

Comparative Analysis of India's Sesame Seed

Asso. Prof. Dr. Mahendra B. Bagul

Chintamanrao College of Commerce, Sangli

Introduction:

Sesame seed (*Sesamum indicum* L.) is cultivated in several countries. India, Sudan, China, Myanmar and United Republic of Tanzania are the major sesame seed producing countries in the world. Sesame seed is originated and cultivated a very long year ago in India. In India sesame seed is known as til in Assamese, Bengali, Marathi, Hindi, Punjabi, tal in Gujarati, nuvvulu, manchi nuvvulu in Telugu, ellu in Malayalam, Tamil, Kannada, tila/pitratarpa in Sanskrit and rasi in Odisha.

Sesame seed plays an important role in human food and animal feed. Sesame seeds are used for the production of oil, paste, sesame hull and sesame seed cake after extraction of oil. Sesame seed contains highest oil compared to any other oil seed. It contains 50 per cent oil, 25 per cent protein and 15 per cent carbohydrate. It is used for baking, candy making, livestock feed, ruminants, poultry feed and many other food industries. The sesame oil is used in cooking, salad and margarine.

India is largest sesame seed producing and consuming country in the world. After the green revolution in the 1970's and 1980's, the production of sesame seed increased in huge amount. Sudan is leading sesame producer country in the world. It produces 18.27 per cent sesame seed per year. India is the second leading sesame seeds producer which produces near about 11.29 per cent per year. Myanmar is at third place with 11.29 per cent, Tanzania is at fourth place with 10.38 per cent and China is fifth producer in the world which produces 6.49 per cent on an annual basis. India, Sudan, China, Myanmar and United Republic of Tanzania, these five largest producer countries contributed near about 58.13 per cent of total world production. (www.fao.org data, 2022).

Keywords: *production, productivity, area under cultivation, countries etc.*

Significance of the Study:

The micro study of agricultural commodities is important to understand economical situation of particular commodity and it's useful to suggest policy to production, productivity and area under cultivation for the policy maker. Sesame seed is useful for human food as well as animal food. India is one of the largest sesame seed producing country in the country. The present study makes useful contribution to the performance of India's agricultural production, productivity and area under cultivation during the post liberalization regime comparing with pre-liberalization period.

Objectives of the study:

- i. To examine comparative analysis of India and major sesame seed producing countries in the world.
- ii. To study production in major sesame seed producing countries.
- iii. To study productivity of sesame seed in major sesame seed producing countries.
- iv. To study area under cultivation of sesame seed in major producing countries.

Data Base and Methodology:

The study is based on secondary sources. The secondary sources of data are collected from published data in various journals, WTO reports, United States Department of Agriculture FAO reports etc. Time series data has been used for the entire period from 1961 to 2022. The purpose was to compare area under cultivation, production and productivity of sesame seed during pre-1991 and post-1991 period. The sub-periods has been also made for short-term comparison. Wherever necessary, longer time series data also used.

Statistical Tools of Data Analysis:

The data collected from the secondary sources by researcher to examine and analyze the production, productivity and area under cultivation of Sesame seed. Statistical tools like; share in percentage, compound growth rate for volatility and consistency etc is used.

Limitations of the study:

The data of production, productivity and area under cultivation of sesame seed is available till 2022. The determinants like infrastructure, qualities etc. also affect on the production; but due to difficulty in qualifying; these determinants were not considered. Major problem that arises in the study was break in time series data between pre-1991 and the post-1991 period. Some countries data of productivity and production are not available on FAO such as Sudan’s productivity, production and area under cultivation data is available only from 2012 and China’s productivity data is available only from 1991.

Area under cultivation of sesame seed in major sesame seed producing countries:

This section examines the percentage share of area under cultivation of major sesame seed producing countries in the world during pre and post 1991 period. Table-1 shows percentage share of area under cultivation of the major sesame seed producing countries in the world. India’s area under cultivation of sesame seed was around 39.77 per cent during pre-1991 period which was at highest position but after 1991 it was declined to 20.94 per cent. Also if we look phase wise; area under cultivation of India’s sesame seed during pre-1991 and post-1991 shows declined trend.

China’s sesame seed cultivated area was around 12.02 per cent during pre-1991 period but after 1991 it has declined to 6.08 per cent. If we look phase wise; area under cultivation of China’s sesame seed during pre and post-1991 period shows declined trend except 1981-90.

Myanmar’s share in area under cultivation has increased from 11.36 to 14.91 per cent during post-1991 period and it stood at third position in the world. It shows increasing trend during pre and post-1991 period.

Tanzania’s area under sesame seed cultivation was around 0.91 cent during pre-1991 period and after 1991 it has increased to 4.61 per cent during post-1991 periods. During different phases it shows increasing trend.

Sudan’s sesame seed area under cultivation was zero per cent during pre-1991 period in the world but after 2012 Sudan started to cultivate sesame seeds hence it's area under cultivation has increased upto 26.70 per cent in the world. Graph-1 shows area under cultivation of major sesame seed producing countries in the World.

Table-1 % Share of sesame seed in per hector area harvested in major countries.

	Pre-1991 Periods				Post-1991 Periods			
	AV G %	Av g %	Av g %	Av g %	Av g %	Av g %	Av g %	Av g %
	196	196	197	198	199	199	200	201
	1-90	1-70	1-80	1-90	1-22	1-00	1-10	1-22
China	12.02	12.33	10.30	13.38	6.08	10.22	8.03	2.98
India	39.77	44.86	38.62	36.40	20.94	29.08	24.11	15.22
Myanmar	11.36	9.48	11.39	12.96	14.91	14.06	18.55	13.35
Sudan	0.00	0.00	0.00	0.00	35.00	0.00	0.00	26.70
*Tanzania	0.91	0.72	0.72	1.24	4.61	1.35	1.68	7.80

*United Republic of Tanzania

Source: Calculated from www.fao.org data.

Production of sesame seed in major sesame seed producing countries:

Table-2 shows percentage share of production of the major sesame seed producing countries in the world. India’s production of sesame seed was highest around 26.79 per cent during pre-1991 but after 1991 production has declined to 16.36 per cent. production shows declined trend during different phases of pre-1991.

China’s share in the world sesame seed production was at second position. China produced around 18.08 per cent sesame seed during pre-1991 period and after 1991 China’s share in the world sesame seed production was decreased from 18.08 to

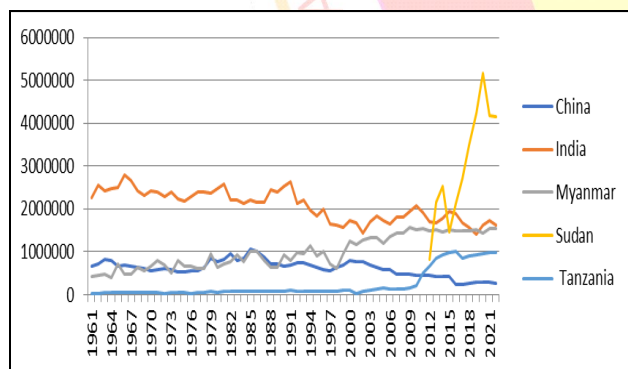
14.00 per cent. Also if we look phase wise; during pre-1991 it shows increasing trend and post-1991 period it shows declined trend.

Myanmar was at third position in the production of sesame seed with around 7.12 per cent during pre-1991 period and after 1991 it was increased up to 13.34 per cent during post-1991. Phase wise production of Myanmar's sesame seed shows increasing trend during pre-1991 and post-1991 period.

Tanzania's share in the sesame seed production was around 0.84 per cent with fourth position in the world during pre-1991 period. After 1991 Tanzania's sesame seed production was highly increased to 6.28 per cent.

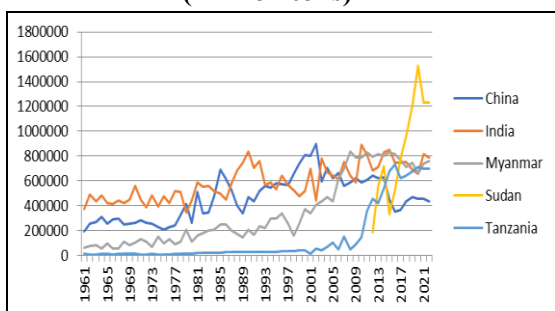
Sudan's production of sesame seed was zero per cent during pre-1991 period but after 2011 production was largely increased up to 13.92 per cent. After 1991 Sudan is the leading sesame seed producer in the world and produces near about 20.31 per cent in the world. Graph-2 shows production of major sesame seed producing countries in the world.

Graph-1 Area under cultivation in major sesame seed producing countries (Hectare)



Source: Calculated from www.fao.org data.

Graph-2 Production of major sesame seed producing countries in the world (Million tons)



Source: Calculated from www.fao.org data

Table-2 Percentage share of sesame seed in production in major countries.

	Pre-1991 Periods				Post-1991 Periods			
	AV G %	Av g %	Av g %	Av g %	Av g %	Av g %	Av g %	Av g %
	196	197	198	199	200	201	201	201
	1-70	1-80	1-90	1-00	1-10	1-22	1-22	1-22
China	18.08	16.29	15.02	22.00	14.00	23.94	18.96	8.17
India	26.79	27.61	24.62	27.99	16.36	23.47	19.22	12.52
Myanmar	7.12	4.83	6.78	9.14	13.34	10.39	16.63	12.76
Sudan	0.00	-	-	-	20.31	-	0.00	13.92
*Tanzania	0.84	0.68	0.64	1.14	6.28	1.31	2.19	9.96

*United Republic of Tanzania

Source: Calculated from www.fao.org data.

Productivity of sesame seed in major sesame seed producing countries:

Table-3 shows average productivity of the major sesame seed producing countries in the world. India's share in the world's sesame seed productivity was around 2108 kg per hecter during pre-1991 period but productivity has been increased from 2108 to 3812 kg per hecter after 1991. India was at the second place in the world. Also if we look phase wise productivity trend of India's sesame seed during pre-1991 and post-1991 periods it shows increasing trend.

Myanmar's share in the world's sesame seed productivity was at third position with around 1881 kg per hecter during pre-1991 period and after 1991 Myanmar's average productivity in the world sesame seed was increased from 1881 to 4116 kg per hecter during post-1991 period. Also if we look phase wise productivity trend of Myanmar's sesame seed during pre-1991 and post-1991 periods it shows increasing trend. Myanmar's productivity rate per hecter is more compared to India during post 1991 period.

The data about China's share in the world's sesame seed productivity was not available during pre-1991 period. But after 1991 China started to

produce sesame seed and China’s average productivity was highest in the world i.e.11971 kg per hector. It means it shows increasing trend during post-1991 period. China’s productivity rate per hector is more than India during post-1991 period.

Tanzania’s sesame seed productivity was around 2838 kg per hector in the world's sesame seed productivity and it was at first position during pre-1991 period. After 1991 Tanzania’s average productivity of sesame seed was increased from 2838 to 5637 kg per hector. Also we look phase wise productivity trend of Tanzania’s sesame seed during pre-1991 and post-1991 periods shows increasing trend. Tanzania’s productivity rate per hector is more compared to India during pre and post 1991 periods.

Sudan’s share in the world's sesame seed productivity was around 2710 kg per hector during post-2012. Graph-3 shows productivity of major Sesame seed producing countries in the world.

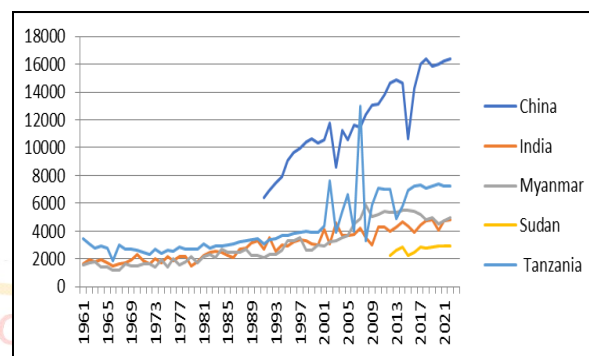
Table 3: Average Productivity (Yield) of Sesame seed in major countries.

	Pre-1991 Periods				Post-1991 Periods			
	AV	Av	Av	Av	Av	Av	Av	Av
G	g	g	g	g	g	g	g	g
%	%	%	%	%	%	%	%	%
19	19	19	19	19	19	20	20	
61-	61-	71-	81-	91-	91-	01-	11-	
90	70	80	90	22	00	10	22	
Chi	-	-	-	-	11	88	11	14
na					97	89	45	97
					1	0	5	
Indi	21	18	19	26	38	30	38	44
a	08	20	01	02	12	70	03	37
Mya	18	14	17	24	41	27	42	51
nma	81	99	45	01	16	88	14	41
r								
Sud	-	-	-	-	27	-	-	27
an					10			10
*Ta	28	27	26	31	56	36	61	68
nza	38	97	06	10	37	81	23	61
nia								
Wor	31	29	29	33	47	37	47	54
ld	09	46	82	99	07	78	65	32

*United Republic of Tanzania

Source: Calculated from www.fao.org data.

Graph-3 Productivity of Major Sesame seed Producing Countries in the World (Kg per hectare)



Source: Calculated from www.fao.org data.

Growth rate of APP in major sesame seed producing countries:

This section examines comparative analysis of Sesame seeds production, area under cultivation and productivity through growth rate during pre and post -1991 period (Table-4).

India’s sesame seeds area under cultivation shows positive growth rate during pre-1991 period. From 1991 to 2010 it's growth rate was 2.60 per cent which is positive. Growth rate of production and productivity was positive during pre and post 1991 period but it shows decreasing trend after 1991. This is not good sign for Indian Sesame Seed economy.

China’s sesame seed area under cultivation shows positive growth rate during pre 1991 period and after 1991 period shows negative growth rate. In all the phases it was negative except during 1971-80. Growth rate of production was positive during pre 1991 period but after 1991 it became negative except 1991-2000. China’s sesame seed productivity also shows positive growth rate during 2011-22.

Myanmar’s sesame seed area under cultivation shows positive growth rate during pre and post 1991 period except 1981-1990. Growth rate of production and productivity shows positive and increasing growth rate during pre and post-1991 period. But production and productivity growth rate during 2011-22 was negative.

Tanzania’s sesame seed area under cultivation, production and productivity shows positive and increasing growth rate during pre and post-1991 period. Only the productivity was negative

during the period 1961-70. After that it started to increase and remained positive till now.

Sudan shows highest growth rate of production, productivity and area under cultivation of sesame seed after 2011.

Table:4 Growth rate of Sesame Seed

		Pre-1991 Periods				Post-1991 Periods			
		1961-1990	1961-70	1971-80	1981-90	1991-2022	1991-2000	2001-10	2011-22
China	A	0.86	-2.85	3.32	-2.64	-3.58	-0.45	-6.26	-5.25
	P	2.65	1.39	2.45	0.04	-1.04	5.60	-3.61	-3.55
	Y	-	-	-	-	2.63	-	-	1.80
India	A	-0.30	0.19	0.50	0.48	-0.60	-4.74	2.60	-1.30
	P	1.46	1.59	0.13	3.99	1.04	-3.73	2.17	-0.20
	Y	1.76	1.39	-0.36	3.49	1.64	1.06	-0.42	1.12
Myanmar	A	2.19	4.74	0.18	-0.50	2.15	0.20	2.84	0.03
	P	4.43	3.36	2.27	0.03	5.10	3.65	10.88	-1.40
	Y	2.19	-1.32	2.08	0.53	2.89	3.45	7.81	-1.43
Sudan	A	-	-	-	-	88.19	-	-	96.97
	P	-	-	-	-	78.19	-	-	90.56
	Y	-	-	-	-	39.85	-	-	37.87
Tanzania	A	3.44	2.76	4.51	2.13	11.15	1.39	14.75	3.94
	P	4.02	0.44	6.28	4.20	14.30	3.88	17.50	5.66
	Y	0.56	-2.26	1.69	2.02	2.84	2.46	2.40	1.65

*United Republic of Tanzania

Note: A-Area Harvested, P-Production and Y- Yield (Productivity)

Conclusions:

While examining comparative analysis area under cultivation, production and productivity of India’s sesame seed with major sesame seed producing countries in the world during pre and post 1991 period it is observed that area under cultivation and production of sesame seed in India was highest in the world during pre-1991 period. It is astonished that Sudan’s sesame seed area under cultivation and production was zero per cent during pre-1991 but after 2012 it is highest in the world. In case of productivity; India’s productivity was less than other countries like China, Myanmar and Tanzania. India is at fourth position in the world after 1991. Growth rate of sesame seeds area under cultivation was negative in India which was less than compared to other countries during pre and post-1991 period. Growth rate of sesame seeds production in India was also less than compared to other countries and it became negative after 1991. Growth rate of sesame seeds productivity in India was more during pre-1991 period but it was less than China, Sudan and Tanzania after 1991. India has more opportunity to increase the production of sesame seed because it contains more nutrients and beneficial for human health.

References:

- 1) Ranganatha, A.R.G. (2013) *‘Improved Technology for Maximizing Production of Sesame’*, All India Coordinated Research Project on Sesame and Niger, Indian Council of Agricultural Research, JNKVV Campus, Jabalpur-482004 (MP), December 2013.
- 2) Mohamed Elleuch, Souhail Besbes, Olivier Roiseux, Christophe Blecker and Hamadi Attia (2007), Quality characteristics of sesame seeds and by-products, Food Chemistry, Volume 103, Issue 2, 2007, Pages 641-650
- 3) Sathe Dhanmanjiri and Deshpande R. S. (2006): *‘Sustaining Agricultural Trade Policy and Impact’*, Economic and Political Weekly, pp-5337-5344, December 30.

- 4) Bagul, M. B. (2016), "Soya Cake Economy of India" Published in "Indian Economy views and Vision-Essays" in honors of Professor V. B. Jugale, Edition 2016, ISBN: 978-81-8387-740-4, pp. 298-330 Published by Serials publication (p) LTD. New Delhi..
- 5) Bagul, M. B. (2015), "India's Grape Economy" Published in 'Interlink Research Analysis' half yearly international journal, Vol. I, Issue: XII, ISSN 0976-0377, July. 2015 To Dec.2015 (Impact Factor 2.06).
- 6) Newase, S. B. (2016), "Competitiveness of Maize Production in India" Published in "Indian Economy views and Vision-Essays" in honors of Professor V. B. Jugale, Edition 2016, ISBN: 978-81-8387-740-4, pp. 422-444 Published by Serials publication (p) LTD. New Delhi
- 7) www.wikipedia.org.
- 8) www.fao.org.
- 9) www.apeda.org.

