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Growth Trends and Instability in Export of Basmati Rice, Wheat, Fresh Fruits, Fresh Vegetables and Pulses from India

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ABSTRACT

In this paper an attempt has been made to examine the growth trends and instability in export of basmati Rice, wheat, pulses, fresh vegetables and fresh fruits by using time series data, which were compiled from official website of APEDA, for the period from 2012-13 to 2020-21. To estimate instability and variability in export of selected crops, the coefficient of variance and CDVI was used. The export of agricultural products has shown growth and instability in recent years. Further, it was found that the growth rate in export of agricultural products is highest among fresh fruit and lowest in wheat. As per the value of CDVI, the export of basmati rice is more stable than of fresh fruit, fresh vegetables, pulses, and wheat. Despite the overall growth in the export of these products, there have been periods of instability due to various factors such as changing global demand, weather conditions, and government policies.

Key words; Growth, instability, export, basmati rice, wheat, fresh fruits, fresh vegetables, pulses and India.

1. Introduction

At the global level,Indiais the second-largest producer of rice, wheat, and other cereals. But only limited quantitythese crops are allowed for export.In recent years the production of major cereals, has shown a significant increase. In 2020–21 the production of these cereals has reached over 100 million metric tonnes. The country's export of cereals has also increased, with rice accounting for the highest exported commodity. In the global cereal market, India is a major player, and its production and export levels have the potential to impact prices.

India's diverse climate conditions ensures the production of various fresh fruits and vegetables. Its ranking at global level is second in fruit and vegetable production after China. The vast production base offers India significant export opportunities, with fresh fruits and vegetables.It has a thriving agricultural industry, particularly in the production of fruits and vegetables. With a vast cultivation base and significant export opportunities, India is well-positioned to continue its success in this sector. For Indian fresh fruits and vegetables Bangladesh, UAE, Nepal, Netherlands, Malaysia, Sri Lanka, Oman, and Qatar are major destinations. Whereas in processed fruits and vegetables USA, China, UK, and Saudi Arabia are major destinations. Overall, the agriculture and horticulture sectors in India are experiencing growth and success in cereals, pulses, vegetables and fruits. With expanding markets and improved infrastructure, the future looks bright for Indian agriculture and horticulture producers. Keeping in view this background the study was carried out to examine and analyzed the growth trends and instability in exports of cereals, vegetables and fruits from India. The results of this study are beneficial to policy makers and economic planners to make and implement import and export related strategies in India.

2. Objectives

i. To analyze the growth rate and instability in export of basmati rice, wheat, pulses, fresh vegetables and fresh fruits from India.

ii. Give a set of suggestions accordance with results of the study.

3. Research Methodology

The study is based on the time series data on export quantity of basmati rice, wheat, and pulses, fresh vegetables and fresh fruits, which were compiled from the official website (http://apeda.gov.in) of the APEDA (Agricultural and Processed Food Products Export Development Authority), for the period from 2012-13 to 2021-22. The exponential growth function has been used to compute the compound growth rate in export of these selected crops;

$Y = AB^t$

Where Y = dependent variable, t = time

By taking logarithms of both sides of the equations it takes the form: Log Y = Log A + t Log B.

If we put Log A = a and Log B = b, then equation becomes

Log Y = a + bt, which is linear function with independent variable t and dependent variable Log Y. The compound growth rate calculated as (antilog b – 1) × 100 and represent uniform rate of change from year to year.

The instability in export of selected crops has been estimated by using Coefficient of Variation and Cuddy-Della Valle Index. Although Coefficient of Variation (CV) is the simplest measure of instability, it over-estimates the level of instability in time series data which are characterized by long-term trends. CV can be calculated as follows:

$$CV= \frac{\textbf{SandardDeviation}}{\textbf{Mean}}\textbf{X100}$$

Cuddy-Della Valle Index (%) with an objective to know that, upto what extent risk is occurred in the selected variables. TheCuddyDellaValleIndexde-trendsshowstheexactdirection of the instability. Therefore, it is a better measure tocapture instability in export of selected crops (basmati rice, wheat, pulses, fresh vegetables and fresh fruits). The Cuddy-Della Valle Index can be calculated as follows:

$$\text{Cuddy-Della ValleIndex} = \frac{\text{SandardDeviation}}{\text{Mean}} \text{X } 100 \text{ X}\sqrt{1 - R^2}$$

Where,

C.V. was the Coefficient of Variation in per cent, and R^2 wasthe coefficient of determination from a time trend regression adjusted for its degrees of freedom.

A low value ofthisindexindicateslowinstabilityinthe selected variables. Therangesof CDVIare givenasfollows;

- Lowinstability= 0 to 15 (%)
- Mediuminstability= 15 to30 (%)
- Highinstability=30 and above (%)

4. Results and Discussion

4.1 Growth trends and instability in the export of basmati rice from India

The growth trends and instability in the export of Basmati riceis given in Table 1. This table shows that during the year 2012–13, a quantity of 3459829.00 MT was exported, while during the year 2021–22, this quantity increased to 3947973.00 MT, registering a growth rate of 2.37 percent per annum. The values of the co-efficient variance and instability index (CDVI) have been worked out 9.04 percent and 6.06 percent, respectively. The value of the Instability Index (CDVI) came into the range of 0-15 percent, which confirms a low level of instability in the export of basmati rice from India to abroad. The export of basmati rice from India has been steadily increasing over the years. The growth rate in export of basmati rice is impressive and reflects the increasing demand for basmati rice in foreign markets. The co-efficient of variance and instability index (CDVI) values are relatively low, indicating great news for both Indian exporters and foreign buyers that there is a stable supply chain for basmati rice exports, which can lead to consistent quality and timely delivery. Overall, the calculated instability index (CDVI) value suggest that the export of basmati rice from India is a reliable and sustainable business opportunity for all stakeholders involved.

Table-1: growth trends and instability in the exports of basmati rice from

(MT)

Sr. No.	Particulars	Basmati Rice
1.	2012-13	3459829.00
2.	2013-14	3754102.00
3.	2014-15	3702284.00
4.	2015-16	4044833.00
5.	2016-17	3999722.00
6.	2017-18	4051896.00
7.	2018-19	4415085.00
8.	2019-20	4454713.00

9.	2020-21	4631531.00
10.	2021-22	3947973.00
11.	CGR	2.37
12.	Mean	4046196.80
13.	STD	365884.75
14.	CV	9.04
15.	CDVI	6.06

Source: APDEA

4.2 Growth trends and instability in the exports wheat from India

During the year 2012–13, a quantity of 6514815.00 MT of wheat was exported from India, while during the year 2021–22, it was 7234677.00 MT. The growth rate in the export of this crop has been estimated at (-) 12.34 percent per annum during the study period (2012-13 to 2021-22). The values of co-efficient of variance and instability index (CDVI) have been worked out at 109.92 percent and 113.94 percent, respectively. The value of instability index (CDVI) is greater than 35 percent, which confirms a high level of instability in the export of wheat from India to abroad. The high level of instability in the export of wheat from India to abroad is a cause for concern. Despite this, the total export of wheat during the year 2021-22 was a staggering 7234677.00 MT, which shows that there is still a high demand for Indian wheat in foreign markets. It is important for policymakers to address this issue and take measures to stabilize the export of wheat from India, ensuring that it remains a reliable source for foreign buyers. In conclusion, the export of wheat from India has been affected by various factors such as fluctuating production and instability in prices. However, the high demand for Indian wheat in foreign markets is evident from the significant export figures in the year 2021-22. It is crucial for policymakers to take appropriate measures to stabilize the export of wheat and ensure that India remains a reliable source for foreign buyers.

Table-2: Growth trends and instability in the exports of wheat from India

(MT)

Sr. No.	Particulars	Wheat
1.	2012-13	6514815.00
2.	2013-14	5572025.00
3.	2014-15	2914743.00
4.	2015-16	614096.00
5.	2016-17	262462.00
6.	2017-18	229989.00
7.	2018-19	183162.00
8.	2019-20	217010.00
9.	2020-21	2086372.00
10.	2021-22	7234677.00
11.	CGR	(-)12.34
12.	Mean	2582935.10
13.	STD	2839082.46
14.	CV	109.92
15.	CDVI	113.94

Source: APDEA

4.3 Growth trends and instability in the export of pulses from India

During the year 2012–13, a quantity of 202665.00 MT of pulses was exported, and this quantity increased to 388403 MT in the year 2021–22, registering a growth rate of 3.12 percent per annum. The values of co-efficient variance and instability index (CDVI) have been worked out at 29.97 percent and 30.00 percent, respectively; the value of instability index (CDVI) came between the ranges of 15–30 percent, which confirms a medium level of instability in the export of pulses from India to abroad. Despite the medium level of instability in the export of pulses from India to abroad, there has been a significant increase in the quantity of pulses exported over the past decade. However, it is important to note that the values of co-efficient variance and instability index (CDVI) are still relatively high, indicating that there is room for improvement in terms of stability and consistency in pulses export. It will be crucial for India to continue to focus on improving its agricultural practices and infrastructure to ensure a steady supply of high-quality pulses for export. Additionally, efforts should be made to diversify export markets and reduce reliance on any one particular market, which could help mitigate risks associated with instability in any given market. Overall, while there are challenges ahead, India's pulse export industry has shown promising growth over the past decade and has the potential to continue on this trajectory with strategic planning and investment.

Table-3: Growth trends and instability in the export of pulses from India

(MT)

Sr. No.	Particulars	Pulses
1.	2012-13	202665.00
2.	2013-14	345553.00
3.	2014-15	222104.00
4.	2015-16	255602.00
5.	2016-17	137177.00
6.	2017-18	179113.00
7.	2018-19	285783.00
8.	2019-20	229637.00
9.	2020-21	276863.00
10.	2021-22	388403.00
11.	CGR	3.12
12.	Mean	252290.00
13.	STD	75611.72
14.	CV	29.97
15.	CDVI	30.00

Source: APDEA

4.4 Growth trends and instability in the exports of fresh vegetablesfrom India

During the year 2012–13, a quantity of 2343881.00 MT of fresh vegetables was exported, and this quantity increased to 2384845.00 MT in the year 2021–22, registering a growth rate of 0.55 percent per annum. The values of co-efficient variance and instability index (CDVI) have been worked out at 21.78 percent and 23.05 percent, respectively; the value of instability index (CDVI) came in at 15–30 percent, which confirms a medium level of instability in the export of fresh vegetables from India to abroad. Despite the medium level of instability in the export of fresh vegetables from India to abroad, there has been a steady increase in the quantity of exports over the years. This growth is promising, it is important to note that the values of co-efficient variance and instability index (CDVI), indicating that there is still room for improvement in terms of stability and consistency in fresh vegetable exports from India.

Table-4: Growth trends and instability in the export of fresh vegetables from India

(MT)

Sr. No.	Particulars	Fresh Vegetables
1.	2012-13	2343881.00

2.	2013-14	2291751.00
3.	2014-15	2019342.00
4.	2015-16	1872020.00
5.	2016-17	3631973.00
6.	2017-18	2296075.00
7.	2018-19	2915109.00
8.	2019-20	1927788.00
9.	2020-21	2326538.00
10.	2021-22	2384845.00
11.	CGR	0.55
12.	Mean	2400932.20
13.	STD	522922.09
14.	CV	21.78
15.	CDVI	23.05

Source: APDEA

4.5 Growth trends and instability in the exports of fresh fruits from India

During the year 2012–13, a quantity of 534619.00 MT of fresh fruits was exported, and this quantity increased to 1164603.00 MT in the year 2021–22, registering a growth rate of 9.11 percent per annum. The values of co-efficient variance and instability index (CDVI) have been worked out at 29.91 percent and 13.38 percent, respectively; the value of instability index (CDVI) came into the range of 0–15 percent, which confirms a low level of instability in the export of fresh fruits from India to abroad. This growth in the export of fresh fruits from India is a positive development for the country's economy. The values of co-efficient variance and instability index (CDVI) are also encouraging. This stability provides assurance to both domestic and international markets, ensuring that Indian fresh fruits are a reliable commodity. This development could lead to increased demand for Indian fresh fruits in international markets, further boosting India's economy.

Table-5: Growth Trends and Instability in the exports of fresh fruits from India

(MT)

Sr. No.	Particulars	Fresh Vegetables
1.	2012-13	534619.00
2.	2013-14	525205.00
3.	2014-15	484373.00
4.	2015-16	573203.00
5.	2016-17	798723.00
6.	2017-18	657175.00
7.	2018-19	736946.00
8.	2019-20	819177.00
9.	2020-21	956961.00
10.	2021-22	1164603.00
11.	CGR	9.11
12.	Mean	725098.50
13.	STD	216848.79

14.	CV	29.91
15.	CDVI	13.38

Source: APDEA

5. Conclusions & Suggestions

From the above results and discussion, it was found that the growth rate in export of agricultural products during the study period was highest among fresh fruit and lowest in wheat. As per the value of CDVI, the export of basmati rice is more stable than of fresh fruit, fresh vegetables, pulses, and wheat. These results indicate that export of basmati rice is less volatile and more consistent over the time compared to the other agricultural products. Further, the high growth rate in export of fresh fruit revealed that there may be potential for further expansion and profitability in this sector. These findings suggest that government agencies and agricultural stakeholders should focus on promoting and supporting export of basmati rice to maintain market stability. Additionally, efforts should be made to further develop and capitalize on the growth potential of fresh fruit export. By understanding the dynamics of different agricultural products, policymakers should implement targeted strategies to enhance overall export performance and profitability in the agriculture industry.

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