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Research Article

PRODUCTION AND EXPORT PERFORMANCE OF INDIAN GROUNDNUT

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Abstract- The present study aimed to examine the growth and instability in area, production, productivity and export of groundnut from India as well as export competitiveness of different importing countries for groundnut. It is based on secondary data, which confined for the period 2004-05 to 2013-14. The results of the study revealed that the negative growth rate in area under groundnut was found at national level while production and productivity registered non significant positive growth rate whereas export registered a positive and significant growth rate. The instability in export as well as in area, production and productivity at country level were low. The Nominal Protection Coefficient (NPCs) indicated that groundnut was found to be moderately competitive during the whole study period to all importing countries except Pakistan to which it was less competitive. Indonesia, Malaysia, Philippines, Pakistan, Thailand and Ukraine served as the major importers of groundnut from India.

Keywords- Groundnut, growth, instability, export competitiveness, nominal protection coefficient

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Introduction

Groundnut is the major oilseed crop of India. India occupies the top most position in the world with regard to acreage and production of groundnut[1]. Groundnut production in India for the year 2013-14 was 97.14 lakh tonnes [2]. Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu states accounted for about 90 per cent of groundnut producing area[1]. Gujarat is the largest groundnut producing state in the country with production of 49.18 lakh tonnes in 2013-14[2]. India exports groundnut to more than 75 countries including Indonesia, Malaysia, UAE, Gulf, Srilanka, Philippines, Canada, UK and EU countries. Among these countries, Indonesia, UK and Singapore are the major buyers for Indian groundnut [3]. India's groundnut exports during the 2013-14 was around 5.10 lakh tones [4]. India today faces stiff competition from China who offers their produce in international market at very competitive price. Groundnut kernels of Hand Picked Selection (HPS) varieties are exported in bulk quantities for table purposes. Keeping in view these facts, an effort has been made to study the growth and instability in area, production, productivity and export of groundnut from India and to estimate the export competitiveness of different importing countries for Indian groundnut.

Materials and Methods

The present study is based on secondary data. The growth and instability analysis was done at national level and at state level by selecting the foremost two states in case of production of groundnut in India. The required data for the present study were collected for the period 2004-05 to 2013-14 from various official secondary sources.

Growth rate analysis

In the present study, compound growth rates in area, production, productivity and export quantities of groundnut in India as a whole as well as two major growing states of groundnut i.e. Gujarat and Andhra Pradesh were estimated by using the following exponential growth function of the form:

$$Y = ab^t U_t$$

Where,
Y = Area, production, productivity and export quantities of groundnut
a = intercept
b = regression coefficient
t = time variable
U_t = error term

The equation was estimated after transforming the above equation as follow

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

Then, the per cent compound growth rate (g) was calculated by using the relationship

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

Instability analysis

Estimation of instability in area, production, productivity and export of groundnut was done by using the following formula of Cuddy and Della (1978).

$$\textbf{Instability index} = CV\sqrt{(1-R^2)}$$

Where,
C.V. = Coefficient of variation
R^2 = Coefficient of multiple determination

Coefficient of variation was calculated by using following formula:

$$C.V.= \frac{SD}{AM} \times 100$$

Where,
C.V.= Coefficient of variation
SD = Standard deviation
AM = Arithmetic mean

Nominal protection coefficient

The Nominal Protection Coefficient was estimated as the ratio of the domestic price to the world reference price of the commodity under consideration.

$$NPC = Pd/Pr$$

Where,
NPC = Nominal Protection Coefficient
Pd = Domestic price of the commodity
Pr = World reference price of the commodity

NPC basically helps in measuring the divergence of domestic price from the international price and thus determines the degree of export competitiveness of the commodity. If the nominal protection coefficient is less than unity the commodity under consideration is export competitive and if it is greater than one, then the commodity is protected or non export competitive. In order to identify the most favorable countries for export of major oilseeds, NPC values were computed for different importing countries and were classified into four categories as given below:

- Highly competitive (NPC<0.5)
- Moderately competitive (0.5<NPC<0.75)
- Less competitive (0.75<NPC<1.00)
- Non competitive (NPC>1)

Results and Discussion

Growth in area, production, productivity and exports of groundnut

The compound growth rates (used as growth rates hereafter) of area, production, productivity and exports of groundnut for the period from 2004-05 to 2013-14 were computed. The results for the country as a whole as well as two major growing states of groundnut i.e. Gujarat and Andhra Pradesh presented in [Table-1].

It is evident from [Table-1] that during the study period, the area under groundnut in the country showed negative but significant growth rate of (-) 2.90 per cent per annum. The area under groundnut fluctuated over the years but decrease in area was more pronounced than increase in area. The maximum area under groundnut was 6740 thousand hectares in 2005-06 and it was minimum (4721 thousand ha) during 2012-13. Among the states cultivating groundnut, Gujarat showed the negative compound growth rate of (-) 2.46 per cent per annum in area. The area under groundnut decreased during the study period except in the year 2008-09, 2010-11 and 2013-14 (when the area under groundnut increased). The maximum area under groundnut in Gujarat was 1989 thousand hectares in 2004-05 and it was minimum (1285 thousand ha) during 2012-13. The negative growth rate at national level as well as in the state Gujarat may be due to the fact that farmers have started cultivating other cash crops like cotton, sugarcane etc. in place of groundnut since they provide more return. Similar, results were found by Madhusudhana (2013).

Andhra Pradesh also showed a negative but significant growth rate of (-) 3.39 per cent per annum. The maximum area under groundnut was 1876 thousand hectares in 2005-06 and it was minimum (1263 thousand hectare) during 2011-12. The fluctuation in area over the years was observed. The reason for declining trend of groundnut area was mainly change of cropping pattern in irrigated as well as un irrigated areas and uneven rainfall inall over the state as reported by Madhusudhana (2013).

[Table-1] reveals that groundnut production has shown a positive annual growth of 0.44 per cent at national level. The groundnut production increased from the year 2004-05 to 2005-06 and thereafter, it declined in the year 2006-07. The year 2007-08 witnessed a drastic increase in production. From the year 2007-08 the groundnut production decreases upto the year 2012-13 except 2010-11. The groundnut production increased in the year 2013-14. The groundnut production was maximum (9714 thousand tonnes) in the year 2013-14 and it was minimum during 2012-13 (4694 thousand tonnes). Looking to the data it is apparent that the increase in groundnut production is due to increase in the productivity than the increase in area. The cardinal factors driving this increase in production were the use of high yielding and biotic and abiotic stress tolerant varieties as well as improved packages of practices. Similar results were found by Lokapur *et. at.* (2014). Gujarat showed negative but significant growth rate of (-) 0.18 per cent per annum towards groundnut production as depicted in [Table-1]. The groundnut production increased from 2004-05 to 2005-06 and it decreased in the year 2006-07and again increased in year 2007-08. From 2007-08 to 2012-13, the groundnut production decreased except 2010-11 and thereafter it increased in 2013-14. The groundnut production was maximum in the year 2013-14 (4918 thousand tonnes) and it was minimum during 2012-13 (758 thousand tonnes). The trend in production was in line with the trend in area under groundnut in Gujarat during 2004-05 to 2013-14 showing the more area effect rather than productivity effect on production. Andhra Pradesh also showed negative growth rate of (-) 4.08 per cent per annum in groundnut production. The groundnut production decreased during the study period except in the year 2007-08 and 2013-14 (when the groundnut production increased). It was maximum in the year 2007-08 (2604 thousand tonnes) and minimum in 2006-07 (743 thousand tonnes).

The productivity of groundnut has shown a positive growth rate of 3.43 per cent per annum at national level. The fluctuation in productivity at national level was observed less compared to the state level. The groundnut productivity was maximum in the year 2013-14 (1765 kg/ha) and it was minimum during 2006-07 (865 kg/ha). Gujarat recorded a positive growth rate of 2.34 per cent per annum. The groundnut productivity was maximum in the year 2013-14 (2673 kg/ha) and it was minimum during 2012-13 (590 kg/ha). A negative growth in productivity was observed in case of Andhra Pradesh (-0.72%). The groundnut productivity was maximum in the year 2007-08 (1451 kg/ha) and it was minimum during 2006-07 (557 kg/ ha).

Table-1 *Area, production and productivity of groundnut in India (2004-05 to 2013-14)*

Year	India			Gujarat			Andhra Pradesh		
	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg/ha)	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg/ha)	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg/ha)
2004-05	6640	6770	1020	1989	1887	949	1841	1640	891
2005-06	6740	7990	1185	1958	3389	1731	1876	1366	728
2006-07	5620	4860	865	1868	1850	990	1334	743	557
2007-08	6300	9200	1460	1857	3299	1777	1795	2604	1451
2008-09	6200	7200	1161	1907	2661	1395	1766	1554	880
2009-10	5478	5429	991	1823	1757	964	1300	1006	774
2010-11	5856	8265	1411	1922	3366	1751	1619	1030	636
2011-12	5264	6964	1323	1686	2717	1612	1263	950	752
2012-13	4721	4694	994	1285	758	590	1357	978	721
2013-14	5505	9714	1765	1840	4918	2673	1390	1236	889
CGR (%)	-2.90*	0.44	3.43	-2.46	-0.18**	2.34	-3.39**	-4.08	-0.72
t value	3.84	0.15	1.47	2.10	2.95	0.45	2.47	1.09	0.24

*Significant at 1 per cent level and**Significant at 5 per cent level
Source: Central Statistical Organization (CSO), compiled by India States

Groundnut is very important agricultural commodity of India. It is evident from the [Table-2] that groundnut export has showed very high positive and significant growth rate of 15.89 per cent per annum in terms of quantity. This may be due to lower price in domestic market and good demand for the Indian product in overseas market mainly pushed exports from the country. The export quantity of groundnut has fluctuated between 177 thousand tonnes to about 833 thousand tonnes in the study period. The highest quantity of groundnut was exported during the year 2011-12(833 thousand tonnes) and lowest during the year 2004-05 (177 thousand tonnes). The export quantity of groundnut showed a lot of variations during the period under consideration. Export quantity of groundnut from India had increased till 2011-12 and thereafter during 2012-13 and 2013-14, fall in exported quantity was observed and exported quantity became 510 thousand tonnes in the year 2013-14.

Table-2 *Quantity of groundnut exported from India (2004-05 to 2013-14)*

S. No.	Year	Quantity Exported ('000 tonnes)
1	2004-05	177
2	2005-06	190
3	2006-07	251
4	2007-08	270
5	2008-09	298
6	2009-10	340
7	2010-11	434
8	2011-12	833
9	2012-13	536
10	2013-14	510
	CGR (%)	15.89*
	t value	5.82

*Significant at 1 per cent level Source : APEDA

From the [Table-1 and 2], it can be said that highest export of groundnut (833 thousand tonnes) has been seen in the year 2011-12 was result of one year lagged production effect as higher production (8265 thousand tonnes) was observed in the year 2010-11 instead of the year 2011-12(6964 thousand tonnes).

Instability in Area, Production, Productivity and Export of Groundnut

The instability in area, production, productivity and export of groundnut from India during the period 2004-05 to 2013-14 was computed and presented in [Table-3a] and [Table-3b].

[Table-3a] reveals that quantity of groundnut exported had shown instability of 21.58 per cent which indicate that during the study period export of groundnut was stable. This may be due to demand for Indian groundnut got better in international market in recent times. Moreover, groundnut price was also competitive since domestic market was not so high. At all India level, area under groundnut showed instability of 6.56 per cent. Groundnut production and productivity had showed instability of 24.39 and 19.99 per cent respectively. The area, production and productivity were found to be stable at national level indicated by low instability index. Instability of 9.05, 42.96 and 41.04 per cent in area, production and productivity of groundnut was noticed in case of Gujarat as depicted in [Table-3b]. Area was found to be stable indicated by low value of instability index while production and productivity were found to be unstable indicated by high instability index. In case of Andhra Pradesh, area, production and productivity had showed instability of 12.18, 38.33 and 29.44 per cent, respectively [Table-3b]. Area and productivity were found to be stable indicated by low instability index whereas production was found to be unstable.

Table-3a *Instability analysis of area, production, productivity and exported quantity of groundnut at country level (2004-05 to 2013-14)*

India				
Particulars	**Area ('000 ha)**	**Production ('000 tonnes)**	**Productivity (kg/ha)**	**Quantity Exported ('000 tonnes)**
C.V. (%)	10.94	24.42	22.50	52.35
Instability index	6.56	24.39	19.99	21.58
R^2	0.64	0.002	0.21	0.83
S.E.	0.75	2.98	2.33	2.72

C.V.- Coefficient of variation, R^2- Coefficient of multiple determination, S.E.- Standard error

Table-3b *Instability analysis of area, production, productivity of groundnut in two prominent states (2004-05 to 2013-14)*

Particulars	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg/ha)
Gujarat			
C.V. (%)	11.23	43.81	41.57
Instability index	9.05	42.96	41.04
R^2	0.35	0.038	0.025
S.E.	1.16	133.44	5.15
Andhra Pradesh			
C.V. (%)	16.00	40.87	29.55
Instability index	12.18	38.33	29.44
R^2	0.42	0.12	0.007
S.E.	1.36	3.75	2.96

C.V.- Coefficient of variation, R^2- Coefficient of multiple determination, S.E.- Standard error

Competitiveness of Different Importing Countries

The competitiveness of different importing countries for groundnut was estimated by computation of Nominal Protection Coefficient (NPC) values for different importing countries for the period 2009-10 to 2013-14. For the purpose of calculating NPC, the information regarding transportation and packaging charges was collected from exporter of Gujarat and domestic prices were taken from AGMARKNET and various price policy reports of Commission for Agricultural Costs & Prices. The export competitiveness of groundnut was worked out for different importing countries and presented in [Table-4]. The export of groundnut was found to be moderately competitive to Indonesia, Malaysia, Philippines, UAE, Thailand, Ukraine, Singapore, UK and China while Pakistan was the only country to which export of groundnut was found to be less competitive during the year 2009-10. In the year 2010-11, Indonesia, Malaysia, Philippines, China, Ukraine, Thailand, UAE and UK retained its moderate competitiveness while Pakistan was again found less competitive for export of groundnut from India. Mexico made its entry into top ten importing countries in this year and exhibited moderate competitiveness. During the year 2011-12, Indonesia, Malaysia, Philippines, China, Mexico, Thailand, Ukraine were found moderate competitive whereas Pakistan still remains less competitive in this year. Vietnam and Russia made their entry into top ten importing countries and were found to be moderately competitive for export of groundnut from India. In 2012-13, all the top ten importing countries were found to be moderately competitive for groundnut export from India including Pakistan also. Export of groundnut from India was found to be moderately competitive for Indonesia, Philippines, Malaysia, Vietnam, Thailand, Ukraine, Russia and UAE in the year 2013-14. Pakistan again demonstrated less competitiveness in this year while Algeria entered into top ten and exhibited moderate competitiveness.

The NPC values from period 2009-10 to 2013-14 revealed that groundnut exported from India was moderately competitive during the whole study period to all importing countries except Pakistan [Table-4]. It was less competitive for Pakistan during the study period except the year 2012-13 in which it was observed moderately competitive. Not a single country was highly competitive during the study period. Groundnut was found to be moderately competitive during the study period because of high reference price of groundnut in these years in comparison to the domestic price of groundnut.

Conclusion

The growth rate in area under groundnut was found to be negative at national level while production and productivity registered non significant positive growth rate whereas export registered a positive and significant growth rate. The instability in export as well as in area, production and productivity at country level were low.The Nominal Protection Coefficient (NPCs) indicated that groundnut was found to be moderately competitive during the whole study period to all importing countries except Pakistan to which it was less competitive. Indonesia, Malaysia, Philippines, Pakistan, Thailand and Ukraine served as the major importers and promising countries for groundnut from India. Study indicated that India's export of groundnut was mainly concentrated in Indonesia and Malaysia. India needs to find out other international stable markets rather than depending on few markets, it would reduce the trade risk in long run especially when these countries will set

high standards in future. Hence appropriate export promotion strategies should be evolved to diversify the geographical concentration.

Table-4 *Nominal Protection Coefficient(NPC) values for groundnut exported from India (2009-10 to 2013-14)*

Country	2009-10		2010-11		2011-12		2012-13		2013-14	
	NPC	Remark	NPC	Remark	NPC	Remark	NPC	Remark	NPC	Remark
Indonesia	0.709	MC	0.669	MC	0.623	MC	0.629	MC	0.621	MC
Malaysia	0.691	MC	0.645	MC	0.616	MC	0.609	MC	0.611	MC
Philippines	0.675	MC	0.671	MC	0.612	MC	0.593	MC	0.597	MC
Pakistan	0.786	LC	0.865	LC	0.853	LC	0.673	MC	0.791	LC
UAE	0.677	MC	0.713	MC	-	-	0.596	MC	0.652	MC
Thailand	0.649	MC	0.649	MC	0.607	MC	0.593	MC	0.597	MC
Ukraine	0.634	MC	0.647	MC	0.597	MC	0.561	MC	0.510	MC
Singapore	0.683	MC	-	-	-	-	0.651	MC	-	-
U K	0.544	MC	0.672	MC	-	-	-	-	-	-
China	0.630	MC	0.737	MC	0.626	MC	-	-	-	-
Mexico	-	-	0.683	MC	0.571	MC	-	-	-	-
Vietnam	-	-	-	-	0.629	MC	0.610	MC	0.647	MC
Yemen Republic	-	-	-	-	-	-	0.593	MC	-	-
Russia	-	-	-	-	-	-	-	-	0.580	MC
Algeria	-	-	-	-	-	-	-	-	0.608	MC

MC - Moderately competitive, LC - Less competitive, NPC – Nominal protection coefficient
Source : Directorate General of Foreign Trade (DGFT) and AGMARKNET

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Abbreviations:

AGMARKNET : Agriculture Marketing Information System Network
APEDA : Agricultural and Processed Food Products Export Development Authority
CSO : Central Statistical Organization
DGFT : Directorate General of Foreign Trade
HPS : Hand Picked Selection
IIOR : Indian Institute of Oilseed Research
NPC : Nominal Protection Coefficient

Conflict of Interest: None declared

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