AN EXPORT PERFORMANCE OF WHEAT IN INDIA

ABSTRACT:

Wheat is a plantwhich is valued highly for its kernel as an edible part and an important source of carbohydrate's.India holds second position in wheat production in the world with a contribution of roughly 13.53 percent to global wheat output (Naga Latha *et. al.,* 2022). The study analyses the export performance of wheat and examines the trends in growth performance of wheat in terms of area, production and productivity,export quantity and export value during 1973-2022 which is a period of 50 years. The analysis reveals that the highest compound growth rate in terms of area was 1.16 per cent, production was 4.49 per cent and productivity was 3.29 per cent respectively. The results of the study on the compound growth rates during the study periods have shown positive and increasing value which indicateshigh potential for the export of wheat from India. In the analysis of instability there existshighpositivecorrelationbetweentheexport quantity and value of export in overall period and high variability in Area,production, productivity of wheat. As of trend analysis there is a positive and significant increase. The NPC value of wheat at overall period was0.051, it indicates that the commodity is not protected. NPC<1 indicates that the commodity is exportable and possesses export competitiveness and hencehypothesis i.e. Indian wheat has better competitiveness in International market.

Key Words: Production, Productivity, Export Quantity, Growth rate and Export competitiveness.

INTRODUCTION:

Wheat (*Triticum aestivum*) is the most extensively grown cereal crop in the world. Since wheat is rich in protein, carbohydrates and vitamins, it is becoming staple food for millions of people across the world.

The productivity of wheat has increased multitudes from 663 kg/hectare in 1947 to 3501 kg/hectare in 2024 (FAOSTAT, 2024).The northern states of Uttar Pradesh, Punjab, and Haryana are the main wheat producers of India. About 112.92 million metric tons of wheat was produced in 2023-2024 across the country(FAOSTAT, 2024).

Wheat is commonly cultivated in the northern part of India as shown in the map including the states of Uttar Pradesh, Madhya Pradesh, Punjab, Haryana and

Rajasthan etc. In 1978, for the first time in the post-independence period, India emerged as a net exporter of wheat (Chand, 2001). India was one of the major exporters of wheat until May 2022, when the government decided to ban wheat export from the country. The decision was made due to damage to wheat crops by severe heatwaves and the ongoing Russia and Ukraine conflict, which in turn led to inflation in wheat prices in the market.

The Objectives of the study includes

- To estimate the growth in production and export of Wheat.
- To workout the instability in production and export of Wheat.
- To study the trend in domestic and international prices of Wheat.
- To study the export competitiveness of Wheat.

MATERIAL AND METHODS

Period of study

The data regarding area, production and productivity of Wheat in India were collected. The data werecollected for last 50 years (1973 to 2022) and the data regarding export quantity and export value were collected for past 36 years (1987-2022). The period has been divided into sub periods.

Period I:1973 to 1997

Period II:1998-2022

Overall Period: 1973-2022

Nature and source of data

The data of the study was entirely based on secondary source of data. The secondarydata was collected from various Government websites and publications such as Food and Agriculture Organization (FAO), Agricultural and Processed Food Products Export and Development Authority (APEDA), Agmarknet and Agristat were used for obtaining relevant data for thestudy.

Analytical tools and techniques

The study examined by ShendeN. V*et.al*.(1998)and the estimation was carried out accordingly.The data was collected from secondary source subjected to appropriate analyticaltechniques in order to obtain a meaningful conclusion. The

different analytical techniques used for the study were - growth rate analysis, instability analysis, trend analysis and export competitiveness.

Estimation of growth rates

To estimate the growth rate of area, production, productivity, export quantity and export valueof wheat inIndia. The compound growth rate (CGR) was computed by using exponential growth function as given below.

$$Y = a.bt$$

Where,

Y = Area /Production/ Productivity/Export quantity/Export value

a = Intercept value (value of Y when t = 0)

b = Regression co-efficient

t = Time variable (which takes value 1,2,3…. n).

Significance of the regression co-efficient was tested using the't' test.

Degree of instability analysis

The degree of instability in area, production, productivity, export quantity and export value of wheat was measured by using co-efficient of variation (CV).

Co-efficient of variation (CV) :

$$CV(\%) = \frac{\sigma}{x} x100$$

Where,

CV = Co-efficient of variation

σ= Standard deviation

X = Arithmetic mean of variable

Trend analysis

The present study analyzes trend in area, production, productivity, export quantity and export value of Wheat was computed for the time series data. To trace the path of process index number method was used.

Nominal protection co-efficient:

The export competitiveness of wheat in India was measured by nominal protection co-efficient (NPC) for the past 36 years.The nominal protection co-efficient (NPC) is definedas the ratio of the domestic price to the world reference

price of the commodity under consideration. The NPC determines the competitiveness advantage enjoyed by wheat in context of free trade. NPC was estimated by using following formula.

$$\mathbf{NPC = P_d / P_r}$$

Where,

NPC = Nominal protection co-efficient

P_d = Domestic wholesale prices of wheat

P_r= World reference price of wheat

RESULTS AND DISCUSSION

Growth Rate Performance of Wheat

Based on the objectives of the study, the data collected were analyzed using appropriate analytical tools and techniques.The study examined the growth rates of area,production, productivity,export quantity and export value of wheat. The exponential functional form was used to compute thecompound growth rate of area, production, productivity and export of wheat during 1973 to 2022.The total study period (1973-2022) was divided into three parts period I (1973-1997), period II (1998-2022) and overall period (1973-2022). The results obtained from this study have been presented and discussed critically.

Table1:Compound Growth Rate of Area, Production andProductivityof Wheat in India (1973-2022)

Indicators (CGR %)	Period		
	Period I	Period II	Overall Period
Area	1.16^{NS}	0.80 ^{NS}	0.91 ^{NS}
Production	4.49*	2.10**	2.90*
Productivity	3.29*	1.36	1.96*

Note: * - denotes significant at 5% level

** - denotes significant at 1% level

Table.1shows that the growth rate of area in period I was 1.16 per cent perannum and is non- significant at one per cent level,growth rate of production and productivity in period I were found to be 4.49 and 3.29 respectively and both were significant over 5 per cent level.The growth rate of production in period II and overall period was significant at 2.10 per cent per annum and 2.90 per cent per

annum.Thegrowth rate of productivity in period II was1.36 per cent per annum and it was non-significant.

The highest compound growth rate in terms of area was 1.16 per cent, production was 4.49 per cent and productivity was 3.29 per cent respectively.The production and productivity of wheat has shown positive and significant growth trend for period II. In period I, the production, productivity of wheat has shown positive and significant growth trend but area has showed positive and non-significant growth trend. The overall period of wheat showed positive and significant growth trend for production and productivity.

Table2:Compound Growth Rate ofExport Quantity andExport Value of Wheat in India (1987-2022)

Indicators (CGR %)	**Period**		
	Period I	**Period II**	**Overall Period**
Export Quantity	31.20**	80.89**	12.06**
Export Value	41.59**	89.05**	20.30**

The compound growth rate of wheat was observed highest of export quantity and export value was 80.87 per cent and 89.05 per cent respectively in period II. The compound growth rate of export quantity and export value of wheat was found to be positive and increasing in period I, period II and overall period.The results of the study on the compound growth rates during the study periods have shown positive and increasing value which indicateshigh potential for the export of wheat from India.Hence, the hypothesis reveals that there is significant stable growth in area, production and productivity of wheat in India

Instability in Wheat

In order to study the instability in area, production, productivity, export quantity and export valueof wheat exports during the study period, co-efficient of variation wasworked out, the total period (1973 to 2022) was split into threeperiods*viz*;periodI(1973-1997),periodII(1998-2022) and over all period (1973-1997 to 1998-2022) and export quantity and export value was worked out, the total period(1987-2022) split into three periods viz,period I (1987-2005), period II (2006-2022) and overall period(1987-2022). The results are presentedin tablebelow.

Table3. Instability Analysis for Area, Production and Productivity of Wheat in India (1973-2022)

Period	Area	Production	Productivity
Period I(1973-1997)	9.15	31.02	23.5
Period II(1998-2022)	6.68	16.87	11.19
Overall Period(1973-2022)	12.08	38.63	27.34

Table.3 reveals that Area of wheat exported exhibitedhigh variability with co-efficient of variation at 9.15 per cent and 6.67 percentinperiodIandperiodII,whileitwasthehighestinoverallperiodwithco-efficientofvariationat12.08percent.

The production of wheat exported exhibitedhigh variability with co-efficient of variation at 31.02 per cent and 16.87percentinperiodIandperiodII,whileitwasthehighestinoverallperiodwithco-efficientofvariationat38.63percent.

The productivity of wheat exported exhibitedhigh variability with co-efficient of variation at 23.5 per cent and 11.19percentinperiodIandperiodII,whileitwasthehighestinoverallperiodwithco-efficientofvariationat27.34percent.

Table 4. Instability analysis for Export Quantity and Export valueof Wheat in India (1987-2022)

Period	Export Quantity	Export value
Period I (1987-2005)	132.26	136.18
Period II(2006-2022)	137.28	143.19
Overall Period(1987-2022)	143.29	190.03

As regard the export quantity of wheat exists high positive correlation wasobservedinperiodIandperiodIIwithco-efficientofvariationat132.26percent and 137.28 but in overall period co-efficient of variation was 143.29 percent.

Export earnings in terms of value showed higher instability inoverallperiodwith190.03percentofco-efficientofvariationwhencomparedto the period I (136.18per cent) but for period II co-efficient of variationwas143.19percent.

Table.4 indicates that there existshighpositivecorrelationbetweentheexport quantity and value of export in overall period and high variability in area,production, productivity of wheat. It happened due to increase in price per unit of export quantity

of wheat. Though thismaybegoodforashortdurationfromtheeconomicpointofview,butin thelongrunitislikelytohaveadverseeffectonthewheatexportsasothercountries will be able to sell better quality wheat at a lesserprice.

Trend Analysis of Wheat: Index Number

Table 5. Index Number for area, production and productivity of Wheat in India (1973-2022)

Period I (1973 – 1997)	**Area**	**Production**	**Productivity**
Highest Index Number	104.16(1973)	105.07(1973)	102.91(1986)
Lowest Index Number	90.98(1975)	87.42(1974)	89.67(1974)
Period II (1998 – 2022)			
Highest Index Number	103.64(2000)	104.68(2014)	105.68(2014)
Lowest Index Number	95.81 (2019)	92.32(2010)	91.82(2015)

Table 6. Index Number for export quantity and export valueof Wheat in India (1987-2022)

Period I (1987– 2005)	**Export Quantity**	**Export value**
Highest Index Number	299.53(1996)	299.41(1996)
Lowest Index Number	0.0002(1999)	0.0004(1999)
Period II (2006 – 2022)		
Highest Index Number	291.51(2006)	286.26(2006)
Lowest Index Number	0.016(2010)	0.01(2009)

The index numbers were estimated for area, production, productivity, export quantity and export value of wheat in India. The basic object for estimating index numbers was to make the trends of wheat. For this analysis the data pertaining to the years 1973 to 2022 i.e. past 50years were used.The index numbers were worked out for the area, production, productivity, export quantity and export value of wheat in India. It is seen from data, the index numbers of the area, production, productivity, export quantity and export value of Wheat in India have shown the gradual increase in almost all the periods. According to the table the data compared the area (104.16) Was high in 1973 in period I and in that the lowest index number value was found in 1975 (90.98), the area (103.64) was high in 2000 in period II and in that the lowest index number value was found in 2019(95.81). The production (105.07) was high in

1973 and it was found that it is lowest in the year 1974 (87.42) in period I and in period II it is found that it is high in 2014(104.68) and lowest in the year 2010(92.32). The value of productivity in period I is high in 1986(102.91) and it is lowest in the year 1974(89.67) and in period II the value is high in 2014(105.68) and it is lowest in the year 2015 (91.82). The export quantity is found higher in the year 1996(299.53) and it is found lowest in the year 1999(0.0002) in period I and in period II it is highest in the year 2006(291.51) and found lowest in 2010 (0.016). The export value in period I is found to be highest in the year 1996(299.41) and found lowest in the year 1999(0.0004) and in period II the value is highest in the year 2006(286.26) and lowest in the year 2009(0.01).

Export Competitiveness of Wheat

The export competitiveness of tea was analyzed using Nominal protection co-efficient.

Table 7. Nominal Protection Co-efficient for Export Competitiveness

Period	Year	Domestic Prices (P_d) (Rs/Kg)	International Prices (P_r)(Rs/Kg)	NPC (Pd / Pr)
Period I	1987-2005	5.5	111.25	0.049
Period II	2006-2022	17.83	362.5	0.0510
Overall Period	1987-2022	11.66	236.87	0.0509

Table.7 shows that, at an overall period level, the NPC values of wheat was 0.050, it indicates that the commodity is not protected. NPC<1 indicates that the commodity is exportable and possesses export competitiveness. It was observed that, during the period I and period II average NPC values was 0.049and 0.051, respectively which indicates same like as overall period. From the above Table period II (0.051) having high export competitiveness compared to the period I and over all period. Because NPC decreasing means there was an increase in International price in the world market compared to the domestic market. Hence, the hypothesis i.e. Indian wheat has better competitiveness in International market.

Conclusions:

There existshighpositivecorrelationbetweentheexport quantity and value of export in overall period and high variability in area,production, productivity of wheat. It happened due to increase in price per unit of export quantity of wheat. Though thismaybegoodforashortdurationfromtheeconomicpointofview,butin thelongrunitislikelytohaveadverseeffectonthewheatexportsasothercountries will be able to sell better quality wheat at a lesserprice.Wheat showed positive and significant growth trend for production and productivity.Indian wheat has better competitiveness in International market.

Policy Implications:

Implement a Minimum Support Price (MSP) to safeguard farmers' interests.Invest in storage, transportation, and market facilities to reduce losses and increase efficiency.Conduct price forecasting and transmission analysis to inform farmers' decisions.Enforce stringent quality standards to boost export competitiveness.

Promote certification programs for exporters to enhance credibility. Streamline procurement processes and develop efficient transportation networksEncourage crop diversification to reduce dependence on wheat

Focus on domestic market needs while exploring export opportunities. Implement policies to address stagnation in area growth and promote sustainable wheat production.

By addressing these areas, policymakers can capitalize on India's successes in wheat export, production, and productivity, ensuring a resilient wheat sector [1]. Effective government policies and programs can facilitate changes in agricultural production, as seen in various countries [1].

REFERENCE

Aditya BS, KK Singh, Supriya, Sachin KV, Harshit M and Riyaz A(2023). Production and Export DyanmicsOf Wheat In India. *InternationalJournel of Statistics And Applied Mathematics* ,8(3):206-209.

Agam PA, Perke DS, Chavan RV andBaviskarPP (2022).Wheat Production in India: An OVertime Study on Growth and Instability. *Pharma Innovation Journal.* 1(12):3630-3634.

Khemraj, NK Chaure, G Chandrakar, Tegar A, Singh KP, R Shukla, P Haldar, NK Thakur, Vedprakash andRKesharwani (2022). Trend and Growth Instability Analysis of Wheat Crop in Central India. *International Journal of Environment and Climate Change.*12(11):2607-2616.

K Nagalatha, D Ramesh, P Swarnalatha and Yamini T (2022). Export Performance of Wheat from India: A markov Chain Analaysis. *International Journal for Research Trends and Innovation*. 7 (12): 364-366.

Shende, N.V., Deoghare, B.L. and Shende, T. K. (1998). Rice exports: Present status and future prospects. Indian Journal of Agricultural Marketing, 12(1&2): 3-5.

Syed B , Nirmal K , Dalip K , Vinay K and Ritu(2022). Trends in Area, Production and Productivity of Wheat Cultivation at Global Level.*Economic Affairs,*67(4): 401-406.

Sonu M and Rajni S(2018). Trade Competiveness of India in Wheat during Post-Reform Period. *Asian Review Of Social Science,*7(1):25-32.

Udhayan N, A D Naik, B K Naik, N M Kerur and SS Dolli(2023). Export of Wheat from India:Destinations And Competitiveness, *Pharma Innovation Journal,*12(7):2754 -2758.