Original Research Article

Export status of Fruits and Vegetables from India: An overview

ABSTRACT

Background: Horticulture export is one of the most promising industries, due to rising global demand and country's diverse agro-climatic system. During early 1990's, following post reform there was an increase in agricultural commodities export which boosted the Indian economy.
Method: Secondary time series data of fruits and vegetables (fresh and processed) were collected from APEDA and FAO, the methodologies used were Compound Growth Rate, Instability Index, Revealed Comparative Advantages and Revealed Symmetric Comparative Advantages.
Result: Fruit and vegetable importers include the UAE, Bangladesh, Saudi Arabia, Sri-Lanka and others. Fresh fruits, fresh vegetables, processed vegetables and fruits, nuts and juices showed positive and significant growth throughout the study period. Whereas, the import of fresh fruits and vegetables also shows a positive and significant growth rate, because some fruits and vegetables are cheaper to import than production. Revealed Comparative Advantages shows disadvantages in global market. India has to improve its marketing strategy, storage facilities and improvising their skills for the production and processing of fruits and vegetables, etc. to emerge as a major exporter of fruits and vegetables.

INTRODUCTION

Agriculture has always been India's backbone, accounting for 20.2% of total GDP (2020).. Further 70 % of total the rural population completely depends on agriculture and now they are shifting from cereal based cropping systems to horticulture crops for higher productivity and revenue (Mittal, 2007). India's diverse agro-climatic system allows cultivating different fruits and vegetables almost around the year; therefore India's horticulture sector is a promising sector in global competition (Narasalagi & Shivashankar, 2017). After Independence, need to raise food grain production was more important than promotion of horticulture. Only, economic reforms and policies in 1990's diversify horticultural production due to export-led growth (Chand et *al.* 2008). After that, the National Horticulture Mission was launched in 2004-05 to promote development in horticulture which works as a booster for the production and processing of fruits and vegetables.

India ranked second in the production of fruits and vegetables after China. With changes in lifestyle, urbanization and international market intervention there is an increase in demand for fruits and vegetables both, fresh and processed in the international market. Production and export of Indian fruits and vegetables have increased in recent years. India mostly exports to its neighbors, namely the UAE, Bangladesh, Pakistan, Saudi Arabia, Sri Lanka and Nepal (Ramesh *et al.* 2017).

India produces around 12% of the global fruit and vegetables market but its global market share is still only about 1%. But its horticulture products are becoming increasingly popular due to advancements in cold chain infrastructure, research, contemporary post-harvest technologies, supportive governmental policies and quality control procedures.

METHODOLOGY

The time series secondary data on the export of fresh fruits, fresh vegetables, processed vegetable and fruits, nuts and juices from 1991-92 to 2019-2020 was collected from the databases of APEDA and FAO. The following analytical tools were used to analyze the data:

2.1 Compound Growth Rate

$Y=ab^t$
Where, Y= export quantity
a=constant/intercept
b= regression coefficient
t= time variable in year

Then compound growth rate (r) was computed by using the relationship:

CGR(r) = (antilog of log b-1) x100

The significance of growth rate was judge by student's '*t*' test

2.2 Instability index

The index was originally developed by John Cuddy and Della Valle (1978) for measuring the instability in time series data:

Instability index = $CV*\sqrt{1-R^2}$
CV= (standard deviation/mean)*100
R^2= coefficient of determination

2.3 Revealed comparative advantages (RCA)

The index is based on the premise that countries specialize in export those agricultural commodities that they can produce at a lower relative cost.

The original index of RCA was first formulated by Balassa in, 1965 and can be written as follows:

$$\mathbf{B} = (X_{ij}/X_{ik})/(X_{nj}/X_{nk})$$

Where,

X_{ij} = Exports of country 'i' of commodity 'j'
X_{ik} = Exports of country 'i' of a set of commodities 'k'
X_{nj} = Exports of a set of countries 'n' of commodity 'j'
X_{nk} = Exports of a set of countries 'n' of a set of commodities 'k'

The RCA index value ranges between zero (0) and positive infinity (+∞). If the RCA index value is greater than one then the country has comparative advantage on that product and vice –versa.
Since, RCA suffers asymmetry, RSCA is used. Mathematically, it can be expressed as follows,

RSCA= (RCA- 1) / (RCA+1)

The value of RSCA ranges between {– 1} and {+ 1} and is free from the problem of skewness. A commodity is said to have a comparative advantage in its exports if the corresponding RSCA value is positive and vice-versa.

RESULT AND DISCUSSION

3.1 Growth and instability:

3.1.1 EXPORT

3.1.1.1 Fresh Vegetables

India ranks second in vegetable production and top the list of vegetable exporters worldwide after China. The vast production base offers India tremendous opportunities for export. Table 1 shows moderate instability index all of the major importers showed positive and significant annual growth. India experienced positive and significant growth of 9.03 per cent per annum with low instability index (27.09%).

3.1.1.2 Fresh Fruits

India is the second largest exporter of fruits worldwide after China. Table 2 shows all the major importing countries show positive and significant growth with a moderate instability index except Bahrain Is which showed positive but non-significant growth of 5.94 per cent and a very high instability index (256%). India showed positive and significant growth of 8.72 per cent per annum and a low instability index (19%).

The major importers of fresh fruits and fresh vegetables from India are the United Arab Emirates. The USA, Netherlands and France are India's export market of processed vegetable and processed fruits, nuts and juices (Rabha and Sarma, 2021).

3.1.1.3 Processed vegetables

In table 3India showed positive and significant growth in export of processed vegetables globally with low instability index which is 8.60 and 18.50 per cent per annum. Major destinations of processed vegetables are USA, UK, UAE, France show positive and significant growth annually whereas, Sri Lanka showed non-significant and positive growth of 7.22 and very high instability of 104.40 per cent per annum.

3.1.1.4 Processed fruits, nuts and juices

India showed positive and significant growth in export of processed fruits, nuts and juices with an annual growth rate of 8.62 per cent and moderate instability of 18.34 per cent per annum in table 4. All major importing countries showed a positive and significant growth rate with moderate instability index except for Indonesia which showed positive but non-significant growth (17.48 %) and a very high instability index (105.89%).

3.1.2 IMPORT

3.1.2.1 Fruits and vegetables

India's climate and land don't allow growing all sorts of fruits and vegetables throughout the year. Seasonal difference exit between countries and it is sometimes cheaper to import and transport then it is to produce locally. Table 5 shows there is positive growth in the import of fruits and vegetables which is8.60 and 12.60 per cent with a moderate (18.92%) and very high (98.48%) index per annum.

3.2 Export Competitiveness

Mexico and Spain showed higher RCA and RSCA values which estimates a higher comparative advantages. Whereas India, France and the USA showed comparative disadvantages in the study period for vegetable in table 6. Whereas, Chile, Italy and Spain showed higher comparative advantage in which Chile and Spain showed declining comparative advantage in the export of fruits whereas, India and USA exhibit comparative disadvantage in table 7. The comparative disadvantage of India in the export of fruits and vegetables is due to high domestic demand and post-harvest losses.

Table 1: Growth and instability of fresh vegetables items in major countries: 1991-92 to 2019-20

Name of countries	CGR (%)	Instability Index (%)
Bangladesh	11.317***	51.290
UAE	5.534***	28.226
Sri Lanka	6.270***	21.954
Nepal	23.383***	51.552
Saudi Arab	5.282***	50.815
UK	12.960***	28.927
Total export	9.013***	27.097

Note: *** indicates significance at 1 percent level

Table 2: Growth and instability of fresh fruits items in major countries: 1991-92 to 2019-20

Name of countries	CGR (%)	Instability Index (%)
Bangladesh	5.949***	37.497
UAE	7.466***	24.541
Saudi Arab	5.742***	25.015
UK	6.603***	23.490
Bahrain Is	5.945	265.520
Nepal	28.958***	62.588
Total export	8.727***	19.075

Note: *** indicates significance at 1 percent level

Table 3: Growth and instability of processed vegetables items in major countries: 1991-92 to 2019-20

Name of countries	CGR (%)	Instability Index (%)
USA	10.992***	33.751
UK	14.103***	29.006
France	8.785***	26.054
UAE	6.978***	37.342
Sri Lanka	7.227	104.406
Total export	8.595***	18.498

Note: *** indicates significance at 1 percent level

Table 4: Growth and instability of processed fruits, nuts and juices in major countries: 1991-92 to 2019-20

Name of countries	CGR (%)	Instability Index (%)
Netherlands	15.758***	38.500
Saudi Arab	17.526***	33.097
Indonesia	17.487	105.896
UAE	10.929***	29.788
Yemen Republic	10.950***	35.097
Total export	8.626***	18.347

Note: *** indicates significance at 1 percent level

Table 5: Growth and instability in import of agricultural commodities: 1991-92 to 2019-20

COMMODITY	CGR (%)	Instability index (%)
Fruits	8.60***	18.92
Vegetables	12.60***	98.48

*** indicates significance at 1 percent level

Table 6: RCA, RSCA estimates of vegetables export for India and other major world exporters

Country	Year				
	1992	1999	2006	2013	2020
Balassa RCA					
India	0.54	0.48	0.81	0.52	0.54
France	0.78	0.67	0.68	0.68	0.64
Mexico	6.64	5.44	5.17	5.65	5.71
Spain	4.68	3.99	3.54	3.44	3.07
USA	0.66	0.70	0.59	0.60	0.53
RSCA					
India	-0.30	-0.35	-0.11	-0.31	-0.30
France	-0.12	-0.20	-0.19	-0.19	-0.22
Mexico	0.74	0.69	0.68	0.70	0.70
Spain	0.65	0.60	0.56	0.55	0.51
USA	-0.21	-0.18	-0.26	-0.25	-0.30

Table 7: RCA, RSCA estimates of fruits export for India and other major world exporters

Country	Year				
	1992	1999	2006	2013	2020
Balassa RCA					

India	0.29	0.28	0.34	0.24	0.31
Chile	7.81	5.35	5.35	6.30	5.72
Italy	2.63	1.81	1.48	1.49	1.01
Spain	4.43	2.99	2.70	2.88	2.28
USA	0.92	0.85	0.80	0.92	0.72
RSCA					
India	-0.56	-0.57	-0.49	-0.62	-0.53
Chile	0.77	0.68	0.69	0.73	0.70
Italy	0.45	0.29	0.19	0.20	0.01
Spain	0.63	0.50	0.46	0.48	0.39
USA	-0.04	-0.08	-0.11	-0.04	-0.16

CONCLUSION

The export of fruits and vegetable, both fresh and processed shows a positive and significant growth rate with a low and moderate instability index which indicates less fluctuation in the global market. In contrast fruits and vegetables imports are growing at a positive and significant rate because exotic fruits and vegetables are cheaper to import then to produce. Despite being one of the largest producers Revealed Comparative Advantages reveals disadvantages during the study period and depicts the true picture of fruits and vegetable exports. Because of lack of technology, skills and improvisation in processing strategy, India is still struggling to itself in the global market of fruit and vegetable export.

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