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Trade performance and export competitiveness of horticultural commodities of North East India (NEI)

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Abstract

The present study estimates the trade performance and export competitiveness of horticultural commodities of North East India (NEI) based on entirely secondary data obtained from Directorate General of Commercial Intelligence and Statistics, Kolkata, West Bengal. Compound Annual Growth Rate (CAGR), instability index and trend analysis were used to measure the trade performance and Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) were used to examine the export competitiveness of horticultural commodities from NEI. The study has revealed that though there has been a year to year variation in volume of trade, it witnessed a positive growth in export of fresh fruits, processed fruits, fresh vegetables and processed vegetables. Further, it revealed a very high instability in export of horticultural commodities of NEI in terms of volume and comparatively less instability in terms of export value. The trend analysis showing increasing trends for both fruits and vegetables exported from NEI. The RCA and RSCA index reflects that NEI has been competitive in exporting horticultural commodities in the global market. Adequate infrastructure facilities with trained human resource are suggested to maintain the quality of products as per global standards to boost the international trade of the region.

Keywords: North East India, horticultural commodity, growth rate, instability, competitiveness

Introduction

International trade has a great significance for economic development of nations all over the world. More specifically it plays a crucial role in the economic development of developing countries like India (Naidu, 2004) ^[5]. International trade contributes significantly in foreign reserves of a country, plays a useful role in integrating numerous economies of the world and improves the real GDP and trade of balance of a country (Sahni, 2014) ^[6]. Trade is the exchange of merchandise of goods and services across the countries in all over the world. It is the most customary form of global business and plays a most important role in determining world foreign trade, globalization, privatization, liberalization, export, import, trade balance and balance of payment position of world history (Seyoum, 2009) ^[7]. International trade has witnessed phenomenal growth across the world after the emergence of various international agencies like World Trade Organization (WTO), World Bank, International Monetary Fund (IMF) and liberalization of trade barriers for the various nations (Jagdambe, 2016) ^[4].

The horticultural product acts as a principal means of agricultural diversification and foreign exchange earnings in developing countries (Sharma and Sharma, 2021) ^[8]. North East India is sitting on hotspot of biodiversity of horticultural crops (Dutta *et al.*, 2020) ^[3]. The region

produces marketable surplus of many fruits and vegetables that can be traded both in the domestic and overseas markets (Dasgupta and Dey, 2024) ^[2]. In the region, the export of agricultural products has recorded 85.34 percent growth, export earnings increased from USD 2.52 million to USD 17.2 million during the period from 2016-17 to 2021-22 (The Shillong Times, 2022).

From the geo-political angle, the NEI is located in a strategic location as it is bounded by several foreign countries. It shares boundary with China, Myanmar, Bhutan, Bangladesh and Nepal and have access to the other South-East Asian countries mainly, Malaysia, Thailand, Philippines, Cambodia and Indonesia *etc.*, where almost half of the world's population live. The trade at NEI's border needs to be enhanced to take advantage of its strategic location. There is no doubt that this vast population could have great advantage for establishing any kind of trade and commerce. The NEI border is critical for business and commercial transactions between North East India and its neighbours beyond international borders or in its vicinity by the people inhabiting the area. The importance of border is profound for the NEI as it yields tangible benefits to the region thereby facilitating sustainable economic development. Thus, international trade has special significance for the economies of the North-Eastern States, which have a large segment of international border on their boundaries.

Methodology

The study was taken up for the entire states of North East India. The states included are Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The study area, NEI is situated between 21° 50' and 29°34' North latitude and 85°34' and 97°50' East longitude covering 255.08 million hectares, which is 8% of country's land mass. The region is the "gateway" for India's richest flora and fauna. It contains more than one-third of the country's total biodiversity and considered one of the 18 hotspots of the world. The present study was entirely based on time series secondary data taken from Directorate General of Commercial Intelligence and Statistics, Kolkata, West Bengal.

Analytical tools

Compound growth rate analysis

The analysis of growth is usually used in economic studies to find out the trend of a particular variable over a period of time. The growth in the export under different categories was estimated using the exponential growth function of the form:

$$Y_t = ab^t e^{u_t} \dots \dots \dots (1)$$

Where,

Y_t : Dependent variable for which growth rate was estimated

a: Intercept

b: Regression coefficient = $(1+g)$

t: Years which takes values, 1, 2, ..., n

u_t : Disturbance term for the year t

The equation was transformed into log linear form for estimation purpose and was estimated using Ordinary Least Square (OLS) technique. The compound growth rate (g) in percentage was then computed from the relationship,

$$g = \{ \text{Antilog of } (b-1) \} \times 100$$

Cuddy-Della Valle Instability index

Instability index is an analytical technique to find out the fluctuation or instability in any time series data. The Cuddy-Della Valle Instability index was calculated by using the following equation-

$$I_x = CV \times \sqrt{1 - \bar{R}^2}$$

Where,

I_x = Instability index

CV = Coefficient of variance

$\bar{R}^2$ = Adjusted coefficient of determination

Revealed Comparative Advantage (RCA)

The Revealed Comparative Advantage index or RCA index, originally developed by Balassa (1965) ^[1] is a ratio of two shares. The numerator indicated the share of exports of a particular commodity with the total export of that country at a given point in time. The denominator indicated the share of exports of that particular commodity with total world exports. RCA index value lies between zero and infinity. The value of RCA index >1 indicated comparative advantage for that particular commodity which was calculated as:

$$RCA_{ij} = \frac{X_{ij} \div X_{it}}{X_{jw} \div X_{tw}}$$

Where,

X_{ij} = the value of country's exports of the commodity

X_{it} = the total value of agricultural exports of country

X_{jw} = the value of world exports of that commodity

X_{tw} = the world total value of agricultural exports.

Revealed Symmetric Comparative Advantage (RSCA)

The revealed symmetric comparative advantage also was calculated as RCA suffers from the problem of asymmetry as 'pure' RCA is not comparable on both sides of unity, as the index ranges from zero to one, if a country is said not to be specialized in a given sector, while the value of the index ranges from one to infinity if a country is said to be specialized. The Revealed Comparative Advantage can be made symmetric by obtaining Revealed Symmetric Comparative Advantage (RSCA). This is computed as follows:

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

$RSCA_{ij}$ represents the revealed symmetric comparative advantage the country 'i' enjoy for product 'j'. It varies from -1 to +1. The closer the value is to +1, the higher the competitiveness of a country in the commodity of interest.

Results and discussion

Table 1 depicts the percentage share of horticultural commodities exported from North East India in total Indian export in terms of values earned for the period of 2012-13 to 2023-24. The share of horticultural commodities exported from NEI has been very low as compared to national level export. As compared to processed fruit and processed vegetables, fresh fruit and fresh vegetables have higher percentage share in total Indian export. Though, the processed fruit and processed vegetables have shown lower percentage share, it shows an increasing trend as compared to fresh fruit and fresh vegetables which shows negative trend over the years.

Table 1: Percentage share of horticultural commodities exported from NEI in total Indian export in terms of values from the year 2012-13 to 2023-24

Year	Fresh fruits	Processed fruits	Fresh vegetables	Processed vegetables
2012-13	0.248	0.009	0.153	0.000
2013-14	0.014	0.005	0.055	0.000
2014-15	0.009	0.003	0.059	0.002
2015-16	0.107	0.001	0.005	0.007
2016-17	0.072	0.038	0.334	0.007
2017-18	0.202	0.011	0.452	0.014

2018-19	0.178	0.018	0.184	0.000
2019-20	0.117	0.000	0.244	0.044
2020-21	0.073	0.025	0.025	0.037
2021-22	0.054	0.023	0.153	0.033
2022-23	0.184	0.014	0.113	0.027
2023-24	0.052	0.026	0.039	0.030

Source: Author's calculation based on data obtained from DGCI&S, Kolkata, West Bengal, 2024.

Growth and instability of fruits export from NEI

The compound annual growth rates and instability index of fruits exported from NEI from 2012-13 to 2023-24 are presented in table 2. It shows that the compound annual growth rates of processed fruits are higher than that of fresh fruits both in terms of quantity and value. The instability indexes of quantity exported are higher as compared to exported values both in terms of fresh fruits and processed fruits throughout the study period.

Table 2: Annual growth rate and instability index in export of fruits from NEI

Commodity	CAGR (%)		Ix	
	Quantity	Value	Quantity	Value
Fresh fruits	27.56	38.09	138.22	77.65
Processed fruits	40.44	39.57	117.91	90.42

Source Author's calculation based on data obtained from DGCI&S, Kolkata, West Bengal, 2024.

Growth and instability of vegetables export from NEI

Table 3 shows the results of compound annual growth rate and instability index of vegetables exported from North East India from 2012-13 to 2023-24. The compound annual growth rates of processed vegetables are higher in terms of

quantity and values exported as compared to fresh vegetables. On the contrary, the instability indexes for fresh vegetables are higher as compared to processed vegetables for both in terms of quantity and values exported from NEI.

Table 3: Annual growth rate and instability index in export of vegetables from NEI

Commodity	CAGR (%)		Ix	
	Quantity	Value	Quantity	Value
Fresh vegetable	25.11	38.3	165.08	91.27
Processed vegetable	46.74	59.46	46.99	58.12

Source: Author's calculation based on data obtained from DGCI&S, Kolkata, West Bengal, 2024.

The trends in export of four categories of horticultural commodities from NEI have been presented in figures 1-4 for the period from 2012-13 to 2023-24. The trend analysis of fresh fruit (Figure 1) and processed fruits (Figure 2) shows that its export was variable over the study period. The fresh fruits export shows more stable and increasing trends as compared to processed fruits export. On the other hand, trends of processed vegetables (Figure 4) showing sharp increase in export except the year 2018-19 as compared to fresh vegetables export (Figure 3) for the study period.

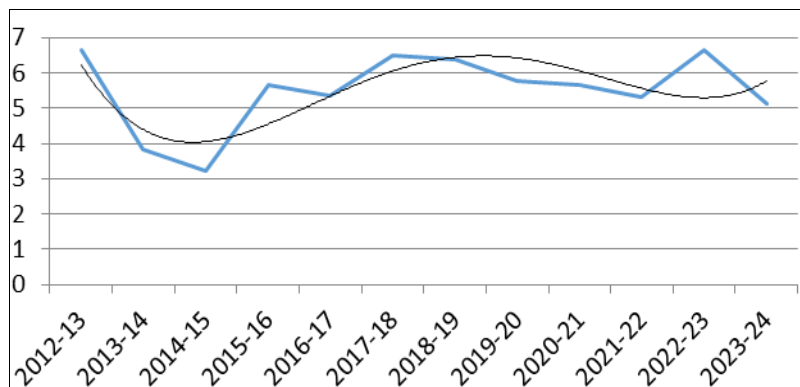


Fig 1: Trends of fresh fruits export from NEI from 2012-13 to 2023-24

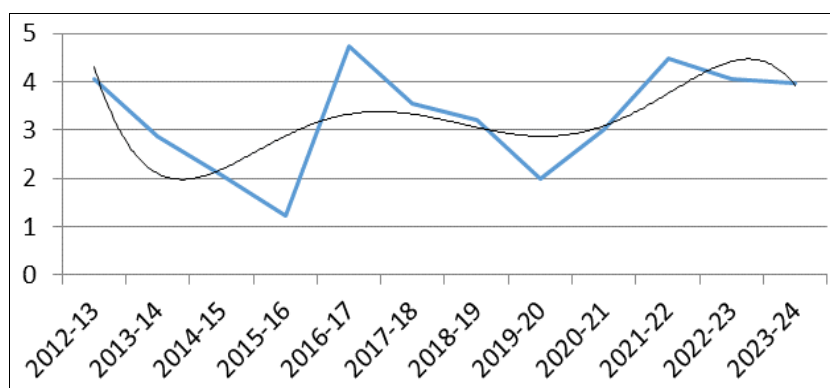


Fig 2: Trends of processed fruits export from NEI from 2012-13 to 2023-24

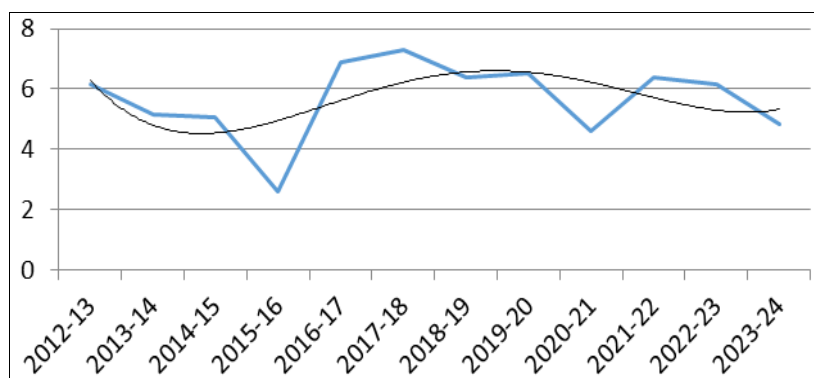


Fig 3: Trends of fresh vegetables export from NEI from 2012-13 to 2023-24

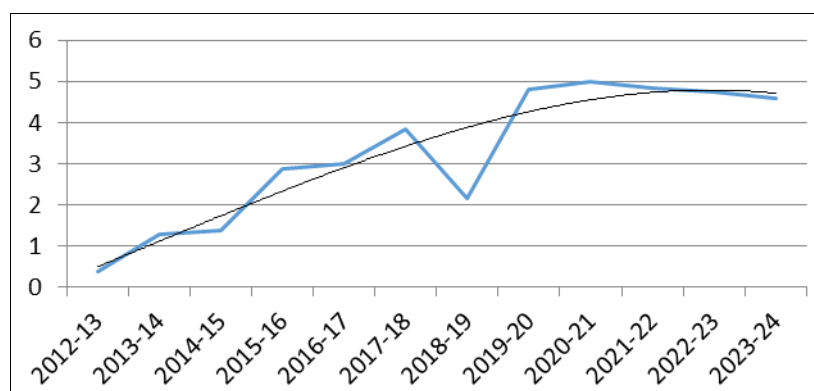


Fig 4: Trends of processed vegetables export from NEI from 2012-13 to 2023-24

Comparative advantage of NEI's horticultural export trade

The year wise revealed comparative advantage and revealed symmetric comparative advantage of fruits export from NEI from the year 2012-13 to 2023-24 have been presented in table 4. It shows that the RCA index of fresh fruits are consistent and more than one for all the years of the study period. Additionally, the RSCA index near to one depicts

that NEI's fresh fruit export has comparative advantage in the global market. For the processed fruit export, the RCA and RSCA index shows that NEI's processed fruit export is highly unstable in the global market. Moreover the near to -1 RSCA index depicts that NEI's processed fruits export has lesser comparative advantage globally. Though, in the recent years from 2021-22, the processed fruits export has shown comparative advantage in the global market.

Table 4: RCA and RSCA of fruits export from NEI: 2012-13 to 2023-24

Year	Fresh fruit		Processed fruit	
	RCA Index	RSCA Index	RCA Index	RSCA Index
2012-13	7.82	0.77	5.82	0.71
2013-14	4.58	0.64	1.75	0.27
2014-15	2.48	0.43	0.79	-0.12
2015-16	2.82	0.48	0.34	-0.49
2016-17	2.14	0.36	1.12	0.06
2017-18	6.57	0.74	3.44	0.55
2018-19	5.78	0.71	2.48	0.43
2019-20	3.22	0.53	0.44	-0.39
2020-21	2.88	0.48	1.91	0.31
2021-22	2.06	0.35	8.92	0.80
2022-23	7.82	0.77	5.82	0.71
2023-24	1.68	0.25	5.23	0.68

Source: Author's calculation based on data obtained from DGCI&S, Kolkata, West Bengal, 2024.

Table 5 shows the revealed comparative advantage and revealed symmetric comparative advantage of vegetables export from NEI from the year 2012-13 to 2023-24. It shows that the values of RCA index for fresh vegetables export from NEI are >1 for entire period of the study. It means that NEI's fresh vegetables export has comparative advantage in the global vegetables market which is also

supported by the positive RSCA index. The RCA and RSCA index depicts that though NEI's processed vegetables export was unstable in the global market initially in the study period, it is continuously developing over the years and in recent years it shows comparative advantage globally.

Table 5: RCA and RSCA of vegetables export from NEI: 2012-13 to 2023-24

Year	Fresh vegetables		Processed vegetables	
	RCA Index	RSCA Index	RCA Index	RSCA Index
2012-13	4.81	0.66	4.53	0.64
2013-14	1.76	0.28	1.19	0.09
2014-15	1.57	0.22	0.32	-0.52
2015-16	1.34	0.15	1.09	0.04
2016-17	9.99	0.82	1.23	0.10
2017-18	1.46	0.19	2.48	0.43
2018-19	5.97	0.71	3.92	0.59
2019-20	6.75	0.74	5.11	0.67
2020-21	9.83	0.82	5.86	0.71
2021-22	5.87	0.71	5.11	0.67
2022-23	4.81	0.66	4.53	0.64
2023-24	1.28	0.12	5.84	0.71

Source: Author's calculation based on data obtained from DGCI&S, Kolkata, West Bengal, 2024.

Summary and Conclusion

The study reveals that export of horticultural commodities from NEI has a positive growth rate over the years. Though, overall horticultural commodities of NEI have shown very high instability in exports in terms of quantity and value, it has positive growth trends which indicate future potential of this sector. The study examines that horticultural commodities of NEI has a comparative advantage in global trade.

The international boundary of NEI provides natural advantage of trading in the region which is to be facilitated through sustainable growth as well as investment in infrastructure development for trade to take place.

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