

Structural Changes and Pattern of Agricultural Development in Kerala

A Dissertation Submitted to the Central University of Punjab

For the Award of

Master of Philosophy

In

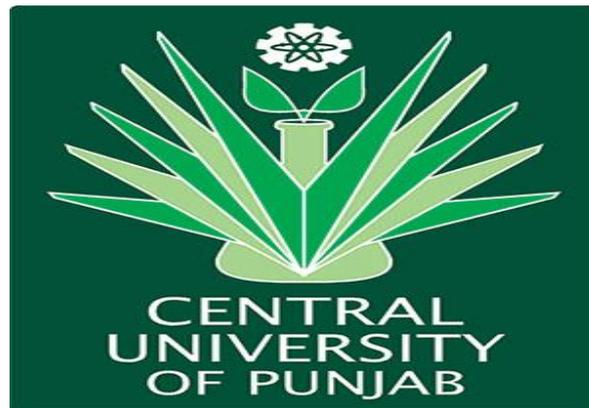
Development Economics

By

Sanitha V.P

Supervisor

Dr. Naresh Singla



Centre for Economic Studies
School of Social Sciences
Central University of Punjab, Bathinda

May, 2015

DECLARATION

I declare that the dissertation work titled, “Structural Changes and Pattern of Agricultural Development in Kerala” has been prepared by me under the guidance of Dr. Naresh Singla, Assistant Professor, Centre for Economic Studies, School of Social Sciences, Central University of Punjab. No part of the dissertation has been formed the basis for the any degree or fellowship in the past.

Sanitha V.P

Centre for Economic Studies,

School of Social Science,

Central University of Punjab,

Bathinda – 151001

Date:

CERTIFICATE

I certify that SANITHA V.P has prepared her dissertation work titled, ““Structural Changes and Pattern of Agricultural Development in Kerala”” for the award of M.Phil. Degree of the Central University of Punjab, under my supervision. She has carried out this work at the Centre for Economic Studies, School of Social Sciences, Central University of Punjab.

Dr. Naresh Singla

Assistant Professor

Centre for Economic Studies,

School of Social Sciences,

Central University of Punjab

Bathinda – 151001

Date:

ABSTRACT

Structural Changes and Pattern of Agricultural Development in Kerala

Name of student : Sanitha V.P

Registration Number : CUPB/MPh-PhD/SSS/CES/2013-14/24

Degree for which submitted : Master of Philosophy

Name of Supervisor : Dr. Naresh Singla

Centre : Centre for Economic Studies

School of Studies : School of Social Sciences

Key words : Structural transformation, sectoral contribution, agricultural commodities, employment, growth pattern.

Structural transformation is a process by which the relative importance of different sectors and activities of an economy changes over time. The Kerala economy is also undergoing the transformation from traditional backward agrarian economy to a modern service sector led economy. The significance of the present study lies in the fact that the whole process of structural transformation of the Kerala economy has not so far been addressed in a detailed and comprehensive manner in the earlier studies. No specific attempt has been made to relate the pattern of agricultural development with the structural transformations in the Kerala economy. In this study, an attempt has been made to examine the structural changes and growth performance and pattern of agricultural development in Kerala economy. The study mainly covers a period of 1980-81 to 2010-11. The study has found that the share of primary sector in GSDP has declined sharply, but the corresponding decline in employment share has not taken place. Moreover, the excess labour force has moved from primary sector to secondary sector, thus causing abundance in secondary sector and there was only a meager increase in share of income from

secondary sector in GSDP. The share of income from services sector in GSDP has increased sharply, but it failed to register a sharp increase in employment. Thus, it follows that Kerala did not experience a sequential growth process (as propounded by structural change growth theories) as the service sector led growth did not provide employment matching with its income and the process of industrialization failed to take off as share of income from secondary sector did not commensurate with the level of employment in the sector.

The changes in land use pattern in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as current fallow, increase in area under non-agricultural land, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity. Irrigation intensity of only 20 per cent points that about 80 per cent of the cropped area is rain-fed. Kerala witnessed shift in the cropping pattern in favour of non-food crops at the expense of food crops as crops such as pulses, rice, tapioca, cashewnut, ginger were replaced by commercial cash crops like rubber and coconut. The declining cultivable area, predominance of tiny and fragmented holdings, decline in work force in terms of reduction in agricultural labour and cultivator has made farming more vulnerable. Finally, the study has suggested some policy suggestions such as training to labour moved to secondary sector, keeping a check on the area under food crops, bringing more area under assured irrigation, strict law enforcing mechanism to avoid unnecessary conversion of agricultural land to non-farming activities, creation of 'Labour Banks' to revive agricultural economy of the Kerala.

Sanitha V.P

Dr. Naresh Singla

ACKNOWLEDGMENT

I am grateful to a number of persons who guided and supported me throughout my research work and provided necessary assistance to me from time to time in order to make this dissertation success.

First of all, I would like to express my deep and sincere gratitude to my supervisor Dr. Naresh Singla, Assistant Professor, Centre for Economic Studies; Central University of Punjab, who delivered valuable guidance in a helpful way throughout the study. His dedication, courage and support make me to achieve the milestone.

My sincere thanks are expressed to the faculty members Dr. Sandeep Kaur Bhatia, Assistant Professor, Centre for Economic Studies; Central University of Punjab and Dr. Kulwinder Singh for their immense help, support and guidance.

I am immensely thankful to Hon'ble Vice Chancellor Prof. R.K. Kohli for providing facilities to carry-out my entire research. I am also highly thankful to Prof. P. Ramarao, Dean, Academic Affairs and Prof. R.C Sharma, Examination in charge, Central university of Punjab, Bathinda for their valuable inputs and suggestions during the course of this work. I also sincerely thank to the staff of Library and Computer Centre of the Central University of Punjab for their vast support for the collection of necessary materials during my study.

I am very happy to express my special regards and grateful to all my friends, especially to Noushad A.P, V.J Jithin, Gulshan Farooq Bhat, Nadeem Ahmed Bhat and Harpreet Kaur for always supporting and believing in me with enormous affection and suggestions during the course of the study.

Again, I owe a debt of gratitude to my family for their caring, prayers, best wishes and support, which never let me to feel alone during the study.

I thank the almighty God for the blessings showed on me to complete this work.

Sanitha V.P

TABLE OF CONTENTS

Chapter	Content	Page number
1.	Introduction	1 – 8
2.	Review of Literature	9 – 20
3.	Database and Methodology	21 – 26
4.	Structural Transformations and Relative Economic Development in Kerala	27 – 46
5.	Pattern of Agricultural Development in Kerala	47 – 64
6.	Summary and Policy Suggestions	65 – 68
	Bibliography	69 – 75

LIST OF TABLES

Table Number	Table Description	Page Number
4.1	Sectoral Contribution in GSDP of Kerala (%) (at 2004-05 prices)	29
4.2	Sector-wise Compound Annual Growth Rate of GSDP (%)	31
4.3	Sectoral Contribution in NSDP of Kerala (%) (at 2004-05 prices)	34
4.4	Sector-wise Compound Annual Growth Rate of NSDP (%)	36
4.5	Sectoral Share of Employment (%)	37
4.6	Per 1000 distribution of usually employed persons by status of employment (%) in Kerala	38
4.7	Labour force participation rate of Kerala (%)	39
4.8	Work Force Participation Rate in Kerala	40
4.9	State-wise HDI values from 1981 to 2011	42
4.10	State-wise per capita GSDP (at 2004-05 prices)	44
4.11	State-wise poverty rate (%)	46
5.1	Land use pattern (Area in 000'ha)	49
5.2	Source-wise pattern of irrigation in Kerala (ha)	51
5.3	Area, Production and Productivity of major crops	54-55
5.4	Profile of workers population in Kerala	57
5.5	Average size, number and area of land holding	59
5.6	Growth of Agricultural income in Kerala (Base year 2004-05)	60
5.7	Capital Expenditure on Agriculture and Allied Heads (Rs. in crores/year)	61
5.8	Fertilizer consumption of Kerala: 1980-81 to 2010-11 (Kgs.)	62
5.9	Pesticide consumption in Kerala (Technical Grade in metric tonne)	63
5.10	Commodity-wise export from Kerala (in MT)	64

LIST OF FIGURES

Figure Number	Figure Description	Page Number
4.1	Sectoral Contribution in GSDP of Kerala (%)	30
4.2	Compound Annual Growth Rate of sub-sectors in GSDP (1980-81 to 2010-11)	32
4.3	A comparison of HDI of southern states with India	43
5.1	Land use pattern in Kerala (1980-81 to 2010-11)	50
5.2	Irrigation intensity (Net irrigated area as % of Net Area Sown)	52
5.3	CAGR of Area, Production and Productivity of Major Crops (1980-81 to 2010-11)	56

LIST OF ABBREVIATIONS

Full form	Abbreviations
Below Poverty Line	BPL
Compound Annual Growth Rate	CAGR
Central Statistical Organization	CSO
Gross Domestic Product	GDP
Government of India	GoI
Government of Kerala	GoK
Government	Govt.
Gross State Domestic Product	GSDP
Hector	Ha
Potash	K
Kilo gram	Kg
Kerala Model of Development	KMD
Labour Force Participation Rate	LFPR
Million Tons	MT
Nitrogen	N
Net Domestic Product	NDP
Number	No.
Net Sown Area	NSA
Net State Domestic Product	NSDP
National Sample Survey Office	NSSO
Phosphorus	P
Per Capita Income	PCI
Reserve Bank of India	RBI
Rupees	RS.
State Domestic Product	SDP
United Nations Development Programme	UNDP
Work Force Participation Rate	WFPR

Chapter 1

INTRODUCTION

1.1 Structural Changes

1.1.1 *India and Kerala context*

Structural changes are considered as a crucial factor for economic development. It has been argued that economic growth and development are strongly inter-linked with the structural changes. Structural changes are considered as the vehicle of economic growth and economic growth in turn also induces structural changes (Van Gemert, 1986). The structural changes would ideally imply as those changes which take place primarily due to economic development and result into shifts in the shares of GDP and labour force from primary sector to secondary sector and the tertiary sector. During the structural transformation, labour is pulled out of agriculture at a speed that depends on the labour intensity of industry and services. A turning point is reached when the share of labour in agriculture starts to decline faster than its share in output and the productivity differential between the sectors starts to diminish (Binswanger-Mkhize, 2012). Four quite relentless and interrelated processes often define the structural transformation: (i) a declining share of agriculture in GDP and employment; (ii) rural-to-urban migration that stimulates the process of urbanization; (iii) the rise of a modern industrial and service economy; and (iv) a demographic transition from high rates of births and deaths (common in backward rural areas) to low rates of births and deaths (Timmer, 2007).

India's growth performance and economic prospects have been transformed over the years. Agriculture sector in India has established an admirable performance over the past four decades, but still there is abundant scope to improve for occupying the premier position in the global market (Geetha, 2006). In spite of rapid economic growth in the last two decades, structural changes in the Indian economy are slow and atypical. While economic growth has accelerated sharply, agricultural growth has badly lagged behind. Nevertheless, as a share of GDP, agriculture sector has declined sharply, manufacturing sector has remained at a low with a fairly stable share, while service sector has increased sharply followed by industry. As a consequence, labour has moved from agriculture to the non-agricultural sectors, but

rather than finding good jobs in the urban economy, the workers have moved to informal sector jobs and self-employment in the vibrant rural non-farm sector, resulting in a stunted structural transformation (Binswanger-Mkhize, 2013).

Agriculture development experience of Kerala, since the last seventies has been characterized by sharp decline in the share of agriculture and allied sectors in GSDP and area under food crops and the substantial expansion in the area under non-food crops (Karunakaran and Gangadharan, 2013). Kerala's agriculture is characterised by small size of land holdings and one of the lowest in the country. Kerala's agricultural economy has undergone a structural transformation by switching over a large proportion of its traditional crop area devoted to subsistence crops like rice and tapioca to more remunerative cash crops like rubber (www.nabard.org). Kerala has been experiencing a wide variety of changes in its productive sectors and other dimensions of the economy and the economy has changed from a traditional backward agrarian economy to modern growing economy (Rajan, 2011). The changes in Kerala's economy have led to a structural transformation, giving it a non-agrarian character, both in terms of income and employment which has now possessed new difficulties for agricultural development at a time when there is a scarcity of labour as well as profits (Kannan, 2011).

1.1.2 Structural changes: Theoretical framework

No single theory fully describes the transformation process. Traditionally, in the economic literature, structural transformations are associated with different growth theories. In Schumpeter's view, innovation (and its dissemination through imitation and further improvements) was the essential force leading to structural economic shifts. For Kuznets (1971), structural changes are required, without which modern economic growth would be impossible. For Pasinetti (1981), economic growth is linked to continuous structural transformation and change (Memedovic and Lapadre, 2009).

Following are some theories which describe the process of structural transformation;

1.1.2.1 Simon Kuznets

Simon Kuznets (1955, 1971) has established the essential link between growth and structural change and believes that the growth is inconceivable without structural shifts. In terms of Kuznets analysis, the sectoral composition of GDP has undergone a perceptible change and the structural shift tends from agriculture to services underlying social, demographic, occupational and institutional shift and changes. He further argues that, it does mean that some structural changes, not only in economic, but also in social institutions and beliefs, are required without which modern economic growth would be impossible (Kuznets, 1966). Kuznets (1966) outlines the trends in the sectoral origin of aggregate output, which generally accompanied modern economic growth. It includes *“a decline in the share of agriculture and related industries; rises in the shares of manufacturing and public utilities and increases in the shares of some service groups. This combination produced marked shifts in the sectoral allocation of the labour force, a somewhat greater decline in the share of agriculture and related industries, a somewhat lesser rise in the share of industry and a distinct rise in the share of services”* (Joseph, 1993).

1.1.2.2 Lewis’s Structural Change Model

The Lewis model presented in 1955 a dominated development theory between the 1960s and 1970s. It is also known as the two sector model and the surplus labour model. It focused on the need for countries to transform their structures away from agriculture with low productivity of labour towards industrial activity with a high productivity of labour.

The model is primarily concerned with the transfer of labour from the traditional to the modern (capitalist) sector (rural to urban) as well as with the growth of output and employment in the modern sector. Lewis calculated that with an increase of 30 per cent or more in the urban wages, workers will migrate from the rural areas to the urban areas- which would lead to growth in output and employment through the modern sector (Welch, 2000).

1.1.2.3 Structural Changes and Patterns of Development: Chenery's Model

Chenery (1960) in his famous article 'Patterns of Industrial Growth' argued that countries develop on differing trajectories, which are specific to each country. He advocated strong relationship between industrial growth and total output of the economy. The patterns that countries follow on their way to higher income are closely related to their size, geographical location and abundance of natural resources. In addition to the accumulation of capital, both physical and human, a set of interrelated changes in the economic structure of the country are required for the transition from a traditional economic system to a modern one. These structural changes involve all economic functions – including the transformation of production and changes in the composition of consumer demand, international trade and resource use as well as changes in socio-economic factors such as urbanization and the growth and distribution of a country's population (Todaro and Smith, 2012).

1.2 Development Experience of Kerala

Kerala is not relatively a rich state. Yet the people of Kerala appear to enjoy a better standard of living than people in any other Indian states (Tharamangalam, 1998). Kerala achieved greater successes in important indicators of social development such as adult literacy, life expectancy, infant mortality and birth rates and the state has received much attention from scholars due to its unique development experience. Kerala's development has three unique characteristics:

- 1) The attainment of a better quality of life as compared to other poorer states in India.
- 2) A low rate of growth and backwardness of productive sectors, namely agriculture and industry.
- 3) A very high incidence of out migration and heavy reliance on migrant remittances (Prakash, 2004).

According to the Indian Human Development Report (2011), among the Indian states, Kerala stands first in Human Development Index. The high Physical Quality of Life Index (PQLI) of Kerala is at par with the developed western nations. The census of India 2011 reveals that Kerala is the highest literate state in the country with 93.91

per cent of literacy rate against the national level of 74.04 per cent. The gender ratio in Kerala shows that it has more female population than male. Kerala represents the highest sex ratio with 1084 females per 1000 males against 940 at India level. It is also the state with the lowest positive population growth rate in India. Kerala has experienced a very low population growth rate (0.91 per cent) compared to the national population growth rate (1.93 per cent) during 1991-2001.

Thus, the development experience of Kerala, popularly known as Kerala Model of Development (KMD) has received international attention owing to its high achievements in the social sectors with a weak commodity producing sectors. The remarkable achievement of Kerala in respect of human development, despite stagnation in agriculture and a low rate of economic growth has been a puzzle to development experts. The protagonists of the KMD argued that progressive state policies and public action in health, education and other social sectors could promote a high degree of human development even in the absence of rapid economic growth and higher investment (Rajan, 2011).

1.3 Present Scenario of Agriculture in Kerala

During the past few decades, the agriculture sector of Kerala has undergone wide-ranging changes in terms of ownership of land, cropping pattern, cultivation practices, productivity and intensity of cultivation (Mahesh, 1999). No doubt, Kerala has a glorious past in agriculture sector. In 1960-61, the contribution of the primary sector to the GSDP was 56 per cent which declined about 28 per cent in 1990-91 and 10.37 per cent in 2010-11 (GoK, 1993; 2012). There has been negative growth in agriculture sector in all the years of the XIth Plan except in 2008-09. Cash crops, like coconut, rubber, tea, coffee, pepper and cardamom, cashew, arecanut, nutmeg, ginger, cinnamon, cloves etc. give the agriculture of Kerala a distinct flavor. Agriculture is the foundation of Kerala's economic edifice. However, during the last few decades, particularly eighties, it has witnessed a transformation in favour of commercial crops. One of the dynamic factors contributing to structural changes in Gross State Domestic Product (GSDP) and employment is the changes in the cropping pattern prompted by market opportunities and demand factors. The most important structural change is the relative decline in the proportion of area under food

grains. Food crops like rice, tapioca and pulses have become less remunerative compared to the more patronized commercial crops (Geetha, 2006).

Currently, agriculture in Kerala suffers from characteristics such as declining cultivable area, low productivity per unit of labour, predominance of tiny and fragmented holdings, aversion of agriculture sector by young generation of farmers and agricultural labourers due to the insecurity in income and uncertainty in the agriculture production and poor marketing channels (GoK, 2013). With the gap between production and requirement of food grain widening every year, Kerala's food scene is turning gloomy. Kerala does not produce even one fourth of its total requirement of food grains. Kerala requires about 38 lakh tonnes of rice per year, while the quantity of production is only 6 lakh tonnes. In other words, 84 per cent of the food grain required comes from other states, namely Andhra Pradesh and Tamil Nadu. The gap between production and requirement is widening every year (www.nabard.org). The agricultural production in the state is also limited by sharp decline in the number of farmers and agriculture labourers in the state. The cultivated area is shrinking day by day. Less profit out turn of field crops compared to industrial crops and labour availability are the main issues faced by the agricultural producers of the state (GoK, 2013).

1.4 Significance of the Study

Agriculture sector is the primary sector whose growth acts as a catalyst to the growth of other sectors. Several studies (Unni, 1983; Mahesh, 1999, 2000; Narayana, 1990; Nithya, 2013) on Kerala agriculture has largely concentrated on agricultural trends such as land utilization pattern, cropping pattern and the area, production and productivity growth, particularly of plantation crops like rubber, coconut, coffee, cardamom and tea etc. There also exist several studies (Kannan and Pushpangadan, 1999; Sivanandan, 1985; Kannan, 2011; and George, 2011) that deal with the performance of agriculture in state in relation with national perspectives. The present study deviates from the above studies and makes an attempt to identify the structural transformations in Kerala's economy along with the development of socio-economic indicators. As indicated earlier, theorists have also propounded the different stages

through which economy's growth is transited from agriculture through industry to the service sector.

Thus, the study tries to find out whether structural changes in Kerala economy have taken place as per the various structural transformation theories propounded or not. The significance of the present study lies in the fact that the structural transformation in the Kerala economy has not so far been addressed in a detailed and comprehensive manner in the earlier studies.

1.5 Hypotheses

1. Structure of Kerala economy has systematically changed from agriculture sector to service sector led economy.
2. Pattern of agricultural development is shifting in favour of non-food crops than food crops.
3. The development indicators in Kerala are better as compared to other states of India.

1.6 Objectives

- 1) To study the structural changes and economic development in Kerala economy from 1980-81 to 2010-11.
- 2) To study the pattern of agricultural development in Kerala from 1980-81 to 2010-11.
- 3) To identify the factors that lead to the structural changes in the agricultural economy of Kerala.

1.7 Limitations of the Study

The study has analysed the sectoral composition of Kerala economy as a whole in terms of income and employment, development indicators and pattern of agricultural development during 1980-81 to 2010-11. There may also exist inter-state variations in these indicators. However, these variations are not analysed due to paucity of time and lack of data sources. Also the study is restricted to Kerala state only and the findings and suggestions may or may not have general applications.

1.8 Chapter Scheme

For better assessment, the present study is divided into six chapters. As already outlined, the first introductory chapter describes structural changes in Kerala and India context besides presenting the conceptual framework of structural changes. It has also outlined present scenario of agriculture and development experience in Kerala. The significance, hypotheses, objectives and limitations of study also described in this chapter. The second chapter has reviewed the existing literature in Kerala economy as well as in some other states. Some studies at India level are also reviewed. The third chapter brings out methodology and key concepts used in the study. Fourth and fifth chapter are devoted to the analysis and discussion. The fourth chapter brings out the structural transformations in Kerala economy and economic development of Kerala. The fifth chapter primarily focuses on pattern of agriculture development in Kerala. Finally, the last chapter concludes the study with some major useful suggestions.

CHAPTER 2

Review of Literature

In the present chapter, an attempt has been made to review some of the relevant studies related to structural changes in the context of Kerala and India. The chapter also reviews studies in the context of dynamics in agricultural economy of Kerala.

Unni (1983) analysed district-wise changes in cropping pattern in Kerala. The study revealed the area under paddy was replaced by coconut across all the districts except Alappuzha. Area under rice cultivation was decreased from 33 per cent in 1960-61 to 27 per cent in 1978-79 and the area under coconut has increased from 21.32 per cent to 22.89 per cent during the same period. Topographically, coconut and rice could be grown under same conditions so it was possible for rice to be substituted by coconut and the topographical features of Kerala are suitable for the substitutability of paddy by coconut.

Kannan and Pushpangadan (1988) observed that agricultural sector in Kerala showed a declining trend in production, acreage and yield during the period 1962-63 to 1985-86. The study attempted to explain the agricultural stagnation in Kerala since mid-seventies. In the case of food grains, the decline in the growth of output was mainly due to decline in the area since the yield has remained more or less same during the period under study. Main conclusion emerged from the analysis was that the decline that took place in Kerala's agriculture was the result of deforestation that reduced the number of rainy days, which increased the environmental degradation since the mid-seventies. Absence of the provision of inputs such as water and land development and the environmental degradation has affected the water availability and soil quality. These were some of the factors responsible for the stagnation of agriculture in Kerala during seventies.

Joseph (1990) considered cash crop sector as the leading sector in the economy of Kerala. The expansion of the economy including that of the tertiary sector became conspicuous with the spurt in the prices of cash crops. Trade, transport,

banking, finance, real estate, education, public service, housing personal and cultural services are some of the tertiary activities which are directly dependent on cash crop cultivation. Expansion of cash crop cultivation in turn is dependent on trade and transport. The extension of cash crop cultivation depends on two factors, namely, the agro-climatic conditions and economic venture. The study concluded that gulf remittances, a major exogenous determinant of development in recent years, could only supplement what the cash crop sector has been doing all these years in sustaining and nurturing the tertiary sector in Kerala. The study concluded that the policies adopted by the government under the successive five year plans have been ineffective in raising agricultural productivity in the context of the peculiar conditions that prevail in Kerala.

Narayana (1990) pointed that agricultural economy of Kerala has predominated by tree crops, especially rubber and coconut. The study pointed out three structural characteristics of tree crops such as long life span, moderate pre-bearing period and yield profile of the tree over the bearing period. The period between 1953-55 and 1963-64 reported an annual average increase of 14,000 hectare of area under rubber, which declined to 8,000 hectares during 1964-65 to 1970-71 and again decreased to below 5,000 hectares after 1970-71 till 1980-81. The study concluded that relative price movements play a central role in determining the growth path of output, agricultural incomes, and the share of wages in value of agricultural output.

Mahesh (1999) identified the causes and consequences of changes in cropping pattern in Kerala. Some of the causes identified were: increase in land use for non-agriculture purpose, technological change, increasing pressure on land, modernization and commercialization of agriculture, price factors, etc. The identified consequences are decline in area under paddy which led to reduction in straw. As a result, number of draught and milch animals' declined that caused the decline in availability of farm yard manure and thus, system of traditional farming started to break down. There was a shift in the area from seasonal/annual crops to high value/cash crops. The study showed a steady growth in agricultural income up to mid-

seventies which began to decline in eighties. Analysis of changes in cropping pattern revealed that the area under paddy had nearly halved during the past two decades.

Santhakumar and Nair (1999) tried to analyse the trends and prospects of Kerala agriculture. There was wide disparities among different crops in Kerala. The production of paddy and tapioca had declined due to the decrease in area of cultivation. From 1983 to 1995, an average of 3.79 per cent of area in rice and 4.3 per cent of tapioca had declined. The area under rubber had increased at the rate of 4.2 per cent during the same period. The price factors and profitability, the changes in the land holding pattern and the agro-climatic factors in the state had influenced the cropping pattern and input levels. The increase in the wage rates of agricultural labour has adversely affected the profitability of crops. Size distribution of the land holdings has also affected Kerala's agriculture. The creation of new houses, division of joint families etc. led to the emergence of a large number of small homesteads in areas, which were previously unused for habitation. The study predicted that rubber may continue to be a major income earner for the state in the near future.

Veron (2001) conducted a study to analyze the Kerala Model of Development and sustainable development of Kerala. Kerala's unique development pattern and its outstanding accomplishments were achieved with little foreign aid and it has gained attention in international circles. The study pointed out that the old Kerala model was not an example of sustainable development. This was pre-occupied with redistributive policies and failed to induce economic development. While the new Kerala model has included the policies towards community based sustainable development and addressed common community failures. The study concluded that environmental awareness among the population is essential to achieve sustainable development with a participatory strategy.

Surendran (2002) explained the structural changes in the Kerala economy. In terms of State Domestic Product and per capita state income, Kerala ranked among the poorest states of the country and stood below the all India average while in case of development indicators like HDI, PQLI etc., Kerala ranked first in all over India and

above the national average. The study found that industrial sector (registered and non-registered) witnessed acute stagnation during 1951 to 1991. The tertiary sector made a commendable performance during this period. It is the product of the Kerala Model of Development which attracted an un-proportionate higher investment by both private and government sectors. The spurt of investment in the tertiary sector permitted to increase its state domestic product and on the occupational front.

Shyjan (2003) discussed about the growth and sectoral performance of Kerala economy. The study was divided into five sections and the study periods have been from 1960-61 to 2005-06 with special emphasis on reform period. It goes through the theoretical background of economic growth and structural change, growth of NSDP and per capita income in comparison with all India average, contribution of different sectors and sub components also. The growth of NSDP in Kerala was highly fluctuated. When compared to the growth of NNP and average annual growth rates of per capita income had been higher in India than Kerala from 1971-72 to 1985-86. The share of primary sector had occupied first position for about two decades from 1960-61 to 1982-83. But after that the position shifted to second from 1982-83 to 1999-2000 and further moved to third position after that. The share of secondary sector was observed to almost stable. The decline in the share of primary sector had been compensated by the increase in the tertiary sector.

Kannan (2004) focused on Kerala's turnaround in growth and the role of social development, remittances and reform. Sectoral growth rate of net state domestic product in primary sector has increased from 0.44 per cent to 2.90 per cent, while that of secondary sector has increased from 3.48 per cent to 6.08 per cent and tertiary sector increased from 3.73 per cent to 7.63 per cent during 1970-71 to 1987-88. In Kerala, the turnaround in growth took place immediately after the economic reforms that started during the mid-1980s. The structural transformation that Kerala had undergone during the last decade of the 20th century was significant. Kerala had a higher share in non-agricultural activities because of its specialization in low-labour absorbing cash crops, high labour-absorbing agro-processing industries and the consequent employment in trade and related activities. By the beginning of the 1980s,

a major share of income was generated outside the primary sector. But, the employment structure remained largely agrarian in the context of a slow growth of the secondary sector. The study concluded that Kerala has left behind the phase of rapid human development improvement and low economic growth but it faced many hurdles in translating its existing high human development status and relatively high growth into meaningful development outcomes especially in meeting the challenge of high unemployment of its educated people and equitable participation of its women folk in all walks of life.

Pillai and Shanta (2005) studied the long term trends in the growth and structure of the net state domestic product in Kerala. In the case of structural transformation, a steady decline in the primary sector's contribution to state domestic product, a marginal increase in the secondary sector and tertiary sector has steadily increased over the last three decades. The study analysed the change, which shifts the largest contribution of state income from primary sector to tertiary sector over the periods from 1970 to 1990. During 1970-71 to 1999-2000, average growth rate of primary sector in NSDP was 1.20 per cent, while in secondary and tertiary sector growth rate was 4.81 per cent and 5.29 per cent respectively. The study pointed that remittances had played a great role in the structural changes of the Kerala economy.

Cheriyann (2004) examined the changes in the mode of labour due to shift in the land use pattern in Kerala. The area put to non-agricultural purposes had increased mainly due to population pressure and rise in the cost of cultivation of traditional crops, and decline in area under forests due to the large expansion of plantations, river valley projects etc. The study found that the state economy was characterized by a high wage share due to predominance of cultivation of cash crops, labour-intensive agro-processing activities in industry and up rise of the service sector consisting of trade and transportation and other social services.

Papola (2005) pointed that economic development in India over a period of half a century seems to have followed the same pattern of structural changes. The share of agriculture in GDP declined from around 60 per cent in 1950-51 to 24 percent in 2003-04, while that of industry increased from 13 to 25 per cent and of

services from increased from 28 to 51 per cent. This pattern of shifts had been continued throughout the period of over half a century, but the speed of the shift had been faster since 1990-91. The first forty years saw a decline in the share of agriculture from 59 per cent to 35 per cent, the next 13 years from 35 to 24 per cent. The share of services increased from 28 to 40 per cent in the first 40 years and from 40 to 51 per cent in the next 13 years. The share of industry had grown slowly but has stagnated since 1990-91. The most outstanding feature of the structural change in the Indian economy in recent decades was the services sector as the major contributor to growth which has increased its share sharply in the national output.

Babu (2005) analysed Kerala's growth trajectory with the help of NSDP growth and sectoral growth. The annual growth rate of net domestic product of Kerala had increased over a span of three decades, which was 4.5 times increase over three decades which was the remarkable rate of growth when compared with some of the other states in India. The study noticed that the long-term growth performance of Kerala economy clearly showed the growth path of the 1990s which was higher than that of all India. The per capita net state domestic product in Kerala was also more than that of the all India average. In case of sectoral growth, both the primary and secondary sectors were faced wide fluctuations in growth rates. This study made an attempt to understand about Kerala's growth, which was mainly contributed by the growth of the tertiary sector which contributed more than 50 per cent of NSDP's growth besides absorbing an equal amount of the workforce.

Kumar (2005) conducted a study about the changing scenarios of land use in Kerala and analyzed that agricultural land use changes in Kerala during the past half-century were marked by an initial increase in total cropped area of 26 per cent between 1960 and 1969, and followed by a dramatic shift in the coverage of individual crops. The area under cultivation has increased from 2.3 million ha to 2.9 million ha during 1960 to 1969 and the forest area of Kerala has dropped from 44.4 per cent in 1905 to 14.7 per cent in 1983. The declining ratio of forest to agricultural land and the augmented intensity of land use increased the pressure of remaining forests and resulting the illegal cutting of trees, over grazing and collection of fodder,

litter and non-wood forest products etc. The study also pointed out that a substantial decline in the area under rice and cassava, besides increases in coconut and rubber cultivation were paramount in every respect.

Geetha (2006) carried out a study on the shifts in cropping pattern in Kerala. The study analysed that the yield effect and location effects were the major factors influencing the productivity growth and yield effect determined the output growth in the state. Cropping pattern effect was positively related to output growth in Kannur and Alappuzha districts due to shifting of area under food crops to non-food crops. Positive growth rates in area have been reported in the case of coconut, rubber, pepper, arecanut, and coffee. Productivity growth rates of all crops were positive while negative production growth rates were reported in the case of rice, tapioca and cashewnut. The study also showed positive growth rates in yield across all crops. Compared to food crops, cash crops in general have shown better growth trends, both in production and yield.

Prakash (2006) analysed the economic development of Kerala during the past 50 years by classifying into three phases: First phase (between 1956 and 1975), Second phase (between 1976 and 1991) and the third phase (between 1991 and 2006). Earlier Kerala faced two basic socio-economic problems, that is, massive poverty and unemployment. However, the large scale migration and flows of remittances had resulted in unprecedented economic changes in Kerala and as result poverty and unemployment has decreased in the state. Wide spread changes had took place in the labour market consumption, savings, investment, poverty, income distribution and regional development. In the second phase, migration and consequent remittances had become the biggest factor in Kerala's economic growth and development and in the third phase, the impact of economic reforms implemented by the government of India since 1991 played a major role in Kerala's economic development.

Mani (2006) evaluated the performance of agriculture sector in Kerala with special emphasis on the post-economic reform period. The study found that the area under food crops declined because of the domination of cash crops instead of food

crops. The study had made an attempt to explain the agricultural growth in macro perspectives, trends in land utilizations, trends and growth patterns in area under various crops, cropping pattern, farm credit, fertilizer consumption, irrigation facilities, subsidies etc. The gross cropped area made a notable decrease from 30200 thousand hectares in 1990-91 to 29424 thousand hectares in 2004-05. Rising trend in the output of non-food crops could be seen particularly during the second half of the 1990s. Declining of food crop production was mainly due to the uneconomic agricultural operations because of escalating input prices and increasing labour costs.

Chand et al., (2007) analysed the growth crisis in agriculture at national and state levels. The study pointed out that the growth rate in the initial years of reforms was somewhat favourable for agricultural growth, but the post WTO period witnessed a sharp decline in the growth rate of almost all sub sectors and commodity groups in the agricultural sector. A sharp deceleration in agricultural growth was experienced in all India level. The level of agricultural productivity during the mid-1980s was highest in Kerala followed by West Bengal, Jammu & Kashmir and Punjab. The lowest level of agricultural productivity was recorded in Rajasthan followed by Madhya Pradesh. During 1995-96, NSDP in agriculture showed an annual decline of 3.54 per cent in Kerala. It has resulted Kerala moved from top position to fifth position in productivity. Another aspect was the agricultural sector and non-agricultural sector had a disparate growth path. The slowdown in the growth of fertilizer growth, irrigation and energy were the main reasons for deceleration and stagnation in agricultural output, the study reported.

Bhalla and Singh (2009) found that Kerala has a unique cropping pattern as only 9.9 per cent of the gross cropped area was devoted to food grains as against a national average of 63.8 per cent. Whereas, about 90 per cent of the state's area was under high value plantation crops such as condiments and spices and remaining crops. Kerala along with Punjab has witnessed the highest levels of crop productivity in the country due to the prevalence of high value crops in the state. Kerala also registered a significant increase in share of value of output of plantation crops in total value of output from 16.7 per cent in 1990-93 to 36.3 per cent during 2003-06. As

condiments and spices emerged as important export crops, trade liberalization has created a favourable market situation which induced the farmers to increase the area and production of these crops. The study concluded that unrestricted imports of cheap spices (black pepper) from Sri Lanka and some east Asian countries have posed some problems for the farmers in the state.

George (2011) made an attempt to analyse the structure, growth, strength and weakness of the Kerala economy. The study was based on four sections and the first section described the evolution of Kerala economy from early historic beginnings till the formation of the state in 1957, mainly the course of Kerala's economic development. Section two described the characteristics of the economy and the sectoral changes in state income and employment, section three goes into some of the weaknesses of Kerala economy. Unemployment was one of the important weakness of the state and the unemployment rate in Kerala for rural area was 15.8 per cent and in urban area was 19.9 per cent during 2004-05. Another major weakness of Kerala economy was external dependence, both for employment and for remittances. The non-resident remittances to Kerala in 2006-07 amounted to Rs. 24,269 crores. Aging was also one of the problem in Kerala and the number of elderly in Kerala stood at 33.35 lakhs in 2001. The section four discussed the potential of the state for faster economic growth to sustain its social development. Kerala already had the physical, financial and communication infrastructure. It ranked first in the index of infrastructure among the states in India. Kerala has the highest tele-density of 15.4 per 100 population. The study concluded that the old age population in Kerala shows that the share of old people in the population is expected to reach 6.6 million by 2021.

Lathika (2011) found that Kerala agriculture has rapidly undergoing a transition involving the three basic factors of production, namely, land, water and labour. The average size of land holding in Kerala has declined from 0.36 ha in 1985-86 to 0.24 ha in 2000-01. The unemployment among the labour force in Kerala (UPS) during 1999-2000 was very high (11.4 per cent) compared with the rate in the major Indian states and the average Indian level (2.7 per cent) and the female unemployment rate stood almost 3 times as that of males. The declining contribution

of agriculture towards the state income and the tendency of cultivators to switched over to more easy and quick-earning crops, shrinkage of acreage of food grains and large scale conversion, commoditization and alienation of agricultural land, are some of the well documented manifestations of the characteristic changes that are took place in the state's agriculture sector.

Andrews (2013) analysed the dynamics of cropping pattern shifts in Kerala during 1960-61 to 2010-11. During the land reform period (1960-61 to 1975-76), the area under food crops, non-food crops and total cropped area was registered a significant growth of 1.5 per cent, 2.6 per cent and 1.95 per cent respectively. The percentage share of total food grains has declined from 30.08 per cent in 1975 to 8.7 per cent in 2010, while the non-food crops has increased from 37.2 per cent to 60.2 per cent of total sown area during the same period of time. Dynamics of cropping pattern was showed in coconut cultivation also. The percentage share of coconut in the total sown area was increased from 24.3 per cent to 29.5 per cent during 19975 to 2010. The study concluded that, the crop was shift mainly took place after the land reform measures. The indiscriminate use of land for profit oriented crops will lead to serious environment problems in the state near future. Moreover the initial conversion of paddy land to coconut was ultimately led to non-agricultural uses of land, at the cost of food security and environment.

Nithya (2013) studied the impact of globalization on Kerala agriculture and also the achievements and challenges of Kerala's agriculture. The study explained many factors that hinder the smooth performance of agriculture in the state. Shortage of farm labours, abnormal increase in land prices etc. are some of the factors hindering agricultural growth. Area under paddy has declined from its peak coverage of 8.81 lakh ha in mid-seventies to 4.31 lakh ha in 1996-97. This was mainly due to the enormous pressure exerted by high-value crops like coconut, banana, pineapple etc. During 1985-86, the total increase in area under coconut was 11.8 thousand hectares (1.7 per cent growth), between 1985-86 and 1995-96, total increase in area was 209.6 thousand hectares (29.7 per cent growth) and between 1995-96 and 2004-05, the decline in area was noted to be 16.3 thousand hectares (1.8 per cent decline).

The study concluded that Kerala agriculture adversely affected by trade liberalization and there was also a considerable decline in public investment in the agriculture sector.

Roy (2013) studied structural change and the changing relationship between the industrial and the service sector among the Indian states. The study considered a panel of 16 major states over the period of three decades from 1980 to 2011. During 1990-91, the export share of services was 3.2 per cent of total services output and it increased to 15.1 per cent in 2008-09. From 1980 to 1992, the output share of the industrial sector was a strong positive association with the output of the service sector. Development of the service sector has generally occurred along with the expansion of the industrial sector. The service sector contributed 57 per cent of the gross domestic product (GDP) in 2012-2013 and grew at 9.2 per cent over the period 2001-2011 and the share of the industry in GDP remained more or less stable at around 28 per cent since 1999-2000, and the average annual growth between 1991-1992 and 2011-2012 was 6.7 per cent. The study concluded that there is a strong link between the output of the service sector and the output of the industrial sector and could not grow independent of each other over the period 1980-2011.

Sethi and Kaur (2014) examined the structural transformations and inter-sectoral linkages in income of Punjab and Haryana. The study revealed that the share of tertiary sector has overtaken the share of primary as well as secondary sectors, both in Punjab and Haryana. The relative growth rate of NSDP in Haryana was showed a constant rate during the span of 30 years from 1980-81 to 2009-10, while Punjab showed a downward trend during 2007. NSDP from primary sector in Punjab had witnessed deceleration until 2003 and after that started to increase at a small extent. Relative share of primary sector in NSDP has declined from 38.7 per cent to 26.8 per cent in Punjab and from 41.5 per cent to 16.8 per cent in Haryana. In Punjab, the fastest rate of growth was registered by secondary sector. Tertiarisation of Haryana was more visible than Punjab. The rates of growth in major components of real NSDP of Haryana had undergone acceleration earlier than in Punjab. During 2009-10, NSDP growth rate of Punjab was 7.12 per cent, while Haryana was

estimated 12.03 per cent and the study has concluded that the growth performance of Haryana state was better than that of Punjab.

Mukesh (2015) conducted a study on the dynamics of paddy cultivation in Kerala. Kerala has lost over five lakh hectares of paddy fields between 1980 and 2007 and there were many causes for the declining of paddy cultivation. Labour shortage and low price of paddy was the important reasons identified the loss in area. Thrissur was the only one district which has increased the rate of area, production and productivity of rice in recent years such as 2010-11, 2011-12 and 2012-13. In 2011-12, the largest rice cultivated area was in Palakkad with 833998 ha and the least rice cultivation was in Idukki with 1264 ha. The production of rice was also highest in Palakkad and it was 2244.1 lakh MT and least in Idukki with 31.3 lakh MT during the same period. While, the productivity of rice was highest in Pathanamthitta with 3208 Kg/ha.

CHAPTER3

Database and Methodology

This chapter mainly describes the database and methodology adopted for the study. The chapter has also defined some of the key terms used in the analysis. The study covered a period of 1980-81 to 2010-11.

3.1 Sources of Data

For analyzing the objectives of the study, the data was collected from various secondary data sources. Data on area, production and productivity of crops cultivated in the state, data regarding NSDP and GSDP etc. were collected from the annual publications of government of Kerala, such as various issues of economic review of Kerala, Human Development Report of Kerala, Kerala Development report etc. Some relevant data was also collected and analysed by other reports and publications of government of India such as, National Sample Survey Organization, RBI Bulletin, Reports from Ministry of Planning Commission, Reports from Ministry of Agriculture, Statistical Hand Book of Indian Economy, Economic and Political Weekly, periodical magazines, electronic sources etc.

3.2 Estimation of Compound Annual Growth Rate (CAGR)

The compound annual growth rates of GSDP and NSDP was worked out by dividing the study years into three distinct categories i.e. 1980-81 to 1989-90, 1990-91 to 1999-2000, 2000-01 to 2010-11. Similarly, the pace of agricultural development in Kerala was determined by measuring growth in area, production and yield of crops and dividing the study years into three above mentioned categories. Compound Annual Growth Rate (CAGR) is the year-over-year growth rate of a variable over a specified period of time.

To find out the CAGR in Excel worksheet, the following equation was used,

$$\text{CAGR (\%)} = [\text{logest } (Y_{t1} + Y_{t2} + \dots + Y_{tn}) - 1] * 100$$

Where, Y= Variable under study

t = Time (1, 2....n) for each period

3.3 Splicing GSDP and NSDP

All the data on GSDP and NSDP at different constant prices was converted to 2004-05 prices. For this, GSDP and NSDP data on previous old series (e.g. say 1999-00) was multiplied by the conversion factor which was calculated as a ratio of sum of GSDP/NSDP data for the current base year for the years common in current base year and previous base year. It has been worked out separately for each sub-sectors in the economy.

$$\text{Conversion factor} = \frac{\sum_{i=1}^j (GDP)_{new}}{\sum_{i=1}^j (GDP)_{old}}$$

Where,

J = number of years common between new and old series of GSDP/NSDP.

3.4 Conceptual Framework

Some of the key concepts used in analysis are defined as under:

3.4.1. Net State Domestic Product

Net State Domestic Product (NSDP) is defined as a measure, in monetary terms, of the volume of all goods and services produced within the boundaries of the State during a given period of time after deducting the wear and tear or depreciation, accounted without duplication.

3.4.2. Gross State Domestic Product

Gross State Domestic Product (GSDP) is defined as a measure, in monetary terms, of the volume of all goods and services produced within the boundaries of the State during a given period of time, accounted without duplication.

3.4.3. Per capita income

Per capita income, also known as income per person, is the mean income of the people in an economic unit such as a country or city. It is calculated by taking a measure of all sources of income in the aggregate (such as GDP or Gross national income) and dividing it by the total population. Per capita income is often used as average income; it can also be used as a measure of the wealth of the population of a nation, particularly in comparison to other nations. Per capita income is often used to measure a country's standard of living.

3.4.4. Human Development Index

The Human Development Index (HDI) is a summary measure of key dimensions of human development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. The HDI is the geometric mean of normalized indices from each of these three dimensions. HDI is composed of three equally weighted indices for health, education and income each of which is composed through measurement of various proxies for these factors.

$HDI = 1/3 \text{ Health Index} + 1/3 \text{ Education Index} + 1/3 \text{ Standard of Living Index.}$

(Human Development Report, 2013)

3.4.5. Primary Sector

The primary sector of the economy extracts or harvest products from the earth. The primary sector includes the production of raw material and basic foods. Activities associated with the primary sector include agriculture (both subsistence and commercial), mining, forestry, farming, grazing, hunting and gathering, fishing and quarrying.

3.4.6. Secondary Sector

The secondary sector of the economy manufactures finished goods. All of manufacturing, processing, and construction lies within the secondary sector. Activities associated with the secondary sector include metal working and smelting, automobile production, textile production, chemical and engineering industries, aerospace manufacturing, energy utilities, engineering, construction, and shipbuilding etc.

3.4.7. Tertiary Sector

The tertiary sector of the economy is the service industry. This sector provides services to the general population and businesses. Activities associated with this sector include retail and wholesale sales, transportation and distribution, restaurants, clerical services, media, tourism, insurance, banking, healthcare, and law.

3.4.8. Agricultural Productivity

Agricultural productivity may be defined as the ratio of the index of total agricultural output to the index of total input used in farm production. It is measure of the efficiency with which inputs are utilized in production, other things being equal.

3.4.9. Cropping Pattern

Cropping pattern means the proportion of area under various crops at a point of time or yearly sequence and spatial arrangement of crops and fallow on a given area. Cropping pattern is dynamic concept as it changes over space and time. The cropping patterns of a region are closely influenced by the geo climatic, socio-cultural, economic, historical and political factors.

3.4.10. Operational holding

An operational holding is defined as a techno-economic unit used wholly or partly for agricultural production and operated (directed/managed) by one person alone or with the assistance of others, without regard to title, size or location. The holding might consist of one or more parcels of land, provided they are located within the country and form part of the same technical unit. In the context of agricultural operations, a technical unit is a unit with more or less independent technical resources covering items like land, agricultural equipments and machinery, draught animals etc. (NSSO, 1992).

3.4.11. Capital expenditure

The expenditure incurred with the objective of acquiring tangible assets of a permanent nature (for use in the organisation and not for sale in the ordinary course of business) or enhancing the utility of existing assets, is broadly defined as Capital expenditure. Subsequent, charges on maintenance, repair, upkeep and working expenses, which are required to maintain the assets in a running order as also all other expenses incurred for the day to day running of the organisation, including establishment and administrative expenses shall be classified as capital expenditure (Gol, 2004).

3.4.12. Net area sown

Area sown with crops and orchards, counting the area sown more than once in the same year, only once. The above definition can be elaborated as follows: The net

area sown was defined as the difference between the total geographical area of all plots of land of the holding and the sum of the areas of land under (1) forest, (2) barren & uncultivable wastes, (3) put to non-agricultural uses, (4) cultivable wastes, (5) permanent pastures & other grazing land, (6) miscellaneous tree crops excluding orchards and (7) all type of fallow lands (NSSO, 2012)

3.4.13. Gross Cropped Area

This represents the total area sown once and/or more than once in a particular year, i.e. the area is counted as many times as there are sowings in a year. This total area is also known as total cropped area or total area sown.

3.4.14. Gross Irrigated Area

The total irrigated area under various crops during a year, counting the area irrigated under more than one crop during the same year as many times as the number of crops grown and irrigated (Irrigation Census in India, 2010).

3.4.15. Net Irrigated Area

The net irrigated area (NIA) as defined by Directorate of Economics and Statistics is the total area that is irrigated at least once per agricultural year. It does not include areas that were left fallow or that were entirely rain fed during the year of statistics.

3.4.16. Labour Force

Persons who are either 'working' (or employed) or 'seeking or available for work' (or unemployed) during the reference period together constitute the labour force. The labor force is defined simply as the people who are willing and able to work. The size of the labor force is used to determine the unemployment rate (NSSO, 2007).

3.4.17. Work Force

Work force consists of all persons who are actually working, whether in the formal or in the informal sector, i.e. labour force less unemployed.

3.4.18. Self-employed

Persons who operate their own farm or non-farm enterprises or are engaged independently in a profession or trade on own-account or with one or a few partners are self-employed in household enterprises. The essential feature of the self-

employed is that they have autonomy (i.e., regarding how, where and when to produce) and economic independence (i.e., regarding market, scale of operation and money) for carrying out operation. Their remuneration is determined wholly or mainly by sales or profits of the goods or services which are produced (NSSO, 2007).

3.4.19. Regular salaried/wage employee

Persons working in others farm or non-farm enterprises (both household and non-household) and getting in return salary or wages on a regular basis (and not on the basis of daily or periodic renewal of work contract) are the regular salaried/wage employees. The category not only includes persons getting time wage but also persons receiving piece wage or salary and paid apprentices, both full time and part-time (NSSO, 2007).

3.4.20. Casual labour

A person casually engaged in others farm or non-farm enterprises (both household and non-household) and getting in return wage according to the terms of the daily or periodic work contract is a casual wage labour. Usually, in the rural areas, a type of casual labourers can be seen who normally engage themselves in 'public works' activities. 'Public works' are those activities which are sponsored by Government or local bodies for construction of roads, bunds, digging of ponds, etc. as 'test relief' measures (like flood relief, drought relief, famine relief, etc.) and also employment generation scheme under poverty alleviation programmes (NREP, RLEGP, etc.) (NSSO, 2007).

CHAPTER 4

Structural Transformations and Relative Economic Development in Kerala

The estimates of the income and employment of a state have for long been accepted as important indicators of the overall performance of the economy. An analysis of the changes in the growth of income and employment among various sectors and sub-sectors over time provides a useful measure of structural changes in the pattern of production and services. The structural transformation involves four main features: a falling share of agriculture in economic output and employment, a rising share of urban economic activity in industry and modern services, migration of rural workers to urban settings and a demographic transition in birth and death rates that always leads to a spurt in population growth before a new equilibrium is reached (Timmer, 2007). Economic development ideally refers to the sustained actions of communities and policy makers that improve the standard of living and economic health of a specific locality. It can also be referred to as the quantitative and qualitative changes in an existing economy. Kerala has been experiencing a wide variety of changes in its productive sectors and other dimensions of the economy. Kerala economy has changed from a traditional backward agrarian economy to modern growing economy. The economy faces structural changes since its formation in 1956. While the real sectors remained as sluggish in growth rate, the service sector achieved a high growth path (Subash, 2011). There are changes not only in traditional indicators like Gross State Domestic Product (GSDP) and per capita Income, but also in other socio-economic indicators. It is in this context that this chapter analyses major structural transformations in Kerala economy and relative economic performance of the state with other major Indian states.

4.1 Structural Transformations in Kerala economy

Accelerating production and expanding employment opportunities are the goals of economic policy (Rangarajan, 2006). Because of the structural transformation in Kerala economy, the output and employment pattern has also been

changed. The various structural transformations in Kerala in terms of output (GSDP, NSDP) and employment are explained as under:

4.1.1 Sectoral Contribution in GSDP

Table 4.1 shows the sectoral contribution of GSDP in different sectors of Kerala economy during 1980-81 to 2010-11. The contribution of agricultural sector in GSDP has continued to decline over the years; while that of other sectors, particularly services has increased. In 1980-81, primary sector contributed about 38 per cent of GSDP, which declined to 27.82 per cent, 21.88 per cent and 10.37 per cent in 1990-91 and 2000-01 and 2010-11 respectively. Out of the total share of 38 per cent of the GSDP from primary sector in 1980-81, agriculture and allied activities accounted for 21 per cent followed by forestry and logging (13.26 per cent), fishing (3.40 per cent) and mining and quarrying (0.19 per cent). The share of agriculture and allied sectors in GSDP has declined from 21.04 per cent in 1980-81 to 7.78 per cent in 2010-11.

All the sub-components of primary sector except mining and quarrying had been declining over the last three decades. Forestry and logging has declined from 13.26 per cent in 1980-81 to 1.25 per cent in 2010-11. All the sub-components of secondary sector had showed an increasing trend during the period of 1980-81 to 2010-11. Out of this, construction sector has contributed the highest share in GSDP. The share of the tertiary sector, which comprises of transport and communication; storage; trade, hotels and restaurants; banking and insurance; real estates and ownership of dwellings; public administration and other services has leaped up from 45.22 per cent in 1980-81 to 54.54 per cent in 1990-91. It further hiked to 58.32 per cent in 2000-01 and 67.61 per cent in 2010-11. The tertiary sector is the one, which has consistently shown high growth rates. The growth in aggregate income has been largely achieved due to the buoyancy in tertiary sector only. Under tertiary sector, all the sub-components has shown an increasing trend during the entire study period, except trade, hotel and restaurant. In 1980-81, the share of trade, hotel and restaurant in GSDP was 19.87 per cent, which increased to 20.42 per cent in 2000-01 with marginal decrease to 19.26 per cent in 2010-11. The contribution of public administration to GSDP has also increased from 2.09 per cent in 1980-81 to 3.61 per cent in 2010-11 (Table 4.1). There is a large decline in the contribution of primary

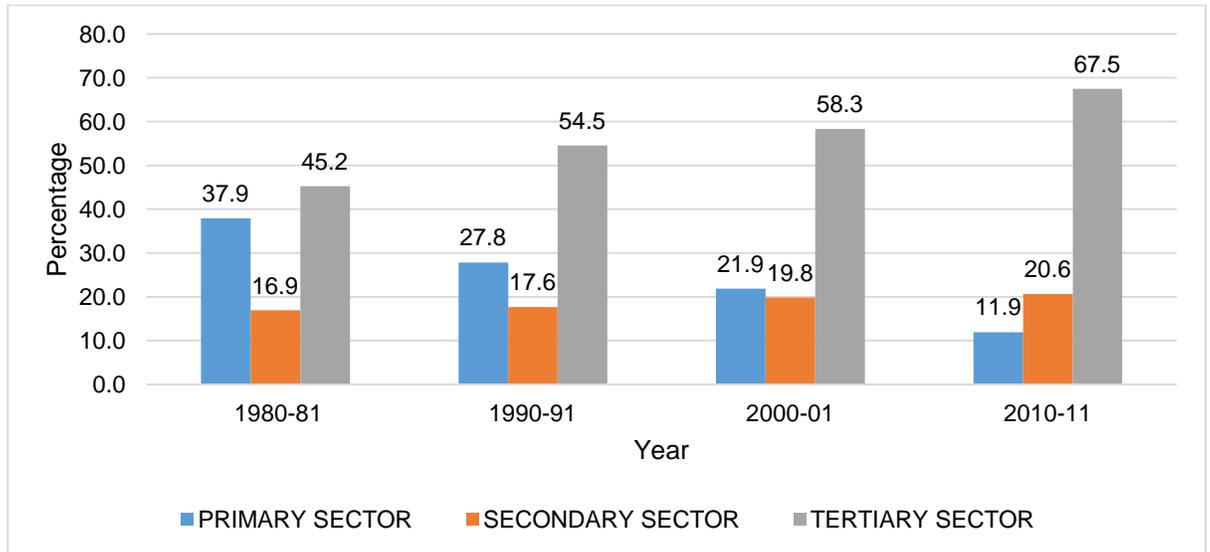
sector to the total GSDP and a rapid increase in the contribution of service sector. More than half of the share of primary sector had declined from 1980-81 to 2010-11. The growth of secondary sector has also increased, but there is not much variation and the lion share of GSDP is now contributed by tertiary sector (Figure 4.1).

Table 4.1: Sectoral Contribution in GSDP of Kerala (%) (at 2004-05 prices)

Sectors/Sub-sectors	1980-81	1990-91	2000-01	2010-11
Agriculture and allied activities	21.04	21.87	17.49	7.78
Forestry and logging	13.26	2.22	2.15	1.25
Fishing	3.40	3.22	1.93	0.95
Mining and quarrying	0.19	0.51	0.31	0.39
Sub-total of primary sector	37.90	27.82	21.88	10.37
Manufacturing	7.65	9.19	9.77	7.95
Electricity, gas and water supply	1.16	0.96	2.17	1.28
Construction	8.07	7.50	7.86	12.79
Sub-total of secondary sector	16.88	17.64	19.79	22.02
Railways	0.34	0.41	0.44	0.43
Transport by other means	2.32	3.97	6.72	7.40
Communication	0.30	0.46	1.38	6.90
Storage	0.03	0.05	0.05	0.05
Trade, hotel and restaurants	19.87	19.83	20.42	19.26
Banking and Insurance	0.99	2.61	4.90	7.17
Real estate, ownership, business, legal services	9.80	14.56	10.64	11.78
Public administration	2.09	3.39	4.00	3.61
Other services	9.49	9.26	9.78	11.00
Sub-total of tertiary sector	45.22	54.54	58.32	67.61

Source: Economic Review, Kerala (Various Issues)

Figure 4.1 Sectoral Contribution in GSDP of Kerala (%)



Source: Economic Review, Kerala (Various Issues)

4.1.2 Growth Rate in Sub-sectors of GSDP

The analysis of sectoral growth in GSDP showed negative growth rate of primary sector in the first decade (1980-81 to 1989-90), while it was about 1.89 per cent in second decade (1990-91 to 1999-00) and only 0.53 per cent in the last decade (2000-01 to 2009-10). Secondary and tertiary sectors showed positive and increased growth rate throughout the entire decades. Out of the sub-sectors of primary sector, growth rate for agriculture and allied activities had witnessed continuous decline during all the three decades. Forestry and logging and fishing had experienced negative growth rate in the first decade. Except last decade, fishing also showed negative growth rate. On the other hand, all the sub-components of secondary sector have shown increasing growth rate except electricity, gas and water supply in the last decade. Electricity, gas and water supply showed a drastic decreased growth rate from 13.08 per cent to 0.77 per cent from second decade to third decade. Under tertiary sector, communication sector has experienced the highest growth rate. Between 1980-81 and 1989-90, the decadal growth rate of communication was 6.75 per cent, which increased to 16.22 per cent in 1990-91 to 1999-00 and 26.39 per cent in 2000-01 to 2009-10. Decadal growth rate of banking and insurance was 14.48 per

cent between during 1990-91 and 1999-2000 which declined to 11.30 per cent in 2000-01 to 2010-11.

Table 4.2: Sector-wise Compound Annual Growth Rate of GSDP (%)

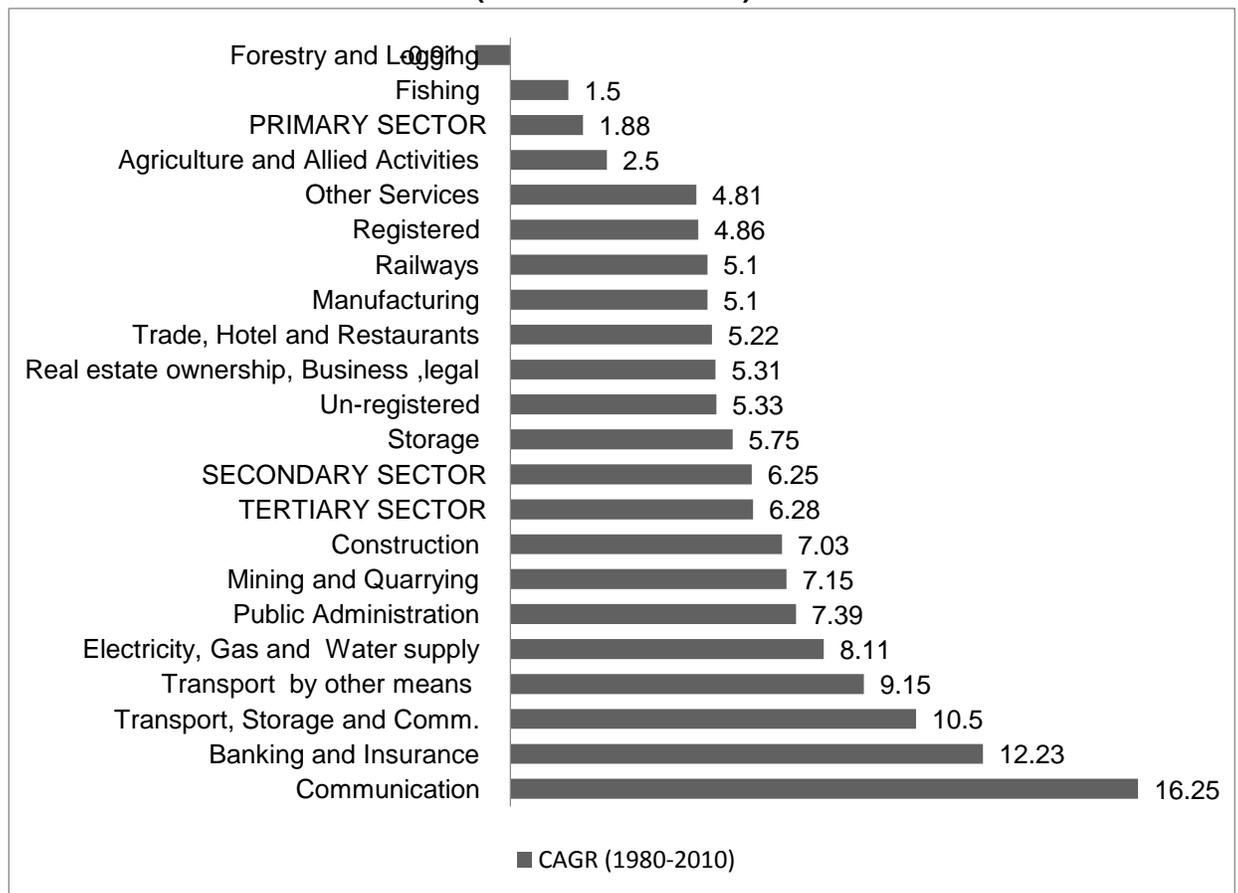
Indicators	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2009-10
Agriculture and allied activities	2.32	2.08	0.14
Forestry and logging	-12.99	2.04	1.46
Fishing	-2.42	-0.06	0.23
Mining and quarrying	11.15	2.67	10.41
Sub-total of primary sector	-1.24	1.89	0.53
Manufacturing	2.43	5.62	6.63
Electricity, gas and water supply	1.52	13.08	0.77
Construction	1.38	7.38	13.16
Sub-total of secondary sector	1.89	6.79	9.33
Railways	5.10	4.47	7.80
Transport by other means	8.27	11.23	9.35
Communication	6.75	16.22	26.39
Storage	7.68	6.56	8.52
Trade, hotel and restaurants	2.11	5.86	8.59
Banking and insurance	13.75	14.48	11.30
Real estate, ownership, business, legal services	3.21	3.69	8.65
Public administration	7.89	7.60	9.87
Other services	2.11	5.68	9.30
Sub-total of tertiary sector	3.48	6.69	10.01

Source: Economic Review, Kerala (Various Issues)

An analysis of growth rate for all the three decades from 1980-81 to 2010-11 shows that communication sector has witnessed highest compound annual growth rate of about 16.25 per cent followed by banking and insurance (12.23 per cent); transport, storage and communication (10.5 per cent); transport by other means (9.15

per cent). These all sub-sectors are under tertiary sector. The least growth rate was shown by forestry and logging (-0.91 per cent) followed by fishing (1.5 per cent); agriculture and allied activities (2.5 per cent) which were the sub-sectors of primary sector. Thus, the analysis shows that Kerala economy has shifted from agricultural economy to service oriented economy.

Figure 4.2: Compound Annual Growth Rate of sub-sectors in GSDP (1980-81 to 2010-11)



Source: Economic Review, Kerala (Various Issues)

4.1.3 Sectoral Contribution in NSDP

Table 4.3 depicted sectoral contribution in NSDP of Kerala for the last three decades. It showed that the share of primary sector in NSDP has also continuously declined from 1980-81 to 2010-11. While, in case of tertiary sector, it has continuously increased from 46.98 per cent in 1980-81 to 73.20 per cent in 2010-11. The relative shares of three sectors during the period 1980-81 to 2010-11 shows that

tertiary sector has been the major contributor of NSDP. However, the decadal trends demonstrate interesting patterns. In the eighties, it was the tertiary sector that dominated (46.98 per cent) followed by the primary (36.29 per cent) and secondary sectors (16.72 per cent). The period of 1990-91 and 2000-01 has also shown the same pattern with major share being contributed by tertiary sector followed by primary and secondary sectors. In 2010-11, share of secondary sector attained the second position and primary sector moved to third position. It is important to note that up to 2000-01, the share of secondary sector has been the lowest. Thus, the increase in the share of the tertiary sector has been at the expense of the primary sector. Alternatively, it can be concluded that the decline in the share of the primary sector has been offset both by the increase in the share of the tertiary sector and to a smaller extent increase in the share of the secondary sector. The decline of the primary sector share can be largely attributed to the decline in agriculture sector in the state.

During 1980-81, the share of agriculture in NSDP was about 36.29 per cent, while that of industry was about 16.72 per cent and services was nearly 46.98 per cent. The improvement in the share of industry in NSDP has been modest from about 16 per cent in 1980-81 to 18.06 per cent in 1990-91, with only marginal improvement to 18.57 per cent in 2010-11. But, there was a sharp escalation in the share of the service sector from about 47 per cent in 1980-81 to 55.44 per cent in 1990-91 and about 73 per cent in 2010-11. Although the share of agriculture and allied activities in NSDP has slightly increased from 18.06 per cent to 20.05 per cent from 1980-81 to 1990-91, but thereafter it declined to 14.20 per cent in 2000-01 and 6.07 per cent in 2010-11. Under secondary sector, contribution of manufacturing sector in NSDP has also declined from 7.75 per cent in 1980-81 to 6.15 per cent 2010-11. The share of electricity, gas and water supply was major in NSDP and it had not shown much variation during the entire period. Construction sector has shown a fluctuation trend as its share was 8.55 per cent in 1980-81, which declined to 8.14 per cent and 7.93 per cent in 1990-91 and 2000-01 respectively. But, in 2010-11, it again increased to 11.89 per cent. The share of most of the sub-sectors of tertiary sector in NSDP has increased continuously throughout the study period. Tertiary sector is considered as

an engine of growth or necessary concomitant of growth resulting from the growth of high value added sectors such as software, communications, financial services, etc.

Table 4.3: Sectoral Contribution in NSDP of Kerala (%) (at 2004-05 prices)

Indicators	1980-81	1990-91	2000-01	2010-11
Agriculture and allied activities	18.06	20.05	14.20	6.07
Forestry and logging	14.44	2.44	2.24	1.22
Fishing	3.60	3.56	1.90	0.74
Mining and quarrying	0.19	0.45	0.23	0.20
Sub-total of primary sector	36.29	26.50	18.56	8.23
Manufacturing	7.75	9.59	8.69	6.15
Electricity, gas and water supply	0.42	0.32	0.88	0.53
Construction	8.55	8.14	7.93	11.89
Sub-total of secondary sector	16.72	18.06	17.51	18.57
Railways	0.19	0.33	0.32	0.36
Transport by other means	1.79	3.27	6.43	6.07
Communication	0.23	0.34	1.19	6.42
Storage	0.02	0.04	0.05	0.04
Trade, hotel and restaurants	21.28	21.83	20.69	17.98
Banking and Insurance	1.09	2.99	5.05	7.01
Real estate, ownership, business and legal services	8.85	10.17	9.74	9.57
Public administration	2.01	3.52	3.43	2.96
Other services	9.49	9.36	9.66	9.91
Sub-total of tertiary sector	46.98	55.44	63.92	73.20

Source: Economic Review, Kerala (Various Issues)

4.1.4 Growth Rate in Sub-sectors of NSDP

As is evident from the Table 4.4, the primary sector registered a growth rate of only 1.59 per cent over the entire period of study, 1980-81 to 2010-2011. During the decade of the eighties, the primary sector registered a growth rate of -2.01 per cent, the lowest among all the sectors. In the nineties, though the primary sector recorded a positive growth rate (2.06 per cent), it was still lower than that of secondary (6.80 per cent) and tertiary sectors (7.34 per cent). Thus, the primary sector has consistently recorded the lowest rate of growth among the three sectors and always

has growth rate below than that of NSDP which suggest that the primary sector has never been a fast growing sector of the economy.

Decadal analysis of the sub-sectoral growth rates within the primary sector shows that mining and quarrying have performed reasonably well in all decades except nineties. In the nineties, forestry and logging had achieved a growth rate of 3.81 per cent against negative growth of around 14 per cent during 1980s and 1.73 per cent during 2000-01 to 2009-10. The growth in agriculture and allied activities was higher (2.25 per cent) during the eighties relatively to fishing and forestry and logging, which have been displaying negative growth rates (-2.15 per cent and -13.99 per cent respectively). The scenario changed in the nineties with agriculture growth rate being only 2.29 per cent, while mining sharply declined to 2.04 per cent and fishing showed small improvement, but growth rate was still negative (-1.03 per cent). Thus, while mining was a major contributing sub-sector within the primary sector during 1980's and 2000's, while in the nineties, it was forestry and logging. In the nineties, both agriculture, forestry and fishing showed signs of recovery and have achieved the highest ever recorded growth rate during the entire period.

The growth rate in secondary sector was 1.04 per cent during 1980-81 to 1989-90, which increased to 6.80 per cent in 1990-91 to 1999-00 and 9.47 per cent in 2000-01 to 2009-10. Under secondary sector, electricity, gas and water supply recorded negative growth rate (-11.65 per cent) in 1980-81 to 1989-90, 17 per cent in 1990-91 to 1999-00 and only 1.24 per cent in 2000-01 to 2010-11. Construction sector has experienced ever increasing growth rate for whole period. The growth rate of tertiary sector also witnessed increasing growth rate in each decade. Among sub-sectors of tertiary sector, growth rate during the whole period was the highest in case of communication sector (17.6 per cent) followed by banking and insurance (12 per cent) and transport by other means. Thus, analysis shows that both in terms of rates of growth and share of NSDP, the tertiary sector was a dominating sector compared with primary and secondary sectors since the 1980s and this has further strengthened during the 1990's and 2000's.

Table 4.4: Sector-wise Compound Annual Growth Rate of NSDP (%)

Indicators	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2009-10	1980-81 to 2010-11
Agriculture and allied activities	2.25	2.29	0.91	2.63
Forestry and logging	-13.99	3.81	1.73	-0.76
Fishing	-2.15	-1.03	-1.67	0.92
Mining and quarrying	11.20	2.04	7.59	5.96
Sub-total of primary sector	-2.01	2.06	0.89	1.79
Manufacturing	1.29	5.34	5.14	4.59
Electricity, gas and water supply	-11.65	17.00	1.24	12.81
Construction	1.17	7.86	13.47	7.04
Sub-total of secondary sector	1.04	6.80	9.47	6.10
Railways	6.97	3.95	10.09	6.00
Transport by other means	8.70	13.28	8.22	10.57
Communication	5.72	18.19	28.53	17.61
Storage	7.96	9.44	6.83	7.27
Trade, hotel and restaurants	1.83	5.80	8.20	5.20
Banking and insurance	12.45	13.25	11.52	12.28
Real estate, ownership, business, legal services	3.33	4.04	8.27	5.50
Public administration	7.44	5.99	9.58	7.06
Other services	1.79	6.10	8.21	4.98
Sub-total of tertiary sector	3.40	7.34	10.26	6.91

Source: Economic Review, Kerala (Various Issues)

4.1.5 Sector-wise Employment Pattern

Employment elasticity varies from sector to sector. Some sectors, by their very nature, are labour intensive. Also demand for labour depends on the relative prices of capital and labour (Rangarajan, 2006). The sectoral composition of employment in Kerala is given Table 4.5. The sectoral composition of employment shows the dominance of tertiary sector from 1999-2000 onwards. The 38th round of NSSO data showed that majority of the workforce was engaged in primary sector followed by

tertiary and secondary sectors. 38th NSSO round also indicates that 46.2 per cent of people in Kerala were engaged in primary sector, 31.1 per cent in tertiary sector and 22.3 per cent in secondary sector in 1983. During 43rd round, the employment in primary sector declined to 44.2 per cent, while in case of secondary and tertiary sectors, it increased to 22.7 per cent and 33 per cent respectively. Under 50th round of NSSO, percentage share of employment in primary as well as tertiary sector has decreased and secondary sector has increased. From 55th round onwards, Kerala's sectoral share of employment is higher in tertiary sector. The 68th round indicates that the employment were the highest in tertiary sector (42.6 per cent) followed by secondary (31.8 per cent) and primary sector (25.5 per cent).

Table 4.5: Sectoral Share of Employment (%)

NSS Round	Primary	Secondary	Tertiary
38 th (1983)	46.2	22.3	31.1
43 rd (1987–88)	44.2	22.7	33.0
50 th (1993–94)	43.5	23.8	32.7
55 th (1999–00)	33.1	28.3	38.6
61 st (2004–05)	31.6	28.0	40.4
68 th (2011-12)	25.5	31.8	42.6

Source: NSSO (Various rounds)

4.1.6 Status of Employment

Table 4.6 shows that the distribution of usually employed persons by status of employment in Kerala. There are mainly three categories of employment, namely, self-employed, regular employment and casual labours. In Kerala, the percentage of self-employed persons in rural and urban areas are declined. In 1983, 51.5 per cent of rural persons and 46.8 per cent of urban persons were self-employed. While, in 2011-12, the proportion of self employed persons declined to 38.2 per cent and 36.4 per cent in rural and urban areas respectively. The regular employed persons witnessed an increasing trend in case of both rural and urban Kerala. During 1983, only 12.6 rural persons were regular employed in Kerala, which increased to 17.8 per

cent in 2011-12, while regularly employed persons in urban areas were 32 per cent in 1983 which increased to 35.8 per cent in 2011-12.

In Kerala, the percentage share of casual labours in the distribution of usually employed persons has also increased in both rural and urban areas during 1983 to 2011-12. The percentage of casual labours engaged in Kerala has increased from 35.8 per cent to 44 per cent in rural areas and from 24.8 per cent to 27.8 per cent in urban areas during 1983 to 2011-12. The increase in casual labours was higher in rural areas than that in the urban areas which points labourers working in rural areas start getting more of casual works rather than regular works. In urban areas, the percentage of casual labours were highest in 1999-00 (40.5 per cent) and lowest in 1987-88 (22 per cent).

Table 4.6: Per 1000 distribution of usually employed persons by status of employment (%) in Kerala

Year	Self employed		Regular employment		Casual labours	
	Rural	Urban	Rural	Urban	Rural	Urban
1983	51.5	46.8	12.6	32.1	35.8	24.8
1987-88	51.1	46.3	10.8	31.8	38	22
1993-94	45.4	39.8	11.5	26.8	43.1	33.4
1999-00	45.6	21.8	14	16.3	41.1	40.5
2004-05	43.7	26.4	15.8	25.4	41.6	38.6
2009-10	39.8	34.1	19.4	34.2	40.7	31.8
2011-12	38.2	36.4	17.8	35.8	44	27.8

Source: NSSO (Various rounds)

4.1.7 Labour Force Participation Rate (LFPR)

Labor force participation rate is the proportion of the population ages 15 and older which is economically active i.e. all people who supply labor for the production of goods and services during a specified period (<http://www.worldbank.org>). Table 4.7 shows LFPR in Kerala. The total LFPR was in general higher in rural areas than urban areas. But, female participation was higher in urban areas. During 1983, LFPR was 42.8 per cent in rural areas and 39.8 per cent in urban areas. In both rural and

urban areas, male participation rate was higher than female participation rate. The male participation rate in 1983 was 52.2 per cent and 55.1 per cent in rural and urban areas respectively, while the respective figures for females were 33.8 per cent and 25.9 per cent. After 1983, rural and urban LFPR started declining. It reached to 40 per cent and 37.1 per cent respectively for rural and urban areas during 2004-05. Thereafter, LFPR for both rural and urban areas started increasing.

During the 68th NSSO round (2011-12), total rural LFPR was 41 per cent with rural male and female LFPR 58.3 per cent and 25.8 per cent respectively. Thus, rural male LFPR has increased from 52.2 per cent to 58.3 per cent during 1983 to 2011-12, while female LFPR has decreased from 33.8 per cent to 25.8 per cent during the same period. In urban areas also, male LFPR has increased from 55.1 per cent to 56.7 per cent, while female LFPR has declined from 25.9 per cent to 22.2 per cent during 1983 to 2011-12.

Table 4.7: Labour force participation rate of Kerala (%)

Year	Rural male	Rural female	Rural Persons	Urban male	Urban female	Urban Persons
1983	52.2	33.8	42.8	55.1	25.9	39.8
1987-88	51.4	30.6	42.5	54.7	25.3	38.3
1993-94	56.8	26.4	40.9	59.9	25	42
1999-00	58.7	27.3	42.2	59.1	25.4	41.5
2004-05	55.9	25.6	40	54.7	20	37.1
2009-10	58.3	26	41.4	56.4	23.3	39.1
2011-12	58.3	25.8	41	56.7	22.2	38.6

Source: NSSO (Various rounds)

4.1.8 Work Force Participation Rate (WFPR)

Table 4.8 shows the work force participation rate (WFPR) in Kerala. The WFPR is defined as the percentage of total workers to the total population (Census of India, 2001). WFPR was 31.3 per cent in rural areas and 27.4 per cent in urban areas as per the 1981 census. In the same census year, male WFPR was 45.2 per cent and female WFPR was 17.7 per cent in rural areas, while male WFPR was 43.4 per cent and female WFPR was 11.8 per cent in urban areas. WFPR for rural males has

increased from 45.2 per cent to 53.6 per cent during 1981-2011, while in case of rural females, it has improved significantly from 17.7 per cent to 20.2 per cent during the same period. For urban males, WFPR has increased from 43.4 per cent to 52.7 per cent, while for urban females, it has increased from 11.8 per cent to 14.3 per cent during 1981-2011. Thus, total WFPR has also shown an increasing trend during these census years. The total WFPR in rural area has increased from 31.3 per cent to 36.3 per cent, while for urban areas, it has increased from 27.4 per cent to 32.6 per cent during 1981-2011. Thus, rural WFPR is higher both for males and females compared to the urban WFPR.

Table 4.8: Work Force Participation Rate in Kerala

Year	Rural			Urban		
	Male	Female	Persons	Male	Female	Persons
1981	45.2	17.7	31.3	43.4	11.8	27.4
1991	47.9	16.9	32.1	46.8	13	29.6
2001	50.2	15.9	32.6	50.8	13.5	31.6
2011	53.6	20.2	36.3	52.7	14.3	32.6

Source: Census of India (various years)

4.2 Relative Economic Development in Kerala

Kerala has had a unique development experience when compared to the rest of the country. High levels of social indicators comparable with the level of indicators in the developed countries, which came about without the usual 'rapid' economic growth in per capita GSDP and simultaneous increases in the output has in fact attracted a lot of attention to this developmental process and gradually started being referred to as the 'Kerala model of development' (Chakraborty *et. al.*, 2010). The Kerala Model of Development (KMD) has received international attention owing to its high achievements in the social sectors with a weak commodity producing sectors. The course of economic development of the state is closely related to its location, climate and topography (George, 2011). The following sub-sectors describe the

relative development indicators of Kerala in comparison with 15 major states in terms of HDI, per capita GSDP and poverty rate.

4.2.1 Human Development Index

Human Development Index (HDI) was introduced by UNDP in 1990. The committee for the introduction of this index was headed by the Pakistani Economist Mahbub-UI Haq and helped by Amartya Sen (Subash, 2011). The HDI is a summary measure of key dimensions of human development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living (Human Development Report, 2013).

Kerala's human development not only outweighs the achievements made by other states including the high income states in India, but also many countries at equal levels of development. When ranked according to global goalposts, Kerala's rank is 99 (between Philippines and the Republic of Moldova) among 192 countries in the world and its current index is smaller than even the 1980 index of top developed countries (GoK, 2014). Kerala stands first in Human Development Index among all the states in India. The states that perform better on health and education outcomes are also the states with higher HDI and thus higher per capita income. Table 4.5 shows that most of the states that are performing low on human development outcomes are concentrated in the northern and central belt.

The top five ranks in all the years except 1981 were held by the better performing states of Kerala, Punjab, Tamil Nadu, Maharashtra and Haryana. Kerala stood first in all the years and similarly, while Punjab stood second. In 1981, Gujarat was included in the top five states list, while in the following years, its rank was sixth as Tamil Nadu replaced Gujarat. In 1991 and 2001, Tamil Nadu and Maharashtra ranked third and fourth respectively. Major change was occurred in the case of Orissa as its rank was 11 in 1981, which slipped to 14th position in 2011. Bihar stands first in the percentage improvement in HDI with 88.6 per cent over the years followed by Madhya Pradesh (84.1 per cent), Uttar Pradesh (83.5 per cent) and Rajasthan (82.8 per cent). Some of the reasons identified for the high ranking in HDI in Kerala are:

- i. High literacy rate (93.91 per cent)
- ii. Low infant mortality due to adequate provision of basic health and educational facilities
- iii. Favourable sex ratio (1084 females per 1000 males) (Census, 2011)

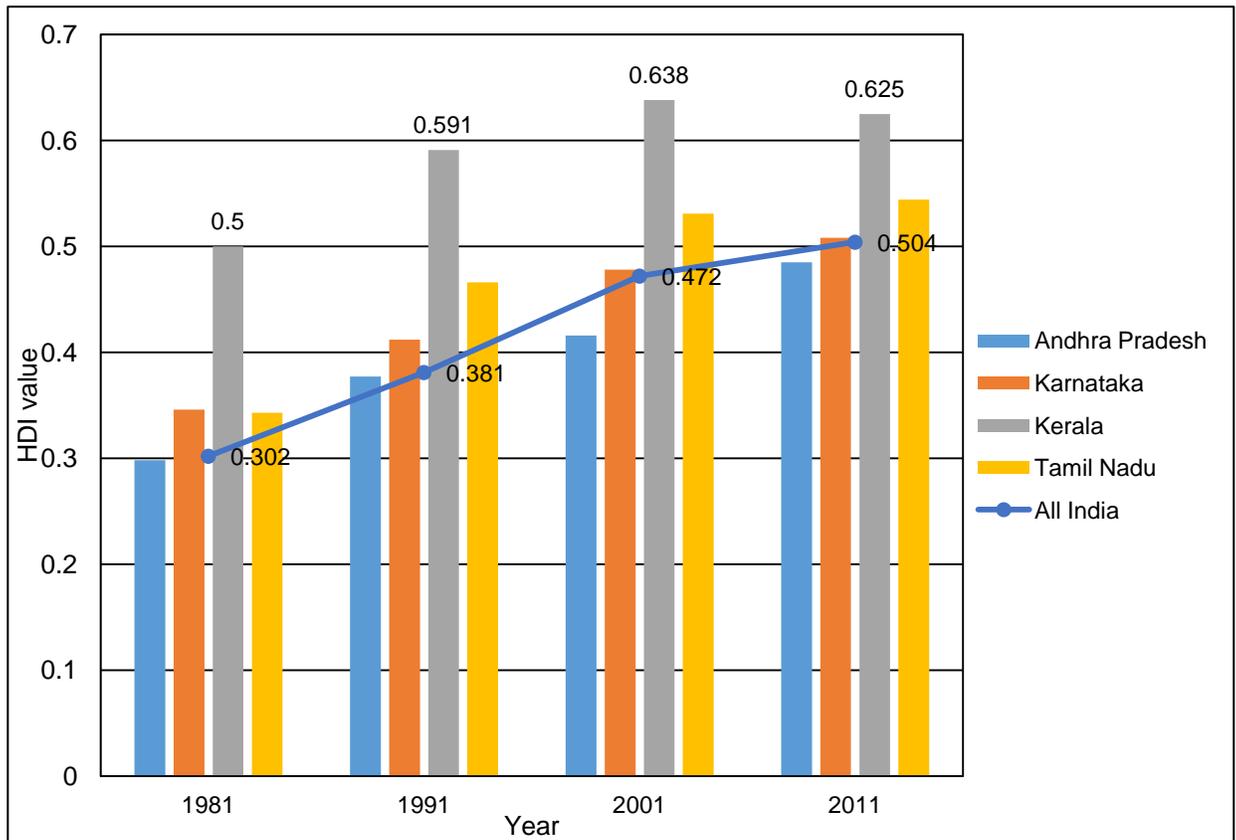
Table 4.9: State-wise HDI values from 1981 to 2011

States	1981	1991	2001	2011	Improvement in HDI (%)
Andhra Pradesh	0.298(9)	0.377(9)	0.416(10)	0.485(9)	62.8 (8)
Gujarat	0.360(5)	0.431(6)	0.479(6)	0.514(6)	42.8 (13)
Haryana	0.361(4)	0.443(5)	0.509(5)	0.545(4)	51.0 (11)
Karnataka	0.346(6)	0.412(7)	0.478(7)	0.508(8)	46.8 (12)
Kerala	0.500(1)	0.591(1)	0.638(1)	0.625(1)	25.0 (15)
Maharashtra	0.363(3)	0.452(4)	0.523(4)	0.549(3)	51.2 (10)
Punjab	0.411(2)	0.475(2)	0.537(2)	0.569(2)	38.4 (14)
Tamil Nadu	0.343(7)	0.466(3)	0.531(3)	0.544(5)	58.6 (9)
Assam	0.272(10)	0.348(11)	0.386(14)	0.474(10)	74.3 (5)
Bihar	0.237(15)	0.308(15)	0.367(15)	0.447(13)	88.6 (1)
Madhya Pradesh	0.245(14)	0.328(13)	0.394(12)	0.451(12)	84.1 (2)
Orissa	.267(11)	0.345(12)	0.404(11)	0.442(14)	65.5 (7)
Rajasthan	0.256(12)	0.347(10)	0.424(9)	0.468(11)	82.8 (4)
Uttar Pradesh	0.255(13)	0.314(14)	0.388(13)	0.468(11)	83.5 (3)
West Bengal	0.305(8)	0.404(8)	0.472(8)	0.509(7)	66.9 (6)
All India	0.302	0.381	0.472	0.504	66.9

Source: Planning Commission, 2011; UNDP, 2011

Kerala has attained number one position in HDI since 1981 among all Indian states. In southern states, Tamil Nadu ranks second and followed by Karnataka. In all the years Andhra Pradesh is below the national level of HDI and in 2001, it was far below the average of India (Figure 4.3).

Figure 4.3: A comparison of HDI of southern states with India



Source: Planning Commission, 2011; UNDP, 2011

4.2.2 Per capita GSDP

Per capita GSDP is sometimes used as an indicator of standard of living with higher per capita GSDP being interpreted as having a higher standard of living. Table 4.6 shows Maharashtra at ₹62729 has the highest per capita income as compared to other major states in the country during 2010-11. At the same time, Kerala's rank was 5th at ₹49873 per capita GSDP. During 1980-81, Punjab had the highest per capita income with ₹17780, followed by Haryana (₹15935), Maharashtra (₹15547) and Kerala (₹13206). Kerala holds 4th position in per capita GSDP in 1980-81 and its rank has moved to 6th position in 1990-91. During 2000-01, per capita income of Kerala was ₹24493.87, holds 5th rank and increased to ₹49873 and maintained 5th rank in 2010-11. Bihar holds last rank compared to other major states of India throughout the study period. A major change was occurred in the case of Andhra Pradesh and Assam. Andhra's rank has improved from 12 to 7 and Assam's has worsened from 6

to 13 from 1980-81 to 2010-11. The per capita GSDP of Maharashtra is around 4 times higher than the states of Bihar and Uttar Pradesh. Thus, in the context of Kerala, it hold more or less same rank throughout the study period.

Table 4.10: State-wise per capita GSDP (at 2004-05 prices)

States	1980-81	1990-91	2000-01	2010-11
Andhra Pradesh	9474.64(12)	14143.31(8)	20967.96(8)	40366(7)
Assam	11635.48(6)	13991.58(9)	14715.77(11)	21406(13)
Bihar	5447.68(15)	7111.09(15)	7410.34(15)	13632(15)
Gujarat	12450.18(5)	16948.93(5)	23422.06(6)	52708(3)
Haryana	15935.16(2)	23593.45(2)	29712.52(3)	59221(2)
Karnataka	10642.52(8)	14276.37(7)	23290.49(7)	39301(8)
Kerala	13206.99(4)	15895.68(6)	24493.87(5)	49873(5)
Madhya Pradesh	9950.03(9)	12426.54(11)	14495.29(12)	22382(12)
Maharashtra	15547.57(3)	22239.09(3)	31775.53(1)	62729(1)
Orissa	9935.61(10)	10457.35(14)	13149.87(13)	25708(11)
Punjab	17780.54(1)	24802.33(1)	31623.61(2)	44752(6)
Rajasthan	8227.23(14)	13074.69(10)	15600.41(10)	26436(10)
Tamil Nadu	11461.51(7)	17115.75(4)	27653.48(4)	51928(4)
Uttar Pradesh	8541.96(13)	11041.72(13)	12139.44(14)	17349(14)
West Bengal	9852.06(11)	11919.16(12)	18958.52(9)	32228(9)

Source: Handbook of Statistics on Indian Economy, RBI, 2013

4.2.3 Poverty Rate

In India, the generally accepted definition of poverty emphasizes minimum level of living rather than a reasonable level of living. Planning commission appointed an expert committee, under Suresh Tendulkar in 2008 which suggested a formula based on consumption expenditure for identifying BPL families. Tendulkar committee has used a broad definition of poverty including expenditure for food, education, health etc. According the committee, the monthly consumption expenditure to measure poverty line is ₹446.68 per person per month in rural areas and ₹578.8 per person per month in urban areas (Subash, 2011). The existing poverty measure of Planning Commission of India is based on the recommended nutritional requirements of 2400 calories/person/day in rural areas and 2100 calories/person/day in urban areas. The poverty ratio in India has declined to 21.92 per cent in 2011-12 from 44.48 per cent in 1983. According to the Planning Commission's estimate, 40.42 per cent of the total Kerala population was below poverty line during 1983-84, as against 44.48 per cent in all India level. While, during 2011-12, Kerala's poverty rate has declined to 7.05 per cent as against 21.92 per cent in all India level.

During 1983-84, poverty was least in Punjab (16.18 per cent) followed by Haryana (21.37 per cent), Andhra Pradesh (28.91 per cent), Gujarat (32.79 per cent) and Rajasthan (34.46 per cent) in that order. The level of poverty was highest in Orissa (65.29 per cent). In Kerala, about 40 percent of the population was below poverty line during 1983-84. During the entire period of 1983-84 to 2011-12, Orissa and Bihar remained the most poverty ridden states while the relative ranking of the states such as Punjab, Rajasthan and Uttar Pradesh remained same throughout the period. Kerala observed a remarkable achievement in terms of reduction in poverty over the period as the level of poverty reduced from 40 per cent in 1983-84 to only 7 per cent in 2011-12, the least among all the states.

Table 4.11: State-wise poverty rate (%)

States	1983-84	1993-94	1999-00	2011-12
Andhra Pradesh	28.91(13)	22.19(14)	15.77(10)	9.2(13)
Assam	40.47(8)	40.86(4)	36.09(4)	31.98(3)
Bihar	62.22(2)	54.96(1)	42.6(2)	33.74(1)
Gujarat	32.79(12)	24.21(13)	14.07(12)	16.63(9)
Haryana	21.37(14)	25.05(12)	8.74(14)	11.16(12)
Karnataka	38.24(10)	33.16(9)	20.04(9)	20.91(6)
Kerala	40.42(9)	25.43(11)	12.72(13)	7.05(15)
Madhya Pradesh	49.78(5)	42.52(3)	37.43(3)	31.65(4)
Maharashtra	43.44(7)	36.86(6)	25.02(7)	17.35(8)
Orissa	65.29(1)	48.56(2)	47.15(1)	32.59(2)
Punjab	16.18(15)	11.77(15)	6.12(15)	8.26(14)
Rajasthan	34.46(11)	27.41(10)	15.28(11)	14.71(10)
Tamil Nadu	51.66(4)	35.03(8)	21.12(8)	11.28(11)
Uttar Pradesh	47.07(6)	40.85(5)	31.15(5)	29.43(5)
West Bengal	54.85(3)	35.66(7)	27.02(6)	19.98(7)
All India	44.48	35.97	26.12	21.92

Source: Planning Commission, 2014 and NSSO Data

Chapter 5

Pattern of Agricultural Development in Kerala

A country without sound agricultural system may not be capable of producing adequate food materials and other crops. Agriculture is the backbone for the survival of any community. As in the case elsewhere, the people of Kerala are also dependent on agriculture and allied activities for their livelihood as about one-fourth of the population is dependent on it. Kerala cultivates a large variety of vegetations of food and non-food crops. However, in recent decade, it is witnessing many changes in agricultural production pattern in terms of shifts in area under food and non-food crops, changes in structure of agricultural work force and cultivators etc. In this context, an attempt has been made to study different dynamics of agricultural development in Kerala.

5.1 Land Use Pattern

Kerala has witnessed major changes in its land use pattern over the period. The most important change is the shrinkage of area devoted to cultivation of food crops and an increase in the rate of deforestation (George, 2001). The total geographical area of Kerala is 3885 thousand hectares. Land under forests has remained same (1082 thousand hectares) as it includes all forested areas and land classified or administered as forests under any legal enactment dealing with forests, whether state or private owned (GoK, 2008). Land put to non-agricultural use include land occupied by buildings, roads, railways or water (e.g. rivers, canals) and land in use other than agricultural purposes. From 1980-81 onwards, area put to non-agricultural use had steadily increased from 6.94 per cent in 1980-81 to 9.89 per cent in 2010-11 of the total geographical area of the state. On the other hand, area under barren and uncultivable land (which includes areas under mountains, deserts etc.) has witnessed a continuous decline as it declined from 85 thousand hectares in 1980-81 to 20 thousand hectares in 2010-11. Area under permanent pastures and other grazing land has also steady declined from 5.4 thousand hectares to 0.15 thousand

hectares i.e. from 0.13 per cent to 0.004 per cent of total geographical area of Kerala during the period under study.

Area under miscellaneous tree crops has also declined continuously from 63.9 thousand hectares (1.64 per cent) in 1980-81 to 3.69 thousand hectares (0.09 per cent) in 2010-11. Cultivable waste represents land available for cultivation, but not occupied for actual cultivation or uncontrolled after a few years of cultivation for one reason or other. Area under cultivable waste land has decrease in from 3.32 per cent in 1980-81 to 1.53 per cent in 2000-01 and after that the increasing trend in the area was noted. An increasing trend in the area under current fallow can be noted in the period of 1980-81 to 2000-01. It increased from 43.6 thousand hectares (1.12 per cent of total area) in 1980-81 to 77.85 thousand hectares (2.0 per cent) in 2000-01. While in the next ten year period, there was a slight decline in area under current fallow as it was 76.03 thousand hectares (1.96 per cent) of total geographical area in the year 2010-11. Area under fallow other than current fallow land was 26.9 thousand hectares (0.69 per cent of total geographical area), which increased to 51.94 thousand hectares in 2010-11(1.34 per cent). Net sown area (NSA) had increased from 2179 thousand hectares (56.10 per cent) in1980-81 to 2246 thousand hectares (57.82 per cent) in 1990-91 then declined to 2071 thousand hectares (53.30 per cent) in 2010-11 (Table 5.1 and Figure 5.1).

Gross cropped area represents the net area sown and area sown more than once during the same year. During the period under study, area sown more than once showed a fluctuating trend and reached the peak level during 2000-01 with 815.56 thousand hectares (20.99 per cent of total geographical area). NSA represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once. Area sown more than once has also increased from 18.15 per cent in 1980-81 to 20.99 per cent in 2000-01, then it declined to 14.82 per cent in 2010-11 (Table 5.1 and Figure 5.1). Although the cropping intensity has increased from 132.5 in 1980-81 to 136.97 in 2000-01, but thereafter it has sharply declined to 127.80 in 2010-11 (Table 5.1). This points that land use changes in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as

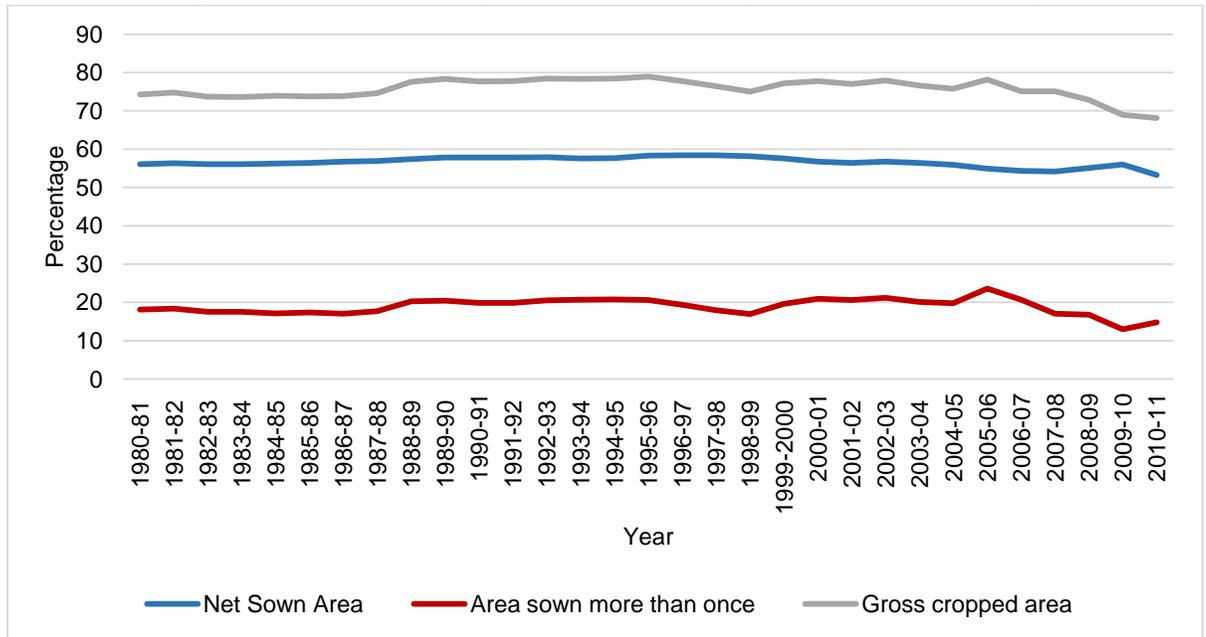
current fallow, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity.

Table 5.1: Land use pattern (Area in 000'ha)

Classification of land	1980-81	1990-91	2000-01	2010-11
Geographical area	3885.50 (100)	3885.50 (100)	3885.50 (100)	3885.50 (100)
Forest	1081.50 (27.83)	1081.50 (27.83)	1081.50 (27.83)	1081.50 (27.83)
Land put to non-agricultural uses	269.80 (6.94)	297.38 (7.65)	381.87 (9.83)	384.17 (9.89)
Barren and uncultivable land	85.80 (2.21)	58.31 (1.50)	29.32 (0.75)	19.57 (0.50)
Permanent pastures and grazing land	5.40 (0.139)	1.91 (0.049)	0.16 (0.004)	0.15 (0.004)
Land under tree crops	63.90 (1.64)	34.38 (0.88)	15.41 (0.40)	3.69 (0.09)
Cultivable waste	129.00 (3.32)	94.61 (2.43)	59.26 (1.53)	91.67 (2.36)
Current fallow	43.60 (1.12)	44.16 (1.14)	77.85 (2.00)	76.03 (1.96)
Fallow other than current fallow	26.90 (0.69)	26.47 (0.68)	33.99 (0.87)	51.94 (1.34)
Net Sown Area (NSA)	2179.60 (56.10)	2246.77 (57.82)	2206.13 (56.78)	2071.51 (53.30)
Area sown more than once	705.20 (18.15)	773.21 (19.90)	815.56 (20.99)	575.95 (14.82)
Gross cropped area	2884.80	3019.98	3021.68	2647.46
Cropping intensity	132.35	134.41	136.97	127.80

Source: Economic Review, Kerala (various issues)

Figure 5.1: Land use pattern in Kerala (1980-81 to 2010-11)



Source: Economic Review, Kerala (various issues)

5.2 Source-wise pattern of irrigation

Irrigation is considered as one of the most important inputs in the agriculture production as it plays an important complementary role in the production process. The irrigation development in Kerala is apparently different from that of the rest of the country although the state is blessed with timely and satisfactory rainfall with an annual rate of 3107 mm (GoK, 2013). As regards the pattern of irrigation from different sources, the main sources of irrigation in the state are canals, tanks and wells including tube wells. During 1980-81, the major sources of irrigation in the state were government canals, which accounted for about more than one-third of the total area under irrigation, followed by private tanks.

From 1980-81 to 1990-91, irrigation through government canals had a dominant place compared to the other sources. In 1999-2000, its share dwindled and after that a small increment was witnessed in 2010-11. The irrigated area under private wells has increased significantly. During 1990-91, the irrigated area under private wells was 64933 ha (19.48 per cent) which increased to 137113 ha (33.08 per cent) in 2010-11. Meanwhile, the area irrigated through government wells went down from 745 ha to 603 ha in the same period. The other major sources include getting

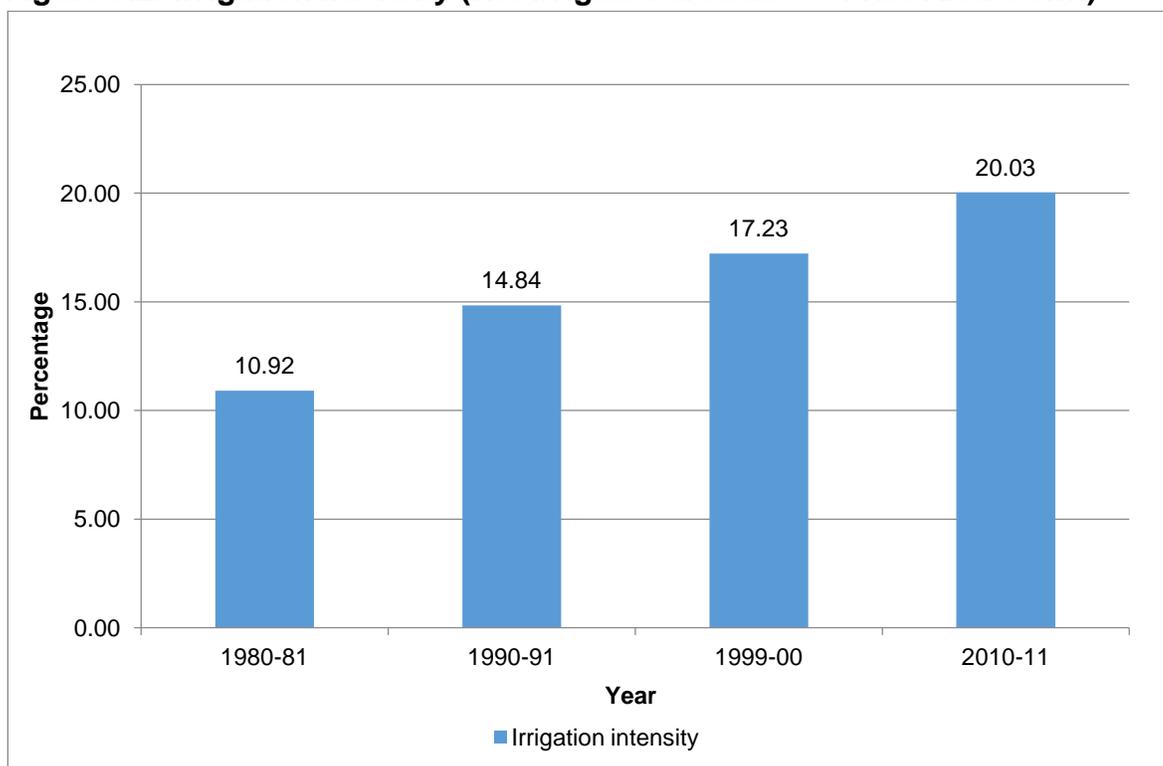
water from rivers and lakes, natural streams etc. It has also increased from 43,606 ha (18.32 per cent) in 1980-81 to 1,38,437 ha (33.36 per cent) in 2010-11. Net irrigated area has increased from 237974 ha in 1980-81 to 415013 ha in 2010-11 resulting in increase in irrigation intensity from 10.92 per cent to 20.03 per cent during the same period (Table 5.2). Despite the investments on canal irrigation, the area under this system has not increased much. However, the irrigation through canals has also contributed to rise in the water levels in the soil through water seepage and supported ground and other surface water irrigation (GoK, 2014). Tanks, even though they are not as important for the state as they are in the other states, still contribute to 10 per cent of the total area irrigated, as per the data of 2010-11.

Table 5.2: Source-wise pattern of irrigation in Kerala (ha)

Sources	1980-81	1990-91	1999-00	2010-11
Govt. canals	99397 (41.77)	104265 (31.28)	81231 (21.37)	85825 (20.68)
Private canals	5299 (2.23)	3691 (1.11)	4803 (1.26)	1971 (0.47)
Govt. tanks	5048 (2.12)	2514 (0.75)	1832 (0.48)	1777 (0.43)
Private tanks	50922 (21.40)	46438 (13.93)	51100 (13.45)	49287 (11.88)
Govt. wells	-	745 (0.22)	1347 (0.35)	603 (0.15)
Private wells	-	64933 (19.48)	120258 (31.64)	137113 (33.08)
Other sources	43606 (18.32)	110783 (33.23)	119472 (31.44)	138437 (33.36)
Net irrigated area	237974	333369	380043	415013
Irrigation intensity	10.92	14.84	17.23	20.03

Source: Directorate of Economics and Statistics, Kerala

Figure 5.2: Irrigation intensity (Net irrigated area as % of Net Area Sown)



Source: Directorate of Economics and Statistics, Kerala

5.3 Area, Production and Productivity of major crops

Table 5.3 shows performance of major crops during the period from 1980-81 to 2010-11 in terms of the trend growth rates in their area, production and yield. Only five major crops namely, rubber, coffee, coconut, pepper and to some extent tea has displayed increase in area, production and yield over the past three decades. The production of rice, pulses, cashew nut and ginger have experienced a conspicuous decline largely due to the reduction in area under these crops though yield of these crops improved to some extent. Area under paddy has declined although there have been some attempts to conserve paddy area through measures such as the Kerala Conservation of Paddy and Wetland Act, 2008 (GoK, 2014). Cashew nut experienced decline in productivity in the 1990s, which showed signs of improving in the 2000s. In the case of coffee and cardamom, growth of production was high in the 1990s due to the growth of productivity. However, in case of coffee yield decreased in 2000s.

Between 1980-81 and 2010-11, growth in the area of most of the crops was negative. Rice and tapioca became lesser important crops compared to other crops in

Kerala as area has declined by three-fourth from 801 thousand hectare to 213 thousand hectare for rice and from 245 thousand hectare to 72 thousand hectare for tapioca in 1980-81 to 2010-11. However, productivity of these crops has increased during this period. The area under rubber has increased two times from 237.8 thousand hectare to 534.2 thousand hectare in the same period. Rice, pulses, cashewnut and tapioca are the crops which have lost their area during the last three decades. Out of these crops, rice and pulses have lost their area resulting in continuous decline of production.

Except banana, the growth rate of productivity was positive for all crops from 1980-81 to 2010-11. Growth rate of area, production and productivity of some crops like coconut, coffee, pepper and rubber was positive during the whole period. The growth rate of area as well as production was highest in case of rubber (Figure 5.3). Kerala state which had a low base in food production is facing serious challenges in retaining even this meager area. Kerala agricultural economy is undergoing structural transformation from the last few decades by switching over a large proportion of its traditional crop area, which was devoted to subsistence crops like rice and tapioca to more remunerative crops like rubber, coconut and other plantations (GoK, 2014). Thus, from the above analysis, it can be discerned that agriculture in Kerala has suffered considerable setback in the recent years, particularly in terms of loss in area. The declining production in some crops like rice, pulses, cashew nut and to some extent ginger etc. is a main cause of concern. However, one positive outcome that can be observed is that most crops have managed to improve their productivity (except banana and tea) even in the midst of losing share in area.

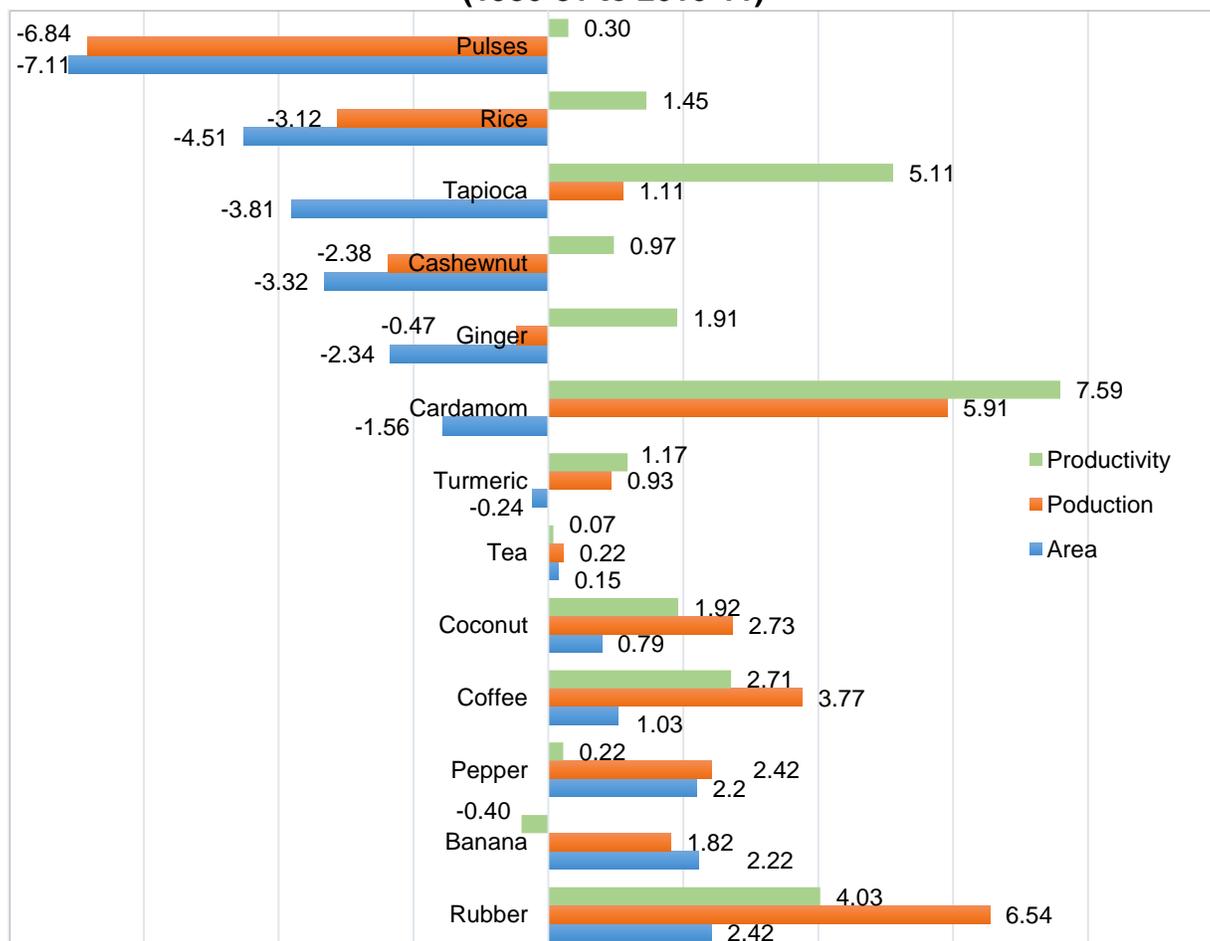
Table 5.3: Area, Production and Productivity of major crops

Crops		1980-81	1989-90	CAGR (1980-81 to 89-90)	1990-91	1999-2000	CAGR (1990-91 to 99-00)	2000-01	2010-11	CAGR (2000-01 to 2010-11)
Rice	Area	801.7	583.4	-4.08	559.5	349.8	-5.55	347.5	213.2	-4.55
	Production	1.272	1.161	-2.52	1.087	0.771	-4.7	0.751	0.523	-2.79
	Productivity	1587	1990	1.63	1942	2203	0.91	2162	2452	1.84
Pulses	Area	33.9	24.3	-3.42	23.4	11	-7.12	10.8	3.8	-8.98
	Production	0.022	0.019	-2.08	0.019	0.009	-7.47	0.005	0.003	-6.96
	Productivity	664	764	1.38	795	780	-0.38	506	760	2.22
Pepper	Area	109.1	151.6	4.98	168.5	198.4	1.17	199.4	172.2	-2.1
	Production	0.029	0.038	6.02	0.048	0.048	1.46	0.061	0.045	-5.84
	Productivity	261	249	0.99	284	240	0.29	306	263	-3.82
Ginger	Area	12.7	13.8	1.75	14.1	11.3	-2.84	11.3	6.1	-6.58
	Production	0.032	0.046	4.9	0.045	0.041	-1.19	0.043	0.033	-3.16
	Productivity	2530	3354	3.1	3147	3670	1.7	3791	5453	3.66
Turmeric	Area	3.3	3	3.53	2.7	4	4.79	4	2.4	-3.65
	Production	0.006	0.006	-0.17	0.006	0.008	6.3	0.009	0.006	-2.28
	Productivity	1878	1959	-3.58	2214	2106	1.44	2284	2592	1.42
Banana	Area	49.3	20.2	-18.92	22.1	39	5.84	39.3	58.7	2.07
	Production	0.317	0.264	-2.98	0.279	0.398	4.52	0.328	0.484	2.33
	Productivity	6443	13059	19.66	12623	10197	-1.24	8346	8244	0.25
Cashewnut	Area	141.3	124.2	-1.81	115.6	89.4	-2.86	86.5	43.8	-7.21
	Production	0.082	0.109	3.24	0.105	0.066	-7.36	0.066	0.035	-6.52
	Productivity	580	877	5.14	911	733	-4.63	765	793	0.74
Tapioca	Area	245	205.6	-4.07	146.5	111.9	-2.76	111.2	72.3	-4.17
	Production	4.07	3.764	17.4	2.799	2.532	-0.42	2.587	2.409	0.18
	Productivity	16613	18309	22.39	19107	22621	2.41	23268	33326	4.54

Coconut	Area	651.4	875.9	3.08	870	925	0.55	936.3	770.5	-2.02
	Production	0.003	0.004	4.93	0.005	0.006	1.74	0.006	0.005	0.21
	Productivity	4618	5017	1.8	5203	6140	1.18	5913	6862	2.27
Rubber	Area	237.8	376	5.73	384	472.9	1.9	474.4	534.2	1.31
	Production	0.14	0.275	7.74	0.308	0.573	7.35	0.58	0.771	3.37
	Productivity	590	732	1.9	801	1211	5.34	1222	1442	2.04
Tea	Area	36.2	34.7	-0.49	34.7	34.8	0.2	36.8	37	-0.11
	Production	0.051	0.057	2.28	0.063	0.062	-0.01	0.069	0.057	-1.58
	Productivity	1402	1646	2.79	1827	1781	-0.21	1876	1550	-1.47
Coffee	Area	57.6	75.1	2.25	75.1	84.1	0.93	84.7	84.9	0.67
	Production	0.036	0.023	1.92	0.036	0.06	8.33	0.071	0.066	-1.44
	Productivity	634	312	-0.32	476	719	7.33	833	773	-2.09
Cardamom	Area	56.4	61.6	1.94	66.9	41.5	-2.81	41.3	41.2	-0.21
	Production	0.003	0.002	-0.58	0.003	0.007	9.22	0.008	0.008	-0.49
	Productivity	55	32	-2.47	41	159	12.38	184	192	-0.28

Source: Economic Review, Government of Kerala (various issues)

Figure 5.3: CAGR of Area, Production and Productivity of Major Crops (1980-81 to 2010-11)



Source: Economic Review, Government of Kerala (various issues)

5.4 Agricultural Labourers and Cultivators in Kerala

The profile of workers population in Kerala is given in Table 5.4. The three-decade period from 1981- 2011 shows almost a stagnancy in the nature of workers population in the state. In 1981, the main workers constituted 26.68 per cent of total population and their number was about 68 lakhs. After one decade, this number rose to nearly 83 lakh constituting about 28.53 per cent of total population. The number of main worker remained almost stagnant during the next two decades (2001- 2011). On the contrary, the agricultural work force has exhibited an unsteady performance. There were 19.2 lakh agricultural labourers in 1981, which rose to 21.2 lakh during the 1990s. During the decade from 1991 to 2001, this number was dropped to 10.2

lakh. In terms of proportion of main workers, a decline was observed from 28.2 per cent in 1981 to 16.1 per cent in 2011. The recent census estimate (2011) has shown a slight improvement in the number to 16.5 lakh (16.1 per cent of workers population). The cultivators also followed similar pattern to that agricultural labours. The number of cultivators has increased from 8.87 lakh to 10.15 lakh during 1981 to 1991. Thereafter, their number decreased to 5.86 lakh in 2001 with small increase to 7.4 lakh in 2011, whereas their share as a per cent of main workers declined from 13.07 per cent to 12.24 per cent. The cultivators as a share of main workers has declined from 13.07 per cent in 1981 to 7.2 per cent in 2011.

Table 5.4: Profile of workers population in Kerala

Particulars	1981	1991	2001	2011
No. of main workers (in lakh)	67.90	82.99	82.37	82.36
As share of total population (per cent)	26.68	28.53	25.87	24.67
Agricultural labour (in lakh)	19.16	21.19	10.21	16.53
As share of main workers (per cent)	28.23	25.54	12.4	16.1
Number of cultivators (in lakh)	8.87	10.15	5.86	7.40
As share of main workers (per cent)	13.07	12.24	7.12	7.2

Source: Economic Review, Government of Kerala (various issues)

5.5 Pattern of Land Holdings in Kerala

An operational holding is defined as all land which is used wholly or partly for agricultural production and operated as one technical unit by one person alone or with others without regard to title, legal form, size or location (Shah, 1985). The size of the land holdings has implications for investments in agriculture, its productivity, farm mechanization and sustaining farm incomes itself (Mahrotra, 2014). Kerala agriculture is mainly dominated by small, marginal and homestead farmers. The average land holding size is smallest in Kerala. Marginal farmers with an area less than one hectare and dominated by home stead farming of 10-20 cents is a special characteristics of Kerala (GoK, 2013).

The trends and patterns in average size, number and area of land holdings are explained in Table 5.6. The average size of operational land holdings has reduced from 0.27 ha in 1995-96 to 0.22 ha in 2010-11. A drastic change has been noticed in the average size of large holdings as average size of such operational holdings has increased from 35.29 ha in 1995-96 to 64.58 ha in 2010-11. While average size of land holdings of marginal, small and medium farmers have more or less remained same during the period. The total number of land holdings have increased from 62 lakh in 1995-96 to 68 lakhs in 2010-11. Under this category, number of marginal holding has increased from 93.96 per cent to 96.33 per cent during the same period, while all other categories have witnessed a decline in number of holdings.

The percentage share of each type of holding in the total area under operation shows that the share of marginal and large holdings had been increasing, while that of small, medium and semi-medium holdings had been decreasing. In terms of area operated, the share of marginal holdings has increased to 58.64 per cent in 2010-11 from 53.27 per cent in 1995-96. Similarly, the share of operated area under large farm holdings has increased from 5.96 per cent to 7.88 per cent during the same period. Small and marginal holdings together constitute 99 per cent in terms of number of operational holdings and 77 per cent of the operated area in the state during 2010-11. Thus, over the period, the marginal category has emerged as a distinct and dominant class.

Table 5.5: Average size, number and area of land holding

Land holding	1995-96			2000-01			2005-06			2010-11		
	Size (ha)	Number (in lakh)	Area (in lakh ha)	Size (ha)	Number (in lakh)	Area (in lakh ha)	Size (ha)	Number (in lakh)	Area (ha)	Size (ha)	Number (in lakh)	Area (in lakh ha)
Marginal	0.15	59.18 (93.96)	9.12 (53.27)	0.14	63.35 (95.18)	8.83 (56.28)	0.14	66.02 (95.63)	8.96 (57.62)	0.13	65.79 (96.33)	8.86 (58.64)
Small	1.33	2.63 (4.17)	3.49 (20.39)	1.32	2.26 (3.40)	2.99 (19.06)	1.33	2.14 (3.10)	2.85 (18.33)	1.57	1.80 (2.64)	2.82 (18.66)
Semi-medium	2.55	0.96 (1.52)	2.44 (14.25)	2.52	0.75 (1.13)	1.91 (12.17)	2.56	0.69 (1.00)	1.79 (11.51)	2.79	0.57 (0.83)	1.59 (10.52)
Medium	5.26	0.19 (0.30)	1.04 (6.07)	5.29	0.16 (0.24)	0.85 (5.42)	5.3	0.14 (0.20)	0.79 (5.08)	5.32	0.12 (0.18)	0.64 (4.24)
Large	35.29	0.02 (0.03)	1.02 (5.96)	40.93	0.02 (0.04)	1.12 (7.14)	47.73	0.02 (0.03)	1.17 (7.52)	64.58	0.01 (0.01)	1.19 (7.88)
All size class	0.27	62.98 (100)	17.12 (100)	0.24	66.56 (100)	15.69 (100)	0.23	69.04 (100)	15.55 (100)	0.22	68.30 (100)	15.11 (100)

Source: Agricultural census, India (Various years)

5.6 Agricultural Income

The trends in agricultural income in Kerala during the last 30 years is shown in Table 5.6. The agriculture in Kerala has undergone significant structural changes in the form of continuous decline in share of state income from 34.21 per cent in 1980-81 to 11.59 per cent in 2009-10. The agricultural income had increased from Rs.12661 crore to Rs.21783 crore from 1980-81 to 1995-96. After that agricultural income started declining and it decreased to Rs. 16236 crore in 2009-10. The dismal performance could be attributed to decline in crop production coupled with low prices of major agricultural commodities. The deficient rainfall especially South-West monsoon also had contributed to the decline in crop production. The contribution of agriculture to state income has also been on the decline as the other sectors registered higher rates of growth (GoK, 2003).

**Table 5.6: Growth of Agricultural income in Kerala
(Base year 2004-05)**

Year	Agricultural income (Rs. crores)	Percentage contribution to state income
1980-81	12661	34.21
1985-86	13496.7	34.13
1990-91	17235.9	33.43
1995-96	21783	25.78
2000-01	17082.7	16.23
2005-06	17998.6	16.8
2009-10	16236.5	11.59
2010-11	16110.59	10.59

Source: Economic Review, Kerala (Various Issues)

5.7 Capital Expenditure on Agriculture and Allied Heads

Capital expenditure on agriculture is one of the basic factors for increasing agricultural production. In order to achieve positive agricultural growth, capital formation in agriculture should be enhanced through strengthening market

infrastructure, more focus on micro irrigation, micro finance, micro insurance and rural credit (Kalamkar, 2011).

Capital expenditure on agriculture at current prices for the state and country as a whole showed increased throughout the period. The increase was very sharp during eleventh and twelfth five year plans (Table 5.7). It can be seen from the table that capital expenditure on agriculture and allied heads has increased at current prices from ₹86 crores per year in 1980-81 to ₹1766 crores per year in 2012-13. Out of the total expenditure on agriculture, Kerala's share was only 1.79 per cent during the sixth plan period. Kerala's share of total India's expenditure on agriculture has increased throughout the five year Plans. In the sixth plan only 1.79 per cent of India's capital expenditure on agriculture has allotted to Kerala, while in the twelfth Plan it has increased to 3.89 per cent.

**Table 5.7: Capital Expenditure on Agriculture and Allied Heads
(Rs. in crores/year)**

Plans	Kerala	India	Percentage
1980-81 to 84-85 (VI th Plan)	86	4797	1.79
1985-86 to 89-90 (VII th Plan)	114	6141	1.85
1992-93 to 96-97 (VIII th Plan)	280	11964	2.34
2007-08 to 11-12 (XI th Plan)	586	22364	2.62
2012-13 to 16-17 (XII th Plan)	1766	45300	3.89

Source: Planning commission (various reports)

5.8 Fertilizer Consumption

Fertilizers have been considered as an essential input to agriculture for meeting the food grain requirements of the growing population of the country. In view of deficiency in nutrients in the soils, the supply of fertilizers becomes inevitable. Chemical fertilizer bear a direct relationship with food grain production along with a number of supporting factors like High Yielding Varieties (HYVs), irrigation access to credit, technical conditions etc. (Shinde, 2013).

Table 5.8 depicts the consumption of three main chemical fertilizers in Kerala during the last three decades. There is a fluctuation in the consumption of fertilizers in Kerala. During 1980-81, the fertilizer consumption was 97.6 metric tonnes, which increased to 244.4 metric tonnes in 1990-91. Thereafter, it declined to 173.2 metric tonnes in 2000-01. However, total fertilizer consumption has again increased to 283.5 metric tonnes in 2010-11. Kerala is a relatively low fertiliser consuming state in relation to other major agricultural states in the country (GoK, 2014). Per hectare fertiliser consumption of Kerala also showed a fluctuating trend from 1980-81 to 2010-11. During 1980-81, per hectare fertilizer consumption was estimated to be 33.83 kg which increased to 80.92 kg in 1990-91. It declined to 57.32 kg per ha in 2000-01. During this period, the fertilizer consumption has also declined from 244.4 metric tonnes to 173.2 metric tonnes. During 2010-11, per hectare fertilizer consumption was 107.10 kg per ha. Kerala consumed lower amount of fertiliser as compared to other states of India. One reason why Kerala consumed lower fertilisers could be that its cropping pattern is rapidly replaced with plantation crops, which require relatively lower amount of fertilizers besides gross cropped area has also reduced over the past many years (GoK, 2014).

Table 5.8: Fertilizer consumption of Kerala: 1980-81 to 2010-11 (MT)

Fertilizer	1980-81	1990-91	2000-01	2010-11
Nitrogen (N)	41.7	93.8	73.75	117.68
Phosphorus (P)	23.4	55.42	37.6	69.0
Potash (K)	32.5	95.15	61.84	96.86
Total (N+P+K)	97.6	244.37	173.20	283.54
Per hectare consumption	33.83	80.92	57.32	107.10

Source: Prowess

5.9 Pesticide Consumption

Table 5.9 showed a fluctuation in the pesticide consumption in Kerala over the years. The consumption of pesticides has shown a downward trend from 941 metric tonnes in 1980-81 to around 724 metric tonnes in 1991-92. Over the past 30 years, pesticide consumption reached the highest level of 1058 metric tonnes in 1999-00

and was the lowest at 605 metric tonnes during 2010-11. Per hectare consumption of pesticides has also fluctuated during the last three decades and follow the same pattern. During 1980-81, per hectare consumption of pesticide was around 326 kg which decreased to around 240 kg in 1991-92 though it again increased to 350 kg in 1999-2000. The per hectare pesticide consumption again decreased to 228 kg in 2010-11. It is largely due to popularization of Integrated Pest Management (IPM) approach, which includes cultural, physical and mechanical, biological and need based use of safest chemical pesticides (GoI, 2010).

Table 5.9: Pesticide consumption in Kerala (Technical Grade in metric tonne)

Year	Fungicide	Insecticide	Weedicide	Rodenticide	Total consumption of pesticides	Per hectare consumption (Kg)
1980-81	558.54	305.63	60.49	16.42	941.08	326.22
1991-92	374.46	325.24	20.46	4.09	724.25	239.82
1999-00	472.41	467	108.27	10.24	1057.92	350.11
2010-11	500.63	75.96	27.27	1.2	605.06	228.54

Source: Economic Review, Kerala (various issues)

5.10 Export of Major Agricultural Commodities

Foreign trade plays an important role in the economic development of Kerala because most of the commodities produced in the state are exported to other countries. The state specialized in the cultivation of various cash crops like pepper, ginger, cardamom, coffee, tea, coconut, cashew, rubber etc. Export orientation of Kerala's agricultural sector portrays the contribution of farm products towards the economic growth of the state. Traditionally, Kerala has been a major exporter of commodities such as pepper, cardamom, ginger, cashew kernels, coir and coir products, tea and coffee. Export of most of the agricultural commodities from the state has been recording fairly good growth till towards the 1990s (Table 5.10).

During 1980-81, 61.2 thousand metric tonnes of tea was exported from Kerala and it has increased to 111.4 thousand metric tonnes in 2010-11. While, its percentage share has declined from 29.3 per cent to 17.4 per cent in the same period mainly on account of marginal increase in area and productivity resulting in marginal improvement in production (Figure 5.3). Export of coffee in quantity as well as percentage share-wise has increased during 1980-81 to 2000-01, but thereafter coffee exports declined in terms of quantity as well as percentage share in total exports. The quantity of cashew export has increased from 29.4 thousand metric tonnes to 64.3 thousand metric tonnes, but the share has declined from 14.04 per cent to 10.02 per cent during 1980-81 to 2010-11 largely on account of reduction in area and production of cashew. The coir product exports also increased in both quantity and percentage share-wise. Export of coir products has increased in terms of quantity as well as share because of the increase of area, production and productivity of coconut. Kerala has emerged as one of the main sea food exporting states in India as sea food exports has increased from 35.5 thousand metric tonnes in 1980-81 to 169.4 thousand metric tonnes in 2010-11, constituting a share of more than 1/4th in total exports of agricultural and sea food products (Table 5.10).

Table 5.10: Commodity-wise export from Kerala (in MT)

Items	1980-81		1990-91		2000-01		2010-11	
	Quantity	% to total	Quantity	%to total	Quantity	%to total	Quantity	%to total
Tea	61242	29.27	9530	4.45	94839	18.36	111366	17.35
Coffee	20839	9.96	35892	16.76	169482	32.81	84792	13.21
Cashew kernel	29365	14.04	49970	23.33	57447	11.12	64298	10.02
Sea foods	35507	16.97	58598	27.36	104064	20.15	169408	26.39
Coir products	29387	14.05	24198	11.30	58140	11.26	131046	20.41
Spices	32860	15.71	35976	16.80	32582	6.31	81079	12.63

Source: Economic Review, Kerala (various issues)

*Export through Cochin port

CHAPTER 6

Summary and Policy Suggestions

6.1 Summary

Structural transformation is a process by which the relative importance of different sectors and activities of an economy changes over time. The Kerala economy is also undergoing the transformation from traditional backward agrarian economy to a modern service sector led economy. Agrarian economy of Kerala has also witnessed structural transformation as a large proportion of area under food crops is changed to non-food crops. Kerala has also achieved greater success in social and economic development indicators such as high literacy rate, high standard of living, high life expectancy, low infant mortality rate and high per capita income etc. The significance of the present study lies in the fact that the whole process of structural transformation of the Kerala economy has not so far been addressed in a detailed and comprehensive manner in the earlier studies. No specific attempt has been made to relate the pattern of agricultural development with the structural transformations in the Kerala economy. In this study, an attempt has been made to examine the structural changes and growth performance and pattern of agricultural development in Kerala economy. Besides, development experience of Kerala is also examined. The study mainly covers a period of 1980-81 to 2010-11. For this, data was collected and compiled from several secondary sources such as Central Statistical Organization, National Sample Survey Organization, RBI Bulletins, various issues of Economic Reviews of Kerala, Directorate of Economics and Statistics, Kerala; Agricultural Census etc.

An analysis of structural transformations in Kerala economy reveals that the contribution of primary sector in GSDP was 38 per cent in 1980-81, which declined to 10.37 per cent in 2010-11, while the share of the tertiary sector has leaped up from 45.22 per cent to 67.61 per cent during the same period. The share of secondary sector has increased from 17 per cent to 22 per cent during the same period. The similar trend was also witnessed in NSDP. Thus, the growth in aggregate income has largely been achieved due to the buoyancy in service sector alone. The employment pattern has also observed changes in sectoral composition. Percentage share of primary sector employment has declined from 46.2 per cent to 25.5 per cent during 1983 to 2010-11, while employment in

secondary sector has increased from 22.3 per cent to 31.8 per cent and that in tertiary sector increased from 31.1 per cent to 42.6 per cent during the same period. Thus, it can be concluded that share of primary sector in GSDP has declined sharply, but the corresponding decline in employment share has not taken place. Moreover, the excess labour force has moved from primary sector to secondary sector, thus causing abundance in secondary sector and there was only a meager increase in share of income from secondary sector in GSDP. The share of income from services sector in GSDP has increased sharply, but it failed to register a sharp increase in employment. Thus, it follows that Kerala did not experience a sequential growth process (as propounded by structural change growth theories) as the service sector led growth did not provide employment matching with its income and the process of industrialization failed to take off as share of income from secondary sector did not commensurate with the level of employment in the sector.

Notwithstanding, atypical pattern of structural transformation in Kerala economy, the state has performed very well in various social and economic development indicators. The state has achieved highest Human Development Index and has lowest poverty rate among all the Indian states. The per capita income is also of the higher order and not that far away from the higher per capita income states such as Maharashtra, Haryana, Gujarat and Tamil Nadu. Thus, Kerala has acquired a unique model of development and most of the policy makers are in puzzle with this kind of model of development with very weak primary and moderate secondary sector development.

The fifth chapter has described the pattern of agricultural development in Kerala. The changes in land use pattern in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as current fallow, increase in area under non-agricultural land, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity. Irrigation is one of the important inputs in the agriculture production function as it often influences the use of other agricultural inputs. The net irrigated area has almost doubled during the past thirty years, but irrigation intensity was only 20 per cent. Thus, still about 80 per cent of the area was rain fed. Depending upon the rainfall for farming has also a role to play in altering the consumption of fertilizers and pesticides. The more

disappointing fact is that area irrigated by government canals and tanks has drastically reduced.

Furthermore, Kerala witnessed shift in the cropping pattern in favour of non-food crops at the expense of food crops as crops such as pulses, rice, tapioca, cashewnut, ginger were replaced by commercial cash crops like rubber and coconut. It mainly happened due to shortage of labour and less labour requirement for commercial crops (GoI, 2010). The agricultural work force in Kerala has also dropped out from farming as agricultural labours and cultivators have declined in both absolute number and relative terms. Kerala agriculture is mainly dominated by small, marginal and homestead farmers. The average size of operational land holdings has further reduced from 0.27 ha in 1995-96 to 0.22 ha in 2010-11. Small and marginal holdings together constitute 99 per cent of the total operational holdings and the area operated by them has also increased from 74 per cent in 1995-96 to 77 per cent in 2010-11. The percentage of casual labours engaged in Kerala has increased from 35.8 per cent to 44 per cent in rural areas and from 24.8 per cent to 27.8 per cent in urban areas during 1983 to 2011-12. The increase in casual labours was higher in rural areas than that in the urban areas which points labourers working in rural areas start getting more of casual works followed by regular works and self employment. Thus, the declining cultivable area, predominance of tiny and fragmented holdings, decline in work force in terms of reduction in agricultural labour and cultivator has made farming more vulnerable. The miserable performance could be attributed to decline in crop profitability due to low prices of major agricultural commodities and the deficient rainfall that had contributed to the decline in crop production (GoK, 2003).

Furthermore, capital expenditure on agriculture in Kerala has increased in every five year plan. It has increased from ₹86 crores in VIth plan to ₹1766 crores in XIIth plan. But, agricultural growth rate during the period of 1980-81 to 2010-11 was only 2.5 per cent, the least among all sub-sectors of secondary and tertiary sector. Thus, it can be inferred despite increase in capital expenditure, agriculture growth has not increased. It might be due to investment in some of the non-productive agriculture assets.

6.2 Policy Suggestions

The excess labour force has moved from primary sector to secondary sector, and has caused abundance in secondary sector; and there was only a meager increase in share of income from secondary sector in GSDP. This points that labour moved to secondary sector is mainly unskilled and thus, it could not be employed. Therefore, sub-sector specific training must be provided to this labour force which will also result in increase in income in secondary and hence, its share. The root cause for the movement of labour can be attributed to the deceleration in growth in agriculture sector in the state. The reduction in the area under crops needs to be checked. Although the Kerala Conservation of Paddy Land and Wetland Act, came into effect during December, 2008. During 2008 to 2013, an area of 20,000 ha has already been converted to some other crops. This brings out the fact that even though the Act was passed during 2008, no earnest efforts are seen taken so far to protect the area under paddy (GoK, 2013). So, such Acts needs to be implemented with full force so that the remaining area could be protected.

About 80 per cent of the cropped area is still rain-fed. In order to decrease the reliance on rainfall, more area should be brought under assured irrigation as irrigation is one of the key inputs in farming, which often enhances the use of other inputs used for production. The analysis also shows that area irrigated by government canals and tanks has been drastically reduced. Capital expenditure on irrigation structure should also be put in place so as to expand the area irrigated by government canals and tanks. Since about 99 per cent of the cultivators are marginal and small farmers, a strict law enforcing mechanism must be put in place so that only a meaningful conversion of agricultural land to non-farming activities take place. During the structural transformation, it has been witnessed that labour is pulled out of agriculture, which was also evident from the declining labour force participation rate in rural areas, particularly in case of rural females. In order to address acute labour shortage, 'Labour Bank' should be constituted so that the required number of skilled labourers could be supplied to the needed agricultural operations.

BIBLIOGRAPHY

- Abraham, M.P., & Prakash, B.A. (2004). Employment and Unemployment in Kerala. In B.A. Prakash (Ed.), *Kerala's Economic Development: Performance and Problems in the Post Liberalisation Period* (pp. 82-101). New Delhi: Sage Publications.
- Aktar, W., Sengupta, D., & Chowdhury, A. (2009). Impact of pesticides use in agriculture: their benefits and hazards. *Interdisciplinary Toxicology*, 2(1), 1-12.
- Andrews, S. (2013). Dynamics of Cropping Pattern Shifts in Kerala: Sources and Determinants. *Publication Division Directorate of Economics and Statistics Department of Agriculture and Co-Operation Ministry of Agriculture Government of India*, 15-24.
- Babu, M. S. (2005). Kerala's Growth Trajectory. *Economic and political weekly*, 40(30), 3291.
- Binswanger-Mkhize, H. P. (2012). India 1960-2010: Structural Change, the Rural Non-farm Sector, and the Prospects for Agriculture. In *Berkeley, California: Department of Agricultural and Resource Economics, University of California, Berkeley*.
- Binswanger-Mkhize, H. P. (2013). The stunted structural transformation of the Indian economy. *Economic and Political Weekly*, 48(26&27), 5-13.
- Chakraborty, P., Chakraborty, L., & Mitra, S. (2010). *Financing Human Development in Kerala: Issues and Challenges*. New Delhi: National Institute of Public Finance and Policy.
- Chand, R., Raju, S. S., & Pandey, L. M. (2007). Growth crisis in agriculture: Severity and options at national and state levels. *Economic and Political Weekly*, 42 (26), 2528-2533.
- Chatterjee, D.R., & Murthy, S.D. (2013). Issues Related to Kerala's Development. *Asia Pacific Journal of Marketing & Management Review*, 2 (6), 90-94.

- Cheriyar, O. (2003). *Changes in the Mode of Labour due to Shift in the Land Use Pattern*. KRPLLD Discussion Paper, (81).
- Cheriyar, O. (2004). *Changes in the Mode of Labour due to Shift in the Land Use Pattern*. Thiruvananthapuram, *Kerala Research Programme on Local Level Development*, Centre for Development Studies, Discussion Paper, (81).
- Devi, I. (2010). Pesticides in agriculture—a boon or a curse? A case study of Kerala. *Economics and Political Weekly*, 45(26&27), 199-207.
- Economic Review. (Various years). Annual Report 1981. Govt. of Kerala, Thiruvananthapuram: State Planning Board.
- Geetha, P. (2006). *Shifts in cropping pattern in Kerala*. Unpublished Ph.D. Thesis, Mahatma Gandhi University, Kalady, Kerala.
- George, (2001). Population and Land Use in Kerala. In Wolman, M. G., Ramakrishnan, P. S., George, P. S., Kulkarni, S., Vashishtha, P. S., Shidong, Z., & Solecki, W. D. (Eds.), *Growing populations, changing landscapes: Studies from India, China, and the United States* (pp. 79-106). Washington, DC: National Academy Press.
- George, K. K. (2011). *Kerala Economy: Growth, Structure, Strength and Weakness*. Kochi, Centre for Socio-economic & Environmental studies, working paper, (25).
- Government of India, (2010). Inter-state Council Secretariat. Ministry of Home Affairs. Retrieved from <http://interstatecouncil.nic.in/kerala.html>.
- Government of India, (2011). *India Human Development Report 2011*. New Delhi, Planning Commission.
- Government of India, (2014). *Data-book Compiled for use of Planning Commission*. New Delhi, Planning Commission.
- Government of Kerala, (2006). *Human Development Report 2005*. Prepared by Centre for Development Studies, Thiruvananthapuram, State Planning Board.

- Government of Kerala, (2008). *Kerala Development Report*. Planning Commission, Government of India, New Delhi.
- Government of Kerala, (2013). Agricultural Development Policy.
- Government of Kerala, (2013). Agricultural Policy- Policies related to land. *Kerala Karshakan*, 1(4), 31-34.
- Government of Kerala, (2014). *Kerala Perspective Plan 2030*, Government of Kerala.
- Government of Kerala, (2014). *State of Environment and Related Issues*. ENVIS Centre: Kerala, Kerala State Council for Science, Technology and Environment, Sponsored by Ministry of Environment, Forests & Climate Change, Govt of India
- Gronewegen, P.D. (2012). Structural change: some historical aspects of Pasinetti's work with special reference to classical economics. In R. Arena & P.L Porta (Eds.), *Structural Dynamics and Economic Growth* (pp. 37-49). U.K: Cambridge University Press.
- Joseph, K. V. (1993). Structural Transformation and Agricultural Stagnation in Kerala. In D. Thakur (Ed.), *Secondary Sector in Indian Economy*, (pp. 98-112). New Delhi: Deep & Deep Publications.
- Kannan, K. P. (2011). Agricultural development in an emerging non agrarian regional economy: Kerala's challenges. *Economic and Political Weekly*, 46(9), 64-70.
- Kannan, K. P., & Pushpangadan, K. (1988). Agricultural stagnation in Kerala: An exploratory analysis. *Economic and Political weekly*, A120-A128.
- Kannan, K.P. (1998). Political Economy of Labour and Development in Kerala. *Economic and Political Weekly*, 33 (52), L61-L70.
- Karunakaran, N., & Gangadharan, K. (2013). Growth of Output of Principal Crops in Kerala: A Decomposition Analysis. *Middle-East Journal of Scientific Research*, 17(8), 1087-1097.

- Kokate, T. A. S. (2013). Changing agricultural technology in Indapur tahasil district Pune Maharashtra-a geographical analysis.
- Kumar, B. M. (2005). Land use in Kerala: changing scenarios and shifting paradigms. *Journal of Tropical Agriculture*, 42(1-2), 1-12.
- Kumar, L.M.P., & Indira, M. (2014). An analysis of the influence of agricultural policy on changing cropping pattern in India. *International Journal of Advanced Research in Management and Social Sciences*, 3(3), 75-84.
- Kuznets, S. (1979). *Modern Economic Growth: Rate Structure and Spread*. New Haven: Yale University Press.
- Lathika, M. (2011). The changing character manifested, *Kerala calling*, 28-31.
- Lelithabhai, K. N. (1993). *Constraints to Productivity Growth in Kerala Agriculture: A Micro-Level Study*. Unpublished M. Phil. Thesis, Jawaharlal Nehru University, New Delhi.
- Mahesh, R. (1999). Causes and consequences of change in cropping pattern: location-specific study (p. 56). *Kerala Research Programme on Local Level Development*, Centre for Development Studies.
- Mahesh, R. (2000). Farm size-productivity relationship: some evidence from Kerala. *Kerala Institute for Environment and Development*, Working Paper, (2).
- Mahrotra, N. (2014). Agricultural Land Holdings Pattern in India. *NABARD Rural Pulse*, Issue-1, Department of Economic Analysis and Research.
- Mani, K.P. (2006). Performance of Agriculture Sector in Kerala. In R. Sthanamoorthy (Ed.), *Kerala Economy: Achievements and Challenges* (pp. 53-67). Hyderabad: The Icfai University Press.
- Memedovic, O., & Iapadre, L. (2010). *Structural change in the world economy: Main Features and Trends*. United Nations Industrial Development Organization.
- Mukesh, K. (2015). Dynamics of Paddy Cultivation in Kerala. *International Journal of Economic and Business Review*, 3(1), 225-232.

- Narayana, D. (1990). *Agricultural economy of Kerala in the post-seventies: stagnation of cycles?*. Thiruvananthapuram, Centre for Development Studies, Discussion Paper, (235).
- National Sample Survey Office. (1997). *Employment and Unemployment in India, 1993- 94*, NSS report no. 409.
- National Sample Survey Office. (2000). *Household Consumer Expenditure in India, 1999*, NSS report no. 453(55/1.0/1).
- National Sample Survey Office. (2007). *Consumer Expenditure, Employment-Unemployment Survey, 2004-05*, NSS report no. 516(61/10/2).
- National Sample Survey Office. (2014). *Employment and Unemployment in India, 2011-12*, NSS report no. 554(68/10/1).
- Nithya, N. R. (2013). Kerala's agriculture: Performance and Challenges. *International Journal of Physical and Social Sciences*, 3(11), 127-139.
- Papola, T. S. (2005). Emerging Structure of the Indian Economy. *Presidential Address to the Indian Economic Association, Mimeo*.
- Parayil, G. (1996). The 'Kerala model' of development: development and sustainability in the Third World. *Third World Quarterly*, 17(5), 941-958.
- Pillai, P. M., & Shanta, N. (2005). Kerala's Turnaround in Growth. *Economic and Political Weekly*, 40 (41), 4481-4483.
- Prakash, B. A. (2006). Economic policies and performances. *Kerala Calling*, 27(1), 15-17.
- Rajan, D. (2011). *Kerala Economy*. University of Calicut, School of Distance Education, Calicut: Calicut university press.
- Rangarajan, C. (2006). *Employment and Growth*. Madras School of Economics.
- Reserve Bank of India, (2013). *Hand Book of Statistics on Indian Economy 2012-13*. Mumbai, RBI Bulletin.
- Santhakumar, V., & Nair, K.N. (1999). Kerala's agriculture: Trends and Prospects. In M.A Oommen (Ed.), *Kerala's Development Experience II* (pp. 314-322).

Institute of Social Sciences, New Delhi: Ashok Kumar Mittal, Concept Publishing Company.

Shah, S. M. (1985). *Growth centres for rural and urban development*. New Delhi: Abhinav Publications.

Shinde, T. P. (2013). Spatio-Temporal Pattern of Pesticides Consumption in Satara District. *Journal of Current Science & Humanities*, 1 (4), 285-289.

Shyjan, D. (2003). Growth and sectoral performance of Kerala economy: Evidences from long term analysis. In K. Rajan (Ed.), *Kerala Economy: Trends during the post reform period* (pp. 185-207). New Delhi: Serials Publications.

Sivanandan, P. K. (1985). *Kerala's Agricultural Performance: Differential Trends and Determinants of Growth*. Unpublished MPhil thesis, Centre for Development Studies, Thiruvananthapuram.

State Focus Paper 2014-15. Retrieved from <https://www.nabard.org/pdf/SFP>.

Subash, V.P. (2011). *Kerala Economy*. University of Calicut, School of Distance Education, Calicut: Calicut university press.

Surendran, P. (2002). *The Kerala Economy: Growth and Survival* (2nd Ed.). New Delhi: Vrinda Publications.

Thamaramangalam, J. (1998). The perils of social development without economic growth: The development debacle of Kerala, India. *Kerala: Exploring Future Frontiers in Tourism Development*, 92.

Timmer, C. P. (2007). *The structural transformation and the changing role of agriculture in economic development: empirics and implications*. Wendt Lecture, presented to the American Enterprise Institute. Washington, DC October, 30.

Todaro, M.P., & Smith, S.C., (2012). *Economic Development*. (10th, Ed.) New Delhi: Dorling Kindersley India Pvt. Ltd.

- Unni, J. (1983). Changes in the Cropping Pattern in Kerala: Some Evidence on Substitution of Coconut for Rice, 1960-61 to 1978-79. *Economic and Political Weekly*, 18(39), A100-A107.
- Van Gemert, H .G. (1986). *Structural change in OECD countries: some extensions of the normal pattern*, A paper presented at VIII IEA, World congress, session 9, theme 1, New Delhi.
- Veron, R. (2001). The “New” Kerala model: Lessons for sustainable development. *World Development*, 29(4), 601-617.
- Welch, M. (2000). *Rural urban Migration in Developing Countries: A Survey of Economic Theory and Empirical Evidence*. University of Cape Town.