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An Analytical Study on Performance of Soyabean Crop in India

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Abstract: ***Agriculture is backbone of the Indian Economy. Agriculture sector provides food security for the entire population and provide raw material to many agro industries. Oilseed crops are the second most important determinant of agricultural economy, next only to cereals within the segment of field crops. India is one of the largest producers of oilseeds in the world and occupies an important position in the Indian agricultural economy. Soybean contributes significantly to the Indian edible oil pool. Presently soybean contributes 43 % to the total oilseeds and 25% to the total oil production in the country. Currently, India ranks fourth in respect to production of soybean in the world. In the present paper, an analytical study has been taken up for the production trend and growth rate by using three years moving average for area sown, productivity and production for Soyabean crop. State-wise analysis has also been carried out for Soyabean producing States. The future projection for production and productivity have also been worked out. In view of the importance of this sector for ensuring inclusive growth and the need to achieve self-sufficiency in oilseeds production, key challenges faced by the edible oils sector and the strategy to address them are also spelled out.***

Keywords: ***Oilseeds, Soyabean, Growth Rate, Production, Productivity***

I. INTRODUCTION

India is the largest producer of oilseeds in the world and oilseed sector occupies an important position in the agricultural economy of the country. Oilseeds are among the major crops that are grown in the country apart from cereals. In terms of acreage, production and economic value, these crops are second only to food-grains. India is the fifth largest vegetable oil economy in the world. With its rich agro-ecological diversity, India is ideally suited for growing all the major annual oilseed crops. Among the nine oilseed crops grown in the country, seven are of edible oils (soybean, groundnut, rapeseed-mustard, sunflower, sesame, safflower and niger) and two are of non-edible oils (castor and linseed). India ranks first in the production of most of the minor oilseeds (castor, niger, safflower and sesame). In the case of major oilseeds, India ranks first in the production of groundnut, second in rapeseed-mustard, and fifth in soybean. Oilseed crops contribute a significant proportion to the agricultural GDP. Soybean contributes significantly to the Indian edible oil pool. Presently soybean contributes 43 % to the total oilseeds and 25% to the total oil production in the country. Currently, India ranks fourth in respect to production of soybean in the world. The major soyabean growing states are, Maharashtra, Madhya Pradesh, Rajasthan, Karnataka, and Telangana. India has been forced to go in for large imports of edible oils since the domestic production of oilseeds falls short of demand. The self-sufficiency in oilseeds attained through “Yellow Revolution” during early 1990s, could not be sustained beyond a short period. There is a spurt in vegetable oils consumption in recent years in respect of both edible as well as industrial usages but domestic supply is unable to meet the demand.

II. METHODOLOGY

The present study is based on secondary data for the 50 years period from 1970 to 2021. The study examines growth rates of area, production and productivity of Soyabean in India and as well as major Soyabean growing states. In order to examine the degree of relationship in area, production and productivity of Soyabean crop, the statistical measures, such as moving average, mean, percentage, estimation of growth rate have been worked out. The following formulae were used:

1) Three Year Moving Average

$$Y_{t+1} = \frac{Y_t + Y_{t+1} + Y_{t+2}}{3}$$

Where Y_t is variable (area sown, production or productivity) and
t is period, say, t = 0,1,2…..

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2) Growth Rate

The moving averages have been used to estimate growth rates.

$$R_t = \frac{Y_1 - Y_0}{Y_0} * 100$$

Where R_t is the simple growth rate during two periods

3) Projection

Least Square Technique has been applied for the following linear model:

$Y = a + b X$

Where Y is Soyabean production

a is constant

b is regression of Y on X,

X is year (X=1 for 1995-96

=2 for 2000-01 & so on)

III. FINDINGS AND DISCUSSIONS

Soybean has an important place in world's oilseed cultivation scenario, due to its high productivity, profitability and vital contribution towards maintaining soil fertility. The crop also has a prominent place as the world's most important seed legume, which contributes 25% to the global vegetable oil production, about two thirds of the world's protein concentrate for livestock feeding and is a valuable ingredient in formulated feeds for poultry and fish. India ranks fourth in area with 11.34 million hectares accounting for 9.41% of the world area and fifth in production with 11.22 million tones in 2019-20. The major soyabean growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, and Telangana. Table-1 presents the three yearly moving averages of area sown and production for Soyabean. Growth rates have also been estimated. It is seen that there is positive trend in area sown. The area sown has increased from 0.03 M hectare in 1970-71 to 12.6 M hectare during 2020-21. The production has also positive trends and it has been increased to 12.34 M tones in 2020-21 from 0.01 M tones in 1970-71. The productivity also has increased trend. It has constantly increased from 426 kg per ha in 1970-71 to 1131 kg per ha in 2020-21. This table also shows annual growth rates during different periods. The highest growth rate was observed in area sown (167%) , in production (350%) and productivity (5.94%) during 1970-71 to 1980-81.

Table -1 Three years moving average of area, production and Productivity of the Soyabean

Year.	Area Sown M hectare	Growth rate per annum	Production M Tones	Growth rate per annum	Productivity Kg per ha	Growth rate per annum
1970-71	0.03		0.01		426	
1980-81	0.53	166.67	0.36	350.00	679	5.94
1990-91	2.66	40.19	2.3	53.89	866	2.75
2000-01	6.32	13.76	6.11	16.57	967	1.17
2010-11	9.81	5.52	11.64	9.05	1131	1.70
2020-21	12.6	2.84	12.34	0.60	978	-1.35

Table –2 Area, Production and Productivity of Soyabean for Major States (2020-21)

	Production M Tones	%age of Total Production	Area Sown M Hect	%age of Total Area	Productivity Kg per ha.
Maharashtra	6.2	48.06	4.36	34.04	1423
Madhya Pradesh	4.61	35.74	6.5	50.74	710
Rajasthan	1.09	8.45	1.13	8.82	969
Karnataka	0.38	2.95	0.31	2.42	1212
Telangana	0.24	1.86	0.16	1.25	1503
Gujarat	0.2	1.55	0.15	1.17	1361
Others	0.17	1.32	0.2	1.56	817
All India	12.9	100.00	12.81	100.00	1007

The state-wise break up of area sown, production and productivity of soyabean is depicted in Table 2.It is seen that Maharashtra is the highest Soyabean producing state (48%) of the total Soyabean in the country. Maharashtra along with Madhya Pradesh (35.74%) produce about 84% production in the country. The highest productivity has been observed of the order of 1503 kg per ha in Telangana followed by Maharashtra (1423 Kg per ha) and Gujarat (1361 Kg per ha) and lowest 710 Kg per ha in Madhya Pradesh.

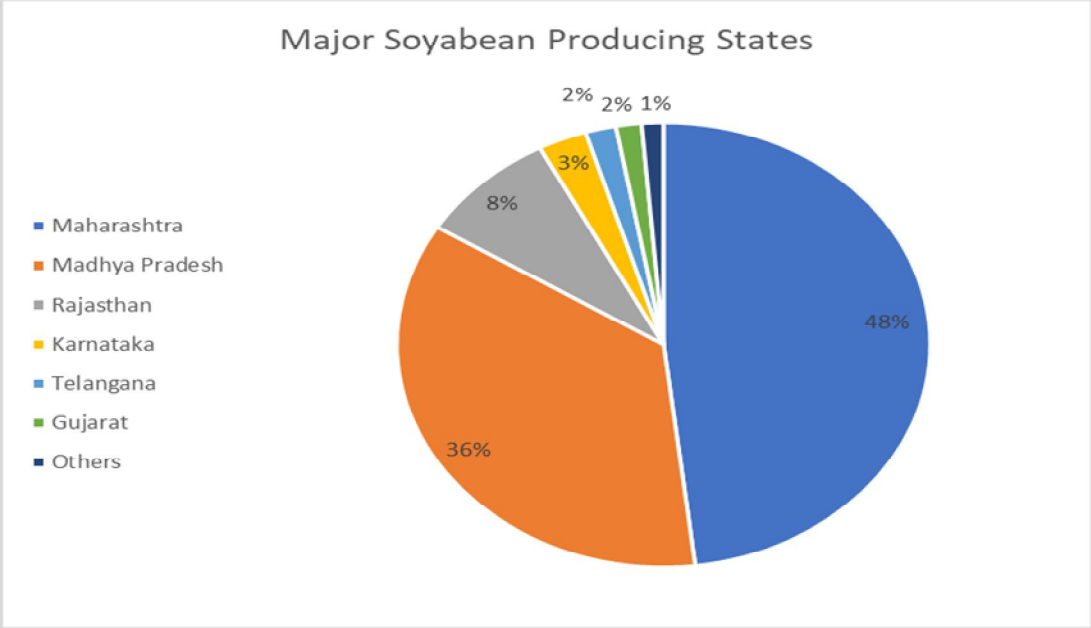
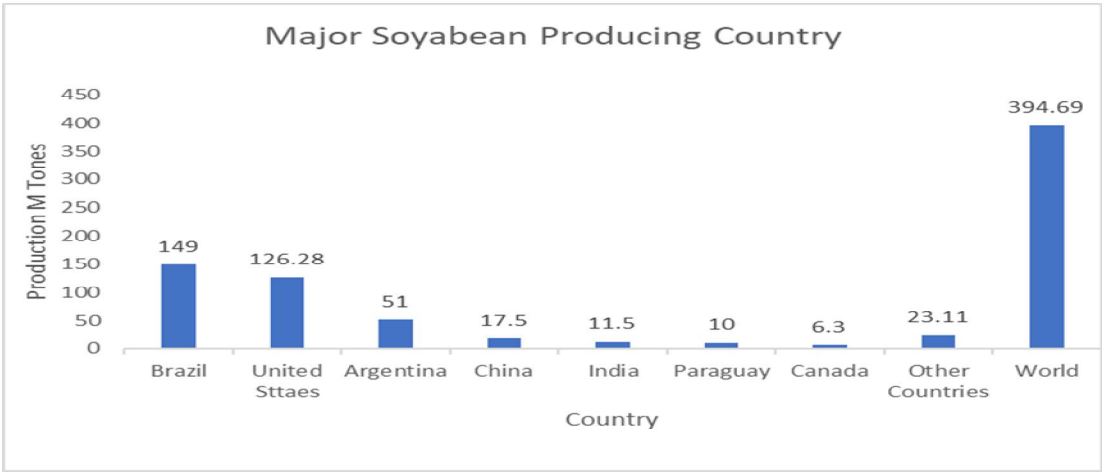


Table 3: Major Soyabean Producing countries in the World (2021)

Country	Production M Tones	Production %age	Cumulative Production %age
Brazil	149.0	37.75	37.75
United States	126.28	31.99	69.75
Argentina	51.0	12.92	82.67
China	17.5	4.43	87.10
India	11.5	2.91	90.01
Paraguay	10.0	2.53	92.55
Canada	6.3	1.60	94.14
Other Countries	23.11	5.86	100
World	394.69	100	



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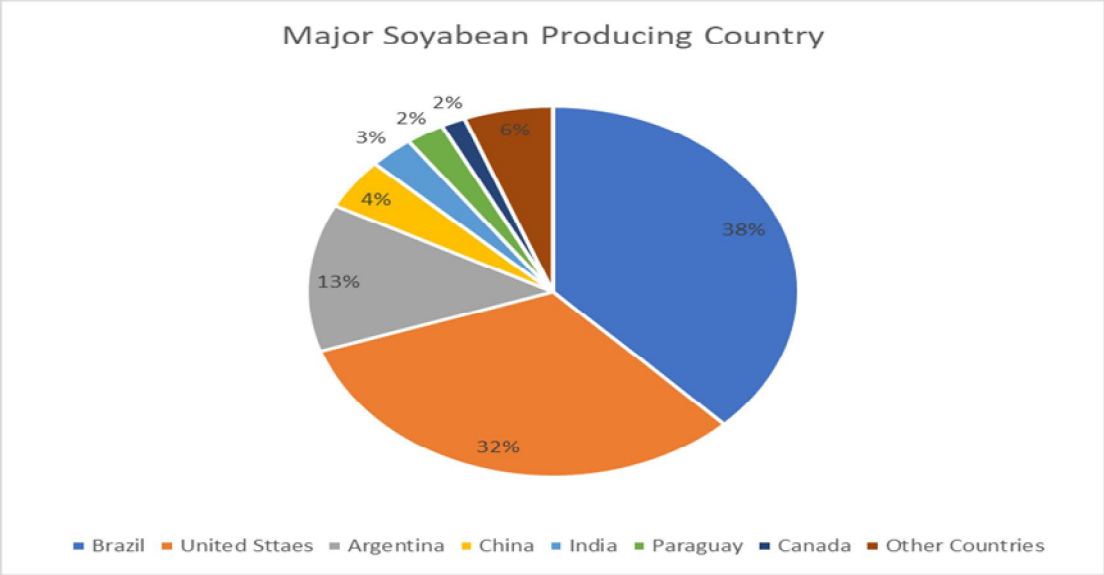


Table -3 presents the major Soyabean producing countries in the world. It is seen, that Brazil is the highest producing country with 37.75% share. Brazil, United States, Argentina, China and India produce together more than 90 % of world's total Soyabean globally. India's contribution is 2.91%.

Table –4 Projected Production, Area and Productivity for Soyabean

	2025-26	**2030-31**
Production M Tones	14.14	15.67
Area M Hectare	14.49	16.10
Productivity Kg per ha	994	993

Table -4 presents the projected area, production and productivity for Soyabean for 2025-26 and 2030-31. It is seen that the production has been estimated of the order of 14.14 M Tones and 15.67 M Tones in 2025-26 and 2030-31 respectively. The area will be 14.49 M ha in 2025-26 and 16.10 M ha in 2030-31. The productivity will be 994 Kg per ha in 2025-26 and 993 Kg per ha 2030-31.

IV. CONCLUSION

Oilseed crops are the second most important determinant of agricultural economy, next only to cereals within the segment of field crops. The self-sufficiency in oilseeds attained through "Yellow Revolution" during early 1990's. Yellow Revolution improved productivity but could not help in increasing oilseeds production significantly owing to lack of awareness and change in cropping pattern leading to significant decrease in area under oilseeds production. Technology mission on oilseeds II and Yellow Revolution 2.0 with better planning can help India to achieve self-sufficiency in oilseeds and also increase India's agri-export. Yield gap analysis shows that India's oilseeds production can improve by reducing yield gap among states itself. There is a great scope for increasing the yields of oilseed crops. Better extension systems, with downward accountability with the last mile extension gaps plugged will increase productivity. Special emphasis for enhancing the productivity of oilseeds may be given to the following:

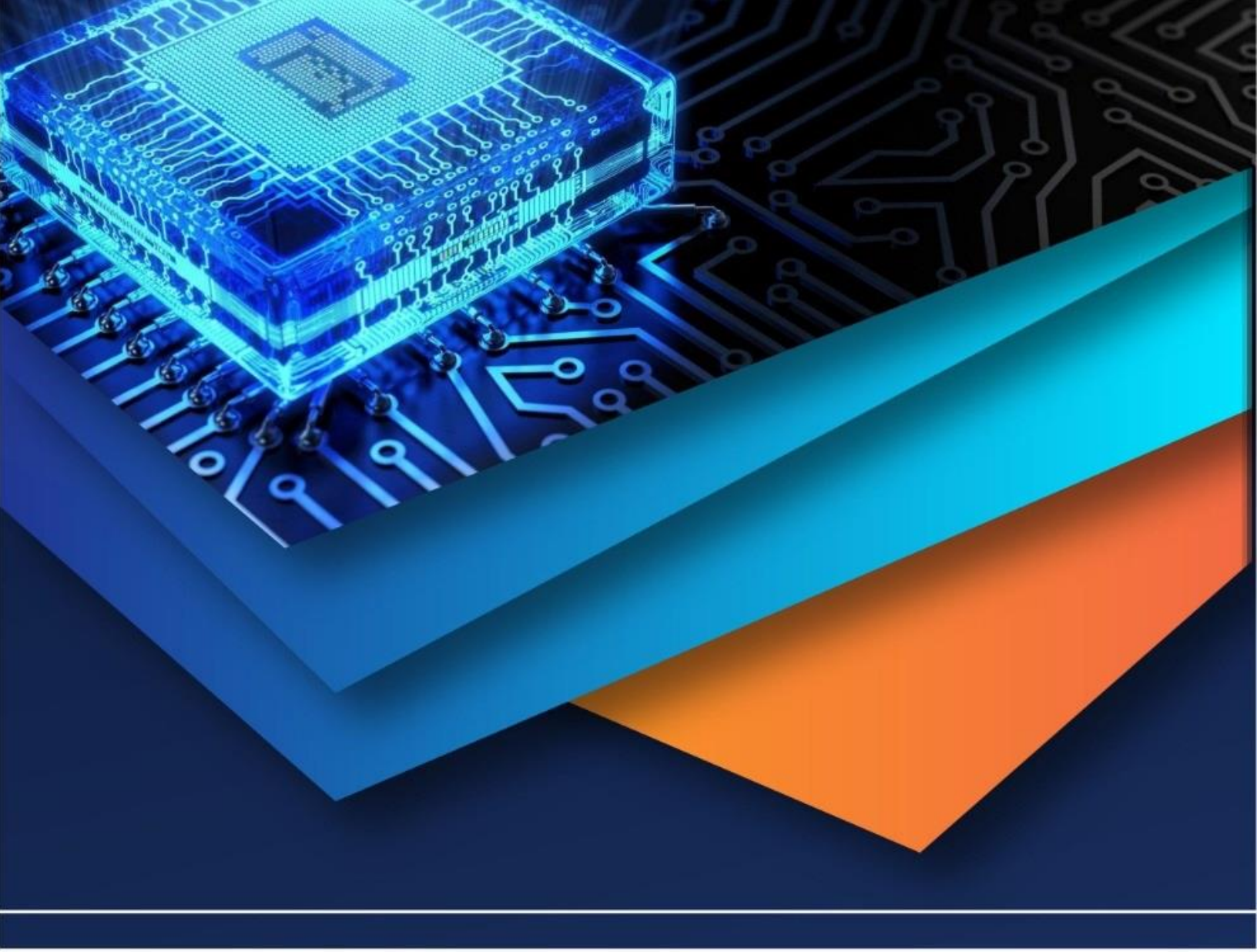
1) Increasing seed production and distribution of newly released varieties.
2) Low-cost technologies with high impact on productivity will result in higher income which will encourage farmers to go for oilseeds farming.
3) Ensure availability of key physical (fertilizers, pesticides), financial (credit facilities, crop insurance) and technical inputs (extension services)
4) Implement market reforms and policies
5) Technology Mission on oilseeds should be strengthening for providing the latest technology for production, processing and marketing

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REFERENCES

[1] Agricultural Statistics at a Glance (2021), Ministry of Agriculture &Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Directorate of Economics & Statistics, Govt of India.
[2] Annual Reports (2020-21), Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Govt of India
[3] Department of Agriculture, Cooperation & Farmers Welfare website, https://agricoop.nic.in
[4] ICAR- Indian Institute of Soybean Research website, https://iisrindore.icar.gov.in
[5] "Present Status of Oilseed crops and vegetable oils in India" (2018), Status Paper, National Food Security Mission, Govt of India.
[6] ICAR- Indian Institute of Soybean Research SOYBEAN MONITOR/ MARKET WATCH September, 2017
[7] Agrawal P C & Kishore Kumar (2005) – "Technology & Environment impact on agricultural production"- International conference on environment and development – Challenges & Opportunities. Delhi University, Delhi
[8] S. C. Gupta, V. K. Kapoor - Fundamentals of Mathematical Statistics, Seventh Revised Edition, Sultan
[9] Statistical Methods. Ed. S. P. Gupta, Sultan Chand & Sons Publishing Co. (PI Ltd., New Delhi. (1997**)**
[10] Jat, R.S., Singh V.V., Sharma Pankaj and Rai, P.K., (2019) "Oilseed Brassica in India: Demand, Supply, Policy Perspective and Future Potential", ICAR-Directorate of Rapeseed-Mustard Research.
[11] Jha, Girish Kumar, Pal Suresh and Mathur, V.C., (2012), "Edible Oilseeds Supply and Demand Scenario in India: Implications for Policy", Division of Agricultural Economics Indian Agricultural Research Institute, New Delhi.
[12] **P**rabha Rani, P C Agrawal & Kishore Kumar (2010)- "Strategic role of Information Technology for Rural Prosperity in India", Journal of IPEM, Vol5 4, Issue No. 1, Jan – June 2010 pp 1-6
[13] Jha, Girish Kumar, (2011), "Yield Gap Analysis of Major Oilseeds in India", Journal of Community Mobilization and Sustainable Development, Vol. 6(2), pp. 209-216

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