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Growth and Instability of Groundnut Exports from India

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***Abstract*: The present study analyzed the growth and instability index of groundnuts. The study depends on secondary data, which was collected from the Agricultural and Processed Food Export Development Authority for the time period year 2006-07-2020-2021. The compound annual growth rate analysis and Cuddy Della Valle Instability Index were employed for the analysis of growth the rate and instability index of groundnut exported from India. The result reveals that growth in the rate of quantity and value of export of groundnut, Indonesia, Ukraine and the Philippines recorded medium instability in terms of quantity and value.**

***Keywords*: Compound annual growth rate, Cuddy Della, Groundnut, Instability index, Oil seed.**

1. Methodology

The research was based on secondary data obtained from the APEDA database.

Methodology: Time series data on the export of groundnut (2006-07 to 2020-21). The export of groundnuts from India was studied using the compound annual growth rate and instability index. (Cuddy Della)

2. Exponential Growth Model

Compound growth rates were estimated by using log-linear functions on the yearly time series data of the quantity, value and unit value of the exports of the selected oil seeds. The trend was fitted for the respective entire study period of each selected commodity.

For computing, the compound growth rate, the following form of exponential function was used

The CAGR was calculated by fitting the exponential function given below:

$$Y = ab^t u_t \quad (1)$$

Where,

Y = Area, production, yield and price of commodity consider in year t

a = intercept

u_t = Error term

b = Regression coefficient

t = Time variable

The equation obtained after transforming (1) is:

$$\log y = \log a + t \log b + \log u_t$$

The Percent CAGR was calculated as:

$$CAGR = [(\text{antilog of } b) - 1] \times 100$$

The significant CAGRs will be classified into two groups *i.e.* negative and positive CAGR. The significance of the growth rate was analyzed by conducting a student's t-test at 1 per cent and 5 per cent levels of significance.

3. Instability Index

The instability index was analyzed by using the Cuddy Della Valle Index method developed by John Cuddy and Della Valle for measuring the instability in time series data (Cuddy and Della Valle, 1978). This index is inherently adjusted for trend, so is considered a better measure than the Coefficient of Variation. As CV overestimates the level of instability in time-series data, which is characterized by long-term trends. Cuddy-Della Valle index corrects the coefficient of variation.

$$\text{Instability index} = \frac{Standard\ Deviation}{Mean} \times \sqrt{1 - \bar{R}^2}$$

Where,

C- D II = Instability Index

CV = Coefficient of variation

$\bar{R}^2$ = Coefficient of determination from a time-trend regression adjusted for its degree of freedom.

When the test statistic is significant, then the Cuddy- Della index is calculated by using the adjusted ^{R2} value. When a test statistic is not significant or the adjusted ^{R2} is less than zero, the unmodified CV is chosen (Adhikari & Sekhon, 2014). The high degree of instability index shows that there were huge fluctuations in the time series data during the study period. The high growth and low instability are prerequisites for sustainable agricultural performance. Since the magnitude of growth and instability in crops, production has serious implications for policymakers.

The range of the instability index was explained as follows

Low Instability = between 0 to 15 Percent

Medium instability = greater than 15 and lower than 30 Percent

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Table 1
Growth and instability of groundnut exports from India (2006-07 to 2020-21)

Country	CAGR (%)		Instability (%)	
	Export quantity	Export value	Export quantity	Export value
Vietnam	53.71 **	60.61 **	70.63	68.35
Russia	28.89 **	32.51 **	49.68	49.64
Nepal	18.91 **	28.71 **	70.04	58.56
Thailand	15.69 **	22.41 **	51.43	52.90
Ukraine	5.28 *	11.15 **	25.87	28.59
Indonesia	3.44 **	9.91 **	15.21	20.12
UAE	2.68 NS	8.59 **	28.08	30.97
Philippines	1.18 NS	7.55 **	18.92	24.42
China	17.20 NS	13.51 NS	114.17	121.02
Malaysia	-1.67 NS	4.91 NS	33.56	41.66
** significant at 1% level * significant at 5 % level				

High instability = greater than 30 Percent

4. Results and Discussion

Growth and instability of the groundnut export from India were given in table 1. Vietnam, Russia, Nepal, Thailand and Indonesia recorded significant growth at a 1% level in terms of export quantity and export value of groundnuts. Ukraine recorded significance in growth at a 5 % level of significance in terms of quantity, and significance in growth at a 1% level in terms of value. UAE recorded significant growth at a 1% level in terms of export value with 8.59 per cent. The Philippines recorded significant in growth at a 1 % level with a value of 7.55 per cent in terms of export value. Malaysia registered negative growth in terms of the quantity of groundnut export.

Vietnam recorded the highest 53.71 per cent growth rate in terms of quantity and 60.61 per cent in terms of value followed by Russia, Nepal, and Thailand with values in growth rates of 28.89 per cent, 18.91 per cent, 15.69 in terms of export quantity and 32.51 per cent, 28.71 per cent and 22.41 per cent in terms of value. Ukraine and Indonesia recorded growth rates of 5.28 per cent and 11.15 per cent in terms of quantity and value of exports, and Indonesia recorded 3.44 per cent growth in terms of quantity and 9.91 per cent in terms of value, respectively.

With regard to Cuddy Della instability values, Indonesia, Ukraine and the Philippines recorded medium instability in terms of quantity and value. Vietnam, Russia, Nepal and Thailand recorded high instability values in terms of quantity and value. UAE recorded medium instability in terms of quantity and high instability in terms of value. China and Malaysia recorded high instability in terms of quantity and value of groundnut, respectively.

5. Conclusion

This paper presented an overview on growth and instability of groundnut exports from India

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