate, 0.258 percent increases in horticulture exports in India.

Table: 5 Impact of Horticulture production and Exchange rate on Horticulture Imports in India

R square	Adjusted R Square	F Change	Durbin-Watson	VIF		P values		t values		
				Production	Exchange rate	Production	Exchange rate	Constant	Production	Exchange rate
.972	.964	119.84	1.230	1.154	1.154	.000*	.009*	-5.405	15.326	3.549

Note: * at 5% significance level

Dependent variable: Horticulture Imports

$$Y = -16734.12 + 1.048(X_1) + 0.243(X_2) + Ut$$

The impact of production and exchange rate on horticulture imports was investigated by using linear regression method. The estimated coefficients values are presented in the equation. The table: 5 shows that, the value of R², the coefficient of determination is 0.972 which implies that 97.2 percent of variation is horticulture imports are explained by production and exchange rate. The coefficient of production is positive and significant at 5 percent of level of probability. The coefficient value of 1.048 implies that 1 percent increase in production, the horticulture imports increases by 1.048 percent. This is the unexpected result because an increase in production, its results in decreases in imports from abroad, which is reduces foreign income.

The coefficient of exchange rate is also positive and significant at 5 percent of level of significant. The coefficient value of 0.243 indicates that 1 percent increases in exchange rate, 0.243 percent increases in horticulture imports in India.

Table: 6 Correlation between the variables

Variables	r value
Horticulture Exports between Agriculture Exports	.963**
Horticulture Imports between Agriculture Imports	.951**
Horticulture Exports between Total National Exports	.975**
Horticulture Imports between Total National Imports	.975**
Agriculture Imports between Total National Imports	.910**
Agriculture Exports between Total National Exports	.994**

Note: ** Correlation is significant at the 0.01 level (2 tailed test)

Source: Authors calculations based on DGCI&S, Ministry of Commerce, Kolkata

In the above table; 6 shows correlation between the variables like horticulture exports, imports, agriculture exports, imports and total national exports, imports in India. There is a strong (.963) positive relationship between horticulture exports and agriculture exports. The coefficient of correlation value is .951 between

the horticulture imports and agriculture imports. The coefficient of correlation value is .975 between the horticulture exports and national exports and horticulture imports and national imports. The coefficient of correlation value is low .910 between the agriculture imports and total national imports to compared other variables. The coefficient of correlation is high (.994) between the agriculture exports and total national exports. There is same relationship between the horticulture exports and National exports And horticulture imports and National imports. However, There is a positive significant relationship between among all the variables.

Conclusion:

The Development has made rapid strides in the last decade in terms of increased Area, production, productivity, availability and export of horticultural commodities. In many of the states horticulture has emerged as a prime mover of economy. The growth rate of horticulture exports rapidly increased from 2001-02 to 2008-09, after 2008-2009 the exports growth rate was declined. The growth rate of horticulture imports decreased since 2001-02. The share of horticulture exports and imports were slightly increased in total agriculture exports/imports but not in total national exports and imports. The study has found that there is a positive and significant impact of Production and exchange rate on the horticulture exports and imports in India. There is a significant positive relation between the horticulture exports/imports, agriculture exports/imports and total national exports/imports in India. Maharashtra state played a key role in the performance of major horticulture crops in India in terms of area, production and productivity. However production challenges have to be met which includes production of fruit and vegetable crops, nutrition and health care for growing population in the scenario of declining water, land and increasing pressure of biotic and abiotic stresses.

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