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Trends in area, production and productivity of cashew in Konkan region of Maharashtra state: An economic analysis

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Abstract

Cashew has been an important crop in Konkan region of Maharashtra state. The present study was undertaken to study trends in area, production and productivity of cashew in Konkan region of Maharashtra state. District-wise trends in area, production, and productivity of cashewnut in Konkan region has been analyzed for the period of 40 years, i-e. 1981-82 to 2020-2021. The time series data has been divided into two periods viz. Period I from 1981-82 to 2000-01 which represents pre-liberalization period and period II from 2001-02 to 2020-2021 representing post-liberalization period. The compound growth rates of area, production, and productivity of cashew crops in the Konkan region registered positive growth rates during the period under study. The District-wise compound growth rates of area, production, and productivity of cashew were worked out. The highest growth rate of the area and production was observed in the Raigad district (13.41 and 17.91 percent per annum) followed by Ratnagiri (13.32 and 16.90 percent per annum), Sindhudurg (5.85 and 6.52 percent per annum), and Thane + Palghar districts (5.72 and 3.97 percent per annum). The growth rates of production and productivity of cashew indicated that impact of cashew research in Konkan region. While growth rate of area indicated the impact of implementation of various government program like Employment Guarantee Scheme (EGS) and Mahatma Gandhi National Rural Employment Guarantee (MGNREGA) schemes.

Keywords: Cashew, Konkan, trend, compound growth rate

Introduction

Horticultural crops play an important role in the economy of the nation, as there are different crops suitable for almost all the agro-climatic zones of the country. India has accelerated in total annual production of horticultural crops touching over 341.63 million tonnes during 2021-22 (Ministry of Agriculture and Farmers Welfare). India ranks second in fruits and vegetable production in the world, after China. As per National Horticulture Database (Second Advance Estimates) published by National Horticulture Board, during 2020-21, India produced 102.48 million metric tonnes of fruits and 200.45 million metric tonnes of vegetables. The area under cultivation of fruits stood at 9.6 million hectares while vegetables were cultivated at 10.86 million hectares. India ranks first in mango and banana production in the world and second in cashew production. Fresh fruits and vegetables have the lions share in exports. Horticultural sector accounts for about 37 percent of the total exports of agricultural commodities, and the exports have recorded sustained rising trend. (Jha *et al.* 2019) ^[9].

Maharashtra is quickly emerging as a "Horticultural State," since its fruits, such as Alphonso mango and cashew from Konkan, oranges from Nagpur, grapes from Nasik, and bananas from Jalgaon, are in high demand both within the country and overseas. Additionally, coconut from the Konkan coast has been included in the picture of the global fruit trade. As per first advance estimates, the total area under fruit crops during 2021-22 was 8.41 lakh ha, of which area under mango was the highest (1.68 lakh ha) followed by pomegranate (1.66 lakh ha), grapes (1.19 lakh ha), orange/mandarin (1.18 lakh ha), banana (0.84 lakh ha) and sweet orange (0.64 lakh ha) in the State. In comparison to the rest of the state, the Konkan region of Maharashtra features special and distinctive agro-climatic characteristics. The Konkan region's agro-climatic conditions are favourable for horticulture crops like mango, cashew, and coconut, among others.

Cashew nut, the native crop of Brazil was introduced in India by Portuguese in the 16th century.

Cashew nut is presently grown in an area of 1124 thousand hectares with annual production of 691 thousand MT. In India cashew nut is grown mainly in Maharashtra, Goa, Karnataka and Kerala along west coast and Tamil Nadu, Andhra Pradesh, Orissa, and West Bengal along the east coast. Traditionally, Cashew has been an important crop in the coastal region of the country but has been recently spreading to non-traditional area as well. The agroclimatic conditions of Konkan region of Maharashtra state are favourable for cashew production and hence it has been predominantly cashew zone in the state. The present study was undertaken to study trends in area, production and productivity of cashew in Konkan region of Maharashtra state.

Methodology

The study is based on secondary data like District-wise area, production, and productivity of cashewnut in Konkan region of Maharashtra state which was collected from the Agriculture office, Thane and various reports like 'Season and Crop Reports' and 'Statistical Abstracts of Maharashtra State'. District-wise trends in area, production, and productivity of cashewnut in Konkan region has been analyzed for the period of 40 years, i.e. 1981-82 to 2020-2021. The time series data has been divided into two periods viz. Period I from 1981-82 to 2000-01 which represents pre-liberalization period and period II from 2001-02 to 2020-2021 representing post-liberalization period.

To study the trend in area, production and productivity of cashew, the compound growth rate was computed by using following exponential model

$$Y = a b^x e$$

Where,

Y = Dependent variable for which growth is estimated. (i.e. area, production, productivity.)

a = Intercept or constant.

b = Regression coefficient.

x = Period in years. (1, 2, 3---n)

e = Error term.

The Compound Annual Growth Rate was computed by using the following formula.

$$CAGR = [\text{Antilog}(b) - 1] \times 100$$

Results and Discussion

District-wise compound growth rates of area, production, and productivity of cashew were worked out and the district-wise results are outlined in following paragraphs.

Sindhudurg district

The Cashew is an important commercial cash crop of this district predominantly grown under rainfed conditions. The research activities on cashew are also concentrated in this district through All India Co-ordinated Research Project (AICRP)-cashew at Vengurla. The annual growth rates of area production and productivity of cashew in the Sindhudurg district are presented in Table 1.

It is observed from Table 1 that, during overall period, the compound growth rate with respect to area and production was found to be positive and significant at 5 percent level, where as in case of productivity the compound growth rate was positive but non-significant, however the compound

growth rate was recorded to 5.85 and 6.52 percent per annum for area and production. The compound growth rates worked out for two sub-periods reflected that during period-I area, production, and productivity of cashew in the district registered a positive and significant growth of 4.18, 7.66, and 3.33 percent per annum, respectively.

Table 1: Compound growth rates of area, production, and productivity of Cashew nut in Sindhudurg district.

	Area	Production	Productivity
Period-I	4.18** (0.010)	7.66** (0.01)	3.33** (0.01)
Period-II	4.06** (0.005)	6.46** (0.006)	2.30** (0.007)
Overall	5.85** (0.003)	6.52** (0.003)	0.63 ^{NS} (0.004)

(Figures in parenthesis are SE.)

** indicates 5 percent level of significance.

The area under cashew in Sindhudurg district was 13600 hectares in the year 1981-82 and remained constant up to 1984-85. This area was mainly under local varieties. In the year 1985-86 area decreased to 9700 hectares, and thereafter area under cashew in the district increased steadily and reached to a maximum of 23289 hectares in the year 2000-01. This decrease in area under cashew may be attributed to the replacement of old cashew orchards with newly released high-yielding variety viz. Vengurla 4 by the university. This has been observed by substantial growth in production and productivity.

In period II, the compound growth rate with respect to area worked out to 4.06 percent per annum which was positively significant at 5 percent of level. Whereas, the compound growth rate was found to positive at 5 percent level of significance for production and productivity of cashew in Sindhudurg district and recorded 6.46 and 2.30 percent growth rate per annum, respectively. The area under cashew in the Sindhudurg district at the beginning of period – II (2001-02) was recorded to 32314 hectares which increased to 71900 hectares up to the year 2020-21. The expansion of area under cashew in the Sindhudurg district can be attributed to the plantation of new cashew orchards through Employment Guarantee Scheme (EGS) and Mahatma Gandhi National Rural Employment Guarantee (MGNREGA) schemes implemented by the government.

Ratnagiri District

Ratnagiri is also one of the important cashew-growing districts in the state. The annual compound growth rate of area, production and, productivity of cashew in Ratnagiri district is presented in Table 2.

The analysis of annual compound growth rates of area, production and productivity of cashew at overall level was positive and significant. There was an impressive significantly positive compound growth rate with respect to the area of cashew in the Ratnagiri district of Maharashtra recorded at 13.32 percent per annum. However, in the case of the production of cashew in the Ratnagiri district at overall level, the compound growth rate was found to be significantly positive and recorded 16.90 percent annual growth rate. Whereas 3.16 percent annual compound growth rate was recorded for productivity of cashew during the overall study period. The low growth in productivity as compared to production could be attributed to the fact that area under

cashew in Ratnagiri district increased sharply from the year 1998-99 and due to the huge area under newly planted cashew orchards the average productivity of cashew had registered low growth rate in the Ratnagiri district.

Table 2: Compound growth rates of area, production, and productivity of Cashew nut in Ratnagiri district.

	Area	Production	Productivity
Period-I	9.48** (0.03)	16.66** (0.03)	6.56** (0.01)
Period-II	6.63** (0.01)	15.28** (0.02)	8.12** (0.01)
Overall	13.32** (0.01)	16.90** (0.01)	3.16** (0.01)

(Figures in parenthesis are SE.)

** indicates 5 percent level of significance.

The compound growth rate for the two sub-period was worked out for Ratnagiri district. During period-I the area, production, and productivity of cashew significantly increased by 9.48, 16.66, and 6.56 percent per annum, respectively. In the initial years of the period-I the area under cashew was 2800 hectare which further declined to 1700 hectare in the year 1985-86 and thereafter, the area under cashew plantation steadily increased to 2637 hectare up to year 1997-98. The decrease in area of cashew plantation in the year 1985-86 may be due to the replacement of old cashew plantation with high yielding varieties like Vengurla 1 to 4, which were released during the same period by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. This replacement resulted in a steady increase in the area, production, and productivity by end of period-I.

The EGS-linked horticulture development program which was launched in the year 1990 also resulted in increase in the area under cashew plantation at end of period I and this rise continued during period – II. In the initial years of period II (2001-02) the area under cashew plantation was 30098 hectares which steadily raise to 94542 hectares in the year 2020-21. This rise is reflected in the annual growth rate of area under cashew plantation in Ratnagiri district of Maharashtra during the period – I which was positive and significant and recorded 6.63 percent growth rate per annum while, production increased significantly by 15.28 percent per annum. However, per annum compound growth in productivity was low (8.129) as compared to growth in production. Similarly, growth in production was more than growth in area under cashew plantation. The higher growth rate in production of cashew in Ratnagiri district could be attributed to plantation of newly released high-yielding varieties, while, the slow growth in productivity is due to the fact that, newly established cashew plantation had not attained age of fruiting.

Raigad district

Raigad district is known as the rice bowl of Maharashtra. However, with the implementation of EGS linked horticulture development program, the area under horticulture crops in Raigad district has increased. Raigad district is not known for cashew production. However, in some parts of western hilly areas cashew is being cultivated on wastelands. The annual growth rate of area, production, and productivity of cashew in the Raigad district is given in Table 3.

Table 3: Compound growth rates of area, production, and productivity of Cashew nut in Raigad district.

	Area	Production	Productivity
Period-I	20.59** (0.03)	30.59** (0.05)	8.29** (0.03)
Period-II	-3.09** (0.01)	-0.17 ^{NS} (0.02)	3.00 ^{NS} (0.02)
Overall	13.41** (0.01)	17.91** (0.01)	3.97** (0.01)

(Figures in parenthesis are SE.)

** indicates 5 percent level of significance.

The annual compound growth rate of area, production and productivity during overall study period in Raigad district was recorded positive and significant at 5 percent level. The annual compound growth rate of area under cashew plantation during the study period revealed that, the area under cashew plantation increased by 13.41 percent per annum. While, production and productivity in cashew registered compound growth rate of 17.91 and 3.97 percent per annum, respectively.

The very small area and production in the Raigad district during the initial period of cashew plantation have resulted in a high growth rate for area and production during the study period. The area under cashew plantation in Raigad district was 100 hectares in the year 1981-82 which raised to 4348 hectares at the end of the study period. This expansion in area has led to the high growth rate of production of cashew nuts during the overall study period.

The disaggregated analysis of the annual compound growth rate for two sub-periods showed that; during period-I, the area under cashew increased significantly by 20.59 percent per annum. While, growth rate of production and productivity was found to be significantly increased by 30.59 and 8.29 percent per annum, respectively. The high growth rate for the area under cashew in Raigad district can be attributed to the expansion of the area under cashew through EGS linked horticulture development program in the district.

It is also revealed from Table 3 that, during the period –II, the compound growth rate in area under cashew was found to be significant but negative which indicated that, the cashew plantation in Raigad district was declined by 3.09 percent per annum. However, the productivity of cashew plantation was negative but non-significant during the period- II. This may be due to extension in the area under industrialization and urbanization in the district. However, the growth rate of productivity was found to be positive but non-significant.

Thane and Palghar districts

The Thane district lies in the northern part of the Konkan region. In the year 2014, the Palghar district was partitioned out from the Thane district so, the data of these two districts was merged and the annual compound growth rate for the area, production, and productivity of cashew was worked out. The annual compound growth rates of area, production and productivity of cashew in Thane and Palghar district together during the period 1997-98 to 2020-21 is presented in Table 4.

Table 4: Compound growth rates of area, production, and productivity of Cashew nut in Thane and Palghar district.

	Area	Production	Productivity
Overall (1997-98 to 2020-21)	5.72** (0.02)	3.97 ^{NS} (0.02)	-1.65 ^{NS} (0.02)

(Figures in parenthesis are SE.)

** indicates 5 percent level of significance.

It is seen from Table 4 that, the compound growth rate for area under cashew was found to be positive and significant. Whereas, production of cashew plantation showed positive growth rate but non-significant. Similarly, the productivity of cashew in the Thane district showed negative but non-significant growth rate. However, the productivity of cashew showed a declining trend of 1.65 percent per annum. The growth in area, production and productivity of cashew plantation in Thane district was comparatively lower than other district of Konkan region due to industrialization and urbanization in the district.

Konkan Region

The Konkan region of Maharashtra state falls under the west coast plains and ghat region. Cashew is one of the important commercial cash crops of this region. The annual compound growth rate of area, production and productivity of cashew in the Konkan region is presented in Table 5.

Table 5: Compound growth rates of area, production, and productivity of Cashew nut in Konkan region.

	Area	Production	Productivity
Period-I	6.50** (0.01)	10.96** (0.01)	4.19** (0.01)
Period-II	4.98** (0.004)	10.42** (0.01)	5.18** (0.01)
Overall	8.53** (0.01)	10.13** (0.01)	1.47** (0.004)

(Figures in parenthesis are SE.)

** indicates 5 percent level of significance.

The Table 5 revealed that, during overall period, the compound growth rate with respect to area, production and productivity of the cashew plantation was worked out to be positive at 5 percent level of significance. During the overall period, the area under cashew plantation in the Konkan region increased from 16500 hectares to 174326.4 hectare at the end of study period. It is observed from Table 5 that, the area under cashew plantation increased by 8.53 percent per annum. The annual compound growth rate of production and productivity was found to be 10.13 and 1.47 percent per annum. The growth rate of production was found to be higher than the growth rate of area and productivity. This could be attributed to the effect of the replacement of local varieties by high-yielding cashew varieties in the late 80's and early 90's, which have attained full bearing stage in late 90's resulting in the high growth rate of production of cashew. Similarly, area expansion under cashew took place in the late nineties the with the implementation of the EGS linked horticulture development program and MGNREGA program by the government under which government insisted for plantation of horticultural crops by providing subsidies to farmer.

The compound growth rate in area, production and productivity of cashew plantation during period I was worked out and observed to be positively significant at 5 percent level. It is observed from Table 5 that, in period I area, Production and productivity of cashew increased by 6.50, 10.96 and 4.19 percent per annum, respectively. It may be noted that in the initial year of the period I, the area under cashew was 16500 hectares which declined to 11500 hectares in 1985-86 and thereafter area under cashew plantation increased continuously. At the end of period I, the area under cashew was 51548 hectares. The fall in area under cashew in 1985-86 could be attributed to the replacement of old low-

yielding cashew varieties by new high-yielding varieties released during the same period by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. This also resulted in an increase in production of cashew during the period –I. Similar results were reported by Thorat V. A. (2005) ^[8] for study period 1981 to 2001.

The compound growth in the area under cashew plantation during period II was found to be 4.98 percent per annum which is positive and significant. While, production and productivity of cashew increased significantly by 10.92 and 5.18 percent per annum. The growth rate of area under cashew was lower than period I. This may be due to the fact that during the initial time of period –II old cashew plantation were already been replaced and area expansion was only through the horticulture-linked EGS and MGNREGA program. The higher growth rate of production and productivity may be attributed to the fact that cashewnut orchards planted in the late 90s have attained a full fruiting stage during period II.

The analysis of compound growth rate for two sub periods revealed that the growth rate in area under cashew plantation was faster during period I as compared to period II. However, the growth in production of cashew during each period was almost equal. The results were in consonance with findings of Thorat V. A. (2005) ^[8], Nayak and Paled (2018) ^[5] and Kandeegan *et al.* (2020) ^[3].

Conclusions

Cashew is one of the important cash crops in the Konkan region of Maharashtra state. The area under cashew in Konkan region is expanding over the years. Similarly, the production and productivity were found to be rising over the years. The expansion of area under cashew in Konkan region can be attributed to implementation of government schemes like EGS linked horticulture program and MGNREGA. While rise in productivity can be attributed to the development of high yielding varieties by conducting cashew research in this region.

References

1. Acharya SP, Basavaraja H, Kunnal LB, Mahajanashetti SB, Bhat ARS. Growth in area, production and productivity of major crops in Karnataka. Karnataka J Agric. Sci. 2012;25(4):431-436.
2. Behura D, Naik D. Area, Production and Productivity Growth of Cashew in India with Special Reference to Its Export and Price. Indian Journal of Agricultural Economics. 1997;52(3):624.
3. Kandeegan M, Mahendran K, Moghana Lavanya. A comparative evaluation of trends in area, production and productivity of cashew in western and eastern regions of India. Indian Journal of Economics and Development. 2020;16(4):565-571.
4. Kulkarni BS, Ramachandra VA, Patil SM. Trends in area, production and productivity of cashew in India – An economic analysis. Internat. J Com. & Bus. Manage. 2012;5(2):128-133.
5. Nayak M, Paled M. (b) Trends in area, production, yield and export-import of cashew in India – An economic analysis. Int. J Curr. Microbiol. App. Sci. 2018;7(12):1-12.
6. Prabeena Ambidattu. An analysis of performance of agro based industries in Kerala with special reference to

- cashew nut. Indian Journal of Economics and Development. 2015;3(12):1-5.
7. Senthil A, Mahesh MP. Analysis of cashew nut production in India. Asia Pacific Journal of Marketing and Management Review. 2013;2(3):106-110.
 8. Thorat VA. Investment in research and development on major horticultural crops in Konkan region of Maharashtra – an economic analysis. Ph.D. thesis submitted to Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli; c2005.
 9. Jha MK, Jo M, Kim JH, Suk K. Microglia-astrocyte crosstalk: an intimate molecular conversation. The Neuroscientist. 2019 Jun;25(3):227-240.