GROWTH PERFORMANCE OF PRODUCTION AND PRODUCTIVITY OF COFFEE IN INDIA– AN ECONOMIC ANALYSIS

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Abstract: Coffee is an important commercial plantation crop and is one among the most traded commodities in the global market. In India coffee is a commercial crop and is grown by plantation method. Arabica and Robusta are the two types of coffee cultivated in commercial scale. In this paper an attempt is made to analyse the growth performance of planted area, production and productivity of coffee in India. This study is mainly based on a time series data has been collected for the years 1970-71 to 2013-14. For the analysis purpose, the study period is divided into two sub periods that is pre liberalization period from 1970-71 to 1991-92 and post liberalization period from 1992-93 to 2013-14. Trend analysis and the Compound Growth Rate are calculated to understand the changes during the pre and post liberalization periods.

Key Words: Coffee, Production, Productivity and Growth performance.

Introduction: Coffee is one of the most popular drinks in the world. Over 2.25 billion cups of coffee is consumed in the world every day. Over 90 percent of coffee production takes place in developing countries (Satya Sundaram, 2006). Worldwide coffee plants are cultivated in over 70 countries, primarily in equatorial Latin America, Southeast Asia, South Asia and Africa (Kumar Saddhu, 2004). The coffee plant belongs to the botanical family *Rubiacea.* Brazil is the world leader in the production of coffee. The other most important countries are Vietnam, Colombia, Ethiopia, Africa, Uganda, Kenya, North and Central America, India, Mexico, Honduras, Guatemala and Thailand.

India is one of the leading coffee producers in the world and holds the sixth position in the year 2013-14. Due to its climatic conditions and the nature of the soil, the Western Ghats are more suitable for coffee cultivation. In India the most important cultivated varieties are Arabica and Robusta. India has consistently been producing an average of 2, 70,000 metric tons of coffee per year. There are approximately 2, 50,000 coffee growers in India and 98 percent of them are small growers. As of 2014, the production of coffee in India was 4 percent of the total production in the world (B.H.Nagoor, 2010).

In India coffee is grown in tropical highlands, at height varying between 900 and 1800 meters above the sea level. Coffee is grown in 17 states of India. Its cultivation extends to 4, 18,975 hectares mainly in the southern states of Karnataka, Kerala and Tamil Nadu. These three states are the traditional areas of coffee production (Bimal Barch, 1998). Coffee is also cultivated in other Non-Traditional areas and North Eastern areas. Non- traditional areas include coastal tribal Andhra Pradesh and Orissa respectively. The north eastern areas comprising the seven sister states of Assam, Manipur, Meghalaya, Mizoram, Tripura, Nagaland and Arunachal Pradesh.

Coffee plantations in India are labour intensive. The labour component forms nearly 65 percent of the total production. At present the plantations offer employment opportunities for 6, 00,000 workers on daily basis (Jagdish and Ram, 2011). It is estimated that nearly a one million of people directly or indirectly depend on coffee for their livelihood.

Objective and Methodology: The main objective of this paper is to analyze the growth trends in planted area, production and productivity of coffee in India from 1970-71 to 2013-14 with the comparison of pre and post liberalization periods.

The study covers the India on the whole. This study is mainly based on a time series data. The study period is 1970-71 to 2013-14. The study period has been divided into two sub periods that is pre liberalization period from 1970-71 to 1991-92 and post liberalization period from 1992-93 to 2013-14. The data is obtained from different issues of coffee journal published by Coffee Board of India, Data Base on Coffee, Economic and Marketing Intelligence Unit and International Coffee Organization Statistics.

The overall trend of area, production and productivity of coffee in India has been fitted by trend line using the ordinary least square method. The equation of straight line trend is $Y_t = a + bX_t$. The annual compound growth rate of area under cultivation, production and productivity of coffee in India was computed using semilog model. The semilog model equation is Ln(Yt) = a + bXt. The b value may be used to compute the compound growth rate of the dependent variable. The compound growth rate coefficient is computed using the following formula. CGR = [antilog (b) -1] * 100.

Analysis and Discussion:

Period Wise Growth Analysis of Coffee Planted Area in India:

Table No. 1: Planted Area of Coffee (in 'ooo hectares)

Area	Mean	Std. Dev	Regression Coefficients		R^2	CGR
			a	b		
Period I	207.771	42.610	133.368*	6.470*	0.97	3.35
Period II	355.380	43.399	279.112*	6.632*	0.98	1.91
Total Area	281.576	85.909	131.503*	6.670*	0.99	2.53

Source: Computed data * indicates significance at 5 percent level

The Table No. 1 reveals that the average planted area of coffee in the period I is 207771 hectares, period II is 355380 hectares and the overall it was 281576 hectares. The result indicates that the average plantation total area under cultivation of coffee increased annually by 6470, 6632 and 6670 hectares respectively. The compound growth rates of respective periods are 3.35, 1.91 and 2.53 percent. The analysis showed that there was a positive and significant growth in both the periods. This indicates that there has been a steady increase in the plantation area of coffee from period I to period II. In fact the area under cultivation in both the periods has been increasing because of the high demand for Indian coffee in the domestic and international market. Coffee cultivation has also been supported with favorable climatic conditions and the increased labour force participation.

Period Wise Growth Analysis of Total Coffee Production in India:

Table No. 2: Production of Coffee (in 'ooo tons)

Production	Mean	Std. Dev	Regression Coefficients		R^2	CGR
			A	b		
Period I	128.247	39.592	76.665*	4.485*	0.54	3.56
Period II	264.203	42.983	202.391*	5.375*	0.66	2.22
Total Production	196.225	79.977	64.197*	5.868*	0.89	3.33

Source: Computed data * indicates significance at 5 percent level

The Table No. 2 shows that the average productions of coffee in the two periods are 128247 and 264203 tons respectively. The results indicate that the average total production of coffee in period I increased annually by 4485 tons. In period II it increased by 5375 tons. In period I, the production of coffee in India did not increase as much as in period II because of the uncertain weather conditions, shortage and glut in the market supply and the poor transport and storing facilities. The period II shows the increasing trend of coffee production but also faced many fluctuations because of the low prices of coffee in domestic and international market and the growers also not get the awareness about the plant protection, irrigation, rejuvenation and replanting coffee trees. The compound growth rates of respective periods are 3.56, 2.22 and 3.33 percent. From this analysis it can be inferred that the Indian coffee production is significant at 5 percent level and also have a positive growth rates.

Period Wise Growth Analysis of Coffee Productivity in India:

Table No. 3: Productivity of Coffee (kg/ha)

Productivity	Mean	Std. Dev	Regression Coefficients		R^2	CGR
			a	b		
Period I	667.273	147.277	567.533*	8.673	0.15	1.23
Period II	843.5	62.779	872.805*	-2.548	0.07	-0.29
Total Area	755.386	143.047	602.943*	6.775*	0.37	0.99

Source: Computed data * indicates significance at 5 percent level

The Table No.3 indicates that the average productivity of coffee in the period I is 667 kg/ha, period II is 843 kg/ha and the overall period it was 755 kg/ha. The result shows that the average total productivity of coffee increased annually by 8673, -2548 and 6775 kg/ha respectively. In the analysis of coffee yields, the regression coefficient for period II shows a negative growth rate and not statistically significant. Productivity of coffee during period II was found to be fluctuating from the beginning. The reasons for fluctuations are mainly the non-availability of credit and reduction in area under cultivation of coffee. This is also due to change in climatic conditions, inconsistent rainfall and resistance to new technologies.

Conclusion: The secondary data analysis on production and productivity of coffee in India has revealed that there is a positive variation in production and productivity of coffee in India during the pre and post liberalization periods. The result expressed that there is a considerable increase in area under cultivation of coffee after the trade

liberalization is taken place. It is evident from the discussion, the growth rate of coffee production increases during the study period. The trend analysis reveals that there is a positive annual change in the production of coffee in India. The productivity of coffee alone shows the negative growth rate in the post liberalization period. This is mainly because of the high fluctuations in the coffee prices. The better prices receives by growers has helped to improve the productivity of coffee. So from the analysis without a doubt there is a positive impact for trade liberalization on area under cultivation and the production of coffee in India.

The positive average production of coffee over the entire study period reveals that there is scope for increasing the coffee production for strengthening the coffee exports in India. This could be done by adopting new technology for coffee cultivation. The climatic events and supply shocks remain the real threat to the development of a balanced market and sustainable conditions for the Indian coffee economy. Government and financial institution should take appropriate steps to increase the credit facility to the growers, which will increase the production of coffee all over India and will help the country to face competition in the international market in the present globalised era.

Figure No.1: Total Production of Coffee in India

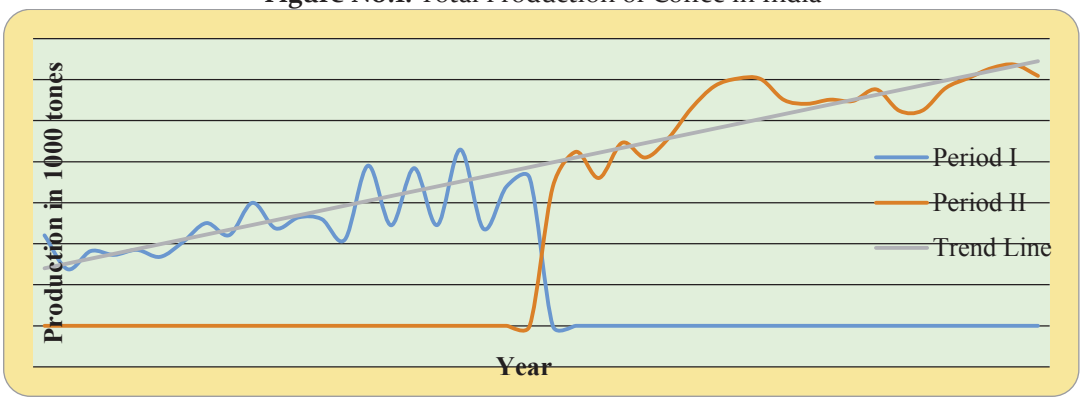
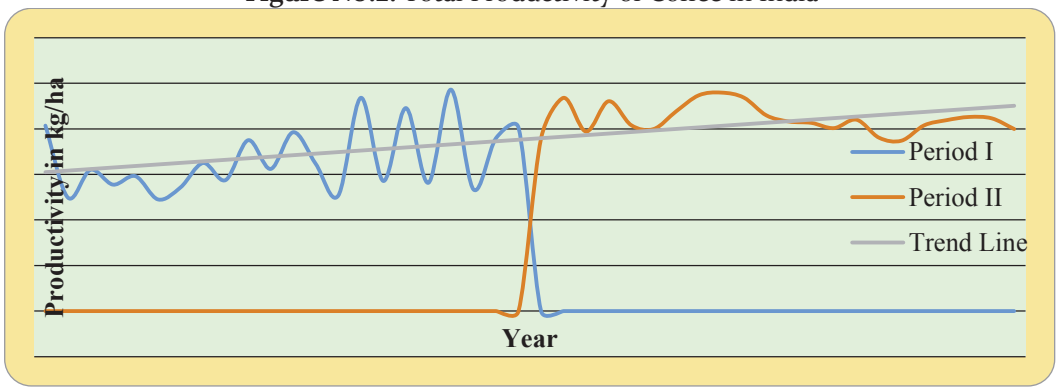


Figure No.2: Total Productivity of Coffee in India



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