

International Market Signals for Indian Horticultural Export Markets: Policies and Prospects

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ABSTRACT: Marketing signals are necessary when entering a foreign market. Information requirement is essential related to on international marketing decision, market selection, product, price, promotion, distribution and competition. India is the fruit and vegetable basket of the world. The vast production base offers India tremendous opportunities for exports. During 2011-12, India exported vegetable and fruits worth Rs. 4801.29 crores. The main objective of the study is analyses market signals of exports and prices of major Indian horticultural commodities and identification of their destinations. The study period is 1990-91 to 2012-13. The sample size is the time series data of 23 years. The methodology adopted is compound annual growth rates, regression and Coefficient variation of instability index. The study found that fruits, vegetables, flowers quantity export growth rates positive and high except walnut and mushrooms. Whereas all commodities price growth rates were positive and high. The study found that all elasticity's of fruits, vegetables and flowers are elastic except walnut and mushrooms (inelastic). Over 65-90% fruits and 50 to 65% vegetables of India's exports in fresh products go to West Asia and East European markets. Exports of Gherkins (53%), Mushrooms (94%) going to the USA, United Kingdom, France, Spain, Israel and Russia. The demand is more than supply indicating fruits and vegetables requirement in the exports markets are promising. The tariffs for fruits banana, grapes and mango are 4.85%, 3.75%, and 3.75% respectively. And for vegetables, onion and green chillies are 11.25%, 11.25%. Important point noted to be is for fruits and vegetable duties are free. The export policies have provided an export friendly environment by simplifying the procedures for trade facilitation. Pesticide residue is the most important food safety factor. Different countries have different standards for fruits and vegetables. The regression signals shows that balance of agriculture trade and quantity exports are positively affecting on onion export prices and percent of exports positively affecting on gherkins export prices. Export prices and balance of agricultural trade are positively affecting on potato quantity of exports. Export prices and production are positive affect on onion quantity of exports. Percentage exports and balance of agriculture trade positively affecting on Mango export prices.

Key words: Export horticultural markets, Market signals, India, Exports, Prices, Elasticities, Policies, Prospects

INTRODUCTION

The market economy depends on price signals to correctly allocate its scarce resources. Sufficient and reliable information is prerequisite for proper decision making be it domestic market or international marketing. Information requirement is essential related to on international marketing decision, market selection, product, price, promotion, distribution and competition. Marketing intelligence (MI) is the everyday information relevant to markets, gathered and analyzed specifically for the purpose of accurate and confident decision-making in determining market opportunity, market penetration strategy, and market development metrics (Wikipedia, the free

encyclopaedia). Market analysis content helps you discover profitable opportunities first, including in emerging markets and new instruments filtered to your precise needs, and integrated in a single, intuitive and easy-to-use desktop and mobile solution. (Thomson Reuters Eikon).

India is one of the largest agrarian economies of the world. Its agriculture sector is at the core of the economy's purchasing power. The National Agriculture Policy (NAP) envisages promotion of demand driven agriculture growth catering to domestic as well as export markets. It seeks to promote agricultural growth maximizes benefits from exports of agricultural products in the face of the

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challenges arising from economic liberalization and globalization. Recent discussions of international agricultural commodity markets have been dominated by the issue of trade liberalization and multilateral negotiations on improvement of market access and limitation of export subsidies.

Price signal is information conveyed, to consumers and producers, via the price charged for a product or service, thus providing a signal to increase supply and/or decrease demand for the priced item. Market export signals at a general level, all commodity prices are affected by the same basic factors, namely the market fundamentals of demand and supply. The price inelastic demand for most agricultural commodities means that lower world prices lead to lower export earnings for developing country exporters. The impact of world commodity price variability on producers and consumers and the effectiveness of price signals in bringing about adjustments in supply and demand depend on the extent to which world market prices are transmitted to domestic markets. It is only if falling prices, for example, are transmitted to domestic markets that producers have the incentive to reduce production and consumers have the incentive to increase their demand moving the market towards balance.

While improving market access is important for food products, tariff levels for tropical products and raw materials at least in their less-processed forms are typically not high. More significant issues for these commodities are tariff escalation, where tariffs increase along value chains, and domestic support in developed countries which encourages excess production (David Hallam 2003-4).

Global Horticulture Market Outlook 2015 scenario reveals that the horticulture industry is one of the most significant sectors in the world. The globe has initiated measures to support this industry. Global fruit production was reported at 548 million tonnes and vegetable production came in at 990 million tonnes in 2011. For the year 2011, the size of the global floriculture industry stood at around USD 109 billion.

India is the second largest producer of fruits and vegetables in the world next only to China (NHB, 2011). India produced around 146.55 MTs of vegetables and 74.88 MTs of fruits (2010-11). The country's annual requirement is 74.40 MTs fruits and 175.2 MTs vegetables. The vast production base offers India tremendous opportunities for export. During 2011-12, India exported vegetables and fruits worth Rs. 4801.29 crores. Horticultural sector contributes 54% of agricultural Exports and 28% of AgGDP in

India. This sector is growing at an average growth rate of 3.6 per cent over the last decade. The consumption basket is changing towards fruits and vegetables. National Horticultural Mission started in 2005, Foreign Trade Policy (2004-09) emphasized the need to boost export growth and promotion of horticultural products. XI&XII Plans also emphasizing accelerated horticultural growth World Development Report (World Bank, 2000-01) points out the markets are central to the lives of poor people. World Bank, World Development Report (2002) designed about people building institutions that support the development of markets. It provides a diagnostic framework for understanding how institutions support market activity.

UNCTAD (2009) findings show that India's exports to world are very responsive to income changes. A 1% decline in GDP growth of world will lead to 1.88% decline in India's growth of exports to world. Singh and S.K. Singla (2012) found from their study (1992 to 2006) that India has been unable to diversify its exports as well as export destinations. Export from India has experienced instability primarily in the developing countries. Demand for India's exports was found to be relatively elastic to both relative prices and income of the importing countries. Traill (2006) uses various assumptions and predicts that supermarket's share of the retail food market will reach 61% in Argentina, Mexico, and Poland 67% in Hungary and 76% in Brazil by 2015.

IFPRI's (2003) research on agricultural Market reforms shown that the liberalization programs adopted by many developing countries in the past two decades have had limited success in developing private, efficient, and competitive agricultural markets. Sankar Lal Guru (2001) has been reported that an efficient agricultural marketing is essential for the development of the agricultural sector. Dastagiri and Immanuelraj (2012) advocates that shifting Indian farming from a rural lifestyle to an agribusiness sector and linking farmers to super markets is a key driver for industrialization of agriculture.

Alberto and Stefano (2010) in their study "Measuring the price elasticity of import demand in the destination markets of Italian exports found that Italy has a relatively low elasticity of substitution in main specialization sector (machinery and equipment), while has higher substitution elasticity for traditional goods like textiles, jewelry and leather. Reardon and Hopkins, 2006; Minton, 2008 report that the war between supermarkets and traditional retailers in developing countries takes place on several

fronts, such as price, convenience, quality of the products and safety. Mithofer et al. (2008) found in Kenya that more smallholders were linked to the export market by middlemen and flexible arrangements than by an export company. Galanopoulos et al. (2009) found that Mediterranean countries are traditional growers of fruit and vegetables, but are struggling to remain competitive in the global market. Dastagiri et al. (2013) estimated and found that for all vegetables the NPC is less than 1 indicating they are competitive in the international markets. Lenné & Ward (2010) found that the export vegetable subsector as a role model for improving the efficiency, growth and economic value of domestic vegetable marketing systems in East Africa. Dastagiri et al. (2012) found that the majority of Indian horticultural commodity markets were operating efficiently, while the most efficient channel was producer-consumer. Diego et al. (2011) found in Niamey, Niger that for amaranth and lettuce, the net profit (NP) of market retailers depended only on marketplace, whereas the NP of cabbage and tomato strongly depended on season and marketplace. Dastagiri (2012) found that the direct market models are found to be the best because the producer share in consumer rupee is 100% and will eliminate completely middlemen.

There are no or limited empirical studies on market and price signals research of horticultural exports markets and identification of major destinations. This study analyses market signals of exports and, prices of major Indian horticultural commodities and identification of their destinations. Finally, the study will suggest multispeed strategies for promotion of exports

The specific objectives of the study are:

1. To analyze exports market and price signals of India's horticultural commodities.
2. To identify major market destinations for India's horticultural exports.
3. To track information on demand, policy changes, tariffs, safety and standards of exports for Indian fruits, vegetables and flowers.
4. To estimate the effects of exports coefficients signals on production, trade and poverty of India's horticultural commodities.
5. To suggest policies and strategies for boosting Indian horticultural exports and foreign earnings.

METHODOLOGY

This is basically exports market research study. India's major export horticultural commodities were selected. It includes fruits, nuts, vegetables and flowers. Study Period is 1990-91 to 2012-13. Data on quantity, values, and prices of exports, and destinations of fruits, vegetables and flowers were collected. India is exporting these commodities to maximum 130 countries. Data sources are Agricultural Produce Export Development Authority (APEDA), Directorate General of Commercial Intelligence (DGCIS), National Horticultural Board (NHB), FAO Stat, Centre for monitoring on Indian economy (CMIE), Foreign Trade Year Book, Planning commission reports, National Bank for Agricultural and Rural Development (NABARD), EXIM Bank and export companies. Compound annual growth rates of quantity exports, prices, and price elasticity's of exports were estimated. For each commodity, the countries classified in to the top 10 countries which accounted major share of exports and rest as other countries. Finally top 3 countries which accounted major share of India's exports for each commodity are identified. The compound growth rates, price elasticity's, instability index of exports and regression analysis were estimated using the following formulae's.

Growth rate formulae: (Damodar N. Gujarati and Sangeetha, 2007)

The compound growth rate (r) was calculated by fitting

Exponential function to the variables of interest viz., exports, prices for the period 1990-91 to 2012-13.

$$Y_t = Y_0(1+r)^t \quad (1)$$

Assuming multiplicative error term in the equation 1, model may be linearized by logarithmic transformation

$$\ln Y_t = A + Bt + \epsilon \quad (2)$$

Where, A (=lnA₀) and B (=ln(1+r)) are the parameters to be estimated by ordinary least square regression, t = time

trend in year, r = exp (B) -1

Price elasticity of exports formulae

ΣP_e = % change in quantity exports / % change in price

The percentage change in quantity exports is % ΔQ , and

the percentage change in price is % ΔP .

We calculate % ΔQ as $\Delta Q / Q_{ave}$ and

we calculate $\% \Delta P$ as $\Delta P / P_{ave}$

so we calculate the price elasticity of exports as $(\Delta Q / Q_{ave}) / (\Delta P / P_{ave})$.

Instability Index Formulae

Coefficient of Variation $\frac{\text{Standard Deviation}}{\text{Mean}} * 100$

Regression analysis was performed to study the effects of exports on international prices, Quantity of exports, Production, poverty. The results on relevant variables are encouraging with expected sign and magnitudes of coefficients.

The model fitted here is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where Y = dependent variables:

International prices, Quantity of exports, Production, poverty.

$\beta_i (i = 0,1,2,3)$ = Regression coefficients

X_1 = International prices

X_2 = percentage of exports

X_3 = balance of agriculture trade

X_4 = percentage of poverty

ε = Error of the model $\sim N(0, \sigma^2)$

RESULTS AND DISCUSSION

Growth rates, Elasticity's, Markets selection signals for exports

Fruits

Growth rates: The quantity of exports and export price growth rates (%), elasticity's & market selection are during 1990-2012 are shown in Table 1. The export growth rates of fruits such as Banana, Mango, Pomegranate, Grapes are 19.6%, 5.8%, 19%, 14.4% respectively. Mango and Grapes exports are stable as their coefficient of variation is less than 100 percent whereas Banana and pomegranate are instable as their coefficient of variation is more than 100 percent. Singh and S.K. Singla (2012) found from their study (1992 to 2006) that exports from India have experienced instability primarily in the developing countries. The price growth rates of fruits such as Mango, Pomegranate, Grapes, Banana are 3.5%, 6.7%, 6.2%, 1.7% respectively. Similarly, vegetables price growth rates are Onion 6.1%, Gherkin 3.7%, Green chillies 0.8%, Potato 3.7%, and Mushrooms 5.4%. The Rose

price growth rate is 30.6% and walnut is 6.5%. The study found that the price growth rates of all fruits are positive and high. The study concludes that all commodities quantity export growth rates more than price growth rates except walnut.

Export Elasticity's: How responsive are export quantities to a change in international prices is of direct relevance in international economics. Export price elasticities are signals for exporters to increase or decrease their exports as it indicates exports responsiveness to changes in price.

The elasticity's of Fruits such as Banana, Mango, Pomegranate, Grapes are 4.58%, 1.38%, 1.31%, 1.31% respectively. It was found that among fruits banana has high export elasticity (4.38) and among vegetables Green Chillies have high (3.98). The study found that all elasticity's of fruits are elastic except walnut where their elasticity's are inelastic.

Markets selection: The major destinations for Indian mango is UAE (37.20%), Bangladesh (32.66%), Saudi Arabia (9.46%), for Grapes; Bangladesh (29.02%), Netherland (18.29), United Kingdom (15.3%), for Banana; Nepal (78.28%), UAE (6.17%), Maldives (3.13%). for Pomegranate; UAE (48.52%), Bangladesh (12.76%), Saudi Arabia (8.30%). The major destinations for walnut are Nepal (13.08%), United Kingdom (11.52%), France (10.18%).

The study found that India is the fruit and vegetable basket of the world. Over 65-90% fruits of India's exports in fresh products go to West Asia and East European markets.

Vegetables

Growth rates: India's vegetables and flowers export growth rates, elasticity's, market signals during 2000-2012 are shown in Table 2. export growth rates of vegetables such as Onion, Gherkin, Green chillies, potato are 8.4%, 23%, 5%, 13.1%, -28.9% respectively. The export growth rate for Rose is 7.8% and walnut is -8%. During 2000-12, all variables growth rates of Green Chillies are negative because of low export prices and lack of demand during this period. Onion and Gherkins exports are stable as their coefficient of variation is less than 100 percent whereas Green chillies and Potato exports are instable as their coefficient of variation is more than 100 percent.

Similarly, vegetables price growth rates are Onion 6.1%, Gherkin 3.7%, Green chillies 0.8%, Potato 3.7%, and Mushrooms 5.4%. The Rose price growth rate is 30.6% and walnut is 6.5%. The study found that the price growth rates of all vegetables and flowers are positive and high.

Table 1
Growth rates, Elasticity's, Market selection signals for exports

	<i>Top three promising countries</i>	<i>% of exports</i>	<i>Price Growth rate & CV 1990-91 to 2011-12</i>	<i>Export Qty Growth rate & CV 1990-91 to 2011-12</i>	<i>Elasticity % change from 1990-91 to 2011-12</i>
Banana	Nepal	78.3	1.1 (83.54)	19.6 (166.15)	4.58
	United Arab Emirates	6.2			
	Maldives	3.7			
Grapes	Bangladesh	29.0	6.2 (37.26)	14.4 (97.06)	1.31
	Netherland	18.3			
	United Kingdom	15.3			
Mango	United Arab Emirates	37.2	3.5 (34.93)	5.8 (44.08)	1.35
	Bangladesh	32.7			
	Saudi Arabia	9.5			
Pomegranate	United Arab Emirates	48.5	6.7 (58.02)	19.0 (108.30)	1.31
	Bangladesh	12.8			
	Saudi Arabia	8.3			
Walnut	Nepal	13.1	6.5 (36.93)	-8.1 (58.00)	-6.68
	United Kingdom	11.5			
	Spain	9.1			

Figures in parenthesis indicates c.v.

Export Elasticity's: The export elasticity's of Vegetables are Onion 1.15%, Gherkin 1.84%, Green chillies 3.98%, Potato 1.42%. The Rose export elasticity is 0.59%. It was found that among vegetables Green Chillies have high (3.98). The study found that all elasticity's of vegetables and flowers are elastic except mushrooms where their elasticity's are inelastic.

Export Market Selection: The major destinations for Indian vegetables are; for Potato; South Africa (29.75%), UAE (11.93%), Pakistan (12.61%), for Onion; Bangladesh (29.77%), Maldives (21.64%), UAE (15.92%), for Green Chillies; United Kingdom (16.30%), Pakistan (13.54%), UAE (12.19%), for

Gherkins; USA (20.32%), France (17.75%), Spain (14.88%), for Mushroom; USA (80.93%), Israel (12.65%), Russia (1.27%). The major destinations for India's rose are Netherland (26.34%), Ethiopia (21.03%), UAE (9.43%).

Over 50 to 65% vegetables of India's exports in fresh products go to West Asia and East European markets. Exports of Gherkins (53%), Mushrooms (94%) going to the USA, United Kingdom, France, Spain, Israel and Russia. The major destinations for India's Rose are Netherland, Ethiopia and UAE. The major destinations for Walnut is Nepal, UK and France (40%).

Table 2
Growth rates, elasticity's, market signals for Vegetables and flowers

	<i>Country</i>	<i>Total % of Qty</i>	<i>Price Growth rate & CV 1990-91 to 2011-12</i>	<i>Qty Growth rate & CV 1990-91 to 2011-12</i>	<i>Elasticity % change from 1990-91 to 2011-12</i>
Onion	Bangladesh	29.8	6.1 (39.83)	8.4 (69.08)	1.15
	Malaysia	21.6			
	United Arab Emirates	15.9			
Potato	Sri Lanka	44.2	5.1 (65.90)	13.1 (161.49)	1.42
	Nepal	16.8			
	Maldives	9.2			
Green Chilly	United Kingdom	16.3	0.8 (26.94)	5.0 (125.14)	3.98
	Pakistan	13.5			
	United Arab Emirates	12.2			
Gherkins	United States	20.32	3.7 (22.77)	23.0 (70.54)	1.84
	France	17.75			
	Spain	14.88			
Mushroom	United States	80.9	-25.1	28.9	
	Israel	12.6			
	Russia	1.3			
Rose	Netherland	25.34			
	Ethiopia	21.03			
	United Arab Emirates	9.43			

Figures in parenthesis indicate c.v.

Fruits & Vegetables of demand-supply, tariffs, duties, ISI Standards and policies signals

Fruits & vegetables market demand-supply, tariffs, duties, ISI Standards and policies signals are shown in Table 3. The demand is more than supply indicating

fruits and vegetables requirement in the exports markets are promising. The tariffs for fruits banana, grapes and mango are 4.85%, 3.75%, and 3.75% respectively. Whereas for vegetables such as onion and green chillies 11.25%, 11.25%. Important point

Table 3
Fruits & vegetables market demand-supply, tariffs, duties, policies signals

	Tariffs 2012-13	Duties	Global Demand	Safety issues	POLICIES
BANANA	4.85	Free	The increasing global demand for fruits and vegetables could significantly increase the profit margin for their production. According to the Nielsen's Global Health and Wellness Survey, projections estimate that by 2017, the global fruit and vegetable market will be valued at \$2.3 trillion, an increase of 52 percent from 2012 (The Chicago Council on Global Affairs)	Major food safety issues related to vegetables are pesticide residues, microbial contaminants, colouring agents, and heavy metals. Among these, pesticide residue is the most important food safety factor. Considering seriousness of the issue for domestic consumption and export, the Food Safety and Standards Authority of India (FSSAI) has recognized Indian Institute of Vegetable Research (IIVR), Varanasi, an ISO 9001-2008 certified institute of the Indian Council of Agricultural Research (ICAR) 2014. The institute is in process of developing state-of-the-art analytical facilities and will carry out functions related to analysis of pesticide residues, heavy metals, microbial contaminations, mycotoxins, antibiotics, disinfectants, colouring agents, adulterants, food additives, phytohaemagglutinin, allergens etc. in vegetables.	In India, the main legislation concerning foreign trade is the Foreign Trade (Development and Regulation) Act, 1992. Accordingly, With economic reforms, globalisation of the Indian economy has been the guiding factor in formulating the trade policies. The reform measures introduced in the subsequent policies have focused on liberalization, openness and transparency. They have provided an export friendly environment by simplifying the procedures for trade facilitation. For the agriculture sector :- A new scheme called "VisheshKrishiUpajYojana (Special Agricultural Produce Scheme)" to boost exports of fruits, vegetables, flowers, minor forest produce and their value added products has been introduced. Under the scheme, exports of these products qualify for duty free credit entitlement (5 per cent of Free On Board (f.o.b) value of exports) for importing inputs and other goods; Duty free import of capital goods under Export Promotion Capital Goods (EPCG) scheme, permitting the installation of capital goods imported under EPCG for agriculture anywhere in the Agri-Export Zone (AEZ); Utilizing funds from the 'Assistance to States for Infrastructure Development of Exports (ASIDE) scheme' for development of AEZs; Liberalization of import of seeds, bulbs, tubers and planting material, and liberalization of the export of plant portions, derivatives and extracts to promote export of medicinal plants and herbal products. Our export of fresh fruits and vegetables and floriculture suffers from high incidence of freight cost. To neutralize this disadvantage, an additional credit of 2.5% over and above the credit available under VisheshKrishi and Gram UdyogYojana (VKGUY) is proposed.
GRAPES	3.75				
Mango	3.75				
Pomegranate	Free				
Walnut					
	Tariffs	Duties			
Onion	11.25				
Potato	Free				
Green chilly	11.25				
Mushroom					
Rose					

noted to be is for fruits and vegetable duties are free. In India, the main legislation concerning foreign trade is the Foreign Trade (Development and Regulation) Act, 1992. Accordingly, with economic reforms, globalisation of the Indian economy has been the guiding factor in formulating the trade policies. The reform measures introduced in the subsequent policies have focused on liberalization, openness and transparency. They have provided an export friendly environment by simplifying the procedures for trade facilitation. Major food safety issues related to vegetables are pesticide residues, microbial contaminants, colouring agents, and heavy metals.

Among these, pesticide residue is the most important food safety factor.

For the agriculture sector, a new scheme called “Vishesh Krishi Upaj Yojana (Special Agricultural Produce Scheme)” to boost exports of fruits, vegetables, flowers, minor and their value added products has been introduced.

ISI Standards for fruits and Vegetable

Fruits and vegetables ISI standards for different countries in the world are shown in Table 4. The results show that the different countries have different standards for fruits and vegetables.

Table 4
ISI Standards of fruits and Vegetable
ISI Standard fruits and Vegetable

Variety	Middle East	Holland/Germany	U.K	Japan	USA	Netherland
Thompson Seedless Grapes	Berry Size: 15mm Colour: amber	Berry Size: 16mm black	Berry Size: 18mm White			
Alphonso Mango	wt: 200-250gm	wt: 250-300gm	wt: 250-300gm	wt: 250-300gm	wt: 250-300gm	wt: 250-300gm
Ganesh, Bhagwa Pomegranate	300-450gm Red	250-300gm Red	250-300 Red			
Grand Naine Cavendish Banana	Colour: Green, Weight of Bunch: 2.5 Kg					
Green Chilli	3-4 Inch Length					

Current tariff rates in ASEAN and Russia countries

Fruits and vegetables current tariff rates in ASEAN and Russian countries are shown in Table 5. Thailand has no tariff rates for mango, grapes and pomegranate. Rest of the countries have different tariff rates for fruits and vegetables.

Regression Coefficient signals on exports, price, production, poverty and trade

Vegetables: Regression analysis was performed to study the effects of different economic variables on international prices, quantity of exports, production, and poverty. These results are useful to planners,

Table 5
Current tariff rates in ASEAN and Russia countries
Tariff Rate in %

Commodity	Thailand	Indonesia	Philippines	Malaysia	Russia (GSP Tariff)	Ukraine (General Tariff)	Kazakhstan (GSP Tariff)
Mango	Free	25	15	60.82\$/ton	3.75	3	3.75
Grapes	Free	5	7	5	3.75	10	3.75
Pomegranate	Free	-	-	-	-	-	-
Lynches	40% or 852.74 \$/ton	5	10	5	-	-	-
Banana	40% or 852.74\$/ton	5	15	364.96\$/ton	4.85	3	3.75
Pineapples	40% or 852.74\$/ton	5	10	228.17 \$/ton	3.75	4	3.75
Tomato	40% or 108.18\$/ton	5	10	0	16.57 - *25.98	100.96	11.25
Onion	60% or 159.09 \$/ton	25	40	0	11.25	20	15
Green chillies	40% or 108.18 \$/ton	5	20	0	11.25	-	15
Ginger	27% or 95.46 \$ /ton	5	20	0	-	-	-
Turmeric powder	27% or 95.46 \$ /ton	5	3	0	-	-	-
Soya meal	6	0	3	0	3.75	5	3.75
Sesame	30	5	7	0	0	20	3.75
Cotton	0	0	1	10	-	0	0

Source: ITC Trade map (www.trademap.org)

policy makers in designing policies. The empirical results of the vegetables ordinary least squares (OLS) regression coefficients signals in Table 6. Export price coefficients are signals for exporters to increase or decrease their exports as it indicates exports responsiveness to changes in price. The results on relevant variables are encouraging with expected sign and magnitudes of coefficients. The results show that percentage of exports, balance of agriculture trade negatively effecting green chillies export prices and whereas percentage of exports, balance of agriculture

trade and production on potato export prices. Balance of agriculture trade and quantity exports are positively affecting on onion export prices and percent of exports positively affecting on gherkins export prices.

Export prices and balance of agricultural trade are positively affect and Percentage of poverty and production negatively affecting on potato quantity of exports. Export prices and production are positively and percentage of poverty negatively affecting on onion quantity of exports.

Table 6
Fruits Economic Market Coefficients signals on production, prices, trade and poverty
Coefficient signals on price, production, Qty, poverty and trade

	<i>Parameter Estimate</i>	<i>Green chilly</i>	<i>Potato</i>	<i>Onion</i>	<i>Gherkins</i>
Price	Intrecept	0.27399*** (2.22)	1.69888* (4.27)	0.05304** (2.02)	
	persent_Export	- 0.0066*** (-1.9)	- 0.03221* (1.67)	-0.00127 (-2.89)	0.00000105*** (0.03)
	Balance_agri_trade	-6.50E-07*** (-1.82)	1.7E-0.5*** (4.80)	-6.97738E-8 (-2.95)	
	prod		-0.02486* (1.83)	0.01091 (5.25)	
	Qty_exp				
Qty	Adjusted R2	0.5426	0.7895	0.8326	0.3412
	Intercept		2879.62789* (4.27)	1051272*** (2.09)	
	Price		1010.03496* (-3.80)		
	Povert_percentage		-27.57375*** (-2.10)	-46890*** (-1.83)	
	Balance_agri_trade		0.02278* (4.26)		
Prod	Prod		- 47.57263** (-2.76)	123601*** (2.12)	
	Percent_export				-1156.121
	Adjusted R2	0.247	0.06041	0.08326	0.9588
	Intercept	1007.08909*** (2.09)			
	Balance_agri_trade	0.00308** (2.48)			
Poverty	Qty_exp		-0.0074** (-2.76)	0.00000178*** (2.12)	
	Price_exp		-7.7631*** (-1.83)		
	Percent_exp			-0.1394** (-1.38)	
	Adjusted R2	0.706	0.8542	0.9707	
	Intercept	59.3497* (3.28)	38.92586** (2.61)		
Poverty	Persent_exp			1.23107*** (2.03)	
	Balance_agri_trade			-0.00029361** (-2.56)	0.0001766* (4.43)
	Prod_total			1.37231** (2.32)	
	Price_exp			-271.06116* (-2.89)	
	Qty_exp				
	Adjusted R2	0.5872	0.511	0.5581	0.8781

Balance of agricultural trade is positively effect on green chillies production. Quantity of exports and prices are negatively affecting on potato production. Quantity of export is positively and percentage of export negatively affecting on onion production.

Percentage of onion exports positively affecting poverty. Onion prices, production, balance of agricultural trade negatively affecting on poverty.

Fruits: The regression coefficient signals of the fruits ordinary least squares (OLS) estimates in Table 7. The results show that exports quantity negatively effecting banana export prices and percentage of exports and balance of agriculture trade positively affecting on mango export prices. Percent of exports are negatively affecting on walnut and grapes export prices.

Percentage of exports, balance of agricultural trade, production and percentage of poverty are

Table 7
Fruits Economic Market Coefficients signals on production, prices, trade and poverty
 Coefficient signals on price, production, Qty, poverty and trade

	Parameter Estimate	Banana	Mango	Walnut	Grapes	Pomegranate	Rose
Price	Intrecept	0.88728*** (1.84)			0.51032** (2.46)		
	persent_Export		0.00169** (0.45)	- 0.06162** (-2.48)	-0.00739* (2.27)		
	Balance_agri_trade		1.13E-06* (2.51)				
	Qty_exp	-0.00014** (-1.77)					
	Poverty_percentage						-0.96** (-2.28)
Qty	Adjusted R2	0.0188	0.3324	0.1206	0.64	0.8224	0.3496
	Intercept	4768.52434* (4.11)	102689** (2.44)				
	Price Povert_percentage	-32.68137*** (-1.87)					
	Balance_agri_trade Prod	-0.09352** (-2.63)					
	Percent_export	-127.75951* (-2.79)	-3225.5112** (-2.59)				
Prod	Adjusted R2	0.4282	0.7148	0.5129	0.802	-0.9528	
	Intercept		9985.3086*** (3.28)	99.89464*** (2.04)	2206.6779* (3.27)		
	Balance_agri_trade	0.11204* (5.16)		0.00137** (6.22)			
	Qty_exp	-4.12023** (-2.63)					
	Price_exp		20126** (2.97)				
Poverty	Percent_exp	-850.92612** (-2.80)	-200.6717*** (-1.83)				
	Poverty_percentage	-240.15*** (-2.15)			-21.54301		
	Adjusted R2	0.8691	0.9064	0.8512	0.7675	-2.7334	
	Intercept	59.44654** (2.81)			42.58563* (3.09)		
	Persent_exp			1.1133*** (1.93)			
Poverty	Prod_total	-0.00123*** (-2.15)			-0.00998*** (-2.98)		
	Price_exp			-6.59719** (-2.48)			
	Qty_exp	-0.00736*** (-1.87)					
	Adjusted R2	0.5079	0.4085	0.4536	4902	5320	

Note: * -- 1%, ** -- 5%, *** -- 10% level of significance

negatively affecting on banana quantity exports. Whereas percentage of exports negatively affecting on Mango quantity exports. Balance of agricultural trade positively, quantity exports and percentage exports, poverty percentage negatively affecting on banana production. Export prices is negatively and percentage of exports positively affecting on Mango production. Balance of agricultural trade positively affecting on walnut production and poverty percentage negatively affecting on grapes production.

Banana production and quantity of exports are negatively affecting poverty. Walnut percentage of exports positively and export prices negatively affecting on poverty. Grapes production is negatively affecting on poverty.

CONCLUSIONS

The market economy depends on price signals to correctly allocate its scarce resources. Export Market signals is necessary when entering a foreign market. The export growth rates during 1990-2012 (%) of India's fruits, vegetables and flowers are positive except mushroom and walnut. Mango, grapes, onion and Gherkins exports are stable whereas Banana, Pomegranate, Green chillies and Potato are unstable. During this period the price elasticity's of exports of fruits, vegetables, flowers except walnut and mushrooms are elastic. This implies that India should increase exports of these commodities to earn more foreign earnings. The study found that all the price growth rates of fruits, vegetables and flowers are positive and high.

The major markets which accounted 65 to 90% share for Indian fruits are Bangladesh, UAE, Pakistan, Malaysia, Sri Lanka, UK, Saudi Arabia, Nepal, Netherland and France. The major markets for walnut are Nepal, UK and France (40%). The major share 50 to 65% of India's vegetables (potato, onion, green chillies) are exported to Saudi Arabia, UAE, Pakistan, Malaysia and UK. Exports of Gherkins (53%), Mushrooms (94%) going to the USA, United Kingdom, France, Spain, Israel and Russia.

The demand for fruits and vegetables in the exports markets are promising. The tariffs for fruits banana, grapes and mango are 4.85%, 3.75%, and 3.75% respectively. Whereas for vegetables such as onion and green chillies 11.25%, 11.25%. Important point noted to be is for fruits and vegetable duties are free. The export policies have provided an export friendly environment by simplifying the procedures for trade facilitation. Pesticide residue is the most important food safety factor.

Fruits and vegetables ISI standards for the different countries have different standards for fruits and vegetables. Thailand has no tariff rates for mango, grapes and pomegranate. Rest of the countries have different tariff rates for fruits and vegetables.

Export price coefficients are signals for exporters to increase or decrease their exports as it indicates exports responsiveness to changes in price. The results show that percentage of exports, balance of agriculture trade negatively effecting green chillies export prices and whereas percentage of exports, balance of agriculture trade and production on potato export prices. Balance of agriculture trade and exports quantity are positively affecting on onion export prices and percent of exports positively affecting on gherkins export prices. Export prices and balance of agricultural trade are positively affect and Percentage of poverty and production negatively affecting on potato quantity of exports. Export prices and production are positive affect and percentage poverty is negatively affecting on onion quantity of exports.

The results show that quantity exports negatively effecting banana export prices and whereas percentage exports and balance of agriculture trade positively affecting on Mango export prices. Percent of exports are negatively affecting on walnut and grapes export prices. Percentage of exports, balance of agricultural trade, production and poverty percentage negatively affecting on banana quantity exports whereas percentage exports negatively affecting on Mango quantity exports.

The study findings have important implications to be considered in designing agricultural policies and programs to boost exports and foreign earnings of horticultural commodities in Asia and East European markets and USA. The study guides exporters and importers for market and price signals of the horticultural commodities.

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