

**AN ECONOMIC ANALYSIS OF EXPORT OF TEA  
- A CASE STUDY IN NILGIRI DISTRICT,  
TAMIL NADU**

By  
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B.Sc. (Ag.)



**THESIS SUBMITTED TO THE  
ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY  
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**DEPARTMENT OF AGRICULTURAL ECONOMICS  
COLLEGE OF AGRICULTURE  
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July, 2002

CERTIFICATE

This is to certify that the thesis entitled "AN ECONOMIC ANALYSIS OF EXPORT OF TEA - A CASE STUDY IN NILGIRI DISTRICT, TAMIL NADU" submitted in partial fulfillment of the requirements for the **CERTIFICATE** in **AGRICULTURE** of the Acharya N.G. Ranga Agricultural University, Hyderabad, is a record of the honest work of

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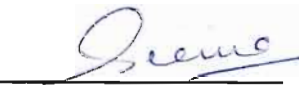

No part of the thesis has been submitted for any other degree or diploma. The published part has been fully acknowledged. All assistance and help received during the course of the investigation have been duly acknowledged by the author of the thesis.

  
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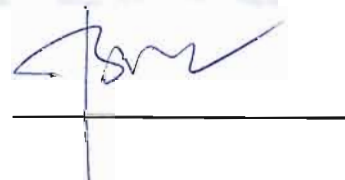
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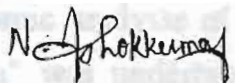
AGRICULTURAL ECONOMICS

## DECLARATION

I, N. ASHOK KUMAR hereby declare that the thesis entitled "AN ECONOMIC ANALYSIS OF EXPORT OF TEA - A CASE STUDY IN NILGIRI DISTRICT, TAMIL NADU" submitted to the ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY for the degree of MASTER OF SCIENCE IN AGRICULTURE is the result of original research work done by me. I also declare that any material contained in the thesis has not been published earlier in any manner.

Date : 28.11.2002

Place : Hyderabad

  
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## ABSTRACT

The present study entitled "An economic analysis of export of tea - A case study in Nilgiri district, Tamil Nadu" was undertaken to study the export performance of tea from India, to measure the quality attributes of tea influencing the export demand, to study the parameters influencing tea exports, to document the constraints associated with export and to suggest policy implications regarding export of tea.

Secondary data on quality, value and unit value of tea exports, production of tea in India, domestic price, domestic consumption, area under cultivation, etc., for the period of 1980-81 to 1999-2000 were collected from various issues of Tea Statistics, Tea Digest published by Tea Board, CMIE Reviews, etc. Per cent change over previous years, compound growth rates, coefficient of variation around the trend, Coppock's instability index, nominal protection coefficient, functional analysis and Kendall's coefficient of concordance test were used as analytical tools.

The results revealed that there was significant negative growth rate in quantity of export whereas value and unit value of tea exports showed a positive growth rates during the study period. Instability analysis showed that the instability was more in value of exports and unit value realisation compared to volume of exports. Nominal protection coefficient analysis was used as a measure of competitiveness. The results revealed that the Indian tea is marginally competitive in the world market.

Functional analysis in the form of double log-linear equation was fitted to analyse the factors influencing the tea exports and it was noticed that there was significant influence of domestic consumption, production and area under cultivation on export of tea.

Kendall's coefficient of concordance test was used to examine the constraints in tea exports. The problems identified regarding the export of tea were lack of order or demand from importing countries, high unit price realisation, phytosanitary problems, lack of export promotional measures and problems in maintenance of quality consistency.

*Introduction*

# INTRODUCTION

Tea culture forms the backbone of the Indian economy. The tea industry has witnessed a remarkable growth and diversification in the last five decades, with significant increases in production and exports. The tea sector contributes nearly 25 per cent to the Gross Domestic Product (GDP) of India. Agriculture and allied products accounts for around 17.50 per cent of India's GDP. As a global commodity, tea is one of the important and traditional exports.

Tea is one of the world's most important beverages and it is grown in Asia and Africa. Among the tea producing countries, India ranks first, followed by Kenya and Sri Lanka. World tea production in the last few decades has increased considerably from 1847 673 million kg in 1980-81 to 2434 million kg in 2000-01.

## Chapter I

# Introduction

India is one of the largest producer as well as the biggest consumer of tea in the world. India produces about 800 million kg of tea. Out of the total production, 60 per cent is consumed domestically and 20 per cent is exported to various countries. The increase in production of tea in India from 1961-62 (400 million kg) to 2000-01 (800 million kg) during last two decades. World import requirements of tea

FAO, The world tea production would increase by 2.5 per cent in the next five years, while export availability would increase by 3.8 per cent.

## CHAPTER I

# INTRODUCTION

Agriculture forms the backbone of the Indian economy and despite concerted industrialisation in the last five decades, still agriculture occupies a place of pride. This sector contributes nearly 25 per cent to the Gross Domestic Product of the country. Agriculture and allied products accounts for around 17-20 per cent of India's exports. Among agricultural commodities, tea is one of the important and traditional export item.

Tea is one of the world's most important beverage crops and it is grown widely in Asia and Africa. Among the tea producing countries, India ranks first, followed by China, Kenya and Sri Lanka. World tea production in the last two decades has grown considerably from 1847.67 M. kg in 1980-81 to 2424.36 M. kg in 1998-99<sup>1</sup>.

India is one of the largest producer as well as the biggest consumer of tea in the world. India produces about 800 million kg of tea. Out of the total production, 80 per cent is consumed domestically and 20 per cent is exported to various countries. Table 1.1 indicates the increase in production of tea in India from 560.427 million kg to 846.483 million kg during last two decades. World import requirements of tea in 2005 has been projected at 1.55 million tonnes against projected 1.6 million tonnes of exports as per FAO. There would be an average annual increase of 3.6 per cent in the import requirements, while export availability would increase by 3.8 per cent.

<sup>1</sup> Source : Tea digest (2000), Tea Board of India, Kolkata

Table 1.1 Area, production and productivity of tea in India (1981-2000)

Year	Area (ha)	Production (M.kg)	Yield (kg/ha)
1981	381,086	560.427	1461
1982	394,170	560.562	1422
1983	396,066	581.484	1468
1984	398,453	639.864	1606
1985	398,966	659.162	1645
1986	407,647	620.803	1523
1987	411,335	665.251	1617
1988	414,347	700.014	1689
1989	414,953	688.105	1658
1990	416,269	720.338	1731
1991	420,470	754.192	1794
1992	420,289	732.322	1742
1993	418,363	760.826	1819
1994	425,966	752.895	1768
1995	427,065	756.016	1770
1996	431,204	780.140	1809
1997	434,294	810.031	1865
1998	474,027	874.108	1844
1999	490,747	824.408	1680
2000	507,196	846.483	1669

Source: Tea Digest (2000), Tea Board of India, Kolkata

In India, tea is grown mainly in North-Eastern region comprising the states like Assam, West Bengal and Tripura and South Indian states of Tamil Nadu, Kerala and Karnataka. It is seen from Table 1.2 that majority of the total production is from Assam (53 per cent) followed by West Bengal, Tamil Nadu and Kerala. These four states are the major contributors of tea production.

Tea is one of the most important and valuable tradable commodities of the world. The traditional tea exporting countries are India, Sri Lanka, China and Indonesia. The new entries in the tea trade are Kenya, Bangladesh, Uganda, Tanzania and Zimbabwe which are also contributing notable tea exports in world trade.

The total exports from India during the year 1999-2000 amounted to 206.816 million kg valued at Rs. 1898.61 crores. The major importing countries of Indian tea are United Kingdom, Germany, USSR, USA, Poland, Iran, UAE and Saudi Arabia. Table 1.3 indicates that the Indian exports of tea in the world market was 26.09 per cent in 1980-81 and this has decreased to 15.27 per cent in 1999-2000. The main reason for the decline in the export share could be attributed to the increasing domestic consumption which accounts for nearly 80 per cent of total tea production of the country and also entry of new countries in world tea trade.

The major competing countries in the tea exports are Sri Lanka, Kenya, China and Indonesia. China is a major producer of green tea while Kenya is producing CTC tea. Sri Lanka and Indonesia are producing mainly orthodox varieties of tea. So, India is facing competition from the above countries in their respective type of tea exports.

Table 1.2 Statewise area, production and productivity of tea in India (2000)

States	Area (ha)	Production (M.kg)	Productivity (kg/ha)
Assam	267,392	451.236	1688
West Bengal	109,690	180.724	1648
Tamil Nadu	74,331	129.699	1745
Kerala	36,762	69.355	1887
Tripura	6,623	6.431	971
Karnataka	2,106	5.468	2596
Bihar	1,350	0.538	399
Uttar Pradesh	1,068	0.264	247
Himachal Pradesh	2,325	1.247	536
Manipur	907	0.096	106
Sikkim	296	0.105	355
Arunachal Pradesh	2176	0.993	456
Nagaland	1214	0.043	35
Meghalaya	351	0.140	399
Mizoram	391	0.039	100
Orissa	214	0.105	491
<b>Total India</b>	<b>507,196</b>	<b>846.483</b>	<b>1669</b>

Source: Tea Digest (2000), Tea Board of India, Kolkata

## 1.1 PROBLEM STATEMENT

India has been traditionally exporting tea to the world market. Falling contribution of India in the world tea trade is a matter of concern and it is important that we gear up to face the increasing competition and expand our exports of tea or at least manage to retain our share in the world market. The preference for high quality, low prices and regular supply of tea coupled with stiff competition from other countries in the international market have imposed serious challenges to the Indian tea industry. The situation, therefore, calls for timely understanding of the changing global tea market scenario as well as domestic market situation. The present study is an attempt to understand the export trade pattern of tea which will be useful in evolving appropriate strategies to sustain the export trade in tea.

Tamil Nadu is the leading state in South India growing tea under an area of 74,331 hectares and producing 129.699 M.kg during the year 1999-2000. In Tamil Nadu, Nilgiri district stands first in area (60,506 ha) and production (91.729 M.kgs). There are about 20 exporters of tea in the district. Hence, the study was undertaken in this district to analyse the export competitiveness of tea and various constraints faced by them.

## 1.2 OBJECTIVES OF THE STUDY

Following are the specific objectives of the present study:

1. To study the export performance and competitiveness of tea.
2. To measure the quality attributes of tea influencing export demand.

- 3. To determine the parameters influencing tea exports.
- 4. To identify the constraints associated with the export of tea.
- 5. To suggest the suitable policy measures regarding the export of tea.

**1.3 HYPOTHESIS**

In order to attain these objectives, the following hypothesis were formulated:

- 1. There is sufficient growth and stability in export of tea.
- 2. The tea exports from India is competitive and has comparative advantage.
- 3. A relationship between the tea exports and exogenous variables exists.
- 4. Number of constraints are associated with tea exports.

**1.4 SCOPE OF THE STUDY**

Though, India is the largest producer of tea in the world, the percentage of total production of tea exported declined from 35 per cent in 1980-81 to 14 per cent in 1998-99. For a proper planning to boost the exports, it is essential to identify the constraints and to study the trends in quantity, value and unit value of tea exports from the country for timely understanding of the changing global market scenario for tea. In this context, an attempt has been made to analyse the export performance of tea. This will be useful to the policy makers and planners to focus their attention for assessing the extent of progress and also in locating the weaknesses in existing export promotion programmes and policies and provide a holistic view into the future.

## 1.5 ORGANISATION OF THESIS

The thesis is presented in six chapters. The first chapter deals with the introduction, highlighting the problem statement along with the objectives of the study. The literature pertaining to the present study has been reviewed in the second chapter. In the third chapter, source of data and tools employed for the analysis of the data have been listed. In the fourth chapter, agro-economic features of the selected district is presented. The results are presented and discussed in the fifth chapter. Final chapter is meant to focus the summary of the study and its major findings along with the policy measures.

Table 1.3 World tea exports (Million Kgs)

Country	1980-81	1990-91	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
India	224.03	210.02	150.69	178.00	162.00	203.00	210.34	191.72
Sri Lanka	184.49	215.25	224.24	235.04	233.57	257.27	265.31	262.95
Indonesia	67.66	110.96	84.92	79.23	101.53	66.84	70.00	97.85
Bangladesh	30.98	26.97	23.64	25.43	26.15	25.16	22.22	15.18
Kenya	74.80	169.59	1842.51	237.50	244.23	198.38	263.02	241.74
Malwi	31.35	41.02	386.73	32.65	36.66	49.22	41.00	42.73
Uganda	0.53	4.76	10.97	10.68	14.98	18.26	23.36	22.10
Tanzania	13.29	14.91	18.57	20.51	18.43	19.91	22.22	21.36
Zimbabwe	123.60	11.51	8.58	9.16	11.57	11.21	10.80	15.21
World	858.70	1135.43	1031.12	1083.46	1115.18	1179.68	1259.58	1255.77
Share of India in world tea exports (%)	26.09	28.50	14.61	16.43	14.53	17.21	16.70	15.27

Source: Tea Digest (2000), Tea Board of India, Kolkata

## Chapter II

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# Review of Literature

## CHAPTER II

# REVIEW OF LITERATURE

In any research, it is essential to look into the relevant studies conducted so far. This helps the researcher to know the present status of research in the area and identify the gaps if any in these studies. Such a review would facilitate the researcher to develop a comprehensive knowledge on the objectives and enable him to draw meaningful conclusions. The literature reviewed is classified and presented under the following headings:

### 2.1 Studies on export performance

### 2.2 Studies on competitiveness

### 2.3 Studies on regression analysis

### 2.4 Studies on constraints associated with exports

## 2.1 STUDIES ON EXPORT PERFORMANCE

### 2.1.1 Studies on growth

Bandyopadhyay (1982) studied the growth rates of India's share in world tea exports by using the simple linear trend equation. The study revealed that India's share was 36.8 per cent of total world export in 1964 while in 1978, the same came down significantly to an unbelievable figure of 27.42 per cent though the total volume of world export of tea showed an upward trend, the reasons being spurt in demand for tea in

domestic market due to population boom and other associated problems were low productivity, high cost of production, scarcity of suitable land and capital and an impressive gain by other countries in their share.

Agarwal *et al.* (1982) analysed the export performance of selected agricultural commodities in India and concluded that there has been a positive and significant growth trend in production of coffee, tea and tobacco, whereas with regard to the quantity exported only coffee and tobacco showed positive and significant growth trends. There existed significant and positive correlation in the quantity of exports of coffee whereas, there was no significant correlation in the case of sugar, tea, groundnut, tobacco and jute.

Sridharan (1982) found that the share of India in the world export trade in cashew kernels declined from 94.84 per cent in 1960 to 37.39 per cent in 1978. Subsequently, in 1978 and 1980, India's share increased to 49.52 per cent and 47.95 per cent, respectively. The world exports of cashew kernels have been steadily growing upto 1975. During 1975-80, there was a decline in the world exports mainly due to fall in the production in East African countries.

Dass *et al.* (1985) estimated the trend in quantity, export value and unit value of coffee exports from India for the period ranging from 1956-57 to 1982-83. He observed that the annual compound growth rates of exports had fallen during the period between 1972-73 to 1982-83 though the world demand and domestic production were high. The quantity, export value and unit value revealed chronic instability during the same period.

Fialor (1985) analysed the production pattern and marketing of cocoa in Ghana and pointed out that the rate of growth in acreage under cocoa for the world as a whole had decreased. However, the total production had increased at 1.4 per cent per annum mainly because of a positive growth rate in productivity at 2.30 per cent per annum. The low growth rates of exports for the world as a whole (-2.30 % per annum) reflected that the international trade on cocoa was on the decline.

Prakash (1986) estimated the growth rates of production, consumption and exports of Indian coffee and concluded that the compound growth rate in production of Indian coffee was 4.51 per cent per annum during 1962-63 to 1981-82. The growth rate of consumption during the same period worked out to be 1.69 per cent per annum. Exports, however had recorded a growth rate of 6.94 per cent per annum.

Indira (1988) computed the rate of growth in internal releases of Indian coffee in comparison to the growth rates in production and exports. The compound growth rates were calculated for two time periods *viz.*, period I ranged from 1953-69 and period II from 1969-81. Between 1953-69, when production increased at an annual rate of 6.16 per cent, consumption increased at 3.13 per cent per annum, while, exports increased at a rate of 9.8 per cent. The annual rate of increase in production, internal releases and exports for the second period was much smaller relative to the first period. Production increased at an annual rate of 4.32 per cent while internal releases and exports recorded growth rates of 2.44 per cent and 5.79 per cent, respectively. For the entire period, these rates were 4.38 per cent, 2.34 per cent and 7.3 per cent in the same order.

Hemchandra (1989) computed the compound growth rates for volume of tea export and obtained a value of -0.98. The correlation coefficient between India's share in world tea export and the volume of world tea export has been found to be negative and statistically not significant, while, the regression coefficient of the former on the latter has been found to be negative and statistically significant.

The results of the study conducted by Mukherjee (1989) revealed an annual growth rate in export value of agricultural commodities as 4.9 per cent per annum (at constant prices) during 1970-71 and 1987-88. The growth rate in the volume of agricultural commodities export was quite low at 0.74 per cent over the years. India's share in the world exports has continuously declined over the years. He suggested for broad institutional development in agricultural production sector and economy of scale to systematically tackle the problems on the export front.

Rajashekharan and Radhakrishnan (1989) analysed the export performance of cashew and noticed that India's share in cashew kernel exports which was almost one hundred per cent in 1950 declined sharply to 55 per cent in 1986. In 1987-88, their share declined further to 42 per cent. They identified non-availability of raw nuts in adequate quantities as one of the major problems affecting cashew kernel exports. Another major problems was competition from other countries like Brazil. They suggested that if the country is not to lose further, it is essential that raw nut production should be increased preferably through increase in productivity.

Sandhu (1989) revealed that India's share in pepper exports in the world market remained stagnant except some marginal incremental changes during eighties. Indian

pepper was also priced high in USA market and export market share was also prominent relative to Brazilian and Indonesian pepper. Despite the competition, the market was favourable to Indian black pepper because of its quality.

Tilekar (1989) observed a consistent decrease in the total value of exports at constant prices. Consistency was also observed in trend of export of agricultural commodities during 1976-77 to 1983-84. It was noticed that the share of total value of agricultural exports declined from 1976-77 to 1983-84. He found that decline in agricultural exports might be due to low productivity and competition from other countries.

Viju Ipe (1989) studied the export performance of spices in India and concluded that spices have exhibited appreciable growth rates both in quantity exported and export earnings. But, they were marked by year to year fluctuations and the consequent inequalities. Among major spices, turmeric recorded the highest growth rate and instability in export earnings followed by ginger, cardamom and pepper. Similarly, among minor spices, growth in export earnings was highest in the case of chillies but cumin showed highest instability in export earnings.

Sinha (1990) identified some of the parameters relating to growth of Indian silk industry. He concluded that over a 37 year period from 1951-52 onwards, silk production in India registered a compound growth rate of 6.6 per cent. In recent years, under the influence of an intensive promotional effort, silk production had grown at over 10 per cent per annum. He also reported that export had also grown rapidly in recent years, at a growth rate of 12.7 per cent per annum over a period of 16 years.

Reddy (1991) analysed the growth rate of world exports of tea during the period between 1974 to 1998 by using exponential function. He concluded that global exports of tea had been increasing with a compound growth rate of 2.26 per cent per annum. The corresponding figures for Asia and Africa were 1.87 and 3.49 respectively. However, the tea exports in India and Sri Lanka were stagnant whereas in China and Kenya exports increased sharply at compound growth rate of 8.66 per cent and 6.97 per cent per annum respectively.

An examination of study conducted by Rameshchand and Tewari (1991) on growth and instability of Indian exports of agricultural commodities for the period of 1970-88 revealed that the rate of growth in exports of agricultural sector was slightly higher than the rate of growth in its imports. On the other hand, total merchandise imports exhibited a significantly higher growth rate (13.27 per cent per annum) compared to the rate of growth of total merchandise exports (9.87%). All the items included in agricultural sector except pulses, sugar, honey and forest products indicated positive growth rates in exports.

Brijbhushan and Garg (1991) observed a growth of 2.8 per cent per annum in quantity of plantation crops exported. On the other hand, export earnings significantly increased over the last three decades from a low level of Rs. 13.4 crores in 1962-63 to 298.1 crores in 1987-88. The unit value realisation witnessed an appreciable upward trend from Rs. 2.7 per kg to Rs. 42.41 per kg which made a considerable contribution in increasing export earnings.

Gemtesa (1991) compared the performance of Ethiopian coffee exports during the pre-revolution and post-revolution periods. The exponential growth model of the form  $y = ab^t e^n$  was employed. The results showed that export growth in the pre-revolution period was lower (1.51%) when compared to the post-revolution period (1.77%).

Hussain (1992) analysed the trends of spices in the world market and identified the major markets for spices as USA, Germany, Japan and certain Middle East countries. International sales to these markets have shown a continual upward trend in recent years. Although spices are traded in variety of forms, an estimated 80-85 per cent are marketed in the whole unground state.

Pal (1992) computed the growth rates in exports of agricultural commodities from India during the period 1970 to 1989. The growth of export earnings from all agricultural commodities was estimated at 6.67 per cent per annum. He concluded that the export earnings from agricultural products increased because of the rise in the unit value and export of non-traditional products.

Sreekanthan (1992) reported that the spices exports have registered an increase of 50 per cent in value and 19 per cent in quantity over 1990-91. In 1991-92, India's share in the global market was around 33 per cent as against the average share of about 22 per cent in the past. Chillies were the major contributors during 1991-92 bringing in foreign exchange equivalent to Rs. 971 millions followed by spice oils and oleoresins, earning Rs. 510 millions.

Veena (1992) worked out the growth rates of Indian coffee exports for the period 1965-1990 using exponential function of form  $Y = ab^t$ . She found that exports of plantation type coffee exhibited a compound growth rate of 3.6 per cent per annum while Arabica grew at a growth rate of 3.0 per cent. Robusta exports registered a marked compound growth rate of 10.7 per cent.

Jeromi and Ramanathan (1993) revealed that between 1975 and 1990, Sri Lanka recorded the highest annual compound growth rate of 24.59 per cent. This is mainly due to its low base in the initial years. Positive and statistically significant growth rate has been recorded only in the case of India. The annual compound growth rates of quantity, export value and unit price were 2.26, 8.39 and 5.99 per cent, respectively during 1950-51 to 1988-89.

Sharath (1993) worked out the growth rates in exports of cardamom from India using exponential function of the form  $Y = ab_t e^{ut}$ . A comparative performance was attempted splitting the time period into two. The first period from 1970-71 to 1979-80 and the second from 1980-81 to 1989-90. In the first period, the quantity of Indian exports registered a growth rate of 4.63 per cent while the value of exports grew at the rate of 27.9 per cent. These were mainly attributed to a 23 per cent increase in unit value realisation in contrast to a 17.05 per cent decline during the second period.

George (1994) estimated that during 1992-93, about 1,23,265 tonnes of different spice products were sold abroad, with a value of \$ 130.77 millions. In terms of value, spices constitute about 5 per cent of the agriculture and related products, exported from India. He also revealed that the world production of spices is estimated to be 5 Mt and growing at an annual rate of 3.6 per cent in quantity and 8.4 per cent in value.

Veena *et al.* (1994) studied the changing direction of Indian coffee exports and concluded that the actual export of Indian coffee to USA decreased from 21.59 per cent to about 12 per cent between 1965-67 and 1985-87. The share of Indian coffee exports to West Germany has increased from 1.54 per cent to 7.64 per cent between 1965-90. The actuals and projected both in quantity and percentage terms showed an increase trend in case of USSR from 24.94 per cent and 24.57 per cent in 1965 to 48 per cent and 62 per cent in 1987, respectively.

Thakur *et al.* (1995) studied the growth rate of Indian tea export price during the period from 1984 to 1988 by fitting exponential function in the form of  $Y = ab^t$ . The results revealed that export price of Indian tea were declining in USA market. The decline noted was about 18 per cent per annum for Indian tea, whereas per annum increase in Indian tea price in UK and USSR market was 1.84 and 1.58 per annum, respectively.

Jain *et al.* (1995) estimated the growth rate of agricultural exports between 1983-89 as 6.65 per cent per annum. He also expressed the need to promote the export performance of agricultural sector to make it more vibrant.

Kumar and Kumar (1996) fitted log-linear regression to analyse the performance of tea exports and results obtained indicated that tea exports increased at the compound rate of 0.29 per cent annually in volume terms and 5.09 per cent in value terms. The study also revealed that tea exports is largely constrained by domestic demand for tea. The income elasticity of demand for tea was positive and significant whereas the elasticity of substitution between tea and coffee was very low and insignificant.

Singh *et al.* (1997) opined that the share of Indian fruits and vegetable exports to the world's exports of vegetables and fruits have decreased from 1.2 per cent in 1970 to 0.7 per cent in 1992. The export trend of onion, grapes, apples and oranges were positive and the export of potato showed a significant negative growth. The analysis of compound growth rates revealed that grapes are the largest contributor to the growth of horticultural exports followed by apple, banana and orange.

Kundu *et al.* (1997) estimated that the exports of agricultural products during 1982-83 were the lowest (Rs. 32 lakhs only) but reached Rs. 57.80 crores in 1995-96, thereby showing a huge increase of 68.13 per cent in 1995-96 over 1980-81. The compound growth rate of about 4 per cent in floriculture export indicated that Indian floriculture exports project credible performance.

Ajjan *et al.* (1998) studied the export performance of senna and periwinkle in India and concluded that the overall compound growth rate in quantity of senna exported was only 1.55 per cent which might be due to wide fluctuations in exports and in case of value of exports, the growth was 14.46 per cent. In case of periwinkle, the wide fluctuations in quantity of exports resulted in a negative growth of 7.61 per cent while the export earnings were found to increase at the rate of 2.16 per cent per annum.

Gemtessa *et al.* (1998) examined the structure of Ethiopian coffee exports and concluded that the change in the total exports of Ethiopian coffee to all markets comprise the import growth effect (96%), market effect (26%) and competitive effect (-22%). The market share of Ethiopian coffee was less than 3 per cent of USA's coffee import which is perhaps the reason for the poor loyalty for Ethiopian coffee.

Shinde *et al.* (1999) computed the export performance of India in tea, coffee and tobacco and concluded that the growth rates for tea and tobacco were negative for India (-0.28 per cent and -1.09 per cent per annum, respectively), whereas, coffee showed very high growth rate, i.e., 6.08 per cent per annum for India's value of exports.

Olani Wirtu Wakjra (1999) analysed the growth in agricultural export of Sub-Saharan African countries. The findings indicated that the percentage share of agricultural exports in total merchandise exports between 1961 and 1997 decreased by 67.72 per cent except Ethiopia which registered an increasing trend. This was due to the domestic policy of government. In Ethiopia, it was agriculture-led industrialization which accounted for 11.23 per cent increase in the share of agricultural exports in total merchandise exports in 1997 over 1961.

Murthy and Subrahmanyam (1999) revealed that the export of fresh onions from India has increased at a compound growth rate of 18.53 per cent per annum. The dehydrated or dried onion exports from India increased at a growth rate of 19.14 per cent per annum. The growth rates in quantity of exports and export earnings were 57.05 per cent and 66.09 per cent, respectively for preserved onion.

Vani (1999) expressed that the chilli exports from Guntur have shown an increased trend over last ten years. She indicated the need to extend the activities of Spices Board to look into the problems of chilli growers.

Peter (2000) found that in chillies, exports increased in value terms by 52 per cent during 1998-99. An annual growth rate of 10 per cent is envisaged for chillies. Spices

exports during 1998-99 made an all time record in terms of value both in rupee and dollar (Rs. 1650.02 crores, \$ 398.90 millions). The overall export realisation was only 99 per cent of the target fixed for 1998-99 in quantity and 100 per cent in value.

Shinde *et al.* (2000) reported that India which exported fresh mangoes to the extent of 0.08 per cent of total production in the year 1980-81 increased up to 0.36 per cent, thereby recording 350 per cent rise in export of mango. They also suggested that the production and export trade of mango be given due consideration and priority to earn more exchange earnings in context of globalised marketing scenario.

Brajesh Jha (2002) studied the recent trends in India's tobacco exports. The results indicated that the unmanufactured tobacco accounts for around 90 per cent of export value of tobacco. The exports market for unmanufactured tobacco was concentrated in Europe (70 per cent) whereas the exports market for manufactured tobacco was concentrated in the Middle-East countries.

### 2.1.2 Studies on instability

Davis *et al.* (1980) studied the instability in the exports of agricultural products of the sub-Saharan African countries and found that the instability in agricultural export earnings being primarily associated with variations in quantity exported rather than with price variability. He emphasised the need to undertake research to determine the optimum range of agricultural diversification consistent with high and stable level of agricultural export earnings.

Harman (1984) examined the export price instability and producer price instability for main coffee exporting countries. The results indicated that a lower instability of producer price than of export prices became obvious, especially for African countries. The export price instability and the producer price instability, for Brazil were 29.5 per cent and 24.1 per cent, respectively and Columbia recorded 29.4 per cent and 19.6 per cent respectively for the same.

Narinder and Singhal (1988) analysed the instability in India's exports and found that instability was the highest in jute and the lowest in tea when value was considered cashew kernels were at the top and tea at the bottom regarding the instability in volume per unit. Value fluctuations were maximum for jute manufactures and minimum in cashew kernels.

Pal and Ray (1989) studied the export instability and economic growth in India and concluded that there was consistency in the magnitude of instability. The results indicated that among the agricultural products, sugar and raw cotton were most unstable sources of export earnings. The fluctuations in prices were the root cause of instability in coffee, tea, jute and raw cotton. For oil cakes, tobacco and sugar, fluctuations in quantity were the dominant cause of instability in export earnings. In coffee, cashew kernels, sugar, jute and raw cotton, the fluctuations in prices originated on supply side while in tea, oil cakes and tobacco, the fluctuating demand caused instability in prices.

Hazell *et al.* (1990) analysed the instability of Sri Lankan tea by using coefficient of variation during the period of 1961-87. He concluded that the variability in Sri Lankan tea export was 17.1 indicating that the instability was moderately higher than previous period.

Gemtessa (1991) compared the variability in export earnings of Ethiopian coffee over two periods i.e., pre-revolution period (1961-74) and post-revolution period (1975-83). The change in price variance contributed for a larger share of variance of export earnings. This accounted for 137.97 per cent increase in the variance of total earnings from coffee.

Veena (1992) found price instability as the single largest source contributing more than 60 per cent to the instability in the total Indian coffee export earning. She observed that the abolition of international coffee agreement was one of the main reason causing instability in prices which were expected to increase in future.

Jeromi and Ramanathan (1993) studied the instability of pepper in Indian and world market. They concluded that the world pepper exports from the producing countries have increased more than 5 times from 27.8 thousand tonnes in 1950 to 153 thousand tonnes in 1990. In terms of stability, India's performance was better and Sri Lanka recorded high degree of instability (1.04). They suggested that reducing cost of cultivation, increasing yield, deepening and widening of markets and the development of value added products would reduce the instability.

Mamata (1995) noticed the sources of instability in export earnings of the selected spices of India. She concluded that fluctuation in production of these spices in other producing countries and increased value of Indian spices in the world market have contributed mainly to instability in export earnings. The study emphasized the need to maintain this upsurge because of the emerging threat from other producing countries.

Ajjan *et al.* (1998) analysed the export performance of senna and periwinkle in India. The results indicated that in senna exports, instability was relatively higher in case of value of exports (44.8%) compared to unit value (41.9%) and volume of exports (40.08%). In periwinkle, there was higher instability of 101.56 per cent and 78.44 per cent in case of volume and value of exports, respectively, but in case of unit value, it was relatively stable with an instability index of 13.42 per cent. They concluded that the reason for high instability in the value could be contributed to the combined effect of instability in the volume and unit value.

Olani Wittu Wakira (1999) analysed the instability of export earnings for a sample of six countries between 1961 and 1997. The results indicated that the least instability index was recorded for Kenya (24.1) and largest instability index of 190.79 for quantity exported and 212.19 for value realised of fruits and vegetables was recorded for Rwanda.

The study conducted by Murthy and Subrahmanyam (1999) on growth and instability of onion exports from India where the instability index of fresh onion exports was estimated as 55.54. The instability index of dehydrated onion exports was found very high compared to fresh onions mainly due to the fact that during last few years, there was a large quantity of exports of dehydrated onions from India.

Sujatha (2001) studied growth and instability in chilli exports from India during 1981 to 2000. The results indicated that the coefficient of variation for total value of exports was maximum (55.76%) followed by quantity of exports (41.9 %). The coefficient of variation for unit value realised was relatively less (23.11 %).

## 2.2 STUDIES ON COMPETITIVENESS

Spriggs *et al.* (1982) analysed the relationship between Canadian and US wheat prices. They found that US wheat prices led Canadian wheat prices. The lack of any significant price relationship indicated the effectiveness of the US government's export subsidy programme.

Anderson and Ahn (1984) studied the protection policy and changing comparative advantage in Korean agriculture from the mid-1960s by using domestic resource cost methodology to measure the foreign exchange earnings foregone by keeping resources in rice production. They concluded that agricultural protection was unlikely to continue to achieve its objective of slowing the decline in food self-sufficiency and helping farmers keep pace with urban incomes unless it was increased continually.

Jamal (1987) analysed the cotton pricing policies followed by Pakistanese government and the nature of its intervention in cotton trade and quantified the effects of price distortion over the period of 1977-78 to 1982-83. Two distinct phases in the trends of nominal protection coefficient's (NPC's) indicated the government's divergence in maximising foreign exchange in earlier years to revenue maximisation in later years.

Gulati *et al.* (1990) computed nominal protection coefficient for six rice growing states *viz.*, Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Punjab and Uttar Pradesh under the exportable and importable hypothesis. The NPC under importable hypothesis for six states were 0.69, 0.65, 0.67, 0.65, 0.74 and 0.66, respectively and under exportable hypothesis only Punjab was considered and it had a NPC of 0.97. The results

also indicated that the rice cultivars were more heavily taxed on the pricing front under import competitive hypothesis.

Gulati *et al.* (1994) studied the export competitiveness of agricultural commodities using nominal protection coefficient. He concluded that the commodities like rice, banana, grapes, sapota, lychee, onion, tomato and mushroom were highly competitive with NPC less than 0.75 while wheat, mango, potato and tomato paste were moderately competitive with NPC ranging between 0.75 to 1.00.

Dass *et al.* (1994) analysed the comparative advantage, quantity, unit value, terms of trade and other major factors influencing exportable surplus of Indian tea exports by using time series data from 1970-71 to 1992-93. They observed that India had the highest yield per hectare of tea in relation to other tea exporting countries of the world till 1984, but, since 1985, Kenya has replaced India with respect to yield. The unit value realised for tea was highest for India (\$ 2.46) as against Sri Lanka (C\$ 1.76). In terms of value, tea exports increased from 1970-71 to 1992-93 indicating an annual increase of 9.6 per cent.

Datta (1996) computed NPC and DRC for Indian basmati and non-basmati rice. The results indicated that India had barely enough competitive strength in export of basmati rice. While, DRC analysis showed that an Indian exporter had some amount of buffer, because India required spending of only Re. 0.89 on non-tradable in order to earn one rupee of foreign exchange. In case of non-basmati rice these two ratios were below one.

Selvaraj *et al.* (1998) analysed the comparative advantage of agriculture in Tamil Nadu and concluded that rice and cotton has comparative advantage in terms of

productivity and output - input ratio whereas sugarcane and groundnut has comparative disadvantage.

Brajesh Jha (2000) studied the comparative advantage based on observed pattern of trade on the selected years viz., 1985, 1990, 1993, 1995 and 1997 by using Export Performance Ratio (EPR), Domestic Resource Coefficient (DRC), Effective Protection Coefficient (EPC) and Nominal Protection Coefficient (NPC). He concluded that India has comparative advantage in producing tobacco, cotton, jute and rice with DRC of 0.56, 0.58, 0.54 and 0.71 respectively and EPC of 0.77, 0.81, 0.66 and 0.89 respectively and NPC of 0.88, 0.91, 0.95 and 1.10 respectively.

## 2.3 STUDIES ON REGRESSION ANALYSIS

### 2.3.1 Studies on log-linear form of regression equation

Raveendaran and Aiyasamy (1982) studied the export growth and export prices of turmeric in India and concluded that the value of multiple determination was 0.6327 and statistically significant, indicating that nearly 63 per cent of variation in exports of turmeric can be explained by variables such as production lagged by one year, export price relative to domestic price of turmeric and time.

Arnade and Davidson (1987) analysed the export demand for US wheat by regression analysis for the period 1961-83. Estimates of price, income and exchange rate elasticities were 0.31, 0.48 and -0.24 respectively. US exporters failed to increase revenues with price within short-run. However, long-run responses were different as importers and exporters had time to adjust production, import and export policies.

Achoth and Ramanna (1988) analysed the export demand elasticities of tea from India as well as from other major tea exporting countries. Export demand elasticities and market share were calculated for tea from India, Sri Lanka, Kenya and Indonesia. India's share in world market was progressively diminishing. Except in the USA, demand for Indian tea was inelastic in all the important markets studied, in UK, the elasticity of demand for Indian tea was higher than that of East African tea. In the USSR, Indian tea had virtual monopoly.

Mazzami and Wong (1988) analysed the price and income elasticities of China's international trade to determine the appropriate policy for correcting China's short run trade deficits and ascertain the likely pattern of China's net trade position over time. In the long-run, the higher income elasticities estimated for import demand implied that China would grow at a lower rate than her trade partners so that she could improve her deteriorating trade balance.

Gutu and Roy (1989) computed the nature of export demand and estimated revenue maximising allocation of coffee exports among different markets. The results of regression analysis indicated that the demand for Ethiopian coffee in the major importing countries was relatively price elastic and there was scope for measuring export earnings by reallocating exports among quota countries.

Islam and Subramanian (1989) analysed price and income elasticities of demand for aggregate agricultural exports for all developing countries taken together as distinct from individual exporting countries. The results showed that when individual exporters of all developing countries were considered, income and price elasticities of demand for

tropical commodities such as tea, coffee, cocoa and banana was found to be low. Non-traditional exports like pineapple showed higher income and price elasticity. This indicated the importance for diversification of agricultural exports as a vehicle for their future growth.

Thomas *et al.* (1989) analysed the trend in cardamom exports from India and revealed that the response of cardamom exports to export price was highly significant and positive. The negative intercept (-1498.96) probably implied that the cardamom exports from India is non-responsive to the influence of specified explanatory variables until it exceeds the quantity of 1499 tonnes per annum.

Kumar and Kumar (1996) studied the factors influencing tea exports by using log-linear regression analysis. The results revealed that tea exports was largely constrained by domestic demand for tea and the income elasticity of demand for tea is positive and significant. They also concluded that the elasticity of substitution between tea and coffee was very low and insignificant and confirmed to the earlier results.

Sujatha (2001) analysed the chilli exports from India to identify the factors which influence the chilli exports by using log-linear regression analysis. The co-efficient of multiple determination was found to be 0.81 indicating best fit of equation. The results revealed that export price and exchange rate had significantly affected the chilli exports.

#### **2.4 STUDIES ON CONSTRAINTS ASSOCIATED WITH EXPORTS**

Bandyopadhyay (1982) identified that increase in domestic consumption demand, climatic reverses, high cost of production and paucity of suitable land and capital, tough

competition from other nations as the main problems experienced by both tea growers and exporters.

Mukherjee (1982) studied the agricultural exports and revealed that the factors which affected the agricultural exports were inelasticity of demand for primary products, competition among the countries supplying primary products, low productivity, competition from substitutes and increased protectionism in the developed countries.

Mitra (1991) pointed out the factors inhibiting the tea exports as inferior quality of tea, lack of superior processing technologies, increased domestic consumption and changes in the world demand for Indian tea.

Dahiya and Bhatia (1989) analysed the potato exports and revealed that inadequacy of cold storage capacity and transport bottlenecks along with non-availability of refrigerated shipping tonnage capacity as the main obstacles in promotion of potato exports.

Singh and Singh (1989) concluded from their study on Indian agricultural exports that higher cost of production which in turn is due to relatively low level of technology and marginal efficiency and sluggish growth of domestic agricultural production and rise in domestic consumption as the factors which adversely affected the competitiveness of our exports.

Sundaresan and Preeti Manon (1994) concluded that the high unit value, lack of export promotional measures and non-development of international marketing intelligence as the major constraints in Indian tea exports which deteriorated the Indian tea exports scenario in global market.

Thakur *et al.* (1995) identified that increased domestic consumption, higher cost of production, low productivity, paucity of suitable land, poor quality of tea, government exim policy, competition from other exporting countries and change in demand pattern in world tea trade as the constraints in production and export of tea.

Yadav (1995) analysed the problems and prospects of export of fruits and vegetables from India. The results revealed that the lack of infrastructural facilities for storage which resulted in heavy post-harvest losses as the major impediment for export of fruits and vegetables.

Gupta (1996) in his study on vegetable export promotion, recommended introduction of training and appropriate technology in harvesting, grading, packaging, storage and transportation practices of exportable vegetables as very much necessary for export promotion.

Rangi and Sidhu (1996) concluded that infrastructure in terms of bulk handling, grading, packing, transportation, storage and communication as necessary to promote export of all farm products in the competitive world market.

Autkar (1997) analysed the prospects for exports of horticulture products and concluded that India is able to process only one per cent or less than one per cent of total production of fruits and vegetables and thus there was great scope for processing to increase exports by way of value-added products.

Gupta (1997) suggested the strategies for boosting exports of agro-products from Punjab. The suggestions included setting up of a high powered board and development of market infrastructure in the shape of specialised market for exports of agro-products.

Nagaraj (1998) analysed the prospects of selected fruits, vegetables and processed fruits in India and expressed that to make Indian horticultural products much more competitive, minimise the cost of internal and international transport and handling costs, an effective system of packaging, processing, storage, transport and distribution both nationally and internationally organised by both the state and central government were necessary.

Singh *et al.* (2000) analysed the problems and prospects of export of sugar from India. The results revealed that the restrictions on export of sugar in India, import of cheap sugar as the major constraints faced by sugar industries which in turn affected the sugar exports.

Sujatha (2001) studied the export performance of chillies and concluded that the pesticide residues and aflatoxin were the major constraints in export of chilli.

Brajesh Jha (2002) made an attempt to identify the constraints in tobacco exports and concluded that poor quality of Indian tobacco specially pesticide residues and highly price elastic nature of tobacco as the major constraints which is affecting tobacco exports from India.

## Chapter III

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# Materials and Methods

### TYPES OF ACTS

Table 1.1 The various types of acts collected in the survey. The table lists the types of acts and the number of acts collected.

## CHAPTER III

### MATERIALS AND METHODS

Perfect understanding and knowledge of the data is a sine-quo-non for any scientific enquiry. Hence, this chapter deals with the methodology followed in the present study, which includes selection of the study area, data base and source, analytical tools employed in achieving the objectives of the study. Compound growth rate, Coefficient of variation, Coppock's instability index, Nominal protection coefficient (NPC), Functional Analysis, Kendall's coefficient of concordance test, etc., are the important analytical tools being used in this study.

#### 3.1 SAMPLING DESIGN

Nilgiri district of Tamil Nadu was purposively selected for the study since it ranks first in area, production as well as in export of tea. Coonoor town from Nilgiri district was purposively selected as majority of exporters are concentrated in this town.

#### 3.2 TYPES OF DATA

Secondary data on area, production, productivity, domestic price, export price, domestic consumption and quantity of export over the period of 1980-81 to 1999-2000 was collected to study the growth and instability of the exports and competitiveness of tea from India. The various quality attributes influencing the tea export was also obtained from the secondary source. Primary data regarding the constraints being experienced by the tea exporters was collected.

### 3.3 PERIOD OF STUDY

The secondary data was collected for the period ranging from the year 1980-81 to 1999-2000. This period was quite crucial for India because of the stiff competition being faced from other tea exporting countries like Sri Lanka, Kenya, China, etc. The reference period of study for the primary data was 2001-2002.

### 3.4 SOURCES OF DATA

The primary data was collected from a sample of ten tea exporters who were selected randomly from the leading twenty exporters from the district under study. The secondary data source was Tea Board Reviews, Tea Statistics, Tea Digest 2000 - a publication of Tea Board, CMIE Reports, etc. The information collected was with regard to production of tea, quantity of tea exports, value of tea exports, unit value of tea exports, domestic price of tea, exchange rate (Rs/Dollar) and domestic consumption.

### 3.5 TOOLS OF ANALYSIS

To assess the growth and instability in export of tea, separate growth rates and instability indices were computed for the quantity exported, export earnings and for unit value of exports. Compound growth rate was used as measure of growth. Coefficient of variation was used as a measure of instability and Coppock's instability index was used as an index of instability.

To analyse the export competitiveness of tea, a simple measure known as nominal protection coefficient was used. Regression equation in log-linear form was worked out

to identify the parameters affecting the export of tea. To test whether there is significant agreement among exporters about the constraints in the export of tea, Kendall's coefficient of concordance test was worked out. In addition to this, conjoint analysis was also tried to identify the important quality attributes for tea exports but due to lack of sufficient parameters on quality attributes, the results are not presented.

### 3.6 ANALYSIS OF EXPORT PERFORMANCE OF TEA

#### 3.6.1 Analysis of growth

The growth in export of tea from India was estimated for quantity exported, export earnings and unit value of exports by using the following analytical tools:

##### 3.6.1.1 Per cent change over previous year

Per cent change over previous year was taken as a measure of annual fluctuations for quantity, value and unit value of tea. Per cent change over previous year for  $t^{\text{th}}$  year is given by:

$$\frac{E_t - E_{t-1}}{E_{t-1}} \times 100$$

$E_t$ ,  $E_{t-1}$  represents the quantity exported in  $t^{\text{th}}$  and  $(t-1)^{\text{th}}$  period, respectively. Similar procedure was followed for the value of exports and unit value.

### 3.6.1.2 Compound growth rates

In the present study, the compound growth rates in export of tea were obtained by fitting the following exponential function. The adequacy of the model for the respective series was indicated by the coefficient of multiple determination ( $R^2$ ):

$$Y = ab^t$$

Where,

Y = Dependent variable for which growth rate is estimated

a = intercept

b = regression coefficient

t = time variable

The compound growth rate ( $r$ ) was obtained for the logarithmic form of the equation as below:

$$\log y = \log a + t \log b$$

The per cent compound growth rate ( $r$ ) is given as,  $r = [ (\text{Anti log of } \log b) - 1 ] \times 100$ .

The compound growth rate was tested for their significance by using the following formula:

$$t = \frac{r}{SE(r)}$$

Where,

$$SE(r) = \frac{100 b}{\log_{10} e} \times SE(\log b)$$

### 3.6.2 Analysis of instability

Instability in export of tea in terms of quantity of export, value of export and unit value was worked out by using coefficient of variation and Coppock's instability index. Value of exports is the total quantity of exports expressed in terms of money value whereas unit value of export is obtained by dividing total value of exports with the quantity exported.

#### 3.6.2.1 Coefficient of variation

Coefficient of variation around the mean was used as a measure of instability in the quantity exported and unit value. The coefficient of variation (CV) was calculated using the formula:

$$CV = \frac{\text{Standard deviation } (\sigma)}{\text{Mean } (\bar{x})} \times 100$$

A linear trend was fitted to the original data on quantity, value and unit value of exports and the trend coefficient was tested for its significance wherever the trend coefficient of series was found significant. The coefficient of variation around the trend rather than the coefficient of variation around the mean was used as an index of

instability. The formula suggested by Cuddy and Dell (1978) to compute the degree of variation around the trend was as follows:

$$CV_t(\%) = \frac{S.D}{\text{Mean}} \times 100 \times \sqrt{1 - R^2}$$

i.e., coefficient of variation around the mean was multiplied by the square root of the difference between the unity and coefficient of multiple determination ( $R^2$ ) of the trend equation  $Y = a + bt$ .

### 3.6.2.2 Coppock's instability index (CII)

CII is a close approximation of the average year to year per cent variation adjusted for trend.

The algebraic form of equation is:

$$C.I.I = [\text{anti log } \sqrt{V \log - 1}] \times 100$$

$$V \log = \frac{\sum [\log(X_{t+1} / X_t) - m]^2}{N - 1}$$

Where,

$X_t$  = Export in the year t

N = Number of years

m = Arithmetic mean of difference between the logs of  $X_t$ ,  $X_{t-1}$  and  $X_{t+1}$ ,  $X_{t+2}$ , etc.

V log = Logarithmic variance of the series

Steps involved in the construction of Coppock's instability index:

- i) Logarithms are obtained for each annual value of the variable.
- ii) The logarithms of the value for year 1 is subtracted from the logarithm of the value for year 2 . . . . etc., in order to get the first difference of the logarithms.
- iii) The arithmetic mean of the logarithmic first difference is then obtained.
- iv) The logarithmic mean is then subtracted from each year to year logarithmic first difference in order to obtain the logarithmic difference between actual and the average (or trend) year to year logarithmic differences.
- v) The logarithmic difference from the trend are then squared, summed up and divided by the number of years minus one. The resulting number is referred to as "log variance".
- vi) The next step is to take the square root of the variance and obtain the antilog of the square root value. Unity is then subtracted from the antilog and the decimal moved 2 places to the right.
- vii) The resulting instability index is a measure of variation around the trend.

### **3.7 ANALYSIS OF EXPORT COMPETITIVENESS OF TEA**

Competitiveness is the ability of a nation to grow successfully and to maintain its share of world trade. The export competitiveness of tea in the present study has been assessed by using a simple measure known as Nominal Protection Coefficient (NPC).

Nominal Protection Coefficient is the ratio of domestic price to the border price or reference price.

NPC helps in measuring the divergence of domestic price from the international price and thus determines the degree of export competitiveness of the commodity in question i.e., if NPC is less than unity, the commodity under consideration is export competitive.

NPC < 0.5 - Highly competitive

In between 0.5 - 1.0 - Moderately competitive

> 1 - Non-competitive

The NPC is calculated as follows:

$$\text{NPC} = \frac{P_d}{P_r}$$

Where,

NPC = Nominal protection coefficient of tea

$P_d$  = Domestic price of tea

$P_r$  = Reference price or border price of tea

The domestic price is the auction price of tea prevailing in selected market of the country. The reference price is the international price adjusted for transfer costs, marketing and trading margins including any processing to make the domestic commodity equivalent to the internationally traded commodity.

### 3.8 FUNCTIONAL ANALYSIS

Cobb-Douglas type of functional equation is worked out to study the factors influencing the tea exports using double log-linear regression equation.

Factors affecting the export of tea are estimated by developing a log-linear relationship between tea exports from India and production, export price, domestic price, domestic consumption and exchange rate.

The usual form of this function is as follows:

$$Y = \prod_{i=1}^n X_i^{b_i} e^{u_i}$$

Where,

Y	=	India's tea exports
X <sub>1</sub> to X <sub>n</sub>	=	Independent variable considered in export
b <sub>1</sub> to b <sub>n</sub>	=	Respective elasticities of X <sub>1</sub> to X <sub>n</sub>
a	=	intercept

In the present study, the function was fitted in log-linear form with India's exports (y) as dependent variable and X<sup>1</sup> to X<sub>n</sub> as explanatory / independent variables.

The function of double log-linear form would be:

$$\log y = \log a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + b_5 \log x_5 + b_6 \log x_6 + e_i$$

Where,

$y$	=	Export of tea from India (m.kg)
$x_1$	=	Production of tea in India (m.kg)
$x_2$	=	Export price of tea (Rs/kg)
$x_3$	=	Domestic price of tea (Rs/kg)
$x_4$	=	Exchange rate (Value of US dollar in terms of rupees)
$x_5$	=	Domestic consumption (m.kg)
$x_6$	=	Area of production (hectares)
$b_1$ to $b_6$	=	Respective elasticities of $x_1$ to $x_5$
$e_i$	=	Error term

For testing the regression coefficients 't' value was calculated by using the formula:

$$t = \frac{b_i}{\text{SE of } b_i}$$

Where,

$b_i$	=	Elasticity of independent variable $x_i$
SE of $b_i$	=	Standard error of $b_i$

### 3.9 ANALYSIS OF CONSTRAINTS

To identify the constraints in export of tea, a questionnaire was designed covering the aspects of collection of produce, infrastructural facilities and market information, etc. For each of the question on constraints, respondents were asked to indicate how important each constraint was on a scale of 0 to 3

0	=	not present
1	=	little practical importance
2	=	some what important
3	=	very important

After collecting the data, the entire data was analysed with the help of simple statistical tool i.e., averages. Finally, ranks were assigned to each constraint ranging from 1 to 10. After ranking was done, Kendall's coefficient of concordance test was used to find out whether there is significant agreement among all the exporters selected. If there is significant agreement, then final raking can be assigned to constraints.

Kendall's coefficient of concordance test (W) can be calculated as follows:

$$W = \frac{12 \sum (R_i - \bar{R})^2}{K^2(N^3 - N)}$$

Where,

R	=	mean of ranks assigned to constraints
$R_i$	=	rank given to $i^{\text{th}}$ constraint
K	=	number of sample taken i.e., number of exporters selected
N	=	number of constraints

To test the significance of W, Chi-square test was used as follows:

$$\chi^2 = K(N-1)W \text{ at } (N-1) \text{ df}$$

If there is any ties in the ranking, the following formula can be used:

$$W = \frac{12 \sum (R_i - \bar{R})^2}{K^2(N^3 - N) - K(\sum t^3 - \sum t)}$$

Where,  $t$  = ties in ranking

## Chapter IV

# Agro-Economic Features

CHAPTER IV  
AGRO-ECONOMIC FEATURES

This chapter deals with important agro-economic features of study area such as location, area, soil, climate, rainfall, land utilization pattern, demographic pattern and cropping pattern. The present study is done in Nilgiri district of Tamil Nadu state.

LOCATION

Nilgiri is a mountain district located in the western part of the state bordering Kerala and Karnataka.

Chapter IV

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*Agra-Economic  
Features*

AREA

The present study is done in Nilgiri district of Tamil Nadu state. The Nilgiri district is situated in the western part of the state bordering Kerala and Karnataka.

SOILS

The soil is laterite with pH ranging from 4.5 to 5.0. The soil is deficient in phosphorus and nitrogen with high content of nitrogen and organic matter.

## CHAPTER IV

# AGRO-ECONOMIC FEATURES

This chapter deals with important agro-economic features of study area such as location, area, soil, climate, rainfall, land utilisation pattern, demographic features and cropping pattern. The present study pertains to Nilgiri district of Tamil Nadu state.

### 4.1 LOCATION

Nilgiri is a mountain district situated to the north-western part of the state bordering Kerala and Karnataka state. It lies between  $11^{\circ}10'$  and  $11^{\circ}43'$  North latitudes and  $76^{\circ}14'$  and  $77^{\circ}02'$  East longitude with an altitude of 900 to 2636 meters above mean sea level.

### 4.2 AREA

The geographical extent of Nilgiri district is 2,549.00 sq. km accounting for 1.96 per cent of the geographical area of Tamil Nadu state. The Nilgiri district is divided into the revenue divisions namely Coonoor and Gudalur with four taluks under each with a total of 45 revenue villages.

### 4.3 SOILS

The soil is laterite with pH ranging from 4.5 to 5.0. The soil is deficient in phosphorus and potash with high content of nitrogen and organic-matter.

#### 4.4 CLIMATE AND RAINFALL

Nilgiri experiences a pleasant climate with temperature ranging between 18°C to 24°C. The humidity of the region ranges between 75 to 80 per cent.

Nilgiri receives rainfall during South-West and North-East monsoon. The average annual normal rainfall is 1400 mm. Table 4.1 shows monthwise maximum and minimum temperature and the rainfall pattern of the district.

#### 4.5 LAND UTILISATION PATTERN

Land utilisation pattern of Nilgiri district is furnished in Table 4.2, which provides a broad overview of land put under various uses. It is observed that 56.42 per cent of total area is under forest and the percentage of land put under non-agricultural use is 3.29. The net area sown is 28 per cent of the total geographical area.

#### 4.6 CROPPING PATTERN

The net area under cultivation in the Nilgiri district is 71, 225 hectares. The main food crops are paddy, ragi, samai and potato. Tea and coffee are the important non-food plantation crops of the district. Table 4.3 shows area under different crops during the year 1997-98.

#### 4.7 DEMOGRAPHIC PARTICULARS

Demographic pattern of the district is presented in Table 4.4. The total population of the district as per 1991 census is 7,10,214. It is observed that the rural population is

**Table 4.1** Maximum and minimum temperature and rainfall of the Nilgiri district

Station : Udhagamandalam (1998)

Month	Temperature (°C)		Rainfall (mm)
	Maximum	Minimum	
January	21.4	5.4	-
February	23.6	6.8	-
March	22.4	8.4	10.0
April	23.6	10.7	42.8
May	24.3	11.3	68.6
June	19.0	10.4	87.5
July	18.01	10.4	359.9
August	17.9	9.8	53.3
September	19.4	9.98	130.8
October	19.5	9.3	161.4
November	20.03	7.6	73.4
December	21.03	4.8	5.8
<b>Total</b>			<b>993.0</b>

Source : Assistant Director of Statistics, Nilgiri district

Table 4.1(a) Abstract of main non-plantation crops grown in Nilgiri district (1988-99)

S.No.	Crop	Area (Hect)
1.	Paddy	135.7
2.	Chickpea	100
	Ragi	15
	Potato	3,331
	Tea	199
		1912

Table 4.2 Land utilisation pattern of the Nilgiri district

	Land use pattern	Area in hectares	Percentage to total geographical area
1.	Land geographical area	2,54,381	100
2.	Forest	1,43,529	56.42
3.	Barren and uncultivable land	2,709	1.07
4.	Land put under non-agriculture use	8,378	3.29
5.	Cultivable wastes	2,823	1.11
6.	Permanent pastures and other grazing lands	5,733	2.25
7.	Land under tree crops and groves	1,504	0.59
8.	Current fallow	11,698	4.60
9.	Other fallow lands	6,782	2.67
10.	New area sown	71,225	28.0

Source: Assistant Director of Statistics, Nilgiri district

Table 4.3(a) Abstract of main non-plantation crops grown in Nilgiri district (1998-99)

S.No.	Crop	Area (ha)
1.	Paddy	155
2.	Cholam	59
3.	Ragi	15
4.	Potato	3,331
5.	Tapioca	199
6.	Carrot	1912
7.	Beet root	102
8.	Beans	89
9.	Cabbage	688
10.	Groundnut	148
11.	Sugarcane	50
12.	Banana	390
13.	Mango	32
14.	Jack fruit	103
15.	Guava	62
16.	Pear	95
17.	Orange	470

Source : Assistant Director of Statistics, Nilgiri district (1998-99)

Table 4.3(b) Non-food plantation crops, drugs, narcotics and others (1998-99)

S.No.	Name of the crop(s)	Area (ha)
1.	Coffee	9,601
2.	Tea	49,759
3.	Chinchona	209
4.	Jernium	28
5.	Lemon grass	211
6.	Eucalyptus	801

Source: Assistant Director of Statistics, Nilgiri District (1998-99)

3,56,784 and it is slightly higher than the urban population of 3,53,430. The density of population per square kilometer was found to be 279. There are 983 females per thousand males in the district.

#### 4.8 LITERACY STATUS

Literacy rate of the district is 71.70 per cent. Male literates are 81.79 per cent and female literates are 61.47 per cent of total population. Table 4.4 shows the literacy rate of district in per cent terms.

Total	3,56,784	100.00
Males	1,78,129	50.00
Females	1,78,655	50.00
Urban	3,53,430	99.06
Rural	3,53,354	99.06
Density of population (persons per sq. km)	279	
Sex ratio (number of females per 1000 males)	983	
Literacy rate (%)		
Total	71.70	
Males	81.79	
Females	61.47	
Rural	67.02	
Male	78.75	
Female	50.00	
Urban	76.49	
Male	84.88	
Female	67.84	



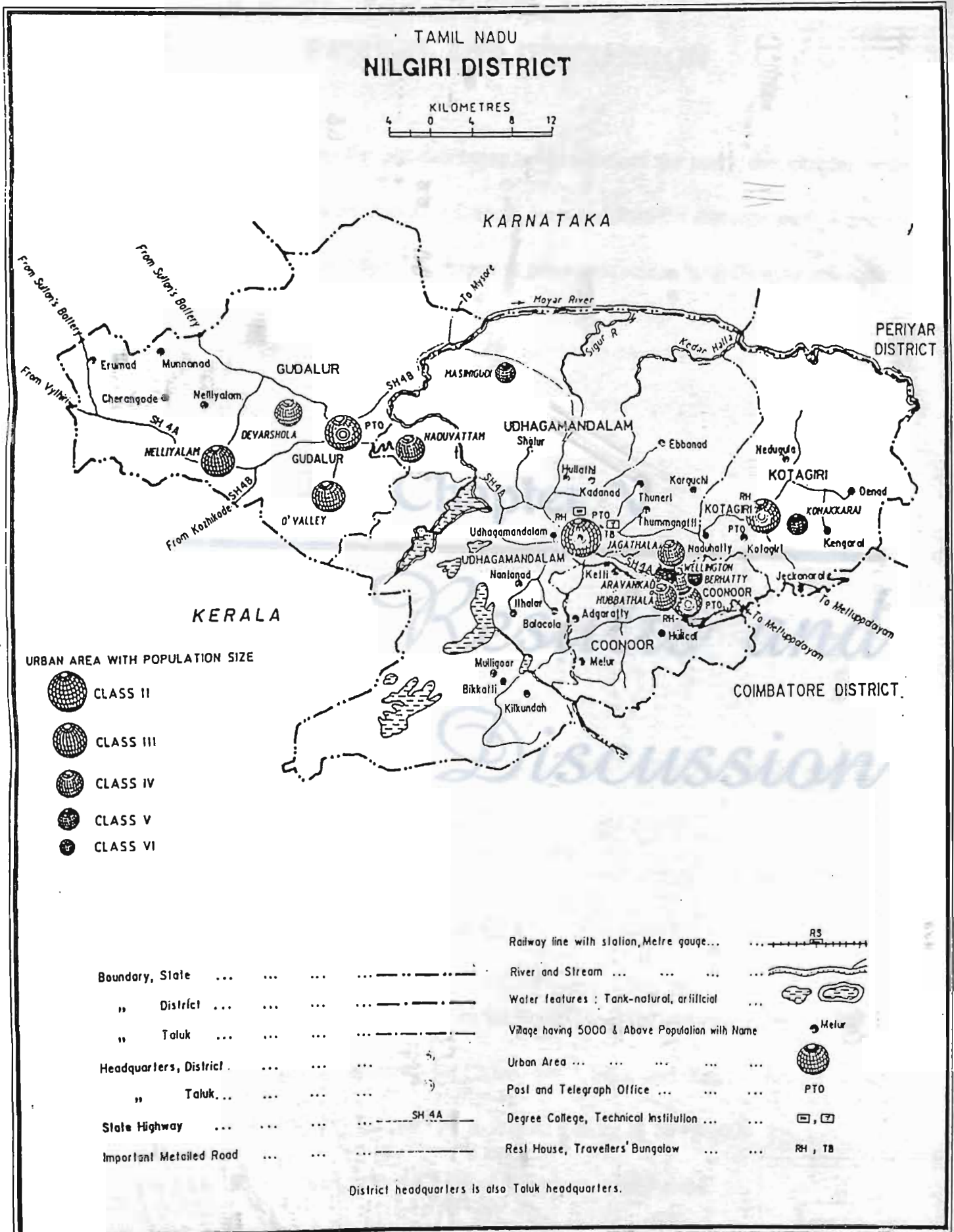
Table 4.4 Demographic features of Nilgiri district (1991 census)

Particulars		Population in 1991	Total (%)
1.	Total	710,214	100.00
	Males	358,129	50.43
	Females	352,085	49.67
2.	Rural	356,784	50.24
	Males	178,910	25.19
	Females	177,874	25.05
3.	Urban	353,430	49.76
	Males	179,219	25.23
	Females	174,211	24.53
4.	Density of population (persons per sq. km)	279	
5.	Sex ration (number of females per 1000 males)	983	
6.	Literacy rate (%)		
	Total	71.70	
	Males	81.79	
	Females	61.47	
a)	Rural	67.02	
	Male	78.75	
	Female	55.26	
b)	Urban	76.45	
	Male	84.84	
	Female	67.84	

Source: Assistant Director of Statistics, Nilgiri district



Fig. No. 4.1 Map of Nilgiri District



Based upon Survey of India map with the permission of the Surveyor General of India.

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CHAPTER V  
RESULTS AND DISCUSSION

In accordance with the pre-determined objectives of the study, this chapter deals with presentation and description of results generated from the research work. For easy reading and convenience this chapter is presented under the following sub-headings:

- 5.1 Export performance of tea
- 5.1.1 General analysis
- 5.1.2 Instability
- 5.1.3 Export composition of tea

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## Chapter V

# Results and Discussion

- 5.2 Factors influencing export
- 5.2.1 Functional regression
- 5.2.2 Error correction mechanism
- 5.2.3 Error correction mechanism
- 5.2.4 Error correction mechanism
- 5.2.5 Error correction mechanism
- 5.2.6 Error correction mechanism
- 5.2.7 Error correction mechanism
- 5.2.8 Error correction mechanism
- 5.2.9 Error correction mechanism
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- 5.2.47 Error correction mechanism
- 5.2.48 Error correction mechanism
- 5.2.49 Error correction mechanism
- 5.2.50 Error correction mechanism

**EXPORT PERFORMANCE OF TEA**

India is the largest producer of tea in the world contributing around 28 per cent of world production followed by China, Sri Lanka and Kenya. Export of tea increased from 242,877 metric tons in 1998-99 to 206,816 metric tons in 1999-2000. India exports tea mainly to the United Kingdom, United States, Japan, and others.

## CHAPTER V

# RESULTS AND DISCUSSION

In accordance with the pre-determined objectives of the study, this chapter deals with the presentation and description of results emerged from the research work. For easy understanding and convenience this chapter is presented under the following sub-heads:

### 5.1 Export performance of tea

#### 5.1.1 Growth analysis

#### 5.1.2 Instability analysis

#### 5.1.3 Export competitiveness of tea

### 5.2 Quality attributes of tea

### 5.3 Factors influencing export of tea

#### 5.3.1 Functional regression analysis

### 5.4 Analysis of constraints in export of tea

## 5.1 EXPORT PERFORMANCE OF TEA

India is the largest producer of tea in the world contributing around 28 per cent of the total world production followed by China, Sri Lanka and Kenya. Export of tea decreased from 242.073 m.kg in 1980-81 to 206.816 m.kg in 1999-2000. India exports substantial quantities of tea to Russia, United Kingdom, and Poland.

In this study, an attempt has been made to analyse the growth and instability in export of tea in terms of quantity of export, value and unit price. The period considered for the analysis is 1980-81 to 1999-2000.

### 5.1.1 Analysis of growth

The pattern of changes in the quantity, value and unit price of tea exported were studied with the help of per cent change over previous year besides estimating growth trends by using compound growth rates. These measures are helpful to know whether the tea export levels are decreasing or increasing or at stagnant over the period of study.

#### 5.1.1.1 Per cent change over previous year

Per cent change over previous year for quantity, value and unit value of tea exported is presented in Table 5.1.

From the table, it is evident that out of 20 years data being analysed, the quantity exported for 10 years had shown negative growth over previous year mostly between 1985 to 1994. Similarly, the value of exports and unit value realisation had indicated a negative change over previous year for 9 and 6 years respectively and the remaining years had shown a positive change. The negative growth in quantity of tea exported is mainly due to the increased domestic demand which outweighed the increase in the production during the study period. Since, late 1980s and early 1990s, Indian tea exports have been adversely affected by several development in world market such as break down of the USSR, which accounted for about half of India's tea exports (Kainth, 1996).

**Table 5.1 Per cent change over previous year of quantity, value and unit value of tea exports from India (1981 to 2000)**

Year	Quantity of export (%)	Value (%)	Unit price (%)
1981	-	-	-
1982	-21.23	-17.95	4.14
1983	9.85	45.33	32.29
1984	4.14	43.35	37.67
1985	-1.47	-6.10	-4.72
1986	-4.95	-16.14	-11.76
1987	-0.75	-9.58	10.42
1988	-0.49	-4.26	-3.79
1989	5.41	37.15	30.12
1990	-1.24	31.14	32.79
1991	-3.38	1.90	5.47
1992	-13.78	-12.27	1.75
1993	0.20	16.67	16.44
1994	-14.05	-14.83	-0.91
1995	7.30	22.13	9.55
1996	3.71	3.22	7.23
1997	21.05	42.34	13.38
1998	3.61	30.13	25.86
1999	-8.85	-14.87	-6.61
2000	7.87	-3.42	-10.47

### 5.1.1.2 Compound growth rates

The performance of tea exports from India with respect to growth in quantity, value and unit value of exports was evaluated for the period 1980-81 to 1999-2000 using an exponential growth model. The details of the results are presented in Table 5.2.

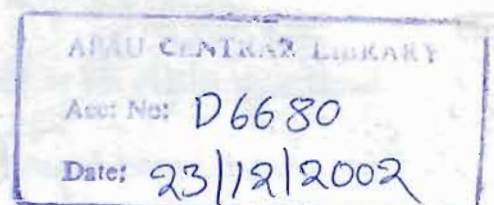
The quantity of tea exports from India exhibited a negative growth rate of 0.9 per cent per annum whereas the export earnings and unit value of exports registered a higher annual growth rates of 8.59 per cent and 9.58 per cent per annum respectively.

The decline in quantum of tea exports from India was mainly due to increased domestic demand and insufficient domestic production in relation to increasing income and population growth. Increasing production and exports from China and Kenya has also depressed world prices and hampered the growth of exports from India.

Dhindsa (1984) and Dass *et al.* (1994) also obtained similar results. They opined that increased domestic demand for tea reduced the exportable surplus of tea from India.

### 5.1.2 Analysis of instability

An attempt has been made to assess the instability in quantity, value and unit value of tea exports from India during the study period of 1980-81 to 1999-2000. The coefficient of variation was used as a measure of instability and Coppock's instability index was used as an index of instability.



**Table 5.2 Compound growth rates of quantity, value and unit value of tea exports from India (1981-2000)**

Particulars	Intercept	Slope	Growth rate
Quantity	12.28	-0.0091* (0.0040)	-0.90** (0.1502)
Value	15.19	0.0824** (0.0066)	8.59** (0.2633)
Unit value	2.91	0.0915** (0.0049)	9.58** (0.2011)

\* Significant at 5% level of probability

\*\* Significant at 1% level of probability

Note : Figures in parenthesis indicate Standard Error (SE) of respective values

### 5.1.2.1 Coefficient of Variation (CV)

It is evident from Table 5.3 that the coefficient of variation was 11.06 per cent for the quantity of tea exports whereas for export earnings and unit value of exports, the same was 51.49 per cent and 51.52 per cent respectively. The results indicated that the volume of tea exports was relatively stable when compared to the export earnings and unit value of exports.

### 5.1.2.2 Coppock's instability index

Table 5.3 indicates the instability in the case of value of exports as the highest with 21.91, whereas the index for unit value realisation (14.81) and quantity of tea exports (16.08) was comparatively less.

The results obtained may be due to the fluctuations in the demand for Indian tea from the major importers like USSR and they are in conformity with the earlier studies conducted by Ajjan *et al.* (1998) for senna and periwinkle. In periwinkle, there was high instability of 101.56 and 78.44 in case of volume and value of exports. But, in case of unit value, it was relatively stable with an instability index of 13.42. In senna exports, instability was relatively higher in case of value of exports (44.8) compared to unit value (41.19) and volume of exports (40.08). They concluded that the reason for high instability in value could be attributed to the combined effect of instability in the volume and unit value as the export is purely determined by the demand from the importing countries.

The export performance of tea from India is affected due to the stiff competition from Sri Lanka, China and Kenya (Singh, 1997), as well as increased domestic demand.

Since, early 1990s, Indian tea exports have been adversely affected by several developments in the international market such as the cash crisis faced by low cost Russia, Sri Lanka's inroads into CIS markets and Poland's move to buy cheaper Kenyan tea and over-supply of inferior tea leading to a price fall (Kishore, 1998).

### 3. Export competitiveness of tea

**Table 5.3** Standard deviation, Co-efficient of variation and Coppock's instability index of quantity, value and unit value of tea exports from India (1981 to 2000)

Particulars	Standard deviation	CV (%)	Coppock's instability index
Quantity	21.85	11.06	16.08
Value	5477.39	51.49	21.91
Unit value	28.30	51.52	14.81

## 5.2 QUALITY ATTRIBUTES OF TEA

Quality attributes play a significant role in respect of any commodity. The quality of tea which is marketed or exported should follow the standards of prevention of Food Adulteration (PFA), Act, 1954. The standard is given in Table 5.4. The table reveals that the total ash content should be within the range of 4 to 8 per cent, of which water soluble ash should be not more than 2 per cent. The acid soluble ash content should

Since, early 1990s, Indian tea exports have been adversely affected by several development in the international market such as, the cash crisis faced by Iran and Russia, Sri Lankan inroads into CIS markets and Poland's move to buy cheaper Kenyan tea and over-supply of inferior tea leading to a price fall (Kainath, 1996).

### 5.1.3 Export competitiveness of tea

The export competitiveness of the tea was analysed using Nominal Protection Coefficient (NPC) (Appendix-1). This measures the deviation of domestic price from international price. If NPC is less than 0.5 the commodity under consideration is highly competitiveness, and if it is between 0.5 to 1.0, the commodity is competitive.

Under exportable hypothesis the Indian tea is marginally competitive in the international market. The Government's intervention through issuing input subsidies will be phased out slowly under WTO regime, the Indian tea may lose its competitiveness (Singh, 1997). The results are in accordance with the studies conducted by Brajesh Jha (2000) wherein he calculated the NPCs for tobacco, cotton, jute and rice and concluded similarly.

## 5.2 QUALITY ATTRIBUTES OF TEA

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be maximum, but the ash content of water soluble tea should be in the range of 1.0-2.2 per cent. The water soluble ash should be at least 40 per cent of water extract and should not exceed more than 17 per cent of crude fibre content.

### FACTORS INFLUENCING EXPORT OF TEA

In order to study the factors influencing the export of tea, functional analysis is

**Table 5.4 Prevention of Food Adulteration Act 1954 standards for tea**

Particulars	Standards
Total ash	4-8 %
a) Water soluble ash (As total ash %)	40% (minimum)
b) Acid insoluble ash	1% (maximum)
c) Alkalinity of water soluble ash as $K_2O$ %	1.0 - 2.2 %
2. Water extract	32% (minimum)
3. Crude fibre content	17% (maximum)

Source : United Planters Association of South India (UPASI), Coonoor.

be maximum one per cent and alkalinity of water soluble ash must be in the range of 1.0 - 2.2 per cent. The tea sample should also have at least 32 per cent of water extract and should not contain more than 17 per cent of crude fibre content.

### 5.3 FACTORS INFLUENCING EXPORT OF TEA

In order to study the factor influencing the export of tea, functional analysis in double log-linear form was attempted.

#### 5.3.1 Double log-linear regression analysis

Double log-linear regression equation was fitted to the data and the results are presented in the table 5.5.

It is observed from the table that tea exports are mainly influenced by production, domestic price, domestic consumption and area under cultivation. The coefficient of multiple determination ( $R^2$ ) was 0.702 which indicated that 70.2 per cent of the total variation in the export of tea was explained by independent variables *viz.*, production, export price, domestic price, exchange rate, domestic consumption and area under cultivation. Further, it is found to be statistically significant at five per cent probability level. The fitted function is given by,

$$Y = 5.786 X_1^{1.6549} X_2^{-0.3488} X_3^{0.4064} X_4^{-0.0651} X_5^{-1.7927} X_6^{1.4628}$$

The positive and significant regression coefficient of area under cultivation suggests that one per cent increase in the area increases the tea export by nearly 1.5 per cent while all other factors are held constant. The regression coefficient of domestic

**Table 5.5 Results of log-linear regression analysis**

S.No.	Variables	Elasticity	Standard error	't' value
1.	Production	1.6549*	0.7471	2.2150
2.	Export price	-0.3488	0.3108	1.1223
3.	Domestic price	0.4064++	0.2221	1.8298
4.	Exchange rate	-0.0651	0.2343	0.2778
5.	Domestic consumption	-1.7927*	0.7984	2.2508
6.	Area	1.4628**	0.5026	2.9105

Intercept = 5.786

$R^2 = 0.702$

\*\* Significant at 1% level of probability

\* Significant at 5% level of probability

++ Significant at 10% level of probability

consumption (-1.7927) was negatively significant indicating that one per cent rise in domestic consumption will decrease the tea exports by 1.793 per cent while the positive and significant production figures shows that one per cent increase in production enhances the tea exports by 1.655 per cent at ceteris paribus. The positive regression coefficient of domestic price implies that one per cent increase in domestic price, increases the volume of exports by 0.4 per cent.

#### 4. High tea price realization

Critical examination of export equation of tea exported indicated that the domestic consumption, production and area under cultivation significantly influenced the tea exports. The inverse relationship between domestic consumption and the quantity exported is due to increase in the population which in turn increases the domestic demand (Kumar and Kumar, 1996). The increase in the domestic price may bring down the domestic consumption resulting in the positive relation between domestic price and tea exports.

#### 5. International market information

The results of the study are in accordance with the results obtained by Kumar and Kumar (1996) on exports performance of tea. They concluded that tea export is largely constrained by domestic demand for tea as the income elasticity of demand for tea is positive and significant.

## 5.4 ANALYSIS OF CONSTRAINTS IN EXPORT OF TEA

### Table 5.6

The constraints being faced by the exporters of tea have been identified using pre-tested and well-designed questionnaire. The constraints identified were:

1. Lack of demand from importing countries
2. Lack of phytosanitary measures
3. Lack of export promotional measures
4. Problems in maintenance of quality consistency
5. High unit price realisation
6. Lack of infrastructural facilities
7. Lack of adequate processing and packaging technique
8. Preferential tariff followed by importing countries
9. High domestic price
10. Improper international market information

The exporters were requested to assign rank for each constraint. Kendall's coefficient of concordance (W) test was used to determine the agreement among the respondents (the exporters) in ranking the constraints in export of tea.

Ranks assigned by the sampled exporters for major constraints is presented in Table 5.6.

Since the estimated Chi-square value of 70.848 was higher than the table value at 5 per cent level of significance, we can conclude that all the exporters are in agreement

Table 5.6 Ranking of constraints in tea exports

Exporters	Ranking assigned to the constraints									
	I	II	III	IV	V	VI	VII	VIII	IX	X
1	2	1	4	6	3	8	7	9	5	10
2	1	3	2	5	4	6	8	10	7	9
3	3	4	5	6	1	7	9	8	2	10
4	5	2	6	4	3	7	8	10	1	9
5	1	3	4	6	2	9	8	7	5	10
6	4	5	1	3	2	8	7	10	6	9
7	2	4	3	5	1	6	10	9	7	8
8	3	2	1	4	5	7	9	8	6	10
9	1	4	2	3	5	9	7	8	6	10
10	2	3	4	5	1	6	8	10	7	9
Total	24	29	32	47	27	73	81	89	52	94

$$\bar{R} = \frac{548}{10} = 54.8$$

$$R_i - \bar{R}; \quad 29.2 \quad 25.8 \quad 22.8 \quad 6.2 \quad 26.2 \quad -18.2 \quad -26.2 \quad -34.2 \quad 2.8 \quad -39.2$$

$$W = \frac{12 \sum (R_i - \bar{R})^2}{K^2(N^3 - N)} = \frac{12 \times 6494.8}{10^2(10^3 - 10)} = \frac{77937.6}{100 \times 990} = 0.7872$$

Then  $\chi^2$  value was calculated to test the significant of test,

$$\begin{aligned} \chi^2 &= K(N-1)W \text{ at } (N-1) \text{ df} \\ &= 10(10-1) \times 0.7872 \\ &= 70.848 \end{aligned}$$

Table  $\chi^2$  value at 5% level of significance with 9 df is 16.919

with ranking of constraints in tea export. It is also observed that most of the exporters expressed lack of orders or demands from importing countries, high unit price realisation, phytosanitary problems, lack of export promotional measures and problems in maintenance of quality consistency as the major obstacle which impede the export of tea.

Besides these lack of export promotional measures, lack of infrastructure facilities, lack of adequate packaging and processing technologies and poor international market informations are the other constraints in tea exports. The results are in agreement with the similar studies undertaken by Mitra (1991). Sundressan and Preeti Menon (1994) and Kainth (1996).

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## Chapter VI

# Summary and Conclusion

## SUMMARY AND CONCLUSION

### Chapter VI

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# Summary and Conclusion

## CHAPTER VI

### SUMMARY AND CONCLUSION

Tea is one of the world's most important beverage crop and it is grown widely in Asia and Africa. World tea production in the last two decades has grown considerably from 1847.67 million kg in 1980-81 to 3013.80 million kgs in 2000-2001. India is the largest producer as well as biggest consumer in the world market and accounts for 20 per cent of the total area under tea in the world, 28 per cent of world production, 22 per cent of global tea consumption and 15 per cent of the global tea exports. Substantial foreign exchange earnings (Rs. 1850 crores) with negligible import content and contribution to the state and central exchequers (Rs. 1,100 crores) are the other significant economic features of the Indian tea industry.

Although India has been traditionally exporting tea to the world market since decades, of late it is being threatened by stiff competition from other producing countries like Sri Lanka, China, Kenya, etc., with their higher productivity level as well as low cost of production. The present study is an attempt to understand the pattern of tea exports, extent of stability, factors influencing the tea exports and the constraints associated with tea exports from India.

The specific objectives of the study are:

1. To study the export performance and competitiveness of tea.
2. To measure the quality attributes of tea influencing export demand

3. To determine the parameters influencing tea exports
4. To identify the constraints associated with the export of tea
5. To suggest the suitable policy measures regarding the export of tea

To study the export performance of tea and factors influencing tea exports the secondary data for the period 1980-81 to 1999-2000 was collected from various publications like Tea Board reviews, Tea Statistics, Tea Digest - A publication of Tea Board, CMIE reports, etc. Primary data was collected from randomly selected sample of tea exporters during May, 2002 with the help of a well structured questionnaire to identify the constraints faced by them.

To assess the growth of export of tea from India, compound growth rate and per cent change over previous year were used. Coefficient of variation and Coppock's instability index were used as a measures of instability. To analyse the export competitiveness, Nominal protection coefficient was used. Regression equation in log-linear form was worked out to identify the parameters affecting the export of tea. To determine the agreement among the exporters about constraints in the tea exports, Kendall's coefficient of concordance test was used.

The major findings of the study are summarized hereunder:

The export quantity of Indian tea exhibited a negative growth rate of 0.90 per cent per annum, whereas the export value and unit value recorded relatively higher annual growth rate at 8.59 per cent and 9.58 per cent per annum, respectively.

The volume of tea exported registered less variability with coefficient of variation at 11.06 per cent. The coefficient of variation for export earnings and unit value realisation were 51.49 per cent and 51.42 per cent respectively. During the study period, there was instability in the case of volume and value of exports and the instability was relatively lower in the case of unit value of exports with an instability index of 14.81 when compared to volume (16.08) and value (21.91) of exports.

The results further indicated that under exportable hypothesis, the NPC was 0.94 implying that Indian tea exports is marginally competitive in global market.

The results of log-linear regression analysis indicated that area under cultivation, domestic production and domestic consumption significantly influence the tea exports. The area under cultivation has positive effect on tea exports with an elasticity of 1.463. Domestic consumption had a negative effect on tea exports with an elasticity of 1.782 while production had a positive effect with an elasticity of 1.654 on export of tea. Domestic price also had positive relation with volume of export but it was significant at 10 per cent level.

From the results of constraint analysis, it is observed that lack of orders or demands from importing countries, high unit price realisation, phytosanitary problems, lack of export promotional measures and problems in maintenance of quality consistency as the major obstacle which impede the export of tea.

## CONCLUSIONS

1. The growth in volume of export of tea had registered negative growth rate whereas export earnings and unit value realisation indicated a positive trend during the study period.
2. High degree of instability is noticed in export earnings and unit value realisation of tea exports when compared to quantum of tea exported.
3. Indian tea is marginally competitive in the global market
4. Area under cultivation, domestic consumption and production played a significant role in influencing the export of tea from India.
5. Lack of import orders from importing countries, high unit price realisation, phytosanitary problems, lack of export promotional measures and problems in maintenance of quality consistency are the major constraints identified in tea exports.

## POLICY IMPLICATIONS

The implications that emerge from the results of this study briefly listed below:

1. The area under tea cultivation can be increased to meet the domestic as well as the export needs.
2. The production and productivity levels have to be improved so as to increase the availability as well as to reduce the per unit cost of production. This can be done by rejuvenation of old orchards and improved R&D in evolving suitable varieties.

3. The government as well as exporters should initiate measures for bringing improvement in the quality, better packaging and storage conditions.
4. The instability in the price factor can be minimised by resorting to measures like futures trading and making readily available international market information, as well.
5. The government and the exporters can make attempt to promote and popularise Indian tea in the untapped potential areas.

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*Appendices*

## Appendix D

Export of the State of New York (1994 to 2000)

Year	Exports (Millions of Dollars)	Imports (Millions of Dollars)	Balance (Millions of Dollars)
1994	12,150	11,800	350
1995	12,500	12,200	300
1996	13,000	12,800	200
1997	13,500	13,300	200
1998	14,000	13,800	200
1999	14,500	14,300	200
2000	15,000	14,800	200
<b>Total</b>	<b>87,650</b>	<b>86,500</b>	<b>1,150</b>

# Appendices

## Appendix - 1

## Export of tea from India (1981 to 2000)

Year	Quantity of export (‘000 kgs)	Value (‘000 Rs.)	Unit price (Rs/kg)
1981	242073	4383467	18.11
1982	190693	3596380	18.86
1983	209480	5226765	24.95
1984	218144	7493013	34.35
1985	214937	7035905	32.73
1986	204292	5900131	28.88
1987	202753	6465573	31.89
1988	201747	6190034	30.68
1989	212662	8489780	39.92
1990	210024	11133510	53.01
1991	202918	11345533	55.91
1992	174962	9953306	56.89
1993	175318	11612636	66.24
1994	150691	9891269	65.64
1995	167996	12080156	71.91
1996	161696	12468719	77.11
1997	202995	17747781	87.43
1998	210338	23094360	109.80
1999	191719	19658684	102.54
2000	206816	18986119	91.80

Source: Tea Digest (2000), Tea Board of India, Kolkata

## Appendix - 2

International reference price  
(Exportable hypothesis)

S.No.	Particular	Unit
1.	FOB price at outside market	US \$ / MT
2.	Exchange rate	1 \$ = Rs.
3.	FOB price at domestic port	Rs./qtl 1+2/10
4.	Domestic reference price	Rs./qtl (9+8+7+6+6)
5.	Freight charges to outside port	Rs./qtl
6.	Port clearance charges	Rs./qtl
7.	Transport cost (local market to port)	Rs./qtl
8.	Marketing margin	Rs./qtl 5% of domestic price
9.	Auction market price	Rs./qtl

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