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Applications of Statistical Indicators in Determining Socio-Economic Significance of Tobacco Cultivation in India

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Abstract
Agriculture plays a key role in the overall economic development of India. Tobacco is one of the most economically significant agricultural crops in the world. Tobacco offers significant employment opportunities, both in on-farm and off-farm situations, and provides a livelihood to millions of people in India. Tobacco is therefore important as a crop, as an exportable commodity and as a source of revenue and foreign exchange earnings for the Government. In the present paper, an attempt has been made to study the production trend and growth for area sown, productivity and production for Tobacco. The growth rates, projections and research methodologies are estimated using Statistical Indicators. State-wise analysis has also been carried out for Tobacco producing States. There is a need for a more comprehensive study of the economic and health costs due to tobacco. It is concluded that there would also be a need to create an effective monitoring and evaluation mechanism at the grass-roots level. The future projection for production and productivity have also been worked out.

Keywords: Cultivation, growth rate, production, productivity, tobacco

Introduction

The Portuguese introduced the Tobacco cultivation in India in 1605. Initially tobacco was grown in Kaira and Mehsana districts of Gujarat and later spread to other areas of the country. Progress in tobacco cultivation in India began in 1787 with the establishment of the Calcutta Botanical Gardens in Howrah and continued with research initiated with the establishment of the Imperial Agricultural Research Institutehpresently the Indian Council of Agricultural Research (ICAR)-in 1903. In order to regulate production, facilitate promotion of overseas marketing and to control recurring instances of imbalances in supply and demand, the Government of India established the Tobacco Board, in place of Tobacco Export Promotion Council, under the Tobacco Board Act of 1975. In view of tobacco's commercial value, the Government of India also established several tobacco research stations and institutions in the country during the period 1938-1980. Tobacco, the golden leaf is one of the leading commercial crops in India. Tobacco made a significant contribution in terms of excise and export. Tobacco provides livelihood security to 36 million people including 6 million farmers and 20 million farm labour engaged in tobacco farming besides 10 million people working in processing, manufacturing and exports, in India. Tobacco is also a highly labour intensive and remunerative crop providing much higher returns than other crops grown in the region.

Fig 1:

Methodology & Statistical Tools

The present study is based on secondary data for the 60 years period from 1960 to 2020. The study examines growth rates of area, production and productivity of Tobacco in India and as well as major Tobacco growing states. In order to examine the degree of relationship in area, production and productivity of Tobacco crop, the statistical indicators such as moving average, mean, percentage, estimation of growth rate have been worked out. The following formulae were used:

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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…..

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

Projection

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

$$Y = a + b X$$

Where Y is Tobacco 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)

Findings and Discussion

Tobacco is one of the most economically significant agricultural crops in the world. India is the 2nd largest producer and exporter after China and Brazil respectively. In the global scenario, Indian tobacco accounts for 15% of the area and 11% of the total production. Table-1 presents the major Tobacco producing countries in the world. It is seen, that China is the highest Tobacco producing country with 42.11% share followed by India (11.42%) Share. China, India, Brazil, USA and Indonesia together produce more than 70% of world's total Tobacco globally.

Table 1: Major Tobacco producing countries in the world (2020).

Country	Production 000 Tones	Production % Age	Cumulative Production % Age
China	2807	42.11	42.11
India	761.32	11.42	53.53
Brazil	675.55	10.13	63.66
USA	285.18	4.28	67.94
Indonesia	196.15	2.94	70.89
Zimbabwe	172.27	2.58	73.47
Zambia	124.64	1.87	75.34
Pakistan	116.16	1.74	77.08
Tanzania	102.47	1.54	78.62
Argentina	93.67	1.41	80.02
Others	1331.59	19.98	100.00
World	6666.00	100.00	

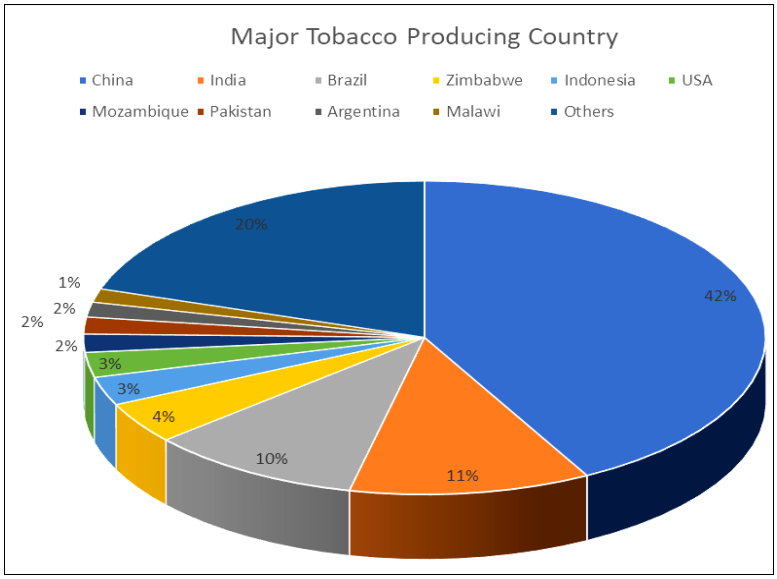

Fig 2: Figure shows major tobacco producing country

Table 2: Three years moving average of area, production and productivity of the tobacco.

Year	Area Sown M ha	Growth Rate Per Annum	Production M Tones	Growth Rate Per Annum	Productivity Kg Per ha	Growth Rate Per Annum
1960-61	0.41		0.31		764	

1970-71	0.45	0.98	0.37	1.94	831	0.88
1980-81	0.44	-0.22	0.48	2.97	1089	3.10
1990-91	0.42	-0.45	0.56	1.67	1352	2.42
2000-01	0.35	-1.67	0.47	-1.61	1365	0.10
2010-11	0.47	3.43	0.75	5.96	1601	1.73
2019-20	0.40	-1.65	0.80	0.74	1982	2.64

Table-2 presents the three yearly moving averages of area sown and production for Tobacco. Growth rates have also been estimated. It is seen that there is no increase in area sown, it is almost static (0.41 M Ha). However, there is a positive trend in the production except 2000-01. The production has been increased from 0.31 M Tones in 1960-61 to 0.80 M Tones in 2019-20. The productivity has also positive trend. It has constantly increased to 1982 Kg per ha in 2019-20 from 764 kg per ha in 1960-61. This table also shows annual growth rates during different periods. The highest growth rate was observed in area sown (3.43%) and in production (5.96%) during 2000-01 to 2010-11.

Table 3: Area, Production and Productivity of Tobacco for Major States (2019-20)

	Area Sown 000 ha	**% Age of Total Area**	**Production 000 Tones**	**% Age of Total Production**	**Productivity Kg Per ha.**
Gujarat	162.26	40.13	382.65	47.75	2358
Andhra Pradesh	85.00	21.02	185.00	23.08	2176
Uttar Pradesh	35.00	8.66	98.00	12.23	2800
Karnataka	90.00	22.26	83.00	10.36	922
West Bengal	15.15	3.75	20.46	2.55	1350
Bihar	10.27	2.54	18.03	2.25	1756
Others	6.61	1.63	14.28	1.78	2161
All India	404.29	100.00	801.42	100.00	1982

The state-wise break up of area sown, production and productivity of Tobacco is presented in table – 3. It is seen that Gujarat is the highest Tobacco producing state (47.75%) of the total Tobacco in the country. Gujarat and Andhra Pradesh (23.08%) produce about 71% production in the country. The highest productivity has been observed of the order of 2800 kg per ha in Uttar Pradesh followed by Gujarat (2358 Kg per ha) and Andhra Pradesh (2176 Kg per ha) and lowest 922 Kg per ha in Karnataka.

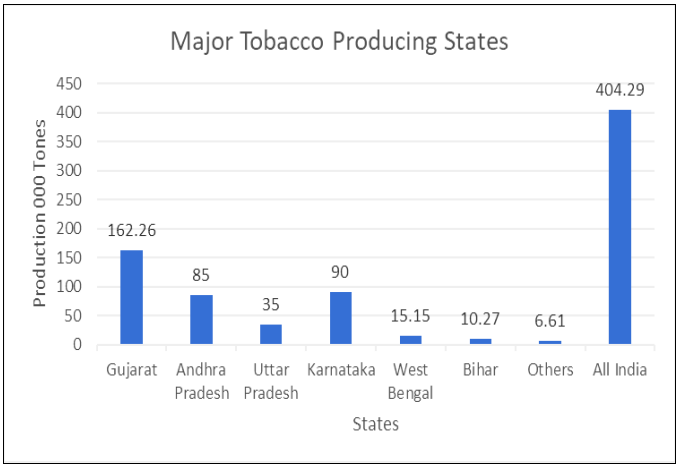

Fig 3: Figure shows major tobacco producing states

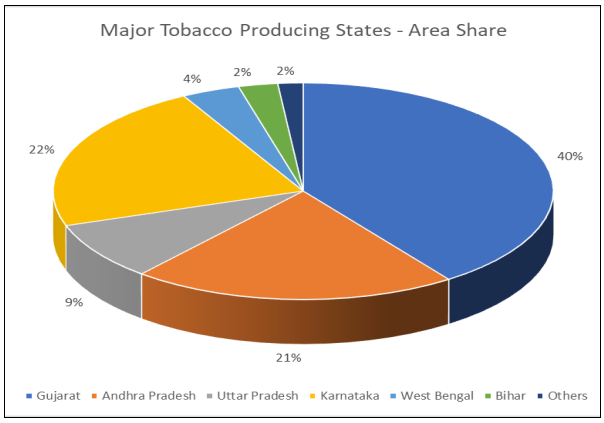

Fig 4: Figure shows major tobacco producing states

Table-4 presents the projected area, production and productivity for Tobacco for 2025-26 and 2030-31. It is seen that the production has been estimated of the order of 0.93 M Tones and 1.02 M Tones in 2025-26 and 2030-31 respectively. The area will be 0.47 M ha in 2025-26 and 0.49 M ha in 2030-31. The productivity will be 2050 Kg per ha in 2025-26 and 2187 kg per ha in 2030-31.

Table 4: Projected Production, Area and Productivity for Tobacco

	2025-26	**2030-31**
Production-M Tones	0.93	1.02
Area-M Ha	0.47	0.49
Productivity-Kg per ha	2050	2187

Conclusion

Tobacco is grown in 0.4 million hectares in India, accounting for approximately 0.27% of the net cultivated area, and around 80% of tobacco production is in the states of Gujarat, Andhra Pradesh and Uttar Pradesh. Tobacco is therefore an important cash crop for India. Millions of people are engaged in the production, manufacture and distribution of tobacco and tobacco products. There have been recent improvements in the performance of the productivity though it is still low when compared internationally. There would also be a need to create an effective monitoring and evaluation mechanism at the grass-roots level. While tobacco's contribution to the Indian economy, however, the net gain or loss to the government in terms of disability, disease and death due to tobacco has not been properly and comprehensively quantified. In addition to causing damage to an individual's health, tobacco use results in severe societal costs, such as reduced productivity, health-cost burdens and environmental damage. In view of the important role that tobacco plays in the country's economy, particularly in terms of employment and livelihood of millions dependent on tobacco, there is a need to strike a balance between tobacco control policies and socio-economic imperatives of tobacco in India.

References

1. Annual Reports, Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Govt of India, 2020.
2. Department of Agriculture, Cooperation & Farmers Welfare Website: https://agricoop.nic.in
3. Agricultural Statistics at a Glance, Ministry of Agriculture &Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Directorate of Economics & Statistics, Govt of India, 2020.
4. Annual Report-ICAR-CENTRAL TOBACCO RESEARCH INSTITUTE (An ISO 9001:2015 Certified Institute) RAJAHMUNDRY-533 105, ANDHRA PRADESH, INDIA, 2020.
5. ICAR-CENTRAL TOBACCO RESEARCH INSTITUTE Website: https://ctri.icar.gov.in
6. Gupta SP. Statistical Methods, Sultan Chand & Sons, New Delhi.
7. Gupta SC, Kapoor VK. Fundamentals of Mathematical Statistics, Seventh Revised Edition, Sultan
8. Agrawal PC, Kishore Kumar. "Application of ICT in Managing Agricultural Productivity and Food Security in India", Journal of IPEM (Institute of Professional Excellence & Management), Vol 3 Issue No.1, Jan-June, 2009; 3(1):28-31.
9. Prabha Rani PC. 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; 5(4):1-6.
10. WHO, Ministry of Health & Family Welfare, Government of India and Centers for Disease Control and Prevention. Report on tobacco control in India. November, 2004.
11. National Institute of Occupational Health (NIOH): Occupational health problems of tobacco harvesters and their prevention. Annual Report. Ahmedabad: NIOH, 2007.
12. Nicotine and its derivatives from tobacco waste. New Delhi, Technology Information, Forecasting & Assessment Council, 2000. (http://www.tifac.org.in/offer/tlbo/rep/st158.htm).
13. Sharma R S. Hobson's choice for AP tobacco farmers. Business Line: internet edition. March, 2000.
14. FAO: Issues in the global tobacco economy. Selected case studies: Raw materials, tropical and horticulture product service. Rome: Commodities and Trade Division, Food and Agriculture Organization of the United Nations, 2003.