

THE ECONOMIC GROWTH OF GOA:  
A SECTORAL AND STRUCTURAL ANALYSIS  
WITH SPECIAL REFERENCE TO THE SERVICE SECTOR

A Thesis Submitted To Goa University  
For The Degree of  
Doctor of Philosophy in Economics

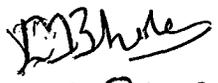
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## CERTIFICATE

This is to certify that Ms. Urankar Geetanjali Ramchandra has worked on the thesis entitled, "The Economic Growth of Goa: A Sectoral and Structural Analysis with Special Reference to the Service Sector", under my supervision and guidance. This thesis being submitted to Goa University, Taleigao Plateau - Goa, for award of the degree of Doctor of Philosophy in Economics, is a record of an original work carried out by the candidate herself and has not been submitted for the award of any degree, diploma, a scholarship or fellowship of this or any other university.

  
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Research guide

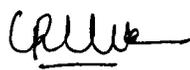
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## DECLARATION

I declare that the present thesis entitled, "The Economic Growth of Goa: A Sectoral and Structural Analysis with Special Reference to the Service Sector", is a consolidation of original work which has been carried out by me under the guidance of Dr. P. K. Sudarsan at the Department of Economics, Goa University, and that the same has not been submitted to any other University or Institution for the award of any other degree, diploma or other such title.



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# **CHAPTER 1**

## **INTRODUCTION**

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of the Study

Goa, one of the tiny states of India, measuring about 3700 sq. kms only, and with a population of 13.43 lakhs is located on the Western coast of India. Yet Goa is famous for its scenic beauty, shady palms, silver sands and golden beaches and is a popular tourist attraction, both for domestic as well as foreign tourists. Until, its liberation in the year 1961 from the Portuguese colonial rule, Goa had an almost stagnant economy with hardly any developmental activity worth mentioning. It was only after 1961, when a popular democratic government was installed, that many development programs were launched which triggered off the growth process in the economy. From 1961, Goa, Daman & Diu were given the status of a Union territory until Goa achieved statehood in May 1987 and became the 25<sup>th</sup> state of India. The policy of the state government, not to allow heavy industries and resultant pollution in the state has gone a long way in preserving its natural scenic beauty and its potential to attract increasing number of tourists to the state.

Hardly any state of our country has achieved a fast rate of economic growth over a short span of time as Goa has. The economy of Goa over the last four decades has moved towards a rapidly growing service pre-dominant economy from an essentially agrarian and trading economy, immediately before. It shows impressive strides in development as measured by some of the socio-economic indicators.

So far, no systematic, dispassionate, quantitative and comprehensive, research study seems to have been conducted as regards the Economy of Goa, since after its liberation till date; analyzing the structural factors as well as changes influencing the long-term economic growth of Goa. The present work is an objective attempt to bridge the above said gap.

Services play a crucial role in the production, distribution and consumption processes of an economy. Because of their interlinkages with the other sectors, especially the industrial sector, services can affect the overall growth rate of the economy. It is through the service sector that the distribution of the primary and secondary sectors' output for the intermediate and final consumption purposes takes place. Thus, varieties of services are provided in the form of producer services to producers and consumers. Trade, transport & storage services provide intermediate services and serve as inputs for the goods producing sectors. They also ensure distribution of goods and services where and when needed by consumers. Similarly, communication infrastructure ensures flow of information, which is an essential input for the development process, if the economy is market oriented. Business and financial services facilitate mobilization of resources and their deployment in the activities of different sectors of the economy. Software services have brought about a quantum leap in the efficiency of not only the service sector itself but of the entire spectrum of economic activities.

The social infrastructure sub-sector performs the most important task of development, namely, human resource development through education and training, skill generation and health care. Public services, defense and legal

services ensure public order and an environment conducive to orderly pace of over-all development of a society. With rising per capita income levels, the demand for consumer services like hotel services, air travel services, laundry services, hairdressing services increase due to their high-income elasticity.

Indeed, lack of appreciation of the real role of services in economic development, had in the past, encouraged the thinking that services are unproductive, low paying and a dead-end. However, in recent years, studies have empirically established the supremacy of service sector's contribution to the output and employment of an economy. Hence improving the performance of the service sector is a vital necessity to enhance the aggregate growth of an economy.

## **1.2 The Problem**

There is nothing unusual per se in the emergence of services as the principal sector of economic activity. What has emerged, as a major area of debate is the sustainability of the service sector growth. There have been studies, which have found consistent growth in the per capita income levels of service pre-dominant economies, which are providers of intermediate services to the manufacturing sector. Studies on the sustainability of the service sector in India (Handsa; 2002 and Bhowmik; 2006) have found that the service sector growth is positively associated with rising services intensity in industrial sector. Acharya (2002) and Chanda (2005) have found that to sustain the growth of service sector, the production sector, especially the industrial sector needs to grow. This is because in the absence of adequate growth in the other sectors of the economy, the services

sector in the long run would be adversely affected by demand constraints and its performance would then depend upon the uncertainty in demand from rest of the world through exports (Sastry et al 2003). In addition, as production of services requires inputs from other sectors, there could be supply constraints due to slow down in the growth of productive capacity in the rest of the economy (Rakshit 2000). Even studies (Aguayo et al 2001; Aguayo et al 2003) based on tourism growth have found that tourism and industrial growth are significant factors in determining service sector growth. Charles (1993) studied 11 tourism based Caribbean economies to determine the nature of Caribbean service sector. The study concludes that any economy, which depends excessively on only one sector for growth is risky. The study suggested that Caribbean countries should diversify their markets and products in tourism, create linkages between tourism and agriculture as also among final demand services and goods and integrate critical producer services with final demand services and goods. Some state level studies (Pillai and Shanta 2005; Babu 2005, Subramanian 2006) on service led growth have observed that sustainability of service sector growth in an economy led by consumption based services like trade, hotels & restaurants, without strong linkages with the production sector of the economy, is doubtful. Studies (Mitra 1988; Thakur, 1992 and Acharya 2002), which have found government and public services as important contributors to service sector growth in the Indian context, observe that such a pattern of growth is autonomous, spurious and has increased the rural urban income disparities.

In the light of these views on service sector growth, the present study, attempts to analyze the service led growth structure and its sustainability in Goa, a sector that

generates nearly 50 percent of the state income in real terms and has over 50 percent of its workforce employed in this sector. The basic research question is whether the service sector led growth in Goa is sustainable in the long run, given the fact that services growth in Goa was driven by government services during its pre-state hood period i.e. from 1970-71 to 1986-87 and by tourism related services like trade, hotel and restaurants, during the post-statehood i.e. from 1987-88 to 2003-04. Also a unique characteristic of Goa's economy is that it represents the case of a small open economy, which is dependent on the neighboring states, foreign countries for many of its inputs as well <sup>as</sup> output, and hence its growth and sustainability is subject to stability of external factors. This has raised doubts about the sustainability of the service - led growth momentum in the long run.

### 1.3 Objectives

The central theme of the present study is to examine the sustainability of the service-led pattern of Goa's economic growth, in an inter-sectoral linkage framework and to find out whether service sector growth has a long-term equilibrium relationship with the other sectors in the economy.

The specific objectives of the study are as follows:

- i) To study the structural changes and pattern of economic growth in Goa over a period of 34 years (1970-71 to 2003-04) in order to find out the leading and lagging sectors and sub-sectors of the economy.

- ii) To find out the sources of economic growth in Goa by analyzing the lagging and leading sectors/ sub-sectors of the economy and to specifically identify the causes which have pushed out employment from certain sectors and pulled it into the service sector.
- iii) To examine the service sector in terms of its structure with special reference to the pre-statehood and post-statehood periods and to find out the determinants of service sector growth.
- iv) To find out the extent of instability in the growth of service sector compared to that in the other sectors of the economy and to trace its growth potential.
- v) To assess the growth linkages of the service sector and its sub-sectors with the primary, secondary and export sectors and to test the sustainability of service sector growth.
- vi) To highlight the issues and consequences emerging out of the service led economic growth and suggest some recommendatory measures for suitable policy framing and planning.

#### **1.4 Hypotheses**

In the light of the above objectives, the present thesis tries to test the following hypotheses:

- i) Goa's economy has undergone a structural change with its service sector, leading its economic growth.
- ii) The agricultural sector and mining sector are the lagging sub-sectors while the industrial sector, export sector, banking and tourism services are the leading sub-sectors of the economy.
- iii) The nature of decline in the agriculture and mining sectors of the economy has influenced the service sector; diverting the concerned labor force into the latter.
- iv) The production techniques used in the industrial sector has some implications on the service sector.
- v) Tourism, banking, exports and the industrial sectors are key determinants of economic growth in Goa.
- vi) Government services and tourism services are the major factors pulling up, the service sector growth in Goa.
- vii) Service sector has viable linkages with the other sectors of the economy and hence service led growth in Goa is sustainable.
- viii) Service led growth in Goa's economy is quite free from ill-effects.

## 1.5 Data and Methodology

The study uses the time series data from 1970-71 to 2003-04, on the Net State Domestic Product (NSDP) by industry of origin, in respect of Goa, compiled by the Central Statistical Organization (CSO), New Delhi and Directorate of Planning Statistics and Evaluation (DPSE), Panaji-Goa. Data relating to employment is collected from various Census reports, CSO and the National Sample Survey Organization (NSSO). Data on agricultural sector has been collected from agricultural census reports of 1980, 1985, 1990, 1995 and 2000. Mining export data has been compiled from the reports of the Goa Mineral Ore Exporters Association (GMOEA). Data on registered industry has been collected from the reports on Annual Survey of Industries (ASI) of various years and Index of Industrial Production (IIP) report 2003-04. Data on the informal sector has been collected from the Economic Census (EC) reports. Data on tourism has been taken from 'Tourist Statistics', available in yearly pocket books of the Department of Tourism, Government of Goa. The NSDP series, by industry of origin with the base years 1970 -71 and 1980-81, have been spliced and converted to the base 1993-94.

The present study uses various statistical and econometric techniques. The average percentage shares, average annual growth rates, compound growth rates, Chenery and Syrquin method (1975) and Instability index (I) suggested by Parthasarathy (1984) are used. Multiple regression method is used to find out the determinants of economic growth and of its key or leading sectors. The growth potential of service sector is analyzed with the help of income and price elasticities computed using

econometric procedures. The intersectoral linkages are tested with the help of Granger Causality (GC) test after making the relevant variables stationary. Augmented Dicky Fuller test is used to test for the stationarity of concerned variables.

The Granger Causality test is used to test the direction of causality. It enables to test whether the causality is unidirectional, bilateral or independent. This test points out which variable precedes or leads the other variable. In the present study, the GC tests are used to study linkages over the study period 1970 to 2003 as also over the pre-state hood and post state hood periods of Goa. Firstly, linkages among primary, export and secondary sectors (the production sectors) and the service sector as a whole are analyzed. Secondly, GC tests among each of the production sectors and sub-services are analyzed. Lastly, the GC tests among the sub-services under the service sector are examined.

Long run intersectoral relationship between the service sector, primary, secondary and export sectors is analyzed using Johansen tests and Vector Error Correction Model (VECM). One of the most common approaches to multivariate co integration is the Maximum Likelihood (ML) test approach of Johansen (1988) and Johansen and Juselius (1990). The coefficient of the error correction term in VECM model indicates the speed of adjustment of a system converging to its long run equilibrium. Since the relationship among services and manufacturing, primary, and exports sectors is multidimensional, the VECM has been used.

## 1.6 Significance and Scope of the study

Since service sector has emerged as the dominant factor in the growth of Goa's economy, the present thesis tries to make an in-depth study of this economy with special focus on the service sector growth in an inter-sectoral framework. So far, there has not been any study on the aggregate economy of Goa or the service sector, though some scholarly persons have conducted some pioneering studies on agriculture development in Goa and occupational structure of Goa for the period 1961 to 1981. Many qualitative studies and reports on Goa's mining, environment, beach tourism and education have been done. However, all these studies have used simple statistical and mathematical tools. The present study is a comprehensive and quantitative one and attempts to examine thoroughly the entire economy of Goa at the sectoral and sub-sectoral levels.

Though the present work attempts to show sectoral linkages, the exact backward and forward linkages cannot be estimated due to the lack of availability of disaggregated data at lowest level for each sector as also lack of any input output tables for Goa's economy. This is one major limitation of the analysis. Also due to non-availability of continuous data on State Income by industry of origin from 1962 to 1968, the period of the study starts from 1970 up-to 2003-04. However, wherever data on other parameters from 1960-61 is available, the study period covers the period 1960-61 to 2003-04. Due to non-availability of full and final figures on state income by industry of origin after 2004 until 2006, at 1999-2000 base year prices, during the course of the present work, the current study could

cover the period only, upto 2004 at 1993-94 base year prices. On some variables, data upto 2006 is presented.

## **1.7 Outline of the Study**

The present research thesis is organized into seven chapters.

Chapter-1 being the introductory chapter highlights the background, the main research problem and significance, scope and limitations of the present study.

Chapter-2 presents a review of literature on the various aspects of the service sector related to various economies.

Chapter-3 consists of an in-depth analysis of the entire economy of Goa, with a focus on its economic structure at the sectoral and sub-sectoral levels, from 1970-71 up to 2003-04, as also in every decade, to find out the major contributory sectors of the economy and the leading and lagging sectors/ sub-sectors in the process of its economic growth.

Chapter - 4 presents a critical analysis of the leading and lagging sectors and sub-sectors in the economy, to find out the factors, which have influenced their nature of growth and their resultant implications on the service sector. This is followed by a quantitative analysis of the determinants of economic growth and of the leading sub-sectors of the economy.

Chapter-5 analyzes the pattern of service sector growth in Goa in terms of its income and employment structure, over the study period as also during the pre-statehood and post statehood periods. The extent of instability in the growth of the service sector and its growth potential is also studied. The chapter then proceeds to test the growth linkages and sustainability of the service sector, in an inter-sectoral and intra-sectoral framework with the help of Granger causality test. The study also attempts to find out the nature of relationship service sector has with the other sectors of the economy with the help of VECM.

Chapter-6 is a critique of the service led pattern of economic growth discussing the adverse consequences of service sector growth in the economy.

Chapter-7 highlights the major findings and conclusions of the present study and their implications. Suggestions for the policy makers and planners, as well as scope for further research work have also been incorporated in this chapter.

**CHAPTER 2**  
**REVIEW OF LITERATURE**

## CHAPTER 2

# REVIEW OF LITERATURE

### 2.1 Introduction

Due to the high potential in services to drive economic growth, there has been a shift in the research focus in recent research years, from agriculture and industry to the service sector. Theoretical and empirical studies have examined various aspects of service sector such as the evolution and conceptualization of services, its significance in economic growth, productivity of services, determinants of service sector growth, sustainability of service led growth, service sector's linkages with the other sectors in the economy, especially with the manufacturing sector and impact of service sector growth on employment and distribution of income.

### 2.2 The Conceptualization of Services

The concept of services and their role in the development process is marked by a long controversy. In fact, the debate dates back to the physiocrats that introduced a new revolutionary concept of 'sterile or unproductive labor' and viewed that the agricultural sector was the only real source of wealth, as it could produce a surplus over replacement costs and farmers therefore formed the class of productive labor. Adam Smith in his 'Wealth of Nations' in 1776 and Karl Marx in his 'Das Kapital' in 1873, basically adopted the physiocratic concept of productive and unproductive labor (although Adam Smith rejected the view that manufacturing, trade and transportation were sterile occupations) and they did not give the

service sector an explicit treatment as a distinct activity. In their framework, the service sector was also implicitly viewed as being immaterial and unproductive, because it could not reproduce the economic system or create wealth to the nations by adding value to materials as agriculture and manufacturing. Further, they asserted that the value of services could not be recaptured by sale due to instantaneous consumption (Anderson and Corley 2003). Adam Smith was of the view that services 'perish in the very instant of their performance and seldom leave any trace or value behind them'. As such, services had drawn for themselves a tag of unproductive activity from the classical economists. Until recently, services used to be treated accordingly by the erstwhile socialist or centrally planned economies. In addition, services were classified as 'non-material production' as against the productive 'material production' in their national accounts statistics.

'Services' as a productive activity, gained significance during the first quarter of the 20<sup>th</sup> century, when their role in the process of economic development were largely captured by the 'stage theories of development'. Fisher (1933, 1935, and 1939) and Clark (1940) originally proposed the differentiation of services as a separate sector or sectors of the economy. They sub-divided the economy into three categories, primary (agriculture, fishing), secondary (mining and manufacturing) and the residual tertiary sector based on the distinctive features of each of the three sectors (e.g. distribution of workforce, income elasticity and structure of consumer demand, technological progress and economic development). In later studies, the nature of output, simultaneity of production and consumption, organization of production and the level of capital intensity were used to define 'service'. However, there was no consensus, on what constitutes the service sector not only

Ehrlich (1996), examined the nature and causes of the U.S. economy's increasing service orientation and its implications for growth and employment, using input output tables and regression analysis, regressing GDP per capita on, the percentage share of service sector in total GDP in the base year and annual percentage change in services output. The important findings are (i) there was a rapid real growth in business services, wholesale and retail trade, air transportation and communications; other service industries have been growing at a steady rate and mining, manufacturing and agriculture have shown slower than average growth, (ii) while the input output tables showed increased importance of services as inputs to production, (iii) the regression analysis, showed a negative, statistically significant relationship between the rate of growth in real GDP and the service industry share of gross domestic product in the base year as also the percentage change in this share, over the periods 1970-80 and 1980-90, attributed to the sluggishness of service sector productivity growth and, (iv) services growing not due to rising income levels but due to demographic changes, long term public preferences, rapid advance of technical knowledge and growing number of women in service activities, which have raised the GDP, as services once done at home appear as part of GDP, overstating the service sector output.

Ansari (1995) tested whether per capita income and government expenditure have a positive contribution to the growth of the service sector in India, Pakistan and Sri Lanka. The paper uses, annual data of National Income by industry of origin of the three countries under study for the period 1973-1991. Generalized Least Square method is applied and per capita service output is regressed on the per capita income and per capita government expenditure for each country and

among the works of different authors<sup>1</sup> but also within the work of the same author.<sup>2</sup> Kuznets introduced a more neutral term 'services' instead of tertiary, thereby bringing the sector into economic discussion (Kuznets, 1955; 1972). Hill gave another definition, bringing out the characteristic features of services. According to him, 'a service may be defined as a change in the condition of a person, or of a good belonging to some economic unit, which is brought about as the result of the activity of some other economic unit, with the prior agreement of the former person or economic unit' (Hill 1977: 318). Riddle (1986) in her book explored the various definitions of services, different theories about the impact of services on the economy. Part of the problem with studying service sector as the author correctly notes, is the differences in the definition of services itself. As a result, data on services tend to be incompatible across time, across countries and especially across academic studies. Unlike manufacturing which has a standard of measurement, services are often treated as residual. Her claim is that services have been systematically misunderstood and undervalued. It is the service sector and not the manufacturing sector, which is indispensable. Thus with the increasing role of services, a series of studies have emerged that have classified services according to their nature, stage of consumption, thereby providing a framework to define what falls in the category of 'services'.<sup>3</sup> While services have long come out of such categorization, the debate seems to have shifted its focus to other aspects of services like the causes of service sector growth, its significance, low productivity

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<sup>1</sup> The sub sectors transport, communication and public utilities, has received differential treatment from scholars, on whether they fall in services or in manufacturing. See Maurice Lengelle 1966; George J. Stigler 1956; Victor R. Fuchs 1968; B.M Deakin and K.D. George, 1965; J.A Dowie 1966 and Gur Ofer, 1967 for details.

<sup>2</sup> For instance, initially Simon Kuznets has included transport, communication and public utilities in 'service sector' but in his later works it was classified under 'industry' (Simon Kuznets, 1955, 1972).

<sup>3</sup> For instance see Bhagwati (1984), Katouzian (1970), Elfring (1989) and WTO classification.

of the sector, sustainability of service led growth and the like. There have been various theoretical and empirical studies focusing on various aspects of service sector in economic growth.

### **2.3 Explanations for Service Sector Growth**

To begin with, the conventional theory also known as the stage theories of economic development, put forth by Fisher (1935) and Clark (1940) suggested that growth in the services sector is a function of economic development. The process of development has been described as being composed of three main phases: (i) the 'pre-industrial' phase, in which the economy is primarily extractive, based on agriculture, mining, fishing, timber and other natural resources, including natural gas and oil; (ii) the 'industrial' phase, in which manufacturing plays the dominant role, in this phase, a significant shift occurs from agriculture to industry; and (iii) the 'post-industrial' phase, in which the economy becomes mainly a 'service – economy'. This theory attributed the preponderance of services in the developed world to its level of per capita income, a variant of the Engel's Law that the income elasticity of demand for services is high. Fisher (1939) and Clark (1940) maintained that since demand for services, manufactured items are more income elastic than that of agriculture, a shift away from agriculture towards services, and manufacturing is expected in the course of development, once agriculture and industry mature. This argument very well applies in the case of developing countries too where both manufacturing sector and services have shown progressive growth over the decades. In addition, the Fisher-Clarke theory stressed that slow growth of technology in the service sector also encourages the growth of

services as economic development moves apace. This is so because technology plays a relatively less important role in the services sector than in the primary and secondary sectors. Development therefore brings in its wake a rapid rise in employment in this sector. The income generation effect of this sector mainly stems from this rapid growth in employment. Thus service sector contribution to income and employment is not only the highest among all sectors in developed economies, but also rapidly rises as an economy marches towards its development peak. Carrying the Fisher-Clarke hypothesis, further the neo-classical growth paradigm (Chenery 1960; Fels et al., 1971; and Kasper, 1978) explains that as income level rises, the tertiary sector grows at the cost of the secondary sector, because the primary sector has already reached a certain minimum. Similarly, Kuznets (1966) also stated that a characteristic feature of economic advancement is the growing share of the service sector in the economy, followed by manufacturing, in income and employment. A relatively high-income elasticity of demand for services compared to goods and low productivity per worker in services compared with other sectors, were the reasons identified to explain this rapid growth of services and consequently the process of economic growth. However, both the arguments have been met with wide criticism.

As pointed out by many, services consist of activities with varying income elasticity of demand (Summers, 1985) and there is no strong evidence to show that growth in service sector in the advanced countries has been the result of higher income elasticity of demand for services compared to goods (Stigler, 1956; Fuchs, 1968 and Wortion, 1969).

Katouzian's (1970) article based on the share of services in national product and employment both of developed and developing countries tries to give an alternative view to the stage theory of development as an explanation of the growth of services, by trifurcating services into (i) new services, defined as those services whose demand is highly sensitive to the per capita income level and also changes in population, social, economic and political conditions, e.g. education and health services, (ii) complementary services, which include those services whose production normally takes a sharp upward turn with the rise in manufacturing production, e.g. banking, finance, transport, wholesale and retail trade. In addition, law, police services, etc, rise as a result of an industrial society and (iii) old services, defined as those services, which flourished before industrialization and whose importance and contribution has declined, e.g. Domestic services. With growth, domestic services are substituted by industrial consumer goods and new services. Demand for complementary services is directly linked with rise in industry, technological advancement, growth of intermediate goods, unification of home and foreign markets, bureaucratization and urbanization, which grow in the growth process. Thus, not all services rise, and those which rise do not entirely depend on high-income elasticity.

Another view, which was popular in the 1970s, was the Bacon and Eltis (1978) view, which states that service sector led structural change<sup>4</sup>, is an outcome of the rapid expansion of the public sector in an economy. Since government expenditure tends to be biased towards services, there is a shift of resources away from goods

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<sup>4</sup> In the discipline of economics, the term structural change is used to represent variations in the relative size of primary, secondary and tertiary sectors in terms of its share in output, employment and productivity or in other macro economic variables. In the present study the term denotes changes occurring between or within sectors.

producing sectors. This view assumes full employment. Nelson (1980) based on his study of OECD countries, maintains that structural change, in favor of service producing sectors and impending manufacturing sector has been largely due to the growth in government.

However, the Cambridge view put forth by (Cornwall 1977; Singh 1977 and Thirwall 1978) attributes deindustrialization to a growing inability of the export sector to pay for rising imports. The inability stems from a slow growth in demand for manufactured goods in both the domestic and the world markets. In the long run, balance of payments constraint makes it necessary to cut down growth in output to match growth in exports consequently, the manufacturing sector declines under pressure and this gives rise to a rise in the share of services.

The Dutch-disease hypothesis, (Corden 1981, 1984, Corden and Neary 1982) explains service sector growth, in terms of resource sector boom and the concomitant resource movement and the spending effects. A boom in one of the resource sectors causes the marginal product of labor to rise in the booming sector. At constant wages, this leads to movement of labor away from the manufacturing and services sector. The excess demand for services due to the inward shift of the supply curve in this sector causes the relative prices of services to rise which leads to further movement of labor away from the manufacturing sector. The spending effect arises from a rapid rise in real income following the boom. A high-income elasticity of demand for services causes the service producing sectors to expand causing a further shift of resources away from the manufacturing sector.

Kravis (1983) attributed fast growth in the share of services to splintering of services i.e outsourcing of indirect production activities. With the increasing complexities of modern industrial organizations, manufacturing activities have become more and more service intensive both upstream (e.g., design and R & D) and downstream like marketing and advertising (Pilat 2000). Competitive advantage of a firm now depends more on providing specialized services like financing and after-sales facilities than on production, which increasingly become routines. On the other hand, new in-house services have come up to extend an interface with the outside provider of services on externalization of the latter (UNCTAD, 1989). All these are arguably reflected in increased demand for intermediate services. The ascendancy of services in the developed world has often been accompanied by deindustrialization.

Based on the above views, there have been many more empirical works on the causes of service sector growth, some strengthening, while some refuting the findings of the various theories and hypotheses mentioned and some bringing out a totally new set of factors causing services growth.

Kellorman (1985) examined the evolution of service economies and the resulting transition from industrial to post-industrial economies by studying seven industrialized countries, viz, USA, Canada, U.K, France, West Germany, Italy and Japan for the period 1959 to 1979. The important findings are: (i) there was a decline in industrial employment in all the seven countries, viewed as a necessary transitional stage for the change into a service economy, (ii) most of the economies also experienced rise in the share of producer services such as finance, insurance

and real estate services, due to industrial growth and (iii) those economies which experienced decline in the share of their agricultural activity earlier, also matured into service economies earlier.

Damesick (1985) in his paper stated the reasons for the well-established shift towards service employment in Great Britain. The pattern of service employment growth by industry groups and in the regions of Britain since 1971 is examined using average annual growth rates and sectoral shares. The findings are: (i) in Britain; higher income elasticity of demand for consumer services, the growth of intermediate demand for services and relatively slow labor productivity growth in services led to its service sector growth and (ii) service sector growth is rising in high value added sub-sectors like finance, banking business services from trade and transport services.

Hill (1994) traces the factors that have contributed to the service sector growth in the Association of South East Asian Nations' (ASEAN) economies. These economies have had growing international trade in services. Banking, insurance, tourism, data processing, a range of business and personal services and even construction services are increasingly traded within and outside the region. Another service industry, which has been crucial for South East Asia's rapid growth, is transport. Governments' massive infrastructure programs have given a boost to transport as also financial services growth. This paper brings out the important role that government spending can play in boosting service sector growth.

thereafter for all the three countries taken together. The paper tests the relevance of the secular trend and the Bacon-Eltis views of structural change to these economies. The results of both sets of estimations indicate a robust support for the secular trend view, while the support for the Bacon-Eltis is less robust.

Ansari (1998) tested the Dutch –disease model of structural change for Canada employing both the standard Granger Causality and Vector Auto Regression (VAR). Empirical results, based on quarterly data from 1961 to 1992, show that occasional booms in the resource sector have significantly influenced the pattern on structural change in the Canadian economy. However, more important, there is a strong evidence to suggest that Canadian resource booms have contributed to a relative decline in the manufacturing sector, and to a lesser extent, to a relative expansion of the service sector. These results are consistent with the expectations of the Dutch-disease model.

Ansari (2001) estimated an econometric model for explaining the service sector growth in the US. An econometric model consisting of a four variable equation is estimated employing in the standard regression techniques. The findings are service sector has grown due to rise in the per capita income, rise in the government spending and balance of payments constraints, thus supporting the relevance of the Secular trend, the Bacon-Eltis, and the Cambridge views respectively to the US service sector growth.

Aguayo et al (2001) in her study on 22 American countries used data from the Economic Development Report and applying dynamic regression models found

that the value-added of the services sector is related with mainly the exports of tourist services and with the value-added of both agriculture and industry sectors. The results show an important positive impact of the production of the agriculture and industry sectors on the services sector, besides tourism. Besides tourism, the industrial evolution is also very important to improve the development of services through some inter-sector relations. The model suggests that some stagnation of services development in many countries is due largely to a lack of industrial investment, especially in countries with a low level of tourism. The main conclusions are that both factors, industry and tourism, need to be increased to contribute service sector development.

Ansari and Ojemakinde (2004) tried to study the dynamics of service sector in Georgia's economy. Using annual data from 1977 to 1998, an econometric model is estimated to explain the rapid growth of the service producing sectors in Georgia's economy. In addition, VAR methodology is employed to capture the dynamics of inter sectoral changes. The rise in the per capita income is found to be the single most important factor contributing to the rapid growth of the service producing sectors, validating the secular trend view of structural change. The Bacon Eltis view has only marginal support. The VAR results rule out relevance of the Dutch –disease view.

Lee (2004) in his paper tested whether service sector growth in England is a function of industrial growth. Testing of this thesis by econometric methods suggested that industry provided a poor explanation for variations in services, and that the main explanation was provided by variations in income. This raised other

questions, since income per head in the industrial areas was generally much lower than in the less industrialized and service-oriented south of England. There is evidence to suggest that this service-oriented regional growth was not derived from industrial development but from international trade and finance together with the consumer spending of a wealthy landed society. There was thus a substantial element of economic and spatial dualism in the Victorian economy.

#### **2.4 Role of the Service Sector**

UNCTAD (1985) in its report on 'Services and Development Process' has stated that services play a far more important role in the development process, due to its inter linkages with other activities in the development process. The report finds that (i) services are interlinked with the rest of the economy and (ii) higher productivity of the service sector in developed countries could reduce labor requirement and hence costs per unit of output and thus undermine the competitive position of developing countries, which are major producers of labor-intensive goods and services.

Greenhalgh and Gregory (2001), in their study using input output tables of 1979 and 1990 analyze the changing role of services throughout the production process in U.K. over the 1980s. The study finds that the biggest source of output and employment change has been the sharply rising demand for intermediate services for the production of further services. The author concludes by saying that the forces of increasing specialization within the economy and within the service sector in particular have provided the dominant component of structural change.

The other striking role of service sector is as a source of productivity gains and as a channel for the diffusion of innovation and improved product quality through the transmission of outcomes of R&D, undertaken in other sectors. It is these developments, which define the new role of services in the economy.

Eswaran and Kotwal (2002) in their paper have examined the role of service sector in the process of industrialization. A model is proposed, which recognizes that consumers and producers demand (non- traded) services. They model services as a sector whose output is non-traded and whose production is characterized by scale economies, and how services act as a link between consumption and production. They state there are two ways in which an expansion of the service sector benefits the industrial sector. Firstly, it enables greater specialization and division of labor, and secondly, it lowers the effective costs of service inputs to industrial sector production. As greater varieties of competing services are available, producers get greater flexibility to minimize the cost of producing a given level of output. However, variety of services available is limited by the market size. If the market size, has to expand there should be growth in the income levels and then assuming Engel's Law holding true there will be more demand for consumer based services as also for consumer goods which will push demand for industry and producer based services also, as industry uses services more intensively compared to agriculture.

Riddle (1987) hypothesized in her paper, that service industries are the primary force for economic growth. In order to prove the above hypothesis, the paper takes four groups of countries based on the per capita income categories used by World

Bank in 1984. The important findings are: (i) the service sector in almost every country contributed a higher percentage to GDP than other sectors and gross capital formation has been occurring primarily in service sector, (ii) the average annual increase in the number of workers compared with the average annual increase in GDP as a ratio, for the service sector was higher than for other sectors, (iii) the low income countries had positive correlation between the percentage of GDP from service sector and average annual growth in per capita GDP, (iv) the upper middle income countries, though mainly manufacturing economies, their service sector contribution and quality of life indicators show positive correlation and (v) the low growth rate economies had a higher proportion of public administrative services in services. The author supports steps like partial privatization, to develop the service sector.

Wolfi (2005) argues that the high performance of the service sector is important to enhance the aggregate economic growth rate. The growing role of services is not only the result of a resource re-allocation towards services. It is also related to demand side factors, such as a high income elasticity of demand for some services, demographic developments, the provision of certain services as public goods, and the growing role of services as providers of intermediate inputs to industry. The policy makers should not necessarily look at services separately from manufacturing industries. In contrast, several services industries show characteristics and problems similar to those of manufacturing industries and the blurring of the two sectors is becoming more and more prevalent. Moreover, addressing some of the problems faced by services may also improve the

performance of other industries, since services provide key intermediate inputs to such sectors.

## **2.5 Linkages between Service Sector and Manufacturing Sector**

High contribution of the service sector to GDP coupled with a relative decline of the share of manufacturing sector has led some observers to express reservation that the excessive growth of service sector is not sustainable and represents, de-industrialization (Datta 2001). Though the manufacturing sector has also expanded in several parts of the world, albeit at a slower pace than services sector (Clemes et al, 2003) the two have spill over effects. First, a very large part of the service activities i.e. distributive trade, transport etc. is an integral part of the manufacturing process and a major share of service sector income are attributed to producer services, which depend on manufacturing (Gershuny and Miles, 1983). In this sense then, producer services are material services, serving as inputs to industry. Grubel and Walker (1989), maintain that although service sector as a whole may have a low productivity growth, producer services are instrumental in raising productivity in the manufacturing sector. This is because these services contain a high level of human and knowledge capital and therefore their use as inputs has important cost reducing effects. Similarly, manufacturing growth is also dependent on service sector income growth to serve as a market for its finished goods. As the economy grows, linkages between sectors become more pronounced. There is a feedback linkage operating between the two sectors.

### 2.5.1 Manufacturing to Services Linkage

Park (1989) examined the nature and extent of linkages between industry and services, using an international input-output table for the Pacific Basin countries. Empirical evidence suggested that the manufacturing sector contributes to urban employment creation in developing countries more through its interindustry and intersectoral linkages, as well as its income-induced demand for various types of services, than through its direct employment effects. This article clearly brings out the employment potential of the service sector, through its linkage and interdependence with the manufacturing sector.

Park and Chan (1989), examined the nature and evolution of inter- sectoral relationships between manufacturing and services at different stages of industrialization as revealed by cross –country comparative analysis of input-output tables of 26 countries at different income levels. A positive and significant association between manufacturing and services is hypothesized. The major findings are:(i) the inter-sectoral relationships between manufacturing and services generally show asymmetrical dependence and service activities tend to depend on manufacturing sector as a source of input to a far greater extent than vice versa, implying that the growth in the service sector depends on growth in the manufacturing sector, (ii)from the manufacturing side, distributive services are quantitatively the most important source of service inputs for the manufacturing sector in the process of development, but their relative importance declines and producer services like banking, insurance etc. become more important in the advanced stages of industrialization and (iii)the employment absorptive capacity of

the manufacturing sector is seriously underestimated, when only direct employment effect of the manufacturing sector is measured, so there is a need for estimating and including inter- sectoral demand of manufacturing sector for service inputs and its resulting employment, and its income induced demand for various types of services.

Aguayo et al (2003), in a study on tourism-based economies of Latin America, hypothesize that besides tourism, the industrial activity evolution is critical in the development of the service sector of Latin American countries, owing to inter- sectoral relationships. An econometric model of pooled least squares, used for 21 Latin American countries, with a sample period of 1991-2000, where GDP of the service sector is the explained variable and the explanatory variables are the lagged value in levels of GDP of the service sector, increment of GDP of the industrial sector and the increment of exports of services. The findings show an important positive impact of the industrial sector and exports of services, which mainly includes tourism, on the service sector growth. The authors argue that industrial development is the main source of economic growth and is fundamental to foster growth in other sectors such as construction and services. Thus service led growth can be attributed to the linkages it has with the manufacturing sector.

### **2.5.2 Services to Manufacturing Linkage**

Francois (1990) highlighted the role of services as complementary to the manufacturing process. A model is developed to incorporate the relationship between services and scale, explicitly assuming that producer services are

important to the co-ordination and control of specialized production processes. The paper argues growth of producer services sector may be important to this process, as they result in economies of scale. Rather than a drag on productivity, a growing producer service sector is an important positive aspect of expanding economies because it facilitates increased division of labor and productivity changes. The arguments presented in the paper highlight the importance of services to production in complex modern economies. The realization of returns to scale and the pace of development are tied to the pace of growth of producer services sector. The disintegration of production into specialized intermediate stages depends on both scale and supply of producer services. This suggests that an expanding producer service sector is an important aspect of growth. Access to producer services through direct trade or through multinationals may help developing countries to take part in the process of specialization.

Reinert and Halst (1994) have used estimates of sectorally detailed social accounting matrices to evaluate the changes in receipt and expenditure patterns, including inter industry linkages, over the 1982-1988 period in the U.S economy. Among other effects, results revealed increasing service orientation shifts in every area of production.

However, Goe (1994) examining the alternative models of producer services development in metropolitan communities and analyzing the factors associated with the development of producer services in two de-industrializing urban Communities –the primary metropolitan state areas of Cleveland and Akron, Ohio came to some different results. Sample surveys of producer services in each

metropolitan areas reveal the following: (i) the producer service-based establishments tend to be primarily dependent upon the local trade within the local metro areas, tend to simultaneously engage in non-local trade and directly contribute to inter urban integration, and (ii) they engage most extensively in trade, both locally and non-locally, with other service sector industries rather than manufacturing. These findings suggest that producer services development may be sustained in de-industrializing urban communities and that it is not primarily dependent upon trade with locally based manufacturing.

Francois and Reinert (1996) examined the role of services in the structure of production and trade. Working with a cross-country, sample of 17 social accounting matrices, stylized facts are developed relating to upstream and downstream service linkages to incomes and the input-output structure of production. Expansion of services is related to the expansion of private sector intermediate services and to increased demand in manufacturing for service inputs. This growth in demand is more closely related to changes in the structure of production rather than to outsourcing processes.

Thus, the decline in manufacturing and the corresponding shift to services is widely held to be unsupportable in the long run, since services depend critically on manufacturing for their existence. Such well-entrenched notion of parasitic and dependent services has recently come under increasing scrutiny (Bryson and Daniels, 1998). Rather than services following and supporting manufacturing, manufacturing is seen as flowing to those countries and areas where the services infrastructure is efficient and well developed (OECD, 2000).

### 2.5.3 Bidirectional linkage

Ansari (1996) drawing from various theoretical explanations of the causes of structural change in Canada, has examined the policy implications for Canada of the recent structural changes. The paper also investigates the relationship between the manufacturing and the service sectors to trace growth effects of structural changes. The paper employs Standard Granger Causality and Co-integration and error –correction-modeling techniques. Results of both tests indicate bidirectional causality, despite a decline in the manufacturing sector and high growth of service sector.

Gani and Clemes (2002) present an empirical study of the determinants of per capita economic growth, service sector growth and the manufacturing sector for five ASEAN economies using pooled data, for the period 1965 to 1994. Generalized Least square model is estimated. The service sector growth is hypothesized to be influenced by growth in real output, growth of manufacturing sector, growth of exports, growth of imports and by public expenditure. The growth rate in real per capita is regressed on the growth rate of population, the ratio of Gross Domestic Investment to GDP to account for the growth in capital stock, real per capita GDP at the start of the period, primary and secondary school enrolment rates, (as proxies for human capital), growth rate of services in real terms, rate of inflation and growth rate of exports in real terms. The growth rate in the manufacturing is determined by real per capita GDP growth rate, real growth rate of service sector, growth rate of export sector, growth rate of imports and government expenditure. The findings of the paper are as follows:(i) the service

sector growth is positively influenced by growth in output, manufacturing, imports and government spending, (ii) the per capita growth is negatively associated with per capita income at the start of the period and inflation and it is positively related to service growth, the export growth and the share of Gross Domestic Investment to GDP and (iii) services growth and lagged manufacturing growth rate values explain manufacturing sector growth. Thus, this paper clearly brings out the interdependence between service and manufacturing sectors growth.

Clemes, et al (2003), in their paper tried to determine the feed back effects between services and manufacturing sectors of an economy. The study uses five ASEAN countries to test for the presence of such spill over effects by using data from 1965 up to 1994, on services, manufacturing, government expenditure, exports, imports and per capita income figures. Multiple regressions are used by the study. The growth rates of real output, exports, imports, lagged manufacturing output and government expenditure are explanatory variables to explain service sector growth. Manufacturing sector growth is explained using growth rates of real output, exports, imports, lagged service sector output and government expenditure. The results confirm the positive and statistically significant effect of service sector growth on the growth of manufacturing and vice versa. Additionally, the government spending, imports and income growth have a significant effect on services growth.

## **2.6 Service Sector Growth in India**

What has driven so much research interest in the service sector growth in India, is

the unique pattern, of 'disproportionality' in its sectoral income and employment share with sectoral income rising way ahead of its employment share. The well-known sequence of structural transformation from an agrarian economy to a predominantly service economy *en route* an industrial economy as noticed in the developed world has not been witnessed in India (Handsa, 2002). This excessive growth of service sector, has been found by some experts, to be autonomous, driven by non-material, consumer based services like public administration and defense services, with no impulse from the manufacturing sector and having serious implications for inflation, income distribution and balance of payments (Mitra, 1988; Bhattacharya and Mitra, 1990). The observed dominance of services ahead of industry, with the decline of agriculture still continues, as in the earlier decades, but the structure of service sector has changed, with business services, Information and Technology services, financial services and producer services driving service growth in the last one and a half decade, implying thereby that, many services serve as inputs to the manufacturing sector (Banga and Goldar, 2004; Gordon and Gupta, 2004) and the two are interlinked and service sector growth is not independent as observed earlier. However, with a stagnant manufacturing sector, there are doubts raised on whether the service led pattern of growth will sustain itself in the absence of a buoyant manufacturing sector (Acharya 2002). The service sector literature on India revolves around these crucial issues of excessive growth of service sector, its sustainability, its intersectoral linkages especially with the manufacturing sector, its impact on employment and distribution in the economy and its role in the growth of the informal sector.

Rao (1979) in one of his pioneering studies on Indian economy and its structural changes, using Net Domestic Product (NDP) figures from 1950-51 to 1976-77, its sectoral shares, annual and compound growth rates and value of factor incomes at current and constant prices, found that: (i) the growth rates and productivity per worker, of secondary and tertiary sectors especially of the secondary sector in the economy went up, and that of the primary sector declined, (ii) but the service sector was growing faster than the commodity sector mainly due to the growth of informal sector employment. The author concludes that the most startling feature of the structural change is the failure of the occupational structure to coincide with that of the sectoral NDP.

Mitra (1988) in his paper analyzed structural changes in the economy from 1950-51 to 1984-85 using National Income data by sectors of origin at 1970-71 prices for the said period and its percentage distribution. The study found that: (i) the proportion of agriculture in the national income have declined, that of the secondary sector has failed to gain and service sector has overtaken the secondary sector, (ii) the emergence of services as the principal sector of economic activity cannot be readily attributed to any impulse from the material producing sectors and it has an autonomous character and it has expanded due to rise in public administrative and defense services, (iii) the expenditure under public administration and defense, emerges as additional output so capital output ratio is low and does not lead to much capital formation and therefore growth, (iv) growth of the service sector needs more outlays but this may squeeze resources from other sectors inhibiting their growth and the depressed rate of material production sectors

may push the government to further concentrate on the service sector and this can be harmful.

Datta (1989) in his paper has tried to find out the sources of service sector growth in India with specific reference to the implications of the rapid growth of distributive trade and transport for Net Material Product (NMP) in India for the period 1950-51 to 1983-84. NMP is defined as the unduplicated aggregate of material goods produced in an economy, including trade and transport. The growth of Public Administration and Defense (PAD) that are excluded from NMP are also analyzed. CSO published data on NMP, NDP and the Net Product in the Tertiary sector and its sub sectors at constant prices along with their three yearly moving averages are used for analysis. The important findings are: (i) trade and transport services are complimentary to material production and the growth of trade in services in India over 1950-51 to 1983-84, has responded to changes in the structure of material production and (ii) a major part of the value added in the tertiary sector constitutes a part of NMP and even after adjusting for value added in PAD there is no much difference in the growth rates of NMP and NDP in India over the study period.

Nagaraj (1990) in his paper has tried to examine various alternative hypotheses on the long term growth rate of India's GDP using 1980-81 series of National Income, fitting trend to the time series data. A comparison of the old (1970-71) and new series shows that while movements of GDP over 1950-51 to 1984-5 are identical but a sharp decline in the growth rate of 'Public Administration and Defense' (PAD) is discernible in the revised series since 1977-78. However, the trends in the

growth rates of real GDP excluding PAD show a clear increase of real GDP in the 80s validating one of his hypotheses that service sector growth is due to growth in services besides PAD services. Another finding of his paper that the secondary sector grew faster than the other sectors in the 80s invalidates one of his hypotheses that tertiary sector growth rate has been higher than that of primary and secondary sectors since 80s.

Mohanty and Raghavan (1990) analyzed the growth and structural characteristics of the Indian economy since the first five-year plan by using CSO data, on GDP and its sectoral shares at constant prices. The study finds that share of primary sector in the GDP has shown a continuous decline which has been offset by rise in the GDP of the secondary and more specifically of the tertiary sectors. Tertiary sector has continued to grow irrespective of fluctuations in the other sectors. The study also finds that not all tertiary activities are undesirable for; a part of the tertiary activities is directly linked to the production of commodities. Further, higher growth of the commodity producing sectors has to be sustained by demand impulses in the tertiary sector in the absence of adequate demand response from agriculture. Thus, there is interdependence from the demand side between secondary and tertiary sectors.

Bhattacharya and Mitra (1990) studied the pattern of growth of the tertiary sector and its implications on growth and distribution in India in the post independence period 1950-51 to 1986-87. The findings of the study are: (i) the service sector in India is growing rapidly ahead of the commodity sector and relative disparity between the two sectors has increased, (ii) service sector has become predominant

even before the economy has become a highly industrialized one, (iii) the commodity output has a very poor relationship with services income, implying that services income is independent of the commodity sector income, (iv) the employment elasticity of the service sector over the study period was lower than that of the commodity sector, (v) the share of services in the National income is much larger than its corresponding share in employment. The author suggests policies like raising commodity output, curbing unproductive services activities, real wage rate regulation in public services and an appropriate tax structure to make tertiary sector growth sustainable in the long run.

Nagaraj (1991) has tested the proposition of Bhattacharya and Mitra that the relatively larger share of tertiary sector in the National Income throughout the post-independence period of the economy (i.e. 1950-51 to 1987-88) is a consequence of its faster growth as compared to the growth of the primary and secondary sectors, by taking NDP at factor cost at 1980-81 prices, for comparing sectoral growth rates. According to log-linear estimates, which give constant growth rates, the study arrives at an opposite conclusion that the secondary sector has grown at a faster rate than the tertiary sector during the study period.

Ghosh (1991) evaluated the hypothesis of Excess Growth of Tertiary sector in the Indian economy and brought out some striking contrasting features of the tertiary sector growth in the developed countries (DCs) and that in developing countries (LDCs). The author points out that: (i) in DCs tertiary sector emerges out of high level of income of other sectors but in LDCs it arises out of scarcity of employment in other sectors. Also per capita productivity in tertiary sector is high

in DCs and low in LDCs,(ii) tertiary occupations in DCs are highly capital intensive but those in LDCs are labor intensive and (iii) in LDCs the distributive services in the tertiary occupation are low income type and poverty induced but those in DCs are high income type and property induced. The author attributes the excessive growth of tertiary sector in India to the above differences in the growth of tertiary sector in DCs and developing countries. The author criticizes the policy to curb service sector growth as; this sector has absorbed the surplus labor that the primary and secondary sector could not absorb.

Bhattacharya and Mitra (1991) in this paper tested the hypothesis that manufacturing sector can contribute to income of services by generating employment. The study used cross – section data on employment of NSSO, 38th round for the year 1983-84 and 43rd round, in 1987-88 .The regression model explained in the study used log of tertiary sector employment as dependent variable and log of manufacturing sector income, log of tertiary sector income and log of agriculture sector income, as independent variables. Nevertheless, results do not support their hypothesis and the finding was manufacturing sector income during the study period did not significantly influence employment in services. The authors conclude that not only income but also employment in services appear to be growing independently of the commodity sector growth. Moreover, excessive growth of tertiary sector could have fuelled inflation and adverse balance of payment in the economy.

Kumar (1995) studied the role of the service sector in economic growth in India to find out the employment potentiality of the service sector, using 60x60 input

output tables of RBI of the year 1973-74. The author used decadal years from 1951 to 1991, for the analysis. Simple and compound growth rates and employment elasticity have been used for analysis and the important findings of his paper are as follows: (i) a major part of the total input in primary and secondary sectors is provided by the tertiary sector, (ii) the tertiary sector's contribution to the GDP is highest and (iii) the tertiary sector has high potentiality to absorb labor compared to other sectors.

Banerjee (1995) studied employment and growth in the service sector for India from 1983 to 1988 and the prospect of employment in the context of deregulated financial services, using National Accounts Statistics, percentage share of different sectors in the net value added to total NDP at Factor cost at current prices and employment elasticity with respect to growth in service sector. Some of his findings are: (i) in India with economic growth, share of the primary sector declined and the service sector has expanded faster than industrial sector; (ii) labor absorption is only in the organized sector and has created growth and employment and (iii) trade and financial services have contributed to higher growth and employment in India. But the burden of labor due to collapsing of Public Sector Undertakings and slow agricultural growth rate is on the service sector.

Sharma and Jayakumar (1995) have analyzed the structural shifts in the Indian economy and their implications for the tertiary sector using sectoral growth rates of GDP for India and for states, relative product per worker for states and growth rate of employment by sector from 1980-81 to 1991. The authors state that tertiary sector has not grown at a faster rate except during the period of industrial

stagnation. There is no significant difference between the growth of income in the secondary and tertiary sectors, but employment has grown faster in the tertiary sector. The study concludes that unless the industrial sector expands at a faster rate the growth of the tertiary sector cannot be sustained for long. However, it is the tertiary sector, which has to absorb a major proportion of labor force.

Murthy and Reddy (1995) tested the hypothesis that the level of service sector employment increases with rising per capita incomes using time series data of a sample of 23 large countries grouped based on their per capita GDP in 1980 and 1990. Linear regression with per capita GDP in real terms as the explanatory variable and service sector employment as the dependent variable have been used. Results show that: (i) in case of 17 countries including India the relationship is positive and statistically significant and (ii) economic reforms in India have had a favorable impact on service sector employment; especially in the private sector. The study concludes that labor productivity in service sector will not be as high as increase in employment in the sector, as there may be disguised unemployment in some areas.

Singh and Sharma (1995) have studied the employment generation vis-à-vis labor absorption position of the tertiary sector in India with the Clark –Fisher Hypothesis using time series data from 1950-51 to 1993-94 of the relative sectoral shares, workforce and employment elasticity with respect to the GDP for the service sector and also for the other major sectors of the economy. The major findings are: (i) except construction sector, employment elasticity of all the sectors during 1980s has been lower than that in 1970s and in 1980s manufacturing sector had the

lowest employment elasticity, (ii) the direct effect of manufacturing growth on employment has been low; its indirect contribution to the employment generation in the tertiary sector has also been very low, (ii) low employment elasticity in tertiary sector is due to the substitution of labor by capital in the industrial and service sectors. So the trend of employment generation in the service sector of India does not conform to Clark- Fisher hypothesis in India.

Suryanarayanan (1996) in his paper analyses the relative size and the structure of the service sector in terms of capital stock, output and employment from 1977-78 to 1993-94. The important findings are: (i) nearly 50 percent of the economy's net capital stock is in the service sector in favor of trade and hotels, though its productivity has declined sharply over 80s,(ii) the share of the services sector in GDP has risen from 34 percent in 1977-78 to over 40 percent in 1993-94 with a small shift in its structure from distributive services to financial services, (iii) the transport, business services and insurance are growing faster than public administration and defense, (iii) the employment elasticity of the service sector and its sub sectors, are large and can have favorable growth implications. The paper recommends service led growth, as these activities are less capital intensive, more knowledge intensive, and this can help address the problem of unemployment among the skilled, unorganized workers.

Kumar and Mathur (1996) have studied the tertiary sector in India and its employment implications using census data on workforce estimates and CSO income data at 1980-81 prices. The findings are as under: (i) in respect of labor absorption, tertiary sector has almost all throughout the four decades 1951-1991

under study, held the second position after the primary sector, (ii) by 1991, the tertiary sector had become the most dominant sector surpassing contribution of primary sector, (iii) using sectoral income and employment elasticity and overall sectoral employment elasticity, trade and commerce had highest labor productivity and other services had the lowest, (iv) regional scenario shows Kerala's tertiary sector is absorbing the highest proportion of labor among all sectors and Bihar the lowest, (v) top ranking states in terms of tertiary productivity per worker are Maharashtra and Gujarat which are industrialized states and (vi) using correlation and regression analysis authors conclude that growth of secondary sector output on demand side and population on the supply side influence pace of expansion of tertiary sector employment. If tertiary sector has to grow at a high rate and become productive, then the population size has to be controlled.

Datta (1998) analyzed, the distributive trade, which accounts for roughly two fifths of the service sector, which has grown steadily relative to GDP in the Indian economy. To explain the growth of trade share in GDP, it is divided into two parts trade in final goods (FTR) and that in Intermediate goods (ITR) using input – output tables of CSO. Rough estimates show that FTR does not have a strong upward or downward trend but the ITR has a strong rising trend. Regression analysis is used where ITR is the dependent variable and valued added of manufacturing and construction in GDP, agriculture sector value added in GDP, share of traded material products in GDP and time trend are used as explanatory variables. The results show that the value added in manufacturing and construction in GDP seems to explain the ITR significantly. Thus, the article concludes that

distributive trade, which constitutes two fifths of the service sector of the Indian economy, is a consequence of the process of industrialization of the economy.

Bhowmik (2000) in her paper has studied the role of Service sector in India by identifying the service intensive industries and its relation with the rest of the economy. For this purpose, the economy is divided into 2 separate blocks of industries, services and non-services. An index of vertical integration has been constructed to measure expansionary potential of service industries on non- service industries. Empirical work is carried out with input- output data of India for the year 1991-92. The study finds that: (i) 50 percent of the industries in the economy are directly and indirectly service intensive, implying the significance of services in the economy, (ii) trade has strongest stimulus on the rest of the economy and value added indirectly induced is more than 14 times higher than the direct value added of its own,(iii) other services had the next strong effect on the economy through value addition, followed by transport services, electricity and other manufacturing. The author concludes that the service sector is growth inducing and generates higher value added in other industries than its own.

D'Souza (2001) in this article explains factors leading to the relatively faster growth of services vis-à-vis the manufacturing sector. He attributes this growth to the rapid pace of technological developments passing across national borders, the comparative advantage of specialized services like designing, marketing, branding and distribution which are integral inputs of the physical production process itself, the growing complimentarity between service and industrial sectors and the expansion of sub-contracting by producing firms to cut their overhead costs and

employee benefits. Thus, to the author the competitive edge of economies will be defined in terms of the services they provide.

Datta (2001) analyzed the growth of tertiary sector and its the causes, from 1950-1999. The study is based on NAS and author's own estimates and uses regression models. The findings are: (i) the tertiary sector has grown in importance due to fast growth of trade and finance, (ii) the rising share of distributive trade in GDP is due to growth of manufacturing and construction and (iii) finance has grown due to conducive government policies related to banking, finance and industry. The book is devoted primarily to an assessment and interpretation of the tertiary sector and its major components in India during the second half of the twentieth century. Various reasons have been cited as factors leading to the rapid growth of services, both, in the developed countries and developing countries, such as linkages of distributive trade, banking and insurance, etc, to manufacturing activities, rising sophistication of service activities, and income elasticity of demand for certain services being very high.

Naik (2002) in his paper identified, the factors leading to decline of Indian manufacturing and points that rapid growth of service sector before manufacturing is not natural but forced growth. With growth rates in both agricultural and industrial sectors falling short of requirements to absorb the growing labor force, those without work are forced to indulge in some subsistence activity. Prevalence of poverty testifies it. Only knowledge-based services cannot sustain in the long run unless it is adequately supported by a growing manufacturing sector. The past policies created a high cost industrial structure, Indian manufacturing has shown

very low competitiveness due the existence of too many, small scale unregistered units, low scale and investment in plant and machinery and fragmentation of units. Also rigid labor laws, poor quality infrastructure, high power costs are not conducive to manufacturing growth. The paper argued that improvement in the manufacturing sector's growth rate is important for the growth of the service sector, to sustain the consumption demand arising out of rising income level. Thus, industry drives service sector growth.

Acharya (2002) in his article has done a comparative study of India's service sector growth using data of seven fastest growing developing economies in 1965-1999 period. Annual average growth rates of their GDP, Agriculture, Industry and Service sectors have been used for analysis. The author based on the growth rates states that in all countries including India, the service sector growth did not exceed industrial sector growth rates. But in India, it's only from 1997 onwards; there has been an unprecedented divergence of services sector growth at 8.1% far exceeding the industrial growth of 4.8 percent. Partly this is due to the spurious growth attributable to government wage hikes and partly to rapid growth of the IT sector from a low base. Neither is likely to be repeated. India's service sector can enjoy fast and sustained growth only in tandem with a buoyant manufacturing sector. Autonomous growth of the service sector independent of industrial growth will not sustain for long term. Therefore, the sustenance of service sector lies in the revival and growth of the industrial sector.

Handsa (2002) in his paper tried to understand the sustainability of services as also of services-led growth of the Indian economy in terms of the inter-sectoral linkages

as emanating from the input-output transactions tables for 1993-94 both at the disaggregated level of 115 activities and the aggregated level of 10 constructed national accounts categories. At the disaggregated level, the Indian economy is found to be predominantly services-intensive with 55 per cent activities directly services-intensive and industry the most services-intensive sector. In the process, industrial activities turn out to be the major pace setter for services-growth. On the other hand, services have the largest inducing effect on the economy. The inducing impulses from services might have worked mainly through forward linkages. However, since the forward linkage is inherently less effective than the backward linkage, the inducing impact of services on the rest of the economy could be limited. Nevertheless, the services sector is found to have the largest expansionary potential (multiplying effect) on the rest of the economy. Therefore, the services-led growth augurs well for the Indian economy and for sustaining the overall GDP growth there must be growth impulses from other sectors.

Sastry et al (2003) examined the growth linkage among the agriculture, industry and service sector in the Indian economy to analyze the structural shifts of GDP to devise a suitable growth strategy using an aggregated 3x3 sector Input-Output (I-O) table and simultaneous equations. The major findings of the study are: (i) there is a major shift in the sectoral composition of India's GDP from agriculture towards service sector and industrial sector, (ii) the input proportion from industry to agriculture increased, enhancing agriculture's dependence on industry for inputs but there was a sharp fall in the input proportion from agriculture to industry reducing industries dependence on agriculture for inputs, (iii) there are shifts in production linkages in favor of agriculture moderately and service sector sharply,

(iv) demand linkages show that dependence of industry on agriculture and service sector has gone up and (v) the impact of service sector is more on industrial output and the impact of industrial sector on increasing growth in services is much larger than agriculture sector. Since there is a strong inter-sectoral linkage between the three sectors, the study suggests stimulating the demand in agricultural sector by deepening economic activities.

Kapila (2003) has analyzed the performance of the service sector in India and its sustainability using sectoral shares of NDP and its annual growth rates over the period (1950-51 to 2000-01). The major findings of the study are: (i) the recent surge in services has been contributed, among others, by the Information Technology (IT) services, increased expenditure on public administration and the faster growth of the financial services sector, (ii) the service sector growth in the reform period has been sustained by an increased share of producer services in the total services, (iii) there is a strong inter-linkage between commodity producing sectors of the economy and service sector growth and (iv) the service sector growth would depend on the demand from industry and agriculture. The study suggested a strengthening of the inter-linkage between service and manufacturing sector.

Joshi (2004) in her paper described the impact of the tertiary sector-driven growth in India on its employment, using the sectoral composition of GDP and employment for the period 1950-2000 and the trend growth rate per annum of the sectors. The major findings of the paper are: (i) during 1983-2000, there has been a disproportionate growth in the tertiary sector, as its share in employment has been

far lower as compared to its contribution to GDP, (ii) the growth rate of secondary employment improved due to growth of manufacturing and construction, (iii) in the pre-reform period, the primary sector was the main source of additional employment followed by tertiary and secondary sectors and (iv) during the post reform period when employment absorption capacity of agriculture has reached saturation limit, and employment growth in the high productivity industrial sector is sluggish, the tertiary sector has been instrumental in employment generation and a large segment of informal sector workers are employed in tertiary activities though the growth rate of service sector income was at a much higher rate. The author concludes that service sector growth can sustain, with the growth of the other basic sectors.

Gordon and Gupta (2004) analyzed the factors behind the recent growth of India's service sector. The high growth of services output in the 1990s was mostly due to the rapid expansion of communication, banking, business services (including IT sector) and community services (health and education). Regression equations are estimated separately using time series data for each service activity, and then pooled data for various activities. The dependent variable is the annual growth rate in the  $i^{\text{th}}$  services activity in year  $t$ . The independent variables include the growth rates of i) the commodity producing sectors, intended to capture demand for services ii) the volume of external trade of goods, and iii) the value of exports in services. To smooth the noise in annual data, all growth rates are measured as three-year moving averages. In order to account for any residual in growth, separate dummies for 1980s and 1990s are used. The results show, for each fast growing sub-sector, the dummy for 1990s is positive and highly significant.

Demand side factor, which is significant for business services, is service exports. Commodity producing sectors and the volume of external trade in goods are both important in explaining growth in distributive services. Using sector specific liberalization Dummies, panel data regression is carried out, controlling for fixed effects and the results found dummy variable for reform measures in each activity to be most significant. Service sector growth was significantly correlated with the growth in the industrial sector. Thus, the authors suggest that services exports have a high growth potential and should be encouraged by continuing deregulation in the sector. However, since service sector growth has been relatively jobless hence agricultural and industrial sectors should also grow.

Banga and Goldar (2004) carried out an analysis of the contribution of services to output growth and productivity in Indian manufacturing using the capital-labor-energy-materials-services (KLEMS) production function framework, using panel data for 148 three-digit level industries for 18 years, 1980-81 to 1997-98. The results show that the growing use of services had a significant favorable effect on growth of output in Indian manufacturing in the 1990s, when major trade and industrial reforms were carried out. The contribution of services input to output growth in manufacturing (organized) was about one per cent in the 1980s, and it increased to about 25 per cent in the 1990s. The study found that when total factor productivity index is regressed on a set of explanatory variables including the ratio of services input to employment, a positive relationship is found between services input and industrial productivity. It seems from the results that the increasing use of services in manufacturing in the 1990s might have favorably affected productivity.

Bathla (2005) seeks to examine the nature and direction of linkages between primary, secondary and tertiary sectors in India and their long-run equilibrium relationship in the post independence period from 1950 to 2001. Results drawn from Granger causality test suggest an independent relationship between primary and secondary sectors, unidirectional causation between primary and a few specialized services and bidirectional causation between secondary and service sectors. Cointegration analysis provides a strong evidence of a positive long-run equilibrium relationship between the sectors during this period. The study suggests strengthening of agriculture-industry linkages.

Chanda (2005) questioned the sustainability of the service sector growth in India in the last decade, which is attributed to the high growth rate of service exports, IT and BPO services in particular. Services in order to be sustainable should create adequate employment opportunities. The author estimates that if the Indian economy needs to grow at 8 percent, then the service sector has to grow at 12 percent on a sustained basis, assuming the primary and secondary sector growth do not change much. But given the composition of the labor in India, services alone cannot provide the kind of jobs required by the economy. Hence, the author suggests more emphasis on industrial growth for sustainable growth and not merely relying on services.

Babu (2005) tried to investigate the nature of economic growth in India, its effect on sectoral linkages in terms of employment and output since 1990s. Growth rates and shares of GDP and its sectors by industry of origin are used. The paper comes to the findings that: (i) in the last two decades, growth has been propelled by the

service sector, (ii) in the 1990s the gap between the tertiary sector and the agricultural sector and manufacturing sector widened, (iii) But 60 percent of the workforce is employed in agriculture sector, while other sectors, are not fast in generating employment. This is due to change in production, demand linkage resulting from change in the composition of GDP, rapid technological growth which has reduced the dependence of industry on agriculture and increasing service sector dependence on itself than on other sectors. This has weakened production and hence demand linkages. Service and manufacturing are dependent on primary sector only for demand linkage and the study prescribes strengthening sectoral linkages.

Banga (2005) studied the pattern of growth in India's service sector and its causes. The findings are: (i) the service sector has grown relatively in terms of its contribution to GDP and also its growth rate since 1990s, (ii) among the sub-services, wholesale and retail trade had the highest share in the total GDP in the last decade, but in terms of the growth rate business services and communications have experienced the maximum growth in the 1990s though their share in the GDP is quite low, (iii) the share of services exports in India's total foreign trade increased from 19.3 percent in 1995 to 24.9 percent in 1998, due to mainly travel, communication and software services and (iv) the growth of India's service sector can be attributed to structural changes and reforms, that led to increase in the usage of services as inputs by other sectors.

D'Souza (2005) analyzed the implications of sectoral transformation in the Indian economy, by using the demand and supply conditions. The important findings are,

(i) as income rises over time, the income elasticity to productivity growth ratio of agriculture declines relative to industry and labor shifts to manufacturing and eventually services become the labor absorbing sector as the income elasticity to productivity growth ratio rises in services, whilst the ratios in the other two sectors continue to decline, (ii) in India, growth in employment in the services sector has been due to low productivity growth in this sector with many individuals performing low-end services such as petty trading and personal services rather than to a high income elasticity of demand for the output of the services sector that stems from productivity improvements in manufacturing, as the economy transforms itself away from a mature manufacturing sector.

Chakravarty (2006) analyzed the determinants of service sector growth in India during the recent years in 16 states of the economy. The Gross State Domestic Product (GSDP) data by industry of origin for some major states and for the country as a whole is collected from NAS for the period 1980-81 to 2002-03. The period under study is divided into two, one the initial phase of liberalization from 1980-81 to 1992-93 with 1980-81 as base and the later phase of liberalization from 1993-94 to 2002-03 with 1993-94 as base. The output elasticity of demand for services output is found using three independent variables, the state's own agriculture and industry and the output of agriculture and industry in the rest of the Indian economy and with service sector output as the dependent variable. The important findings of the paper are: (i) the industrial sector turns out to be the most important determinant of services sector growth in different states, (ii) the 'rest of the Indian Economy' commodity producing sector is an important determinant in determining the service sector performance of a specific state depending on its

labor cost, infrastructure facilities etc. and (iii) for all the states under study, except for the service sector, no significant change can be observed in the growth performances in the other two sectors in the post reform period, including industry. The study recommends diversification over time in the commodity producing sector to foster growth in services.

Bhowmik (2006) assessed the importance of the service sector in the direct and indirect value addition of the economy during 1968-69 to 1993-94. Using a vertical integration index based on Input-Output tables for various years, it is found that Trade, 'Other Services', Electricity, Railway Transport Services, Chemicals and Construction utilized more output of the service sector as input in their production. In general, services industries appear to be the highly grow-inducing sector in so far as it helps higher value addition to other industries.

Mazumdar and Sarkar (2007) have raised concerns about the level of earnings at which labor is being absorbed in the service sector. Using NSSO data and distribution of mean per capita expenditure over successive rounds shows that there has been not only an outward shift of the distribution in the tertiary sector but also increase in inequality and dualism in the sector and within its critical sub-sectors.

## **2.7 Service Sector Growth in Indian States**

Rao and Dev (2003) analyzed sectoral growth of Andhra Pradesh during and after the period of economic reforms using time series data. Their findings are, (i)

Andhra Pradesh has not been able to step up its SDP growth rate in the post reform period compared to the other states due to weak economic and social infrastructure, (ii) also its agriculture growth has declined sharply, due to fall in private capital formation, lack of credit access to small farmers, and government's restrictive policy, (iii) Industrial slowdown has been due to fall in the number of registered manufacturing sector and change in policy towards IT and software services, (iv) its social sector and education sector have lesser allocations and are of poor quality. The paper concludes that though service sector contributes 50 percent of SDP to sustain it, the commodity sectors, the industry needs to grow to generate adequate demand for services. However, he has not suggested any steps for the same.

Majumdar (2001) analyzed the service sector of West Bengal. The state once a major base for manufacturing activities has the manufacturing sector declining due to structural changes like poor infrastructure and power, fierce competition from cheaper imports with the removal of QRs and old manufacturing companies with less scope for mergers and acquisitions. The service sector is emerging as a fast growing sector accounting for over 42 percent of the state GDP. Resurrection of the state's economy depends on development of IT sector as the state has a large pool of skilled work-force and a good institutional support. In addition, border trade with Nepal, Bhutan etc. under SAFTA and SAPTA can increase trading activity. Thus IT and external trade can contribute and sustain the recent service led growth in West Bengal.

Jeromi (2003) analyzed the performance of the major sectors of Kerala's economy in the last 2 decades (1980-2000) using annual average growth of State income as

also of each sector. The important findings of the study are: (i) Kerala's economy driven by service sector depends on expatriate remittance, (ii) agriculture sector growth has declined with the decline of food production and also of commercial crops following the large imports of such products, (iii) the state is industrially backward due to weak traditional industries, sick SSI's, lack of investment and negative image of labor and, (iv) with low growth of productive sectors, the state must improve agriculture productivity and increase private investment, develop tourism, advanced health care services, IT and research institutions, areas where it has comparative advantage and this can sustain service driven growth in the state.

Jeromi (2005) traced the reasons for the slow growth of Kerala's economy and the impact of economic reforms in Kerala. Average annual growth rates, percentage shares and relative shares of the primary, secondary and tertiary sectors and their sub-sectors are used. The important findings are: (i) the primary sector showed a negative growth rate of 1 percent, growth of secondary fell to 3.7 percent and growth of tertiary sector grew to 9.3 percent during the reform period, (iii) the reasons sited for the negative growth of primary sector are poor performance of agricultural sector, (iv) the causes of low industrial growth sited in the article are, lack of investment, weak industrial structure, inefficient public sector enterprises, (v) the tertiary sector seems to driving the growth process in Kerala, with trade, transport, banking and communications showing higher growth rates due to the consumption induced growth of inward remittances and tourist earnings and the private investment in higher education.

Pillai and Shanta (2005) analyzed the economic growth of Kerala for the period

1970-2000, to find out the sectors, which are driving growth in the economy using, average annual growth rates, sectoral shares and weighted growth rates. The important findings are: (i) the average annual growth rate of the primary sector has declined to negligible levels, (ii) the secondary sector has shown high growth rates in the 70s, but it has declined in 80s with a recovery in the 90s, (iii) the tertiary sector has been propelling growth in the state economy and this has been due to the growth of producer services, (iv) the income elasticity of producer services has been found to be the highest but, this has resulted from linkages with production sectors of other states, (v) there are some intersectoral linkages with consumer services and intrasectoral linkages with banking and insurance and transport by other means, (vi) the sectors, which are lagging in growth, are registered manufacturing, construction and public administration while the leading sectors are transport, trade and banking and insurance and (vii) the economy does not show any strong structural changes over the decades raising doubts about the sustainability of such consumption rather than production oriented growth.

Babu (2005) addresses some of the contemporary issues associated with Kerala's growth trajectory viz. the incongruence between the goods producing sector and the service oriented production system and the links between social development and growth, factor movements and growth. The study uses NSDP data by industry of origin and kinked exponential growth rates. The major findings of the paper are: (i) the primary and secondary sectors growth rates fluctuate and are not contributing to growth and the service sector is growing faster than the commodity producing sectors during the last three decades, (ii) in 1970s, the tertiary sector grew due to banking, public administration and communications; in 1980s due to

banking, transport and public administration and in 1990s economic banking, transport and communication services helped growth and thus a combination of high value and low value added activities have contributed to service growth besides absorbing an equal amount of the workforce.

Pushpangadan (2003) studied the role of remittance income, consumption and service activity in the economic growth of the state economy of Kerala from 1970-71 to 1990-91 with kinked exponential growth rates and sectoral shares of income. The important findings of the paper are (i) the state economy grew faster in 1990s than 80s due to growth of the service sector particularly, trade, hotels, transport, telecommunications and other services, (ii) acceleration in the growth of telecommunications sector is the result of economic reforms of 1990s and the communication needs of the migrants' and return migrants' households, (iii) the growth in trade and transport is attributable to the shift in favor of consumer durables, arising from increase in incomes and inability of the domestic sector to supply them and the additional demand for transport, from tourism industry and educational institutions, (iv) other services grew due to growth of the informal sector, (v) the higher growth rates in 90s was mainly due to combined effect of migration in the 80s to the Gulf and financial sector reforms in 90s, (vi) but despite high savings, the commercial banks C/D ratio is falling, as a major portion of savings from migrant income are either spent on unproductive assets or intermediated by informal credit markets to meet the needs of the trade and transport sector. The paper concludes by suggesting strategies such as high skill training for human capital, promotion of tourism and setting up forward linkages in the transport sector for sustainable growth of the economy.

Subramanian (2006) critically evaluated the claim of the end of the 'lop sided' development during the regime of economic reforms in Kerala. Average annual growth rates, percentage shares and weighted growth rates of the various sectors of the economy are used. The main findings are: (i) though Kerala's annual average growth rate is faster during economic reform period, compared to its record in the past, its agricultural and industrial sectors' growth rates were lower than the national averages and the tertiary sector was moving at the same rate as the growth rate at the national level, (ii) the producer services have a lower share than that of consumer services in the service sector, (iii) consumer services are growing mainly due to remittance income which is a transient phenomenon and (iv) a fast growing diversified manufacturing industry, skill intensive jobs, foreign capital investment is suggested for sustainable service led economic growth.

Bhattacharya et al (2004) with a regional econometric model, forecasted growth rates of aggregate and sectoral GSDP for three states of Andhra Pradesh, Karnataka and Uttar Pradesh. The major findings of the paper are: (i) for Andhra Pradesh, services growth is explained by both commodity growth (elasticity 0.35) and growth of services at the national – level (elasticity: 1.26) and there has been an increase in the services growth rate after economic liberalization, (ii) for Karnataka the impact of services output on industrial output is much higher than agriculture and real public expenditure (1.14) and service sector output, is influenced by the industrial output, but there seems to be a negative impact of economic reforms on the services, (iii) in case of Uttar Pradesh(U.P), service sector growth is explained by the growth of the commodity sectors and service sector growth at the national level and the liberalization policies of the 1990s

appear to have adversely influenced service growth and (iv) based on medium term growth forecasts, U.P. may continue to be one of the slowest growing economies of the nation.

Dholakia (2002) attempted to identify the prime movers or principal drivers of the economic growth in the state by fitting a simultaneous equations model on the recent time series data (1980-2000) for Gujarat's economy. Electricity, gas and water supply, storage and communications, constructions, real estate and rainfall are the prime movers <sup>of</sup> growth. Results show electricity, gas and water supply and construction explain 66 percent variation in service sector and storage and communication 35 percent variation in manufacturing. The paper also examines the social and human development aspects and concludes by discussing strategic policy interventionsto achieve the development goals of the state.

Bagchi et al (2005) have critically explored the Gujarat model of growth by studying the trends in the growth rates from 1970-2000 using State Income, employment, and using Annual Survey of Industries data. The paper uses linear, semi-log and quadratic equations with OLS to calculate trends in growth rates .The findings of the paper are, (i) the primary and agricultural sectors' growth has been stagnant and declining, (ii) the secondary and the tertiary sectors in the state of Gujarat have shown statistically significant and high rates of growth, mainly due to registered manufacturing sector and trade, transport, banking, real estate,etc, (iii)the economic growth sustained by secondary and tertiary sectors have made no positive impact on primary sector, (iv) ratio of domestic product per worker in the non –agriculture to agriculture sector has increased and (v) since 1990s, the factory

sector turned capital intensive and labor displacing. The paper finds growing intersectoral inequality and the rural sector being marginalized from the growth process.

## 2.8 Summary of Findings

1. Services were considered as unproductive and immaterial, not generating any value added in the economy. The emergence of the 'stage theory of development' brought services into the realm of productive activity, by establishing a positive relationship between the per capita income and the service sector output.
2. Many views explaining service sector growth, have pointed out the rise of service sector due to its high-income elasticity, low productivity, government spending bias towards services, resource sector boom, balance of payment constraints, and splintering of services. Some more studies attributed rise of the service sector to growth in producer services, demographic changes, long-term public preferences and rapid advance in technical knowledge and international trade.
3. The role of service sector is far more important in the development process, due to its inter linkages with other sectors especially the manufacturing sector as also service sector itself.
4. Growing share of services in the GDP, coupled with relative decline of the share of manufacturing has led some economists to think that this pattern of growth is unsustainable. But some studies have disproved this hypothesis,

by observing spillover effects between the services and manufacturing sector growth and sustainability in growth.

5. Some more studies on service –manufacturing linkage have found that services depend on manufacturing for their inputs more than vice versa. Manufacturing sector requires distributive services initially, and in later stages of growth needs more of financial and business related services and the distinction between the two sectors is blurring.
6. Service sector studies on India, have focused on the excessive growth of service sector and its resultant sustainability. The early studies found that a disproportional growth of service sector in the 1980s in terms of its own sectoral employment is autonomous, spurious and growing due to public administration and defence services. Service sector growth was taking place in the informal sector and could lead to lower productivity, inflation, inequalities and balance of payment problems, as services were found growing independently of the industrial output. Recent studies, on service sector growth have found that service sector growth has been due to IT, BPO services and government wage hike and service sector cannot sustain without a buoyant manufacturing sector. Autonomous growth of services cannot sustain without impulses from agriculture and industry is a finding of some studies.
7. But there is another set of researchers who have found that service sector growth, has linkages with the material producing sectors, especially the manufacturing sector. Some of them have proved that productivity in services is high and service inputs can boost manufacturing growth. Some other studies on service growth have found that the latter had a positive

effect in the reform period, especially the second-generation reforms period, which witnessed a spurt of IT services, export of business services, rise of producer services. Industrial sector and agriculture sector were also found to be linked to the service growth during the reforms period.

8. Service sector studies of State economies of India reveal that, States like Andhra Pradesh and West Bengal have improved their service sector share due to IT services. In Kerala, service led growth is due to growth in remittance income, growth of transport, trade, banking and public services. Kerala shows consumption rather than a production oriented pattern of service growth. A study on state level service sector growth found that in Uttar Pradesh, Andhra Pradesh and Karnataka service sector growth showed a positive relationship with industrial growth. Another study on Gujarat concluded that, in Gujarat, Electricity, Gas and Water supply and Construction explain majority of the growth or variation in service sector.
9. Based on the above review of literature, the present study tries to find out, which of the various views and models on service led growth best explain Goa's service led growth pattern.

**CHAPTER 3**

**THE STRUCTURAL CHANGES IN GOA'S**

**ECONOMY**

## CHAPTER 3

# THE STRUCTURAL CHANGES IN GOA'S ECONOMY

### 3.1 Introduction

The literature on the 'stage theory of economic growth' (Fisher 1935, Clark 1940, Kuznets 1955, 1972) states that, as an economy matures into an advanced stage of growth, the share of its agricultural income and employment declines and that of the non-agricultural sector, especially of the service sector accelerates at a faster rate. However, developing economies, such as India, have slightly deviant experiences. While our GDP share of the agriculture has fallen steadily, this is not true of its employment share. Similarly, employment shares of industry and services have risen very little in proportion to their GDP shares (Datta, 2001). However, the State economies in India, which are service predominant, have not experienced the same growth pattern as at the national level. One such, economy of India, Goa; has witnessed a tremendous growth in its tertiary or service sector, with the latter contributing over 50 percent to its state income and over 50 percent to the state's employment.

The present chapter aims at analyzing the structural changes and the pattern of Goa's economic growth, over the period 1970-71 up to 2003-04, and finding out the important contributors in the growth process of the economy at the sectoral and sub-sectoral level, to determine the sources of economic growth. The study period starts from the year 1970-71, as continuous time series data before that year, is not

available. Nevertheless, the economy's growth, in the sixties, is evaluated based on its domestic product at two periods, 1960-61 and 1968-69. The main objective of the study is to analyze the trends, structural changes and pattern of growth in the economy, in terms of its employment and output and thereby locate the sectors, which have emerged, as the centers of economic growth over time.

### **3.2 General Overview of the State of Goa**

Goa was constituted as the twenty fifth state of the Indian Union on May 30, 1987, prior to which it was a part of the Union Territory of Goa, Daman and Diu, since December 1961, when these areas were liberated from the Portuguese rule. The State of Goa is situated between the coastal borders of Maharashtra and Karnataka states. Its boundaries are well defined in the north by Terekhol river, which separates it from Maharashtra, in the east and south in Karnataka and in the west the Arabian Sea. Its total area is 3702 square kilometers (kms). It is a small state compared to the other states in India. The state has two distinct types of terrains, the hilly tract and the coastal plains. Its hilly area is on the eastern side where the southern end of the Sahayadri range lies. It is intersected by a number of rivers flowing westwards providing a network of internal waterways on the coastal plains. The important rivers are the Mandovi, Zuari, Terekhol, Chapora and Betual, which are all navigable for their total length of about 256 kms. These rivers have facilitated the growth of mining exports in the economy. Goa's coastal line is about 100 kms long and is endowed with lovely beaches and idyllic beauty spots, making domestic as well as foreign tourism a flourishing major economic activity in the state. The port of Mormugao, situated on the southern side of Zuari River is one of

the best natural harbors on the west coast of India. Being a small state, Goa comprises of just two districts namely a) North Goa and b) South Goa. The North Goa district is sub divided into six talukas viz 1) Pernem 2) Tiswadi 3) Bardez 4) Bicholim 5) Ponda and 6) Sattari. In addition, South Goa district is divided into five talukas viz 1) Mormugao 2) Salcete 3) Quepem 4) Canacona and 5) Sanguem. There are eleven talukas in the state. As per the 2001 census, there are 359 villages, of which total number of inhabited villages is 347 and the total number of towns is 44, of which Municipal towns are 14 and census towns other than municipal towns are 30.

### **3.3 The Demographic Structure of Goa**

A high rate of economic growth, which can be sustained over time, is considered one of the main yardsticks of an economy's performance. However, there are many other factors, both economic and social, which influence the growth trajectory. One of them is the population of the state. There have been different schools of thought on the effect of population growth on economic development. The most empirically based theories on population and economic development, the 'Theory of Demographic Transition', explains that, 'All nations in the modern era, which have moved from a traditional, agrarian-based economic system to a largely industrial, urbanized base, have also moved from a condition of high mortality and fertility to low mortality and fertility'(Stolnitz, 1964). Goa did experience demographic transition to some extent, with low birth rates and low death rates along with the growth of tertiary activities and urbanization in the recent past, but migration has had an important role to play in the growth process. There have been

many other theories dealing with various aspects of, population like, migration, age structure of population, population composition, female literacy, etc, and their influence on the process of economic growth. All these factors operate in combination, through a number of different models of causality like simple direct effects, indirect effects, requirements and complementaries, mutual reinforcement, conditioning milieus, etc; (Jain, 1977). For example, a marked reduction in the birth rate in an economy with a previous high birth rate could start a chain of effects concerning several socio-economic aspects. It could reduce the population growth rate and relieve society from the burden of non-productive new entrants. It could affect the age structure of the population and bring about changes associated with a reduction in young dependency. Various changes take place in the economic milieu of a society because of a large-scale increase in women's education, leading to a higher proportion of women participating in the labor force. Hammes et al (1989) contend that as growing number of women have taken full-time jobs, thereby raising their families' incomes, services once produced at home have simply appeared in the measured economy. This in turn leads to increase in the demand for certain kinds of marketable services like laundry, hotels, restaurants, childcare and nurseries, over stating the share of services in the state income.

The population of the Portuguese territory of Goa, Daman and Diu as a whole, in which the share of Goa's population was over 90 percent; grew rather slowly during the first six decades of this century. The compound growth rate hardly exceeded 1 percent during this period and was consistently and significantly lower than what prevailed in India. From 1900 until 1951, the population in Goa grew at merely 0.28 percent, mainly due to the lower birth rates. After integration with the

Indian Union in 1961, there was a sudden spurt of population growth in Goa, which sustained for almost two decades, before it began to decline. The growth

**Table 3.1 Decadal Increase, Compound Growth Rate and Sex Ratio of Goa's Population (1900 -2001)**

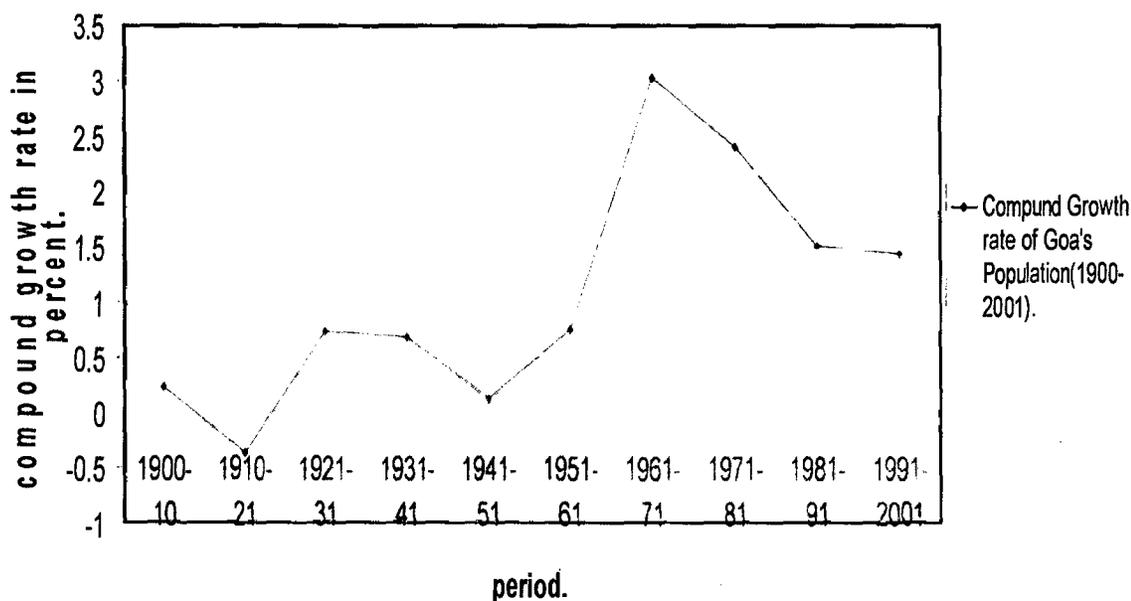
Year	North Goa	South Goa	Goa	Decadal percentage increase	Compound growth rate	Sex ratio
1900	294074	181439	475513	--		1091
1910	306323	180429	486752	2.36	0.23	1108
1921	288039	181455	469494	-3.55	-0.36	1120
1931	313614	191667	505281	7.62	0.74	1088
1941	336628	204297	540925	7.05	0.68	1084
1951	330874	216574	547448	1.21	0.12	1128
1961	349667	240330	589997	7.77	0.75	1066
1971	458312	336808	795120	34.77	3.03	981
1981	568021	439728	1007749	26.74	2.4	975
1991	664804	504989	1169793	16.08	1.5	967
2001	757407	586591	1343998	14.89	1.43	960

Source: Census of India (1961, 1971, 1981, 1991) and Government of India (2001).

rate during 1961-1971 was as high as 3.03 percent, higher than for India as a whole. Since liberation, expansion in Government employment, opening up of a large number of educational institutions and a corresponding increase in the secondary and tertiary sector activities in the economy resulted in net immigration of population both skilled and unskilled, from other states especially from adjacent states of Maharashtra and Karnataka. Thus, influx of population was the major cause of higher demographic growth rate in the 1961-1971 decade.

The subsequent censuses revealed that, the population growth has declined steadily. In 1971-1981 periods, the compound growth rate of population was 2.4

Figure 3.1 Compound Growth rate of Goa's Population (1900-2001)



percent and it declined to 1.50 percent during 1981-1991 and further to 1.43 percent in the 1991-2001 census periods. The low population growth rate in Goa over the years is due to low birth rate as well as death rates (15.95 and 7.46 per thousand respectively in 2001), falling sex ratio from 1066 in 1961 to 960 in 2001, trend of late marriages, with a mean age at marriage of 23 years and high literacy rates in general and of females in particular. Though the natural increase in population is slow, in recent years the immigrant population has been rising. This is evident from the data in table 3.2. Firstly, if one observes the immigrant population as a percentage of Goa's total population, it was 4.46 percent in 1971, rising further to 7.41 percent in 1981 census and in 1991 immigrants formed 14.51 percent of the state's population and by 2001 this share was 14.88 percent. Secondly, the immigrant population from Karnataka and Maharashtra, especially the manual labor and unskilled workers, for employment in the construction industry, has been growing rapidly. For instance, during 1971 and 1981, the

decadal change in the total immigrant population was 10.31 percent, while that in the total population was 26.74 percent (refer table 3.1) and in the next decade of 1981-1991, this change in the immigrant population was 27.32 percent and was higher than the general population decadal percentage increase of 16.08 percent. In 2001 the decadal increase in the total population was 14.89 while that in the immigrant population was higher at 18.00 percent as given in table 3.2.

**Table 3.2 Immigrant Population in Goa (1971- 2001)**

Year 1.	Total population 2.	Total immigrant population 3.	Percentage share 4.	Decadal percentage increase 5.
1971	7,95,710.	35,511.	4.46.	---
1981	10,07,749.	74,682.	7.41.	10.31
1991	11,69,793.	1,69,766.	14.51.	27.32.
2001	13,43,998	2,00,000	14.88	18.00

Source: Government of Goa (2003a).

If the population distribution between the rural and urban areas is considered, it is clear from the table 3.3 that over four decades, the percentage of rural population in Goa has declined from 85 percent in 1961, to 68 percent in 1981 and further to 50.23 percent in 2001 and there has been a rise in the percentage of the urban population from only 16 percent in 1961 to 22 percent in 1981 and rapidly progressing to 49.77 percent in 2001. At the district level, the North Goa district has a higher percentage of rural population and South Goa has a slightly higher percentage of the urban population. The rural urban composition of population across the talukas reveals that the process of urbanization has gained momentum in the coastal talukas, where there is concentration of tertiary and commercial activities indicating a positive relation between service sector growth and the rate of urbanization. For instance, the urban population in Mormugao shot up from 18 to 83 percent, in Salcete from 13 to 58 percent, in Bardez from merely 8 to 58 percent and in Tiswadi from 45 to 65 percent in the above-mentioned period. Thus,

while Mormugao had the highest urban population 83 percent in 2001, Pernem was the taluka with the highest percentage of rural populace of 87 percent. The three

**Table 3.3 Rural, Urban Distribution of Population in Goa (1961- 2001) (in percent)**

District/ Talukas	Rural					Urban				
	1961	1971	1981	1991	2001	1961	1971	1981	1991	2001
Goa,Daman and Dui	84	74	68	----	----	16	26	32	----	----
Goa Dist/ State	85	74	68	59	50.23	15	26	22	41	49.7 7
North Goa	----	----	----	66	55	-----	----	----	34	45
Goa/Tiswadi	55	44	41	35	35	45	56	59	65	65
Bardez	92	84	71	55	41.5	8	16	29	65	58
Pernem	96	94	93	93	87	4	6	7	7	13
Bicholim	95	85	85	76	59	5	15	15	24	41
Satari	67	91	90	86	86.5	33	9	10	14	14
Ponda	94	91	86	88	68	6	9	14	12	32
South Goa				49	44				51	56
Sanguem	93	89	89	89	83	7	11	11	11	17
Canacona	98	95	95	74	73	2	5	5	26	27
Quepem	96	93	79	54	54	4	7	21	46	46
Salcete	87	69	60	49	42	13	31	40	51	58
Mormugao	82	33	29	20	17	18	67	70	80	83

Source: Census of India (1961, 1971, 1981, 1991) and Government of India (2001).

western ghat talukas viz Satari, Sanguem and Canacona, considered the relatively backward talukas in the economy are having majority of the rural population concentration. Thus coastal talukas, which have a high level of service activities, are highly urbanized. The density of population per sq km in the Union Territory was 169 and for Goa, it was 163 in 1961. It rose to 215 for Goa in 1971. By 1981, the density of the population for Goa further increased to 272. In 1991, it was 316 and by 2001, the density was as high as 363 per sq km. The density of population has been rising due to increase in the concentration of population in urban areas especially of the coastal talukas. Nearly 60 percent of the total population lives in the four coastal belts. Beach tourism one of the major economic activities, has created more employment opportunities as also socio-economic infrastructural

facilities in coastal areas, resultantly attracting more population and activities in these talukas. However, this has led to regional inequalities in the economy with coastal talukas getting highly urbanized and other talukas getting a lesser share in the growth process.

### 3.3.1 Literacy Profile of the State's Population

Goa's literacy rate was higher than that of India's literacy rate right since the time of liberation 1961. Today amongst the States and the Union Territories, Goa is at the fourth place in literacy next to Kerala, Mizoram and Lakshadweep. Literacy rates in general and for both males as well as females have increased over the four decades. In 1961, the total literacy rate of Goa was 31.23 percent, it more than doubled to 65.71 percent in 1981 and by 2001, it reached 82.3 percent. The male literacy rate was 39.4 percent in 1961 and rose to 76.01 percent in 1981 and further to 89 percent in 2001. During the same time period, female literacy rates increased from 23.59 percent to 55.17 and to 75.5 percent. Thus, females' literacy rates grew faster than male literacy rates. Comparing literacy across rural and urban areas, as expected, there were more literates in urban areas than in rural areas, but the gap between the rural and urban literacy rates in Goa has narrowed down over the

**Table 3.4 Literacy Rates by Rural, Urban areas and Sex in Goa (1961-2001) (in percent)**

Year	Area		Sex		Total literacy
	urban	rural	male	female	
1961	48.85	28.17	39.38	23.59	31.23
1971	56.78	41.37	54.65	35.81	45.31
1981	65.08	53.56	76.01	55.17	65.71
1991	80.10	72.31	83.64	67.09	75.51
2001	85.0	79.7	88.9	75.50	82.30

Sources: Government of Goa (1996), Government of India (2001).

years. In Goa, both rural and urban areas have higher number of male literates than female literates.

Taluka wise literacy rates; show that in 1961, Bardez taluka had the highest literacy rates of 43 percent and it continued to do so in the subsequent decades. By 2001 census year, majority of the literate population was found in the four coastal talukas of Bardez, Tiswadi, Salcete and Mormugao, with <sup>85 percent</sup>, 80 percent, 75 percent and 80 percent literacy respectively. Sanguem and Sattari had relatively lower literacy rates of 65 percent each in 2001 census, but these rates are much higher than those prevailing in some other states in India. The increase in literacy levels in Goa and of female literacy rates in particular is due to higher government spending on education, infrastructure facilities and rapid growth of rural female literacy rates in the state.

### **3.3.2 Working Population and Dependency Ratio**

Over the last four decades the distribution of population across age groups has changed generating a large base of working population.<sup>1</sup>As given in table 3.5, in 1961 the working population (15-59 years in the present study) was 55 percent of the population while the dependent population (those in 0-14 and above 60 years age group) was 45 percent of the total. By 1991, the working population increased to 64 percent and dependent population declined to 36 percent of the population. In addition, in 2001, this trend continued with the active population rising to 67 percent and dependent population further going down to 33 percent. Sex wise

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<sup>1</sup> The population in the age group 15-59 or 15-64 is considered the working population; that below 15 as the young dependents, and that above 60 or 65 is considered to be old dependents (Bhende and Kanitkar, 1994).

distribution of the active population, indicates that in 1961 percentage of females was higher (55.30 %) than their male counterpart (54.0%), but in the later decades the percentage of male working population has been higher than the female working population. The dependent population showed mixed trends. While the young dependents had a higher share of males, the old dependents had a higher percent of females, in 1961, 1991 and 2001 census years. But, it is evident that Goa's population is going through a phase which in demography is known as 'A Window of Demographic Opportunities', where the maximum number of population is in the most active and potentially productive age group as far as its contribution to economic activities and economic growth is concerned (Mitra and Nagarajan, 2005). The age structure of the population can have a significant impact on the economic performance. States with a relatively higher share of working age population can save and invest more due to the reduced spending

**Table 3.5 Population Distribution by Age Group and Sex (in percent)**

Age group (years)	1961			1991			2001		
	T	M	F	T	M	F	T	M	F
0-14	37.25	39.23	35.41	29	29	28.5	25	25	24
15-59	55	54.0	55.30	64	65	63.0	67	67.5	66
Above 60	8.07	7	9.29	7	6	8.1	8	7	10

Source: Census of India (1961, 1991) and Government of India (GOI)(2001). T- Total, M- Males, F- Females.

on dependents. If all of the members of the 'window of opportunity' generation are provided productive employment opportunities then they should not only be able to fend for themselves and their young ones, but also save and invest. Moreover, the low dependency rate implies that the total expenditure on children decreases even as expenditure per child increases. This results in better and greater human capital

formation per capita. The savings and investments of the working population generation can contribute to the growth of the economy as well as provide returns, which can be used by them to subsist in their later years. Thus, the state, should frame policies that can generate appropriate employment for the potentially most productive segment of the population to provide an upward push to the rates of economic growth.

### **3.4 Occupational Structure of Goa's Economy (1961- 2001)**

The changes in the occupational structure of the workforce, which is an allied aspect of the structure of the economy, are analyzed in order to have a better understanding of the structural changes in Goa's economy. Before analyzing employment structure of Goa, a mention about the data sources is apt. There are two sources of data for employment: the decennial population censuses which provide estimates of the number in the workforce and the quinquennial employment and unemployment surveys conducted by the National Sample Survey Organization (NSSO) which give the worker-population ratio (WPR) that is the ratio of number of persons employed to thousand persons in the sample (Sivasubramonian, 2004). The general economic tables published by the Census of India for the years, 1961, 1971, 1981, 1991 and preliminary results for 2001 and the NSS quinquennial employment and unemployment surveys for the years 1987-88 (43<sup>rd</sup> round), 1993-94 (50<sup>th</sup> round) and 1999-2000 (55<sup>th</sup> round) are utilized for the purpose. While the Census classify workforce into main and marginal workers<sup>3</sup>,

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<sup>3</sup> The main worker is defined as one who participated in any economically productive work by his physical or mental activities for 183 days or more, in the past one year preceding the date of enumeration. And those worked for less than 183 days falls under marginal worker, other things remaining the same.

Principal Status (PS) and Usual Status (US) criteria<sup>4</sup> is used by NSS to define those employed. However, for the various census years, the absolute employment figures are not strictly comparable with one another, due to the changes in the definition of 'worker', so the changes in the relative proportions of employment in sectors and sub-sectors may well be regarded as broadly indicative of the trends in employment in them. In other words, for the present exercise it is tacitly assumed that the changes made in the definition of 'workers' in each census affected uniformly the absolute volume of employment in all sub-sectors, leaving their relative shares in the total employment almost unaffected.

**Table 3.6 Workforce Participation Rates in Goa (1961-2001) (in percent)**

Category	1961	1971	1981	1991	2001
1. Working/Active Population(15-59)	55	--	--	64	67
2. Workforce Participation*	41.2	32	35.35	35.3	38.8
3.males as %of total workers	60	76	66	69.6	71.8
4.females as % of total workers	40	24	33	30.4	28.2

Note:\*workers for 1961, 1971 are total workers, for 1981, 1991, 2001 main & marginal workers are total workers. Source: Census of India (1961, 1971, 1981, 1991) and GOI (2001).—not available

From the table 3.6 one can conclude that though the active population in the state economy has been rising, the work force participation rate, i.e. workers as a percent of the total population has been declining from 41.2 percent in 1961 to 39 percent in 2001 indicating that there is a rise in the number of unemployed in the population or that there are not enough jobs to absorb all those in the labor force. Out of the workforce, the percentage of male workers has shown an increasing trend from 60 percent to 72 percent from 1961 to 2001. However, the female workforce participation has seen a drastic decline from 40 percent to 28 percent in the same period. The table 3.7 indicates that the percentage of main workers in the

<sup>4</sup> The status of activity on which a person spent relatively longer time of the preceding 365 days from the date of survey is considered as principal usual status of the person. A person who is considered as a non-worker (i.e. unemployed or out of labour force) who pursued some economic activity in a subsidiary capacity is called a subsidiary status worker. The principal and subsidiary status worker constitutes 'all workers.' Principal status pertains to those with more or less stable employment. The other classification used by NSS includes current weekly status (CWS) and current daily status (CDS). For details see, *NSS Reports*.

population was around 31 percent in 1981, which increased to 32.79 percent in 1991 and declined to 31.56 percent in 2001. Marginal workers in the population have shown a rise from 4.5 percent in 1981 to 7.23 percent in 2001. The total male workers as a percent of the male population have increased slightly from 51.3 percent to 55 percent and the increase has been in the last 10 years. Female participation rates have declined from 32 percent to 22.3 percent from 1961 to 2001, though between 1971-81 decades it had increased from 14.63 percent to

**Table 3.7 Workforce Distribution in Goa by Category and Sex (in percent)**

Year	Main Workers	Marginal Workers	Male Workers	Female Workers	total workers	NonWorkers
1961 *	---	---	51.27	31.8	41.19	58.81
1971	---	--	46.09	14.63	30.27	69.73
1981	30.89	4.46	48.45	21.87	35.35	64.65
1991	32.79	2.5	49.6	20.5	35.3	64.7
2001	31.56	7.23	54.9	22.3	38.8	61.2

Source: Census of India (1961, 1971, 1981, 1991) and GOI(2001). \* includes Daman & Dui.

21.87 percent. Total workers have declined from 41 percent to 39 percent in forty years. In addition, the percentage of non-workers is a sizeable percent above 50 percent of the population, an indicator of unemployment to some extent.

A decadal analysis of the occupational structure, given in table 3.8 reveals that in 1961 out of the total workforce, majority workers were working in primary sector activity, with 58 percent workers engaged in agriculture and 12 percent in mining. There were just 9 percent workers in secondary sector with 7.3 percent being in manufacturing and 2 percent in construction. Service sector employed 20 percent of workforce with 9.3 percent in public services viz. public administration, education and health. There were more female workers in agriculture sector, whereas the percentage of male workers was higher in mining, secondary and service activities.

In 1971, though 50 percent of the population was engaged in primary sector activities their percentage had declined from 70 percent in 1961. Agriculture continued to provide employment to people, but employment in the secondary sector, manufacturing in particular, rose and provided jobs to 12 percent of the labor force. There was a rapid shift of labor force from primary to service sector and secondary sector activities in particular. Service sector comprised 34 percent of the workforce with community, social and personal services providing the highest percentage of jobs at 15 percent. Female workers were more in the primary sector compared to their male counterparts but in secondary and service sector,

**Table 3.8 Workforce by Industry of Origin & Sex, in Goa (1961- 99) (in percent)**

Work Force	1961			1971			1981			1991			1999
	T	M	F	T	M	F	T	M	F	T	M	F	T
Culti	43.1	37.2	52	23.8	21.7	30.1	16.4	15.1	19.3	13.7	11.9	18.1	16.08
AL	15.2	8.2	25.8	15.0	10.42	29.4	8.58	6.65	12.9	8.55	6.50	13.66	
LS	--	--	--	4.12	4.80	2.02	4.09	5.02	1.99	3.78	4.56	1.83	
MQ	12.1	14.9	7.7	6.38	6.56	5.83	5.33	6.48	2.71	3.98	4.47	2.75	3.54
Manu.	7.3	10.9	1.9	12.0	14.1	5.73	13.1	16.0	6.41	14.3	16.9	7.88	10.00
EGW	--	--	--	0.38	0.49	0.04	0.53	0.75	0.01	--	--	--	--
Cons.	1.6	2.5	0.1	4.46	5.15	1.74	4.81	5.90	2.34	6.07	7.51	2.47	12.75
THR	5.2	5.8	4.5	7.88	8.60	5.62	8.50	9.88	5.37	13.9	15.6	9.96	18.56
TSC	6.2	9.8	0.8	9.02	11.2	2.42	7.12	9.79	1.05	7.78	10.4	1.10	11.94
BRE	--	--	--	1.82	2.24	0.53	1.86	2.24	0.98	--	--	--	5.81
CPS	9.3	10.7	7.3	15.0	15.2	16.0	17.0	17.1	16.9	20.7	19.4	24.0	21.31
Main	--	--	--	--	--	--	87.3	95.0	22.8	7.07	2.58	18.28	--
Margi nal	--	--	--	--	--	--	12.6	5.00	12.7	92.9	97.4	81.72	--
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Census of India (1961, 1971, 1981, 1991) and NSSO(2000). T- Total, M- Males, F- Females. Culti-Cultivators, AL- Agricultural labor, LS-Livestock, MQ-Mining Quarrying, Manu - Manufacturing, EGW- Electricity, Water supply & Gas, Cons- Construction, THR- Trade & Commerce, TSC- Transport, Storage & Communication, BRE- Banking & Real estate.CPS - Community, Personal & Social Services.- -not available.

there were more male workers compared to female workers. In 1981, the change in the occupational distribution of workforce was significant in the primary sector. There was a decline in the main workers in all the sub sectors of the primary sector including mining, which was one of the biggest providers of employment since 1961 after agriculture. Employment in primary sector declined to 34.39 percent. In the secondary sector the workforce increased marginally to 18.46 percent and 34.52 percent of the main workers were employed in the service sector. Thus, in case of Goa's economy there was a shift of labor from primary to manufacturing activities in 1971-1981 decade. Marginal workers were 13 percent of the workforce and 87 percent formed the main workers.

In 1991, the percentage of main workers in the primary sector work force declined to 30 percent, while that in the secondary sector increased to 20.425 percent and the service sector employed 42.49 percent of the main workers in the work force. In the service sector, the other services sector provided 21 percent employment and trade, hotels and commerce 14 percent. The marginal workers were 7 percent of total workers or workforce, there were more female marginal workers than males. Female main workers were more than males in agriculture and other services but secondary and all other sub sectors in service sector had more male main workers.

Comparing 1987-88 and 1993-94 NSSO figures, also reveal a similar finding that the workforce in agriculture has declined from 58.0 percent to 32.39 percent, in mining from 12 to just 1 percent, whereas manufacturing sector employment has gone up from 7 to 16 percent, construction from 1.6 percent to 8.26 percent and trade and hotels sector employment share rose from 5.2 to 12.01 percent, transport,

storage share went up from 6.2 to 8.22 percent and community and other services went up from 9.3 to 19.73 percent. Based on NSSO 55<sup>th</sup> round of employment data for 1999-2000, given in table 3.8 it can be observed that the share of the primary sector in total workforce, including main and marginal workers, has declined to 19.63 percent, the share of the secondary sector has improved to 22.75 percent while the service sector has the largest share of 57.62 percent.

**Table 3.9 Workforce by Industrial Category in Goa - 2001 (in percent)**

Working Force	Persons	Males	Females
As Cultivators	9.6	6.85	17
As Agriculture	6.85	4.25	13
House hold industry	3	2.4	4
Other workers	81	86	66

Source: Government of India (2001).

Table 3.9 shows that in 2001, the cultivators and agricultural labor were 9.6 and 6.85 percent respectively of the workforce and the secondary and service sector or the non-agricultural sector had 83.55 of the workforce with more labor in service activities. Female workers were more than male workers in primary sector and males dominated in the secondary and many service sector activities. A temporal analysis of the important sectors in the economy, reveal that labor in agriculture sector has declined sharply in every decade, from 58.3 percent in 1961 to 24.98 percent in 1981 and further down to 22.25 percent in 1991 and 16.08 percent in 1999-2000. Similarly, mining has shown a declining trend of employment from 12.1 percent in 1961 to 5.33 percent in 1981 to 3.98 percent of the total workers in 1991 to 3.54 in 1999-2000. Manufacturing industries on the other hand showed a rising share of employment from 7.3 percent in 1961 to 13.0 percent in 1981 to 14.30 percent in 1991. However, in 1999-2000, this share has declined to 10 percent. The major sub-services in the economy on the other hand have seen a rising trend of employment in every decade. Trade, hotels and commerce had a

share of 5.2 workers in the total employment in 1961, but it rose to 8.50 percent in 1981 and further increased to nearly 14 percent in 1991 and to 18.56 percent in 1999-2000. Transport services also had a rising trend of employment from 6.2 percent in 1961 to 7.12 percent of the workforce in 1981 to almost 8 percent in 1991 and further rising to 11.94 percent in 1999-2000. In addition, the community, social and personal services that had 9.3 percent of the workforce in 1961 showed a continuously rising trend of workers from 17 percent in 1981 to 20.7 percent in 1991 to 21.31 percent in 1999-2000. Thus, one can conclude that the workforce in primary sector of Goa's economy has declined, while there has been a rise in the occupational distribution of workers in favor of the manufacturing industries and more so in favor of the service industries.

Thus, Goa's economy did witness a structural change in its workforce distribution where the employment share of service sector has grown over a period. This testifies how service sector has been the major employer in the economy.

**Table 3.10 Sectoral Shares of Income and Employment (1971-1999)**  
(in percent)

Sector	1971	1981	1991	1999
<b>A. Sectoral Employment</b>				
Primary	49	34.39	30.00	19.63
Secondary	17	18.46	20.42	22.75
Service	34	34.52	42.49	57.62
<b>B. Sectoral Output.</b>				
Primary	45	28	16.16	12
Secondary	13	28	36.72	40
Service	42	44	47.12	48

Note: sectoral shares of employment for 1981 and 1991 are a percent of main workers, hence, sum to less than 100.

From the table 3.10 it is evident that there has been a significant fall in the share of employment in the primary sector in the economy from 49 percent in 1971, to 30

percent in 1991 and it has fallen further to merely 19.63 percent 1999-2000. Similarly, the share of the primary sector in the State income has also fallen from 45 percent in 1971 to 16 percent in 1991 and further to 12 percent in the year 1999. For the entire period 1971 to 1999 the decline in the share of labor employment is much more than the decline in the share of income of the primary sector. The secondary sector's share in employment rose from 17 percent in 1971 to 20.42 percent in 1991 and thereafter to 22.72 percent of the total workforce in 1999. While the share of its income in the NSDP rose faster from 13 percent to 36.72 percent to 40 percent in the same years; implying the share of industrial employment did not rise commensurately with that of the output from industry possibly due to the faster growth of large and medium scale capital intensive industries in Goa compared to growth of labor intensive industries. However, in the service sector, the share of employment has grown much faster than the share of income. The percentage of persons in the service sector increased from 34 percent in 1971 to 42.49 percent in 1991 to 57.62 percent in 1999. Moreover, share in its income in these years, increased rather slowly from 42 percent to 47 percent to 48 percent. Thus, Goa's service sector absorbed a major part of the workforce, followed by the secondary sector. To analyze the sectoral shares of income and employment more in detail, employment elasticity of each sector is calculated.

### **3.4.1 Employment Elasticity**

Employment elasticity is measured as the ratio of employment growth rate to income growth rate (Bhattacharya and Mitra, 1993). Employment intensity of a sector could be estimated from the sector's elasticity of employment with respect

to GDP. Higher the employment elasticity value greater is the employment absorption capacity of that sector.

From table 3.11 it is evident that in every decade the service sector had the highest value of elasticity, though this value is less than one. In the first sub period, the primary sector has a negative elasticity value because of a negative employment growth rate rather than a negative income growth rate. The secondary sector has a value of 0.30, indicating a lower employment intensity of this sector. In the 1980s, there was hardly any growth in the primary sector employment, due to which the elasticity is very low and secondary and service sectors' income grew much faster than their employment, because of which these two sectors have low elasticity values of 0.31 and 0.45 respectively. In the last sub- period, the negative growth rate of primary sector's employment gives a negative value, whereas the secondary sector has a positive elasticity value of 0.51, and the service sector shows a higher value of 0.61. Based on this, it is clear that the service sector has the highest employment intensity relative to other sectors, though the service sector elasticity is less than unity. The secondary sector appears to be more capital intensive and

**Table 3.11 Sectoral Employment Elasticity for Goa's Economy**

Period	Primary Sector	Secondary Sector	Service Sector
1971-1981	-0.19	0.30	0.77
1981-1991	0.09	0.31	0.45
1991-1999	-1.03	0.51	0.61

labor saving, whereas the primary sector has a very poor employment absorption capacity due to its falling share in the state output. Thus, Goa has witnessed a structural change in its economy, in terms of its income and more clearly in terms of its employment composition. The share of the primary sector in output as well as income has declined rapidly, the secondary sector's output has grown faster than

its employment and service sector has shown a rapid growth in terms of its employment relatively to its output, though service sector has the highest output as well as employment share in the total; making the state a service driven economy.

### **3.5 Economic Structure of Goa: Pre –liberation & Post liberation Decades**

#### **3.5.1 Pre-liberation Period and the Decade after Liberation**

Though Goa was ruled by the Portuguese for 451 years, (1510-1961), there was hardly any development worth its name, to better the socio-economic conditions of the people during the colonial rule. Agriculture was not developed and hence majority of the cultivators had to take up other subsidiary occupation for their subsistence. Irrigation was a most neglected item. There was no program of development of animal husbandry, fishery, etc.. Although there was a tremendous scope for development of forestry in this territory, almost no effort was done for the conservation or scientific exploitation of the forest wealth. The economy was completely dependent on imports for most of the goods, as there was no industrial base, which was developed during the colonial regime. Mining and mineral ore exports were the only activities, which were sustaining the economy due to the rich natural endowment of iron ore in close proximity to navigable rivers and a good harbor. Thus the, pre-liberation economy of Goa was an import oriented economy, and flourished due to the large-scale mining activity. Mineral exports dominated the exports since 1955.

In 1960, the income generated by the mining industry was Rs.4.85 crores i.e. 17.9 percent of the net domestic product. Though agricultural and allied activities in

terms of income generated Rs.6.1 crores of regional income and employed 58 percent of the work force, the productivity in this sector was very low. Goa's industry had very few manufacturing establishments. The industrial structure mainly comprised of agro based, and local resource based traditional industries like rice milling, oil extraction, cashewnut processing, fish canning etc. Limited markets, absence of cheap source of inputs, capital equipment, power supply and lack of institutional credit facilities were responsible for the weak industrial base. There were very few industries in the service sector except printing presses, tyre retreading and small workshops and repair shops.

Soon after liberation in 1961, a phase of planned economic development was for the first time introduced in Goa. Various developmental schemes were planned and implemented especially after the third five-year plan onwards i.e. from 1963-64 and as a result considerable progress was achieved after liberation. Though the broad economic structure changed moderately, there were changes in the sub-sectoral shares of the domestic product. This can be better grasped by comparing the distribution of the regional income on the eve of liberation with that in 1968-69. In 1968-69, Agriculture and allied activities share rose to 36.5 of the total regional income from 22 percent in 1960. The share of mining dropped from nearly 18 percent in 1960 to 12 percent in 1968-69, of manufacturing sector declined marginally from 7.3 percent to 6.01 percent, whereas the share of construction rose from 1.4 percent to 7.0 percent in the same period. Trade, transport and communication had a high share of 39.3 percent in the total net domestic product in the year 1960 and it came down drastically to 18.8 percent in 1968-69 mainly because; Goa was no longer dependent only on foreign trade.

Finance, banking and real estate activities, which were almost negligible in 1960, started contributing though marginally to the total income by 1968-69. Similarly, public administrative services, gained a share of 5.4 percent in 1968-69. The share of other services was nearly constant in 1960-61 and 1968-69. Thus, there were new sectors like the agriculture, construction and public administrative services contributing to growth of the economy by the end of 1968-69, rather than mining, trade and transport services that were the major sub-sectors from 1951 up to 1960.

### **3.5.2 Post Liberation Period (1970-71 to 2003-04)**

#### **3.5.2.1 Sectoral Shares of Income**

The changes in the sectoral shares of Goa's NSDP over the period 1970-71 to 2003-04 given in table 3.12 show that for every decade, the service sector has been the major contributor to economic growth.

There has been a fall in the share of the primary sector in the total income from nearly 38 percent in 1970s to 23 percent in 1980, and a further fall to 17.07 percent in the 1990s. The secondary sector on the other hand has shown a rapid rise from 19.5 percent in the decade of the 1970s to 31 percent in 1980s and a marginal rise to 32.41 percent in 1990s. The service sector has been a major contributor to the growth process right from 1970 with the share of this sector growing, from 43 percent in 1970-79 to 46 percent in 1980-89 to 50.52 percent in 1990-1999. If the pre-statehood and post statehood periods are compared, it is evident that the share

**Table 3.12 Average Shares of Primary, Secondary and Service Sectors in the NSDP**

Sector	1970-79	1980-89	1990-99	1970-1986	1987-2003	1970-2003
Primary	37.5	23.00	17.07	32.00	16.10	24.07
Secondary	19.5	31.00	32.41	24.20	34.00	28.93
Service	43.0	46.00	50.52	43.80	49.90	47.00
NSDP	100.0	100.0	100.0	100.0	100.0	100.0

of the primary sector has reduced to half of its output share in the pre-statehood period, from 32 percent to 16 percent, whereas secondary sector's share in state income has increased by ten percent from 24.20 percent to 34 percent, while the service sector's share has gone up by six percent, from 43.90 percent to almost 50 percent from pre-statehood to post statehood period. Over the entire period, the share of the primary sector in the total state income has been less than a quarter at 24 percent, with the secondary sector contributing nearly 29 percent and the major share of income of 47 percent coming from the service sector. Thus, it is clear that the share of the primary sector has fallen rapidly in every decade, the secondary sector's share rose sharply in the second sub period, i.e. in 1980s but marginally in the 1990s and the service sector's share in the NSDP grew moderately and almost uniformly in every decade.

### 3.5.2.2 Sectoral Growth Rates

To study the long-term trends of economic growth, time series data on the Net

State Domestic Product (NSDP), compiled by the Central Statistical Organization (CSO), New Delhi and Directorate of Planning Statistics and Evaluation (DPSE), Panaji are being used. Although both Gross State Domestic Product (GSDP) and NSDP can be used for the analysis, taking into consideration the nature and availability of data it is held that conceptually NSDP is a better parameter than GSDP (Subramanian 2003). In the present analysis, the NSDP series by industry of origin are at three different base years, 1970-71, 1980-81 and 1993-94. Due to this, one cannot really calculate growth rates of NSDP at constant prices based on different base years. For comparability, different series have been converted into one common series. The two standard concepts used by CSO are 1) Splicing Method and 2) Reworking the estimates as per the current series methodology at the component or detailed item level (Kumar and Chandra 2002). In the absence of availability of detailed back series of SDP at a common base year price for the State of Goa, this exercise is done for NSDP and all its sectors and sub-sectors by industry of origin, by using the method of ratio splicing. In this method, the series of a given year, with the new base is divided by the series of that same given year in the old base year and multiplied by hundred. This gives the value of the old base year series at the new base year price. The 1970-71 and 1980-81 base year series of NSDP by industry of origin have been spliced and converted to 1993-94 base year series. Though the choice of 1993-94 base year has been questioned by some due to the commodity composition and the relevance of commodities which may be changing over time, the study uses this series as it is based on National Accounts Statistics (NAS) of 1993-94, which has wider coverage, new data sources covered and also incorporates some recommendations of the U.N System of National Accounts (SNA). The growth behavior of NSDP is the single most important

indicator to measure the performance of the economy both for the short and long-term periods and for spatial comparisons. The present study uses average annual growth rates and annual growth rates over 10 consecutive years, over pre and post statehood periods and over 1970-71 to 2003-04, to find out the structural changes and long term trends in the economy.

An analysis of the average annual growth rates given in table 3.13, for three decades, pre and post –state hood period and for the entire time period under study, for the three main sectors viz. primary, secondary and tertiary sectors provides a profile of the growth pattern emerging in Goa. The analysis of the long-term trend in NSDP in Goa shows that in the seventies the rate of growth of NSDP was 7.41 percent. In eighties, it declined to 5.27 percent, but it rose to 8.38 percent during 1990s. The growth rate in the pre-statehood period is lower at 5.07 percent than that in the post statehood period at 8.28 percent. For the period as a whole, the growth rate of the NSDP was 6.76 percent. The sector wise growth, present some interesting results. While the primary sector registered a low growth rate of 1.80

**Table 3.13 Average Annual Growth Rates in NSDP in Goa (1993-94 constant prices)**

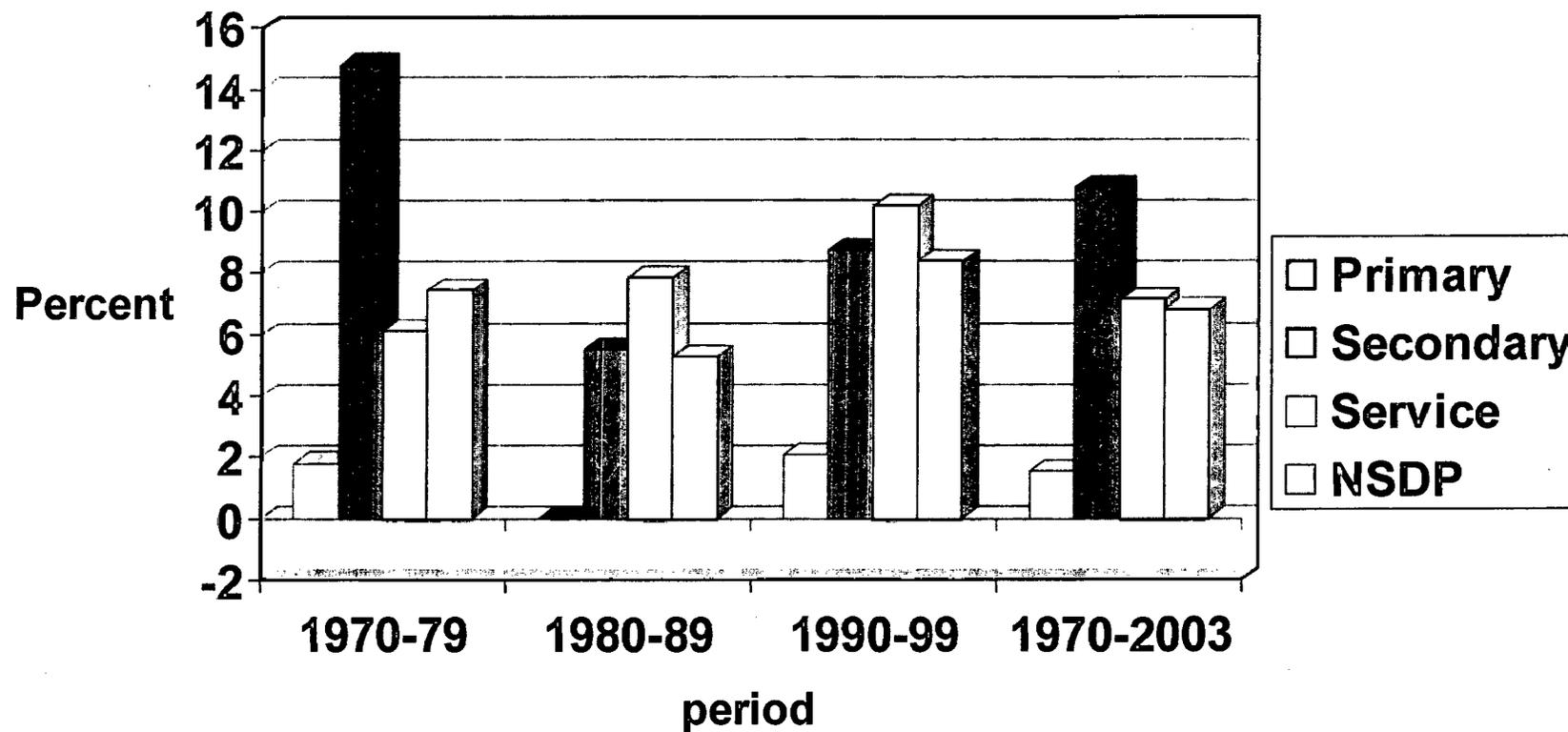
Period Sector	Decadal Growth			Pre and Post - statehood		Total Period
	1970-79	1980-89	1990-99	1970- 1986	1987- 2003	1970- 2003
Primary	1.80**	-0.03	2.63**	0.58	2.39***	1.53**
Secondary	14.77***	5.50***	8.74***	12.84***	11.07***	10.78***
Service	6.10***	7.82***	10.18***	4.62***	8.39***	7.11***
Total NSDP	7.41***	5.27***	8.38***	5.07***	8.28***	6.79***

\*\*\*, \*\* means statistically significant at 1% and 5% level respectively.

percent during the first sub period, it was negligible in the eighties. However, in the third sub-period from 1990-1999, the growth rate increased to 2.63 percent.

As for the secondary sector, the first period saw a spurt in the growth rate of this sector to 14.77 percent. This was followed by a drastic fall to 5.50 percent in the eighties, but a good recovery to 10.74 percent during the third sub- period. Thus the primary sector, secondary sector and the overall growth rate showed a 'U' shaped growth pattern, with a high growth rate in the 70s, decline in the 80s and then an upturn in the 90s. In contrast to this growth pattern, the service or the tertiary sector growth rates showed a steady increase from 6.1 percent during the seventies to 7.82 percent in the eighties and to 10.18 percent in the nineties. Thus in the seventies, secondary sector drove the growth with a growth rate of 14.77 percent, in the eighties and nineties the growth was highest in the service sector at 7.82 and 10.18 percent respectively. The high growth rate of the industrial sector, led to a larger contribution by this sector in the 1970s. However, in the eighties and nineties, it was clearly the service sector, which was the highest in terms of growth rate as also sectoral share towards the NSDP. The trend of growth rates over the pre and post statehood periods shows that the primary sector showed a higher growth of 2.39 percent during the post- statehood period, compared to a low of 0.58 percent in the period of pre-statehood. The growth is mainly due to growth of agriculture and mining sectors. In these periods, the secondary sector shows high growth rates and the service sector growth rate has nearly doubled. For the period as a whole, the growth in primary sector was only 1.53 percent, while the secondary sector growth rate was the highest at 10.78 percent followed by the service sector at 7.11 percent. The overall growth rate was 6.79 percent in the

**Figure 3.2 Average Annual growth rates of Major Sectors and NSDP in Goa  
(at 1993-94 prices)**



above period. In terms of growth rate and sectoral contribution, the secondary sector has been growing at a high rate though its share in NSDP has moved up marginally in the decade of nineties and the service sector predominates in the economy in terms of its large share and high growth rates. Based on this, it can be concluded that the economy of Goa has undergone a structural change over the last three decades.

### **3.5.2.3 Trends in the Sub-Sectoral Growth**

The growth of the sub-sectors within each sector is studied in order to understand the sectoral performance better. Sub-sectoral growth rates are used to identify the leading and the lagging sectors within each sector in the three decades, 1970-71 to 1979-80, 1980-81 to 1989-90 and 1990-91 to 1999-2000, as also over the long term period from 1970-71 to 2003-04 with the help of average annual growth rates and weighted average annual growth rates given by Chenery and Squirin.

The growth pattern is not uniform across different sectors as can be seen from table 3.14. The primary sector of the economy has not grown beyond three percent over the 34-year period in the state. This has been due to the low growth rates of its two main sub-sectors mainly the agricultural sector and the mining sector, although agriculture has shown an upward trend across time. Forestry and fisheries, which were growing at high rates of 14 percent and 7.32 percent respectively in the 1970s, have turned into sectors with negligible growth rates. Over the entire period of study, the primary sector grew at merely 1.53 percent. By contrast, the

secondary and service sectors in the state of Goa have shown statistically significant and high growth rates over the whole period including the sub-periods.

**Table 3.14 Average Annual Growth rates of Sub- sectors (in percent)**

Sector	1970-79	1980-89	1990-1999	1970-2003-04
1.Agriculture and allied activities	4.28	----	2.16	1.65
1.1 Agriculture	1.17	1.48	2.83	2.24
1.2 Forest logging	<b>14.0</b>	-11.65	-5.23	-6.11
1.3 Fishing	7.32	<b>3.17</b>	0.67	<b>3.80</b>
2. Mining Quarrying	0.10	-3.55	3.66	-----
<b>Sub total Primary</b>	<b>1.80</b>	----	<b>2.63</b>	<b>1.53</b>
3. Manufacturing	<b>18.03</b>	<b>5.53</b>	<b>8.44</b>	<b>11.37</b>
3.1 Registered	<b>44.0</b>	<b>12.12</b>	7.68	<b>16.67</b>
3.2 Unregistered	5.51	-15.0	<b>11.63</b>	2.66
4. Electricity, Gas & Water supply	-1.48	----	1.166	----
5. Construction	6.93	2.66	8.65	6.17
<b>Sub total Secondary</b>	<b>14.77</b>	<b>5.50</b>	<b>8.74</b>	<b>10.78</b>
6. Trade, hotels & restaurants	6.16	1.56	<b>17.05</b>	<b>7.05</b>
7. Transport, Storage & Com.	1.59	<b>14.32</b>	6.43	6.72
7.1 Railways	2.74	1.81	10.41	7.00
7.2 Transport by other means	1.35	<b>14.68</b>	-1.612	6.02
7.3 Storage	---	8.27	-0.05	3.41
7.4 Communications	2.42	7.74	17.00	<b>10.00</b>
8. Finance Sector	<b>9.00</b>	7.33	13.47	<b>8.18</b>
8.1 Banking & Insurance	<b>14.52</b>	<b>11.36</b>	<b>20.08</b>	<b>10.00</b>
8.2 Real estate, ownership dwelling and Business services	5.01	3.46	4.15	4.51
9. Community Services	<b>7.73</b>	7.48	4.77	6.17
9.1 Public Administration	<b>12.97</b>	8.28	7.43	8.00
9.2 Other services	4.50	6.49	2.94	4.85
<b>Sub total Service</b>	<b>6.10</b>	<b>7.82</b>	<b>10.18</b>	<b>7.11</b>
<b>Total NSDP</b>	<b>7.41</b>	<b>5.27</b>	<b>8.38</b>	<b>6.79</b>

--- statistically insignificant. All other figures are statistically significant at 1% level of significance.

In the seventies, the secondary sector growth rate has been driven by the registered manufacturing industries, which grew at 44 percent. This was mainly due to the spurt in the growth of large-scale industries like MRF Ltd, Goa Carbon Ltd and Zuari Agro-chemicals Ltd. In the eighties, again registered manufacturing (12.12%), showed the highest growth rate among the sub-sectors.

In 1990-91 to 1999 sub- period, in sharp contrast to the earlier pattern, the unregistered manufacturing sector showed a very high growth rate of (11.30%). The construction sector also showed a high growth rate (8.65%) in the same period. Since Goa does not generate electricity, but purchases it from Maharashtra and Karnataka, and the electricity department suffers losses due to distribution and transmission, the growth is negative or negligible. Thus in the seventies and eighties, registered industry led growth while after 1990 unregistered industry and construction sector have emerged as leading sectors of the secondary sector. From, 1970 to 2003, this sector has shown the highest average annual growth rate of 10.78 percent, among the three sectors and it has been driven by registered industry. The secondary sector, the unregistered industry and construction industry, show a 'U' shape growth rate pattern across three decades.

The service sector showed a consistently rising trend over the three decades from 6.10 percent in 1970s to 7.82 in 1980-89 and 10.18 in 1990-1999 sub-periods. Though this is true of the sector as a whole, this is not true for its sub-sectors, which show mixed trends. In the seventies, banking and insurance services was the sub-service with the highest growth rate of 14.52 percent, followed by public administrative services at 12.97 percent. In the eighties, Transport by other means was the highest growing sub-sector, at 14.68 percent, followed by banking and insurance services at 11.36 percent. Moreover, in the 1990s, banking and insurance, trade, and hotels emerged as the fastest growing sub services at 20.08 and 17.05 percent respectively. Thus, banking and insurance has been continuously contributing to the growth of service sector, alongwith public services in the 70s

and tourism services in the 90s also boosting the service sector growth in the economy.

If the entire period of thirty-four years is taken, it is apparent that the service sector growth at 7.11 percent has been contributed by financial services, especially banking and insurance (10 percent) and tourism services (7.05). Though communication and railway services also show high growth rates over the long term period, their growth has been taking place only in the last five to six years due to the entry of private players in the telecom sector and the setting up of the Konkan railway network. Hence, transport, storage and communication services have also shown a high growth rate of 6.72 percent.

#### **3.5.2.4 Sources of Economic Growth**

In order to identify the best episodes of growth in each sector and sub-sector of the economy, we should consider periods of ten consecutive years over the last two decades in the state. Such best growth episodes would reflect growth potential of the state in the long term (Dholakia 2002). To arrive at the potential growth rates, the average annual growth rates over ten consecutive years in different sectors in Goa over 1980-81 to 2003-04 are worked out. Table 3.15 gives the potential growth rates as the maximum observed in each sub-sector of the state.

These results show that in the case of the primary sector, the fisheries sector has the highest potential growth rate of 11.90 percent. However, in the secondary sector, the registered, unregistered industries as well as the construction sector

show high growth potential of growing at around 14.00 percent. In the service sector, trade & hotels at 18.00 percent possess the highest growth potential, followed by transport, storage and communication (15.49%), and finance and real estate at (11.58 %). Within transport sector, railways show the highest potential growth rate and under finance, banking and insurance have a high potential to grow. The secondary sector has a higher growth potential of 13.03 percent growth than the tertiary sector at 10.00 percent.

It is not only the growth rate of a sector in the economy that is important but its relative contribution to the NSDP is also to be combined with it. There could be a fast growing sector, which is small and hence contributes less to the economic growth and a slow growing large sector, which contributes more in periods of uneven growth across sectors (Babu, 2005). By taking the growth rate of each sector weighted by its share in the total growth, it is possible to get the weighted growth rate of each sector. Following the methodology of Chenery and Syrquin the sectoral contribution to growth is calculated, by first taking each sector's growth rate, weighing or multiplying it by its respective sectoral share in percentage terms and dividing it by the overall growth rate. The formula given is  $gv = \sum \rho_i g_{vi}$ , where  $g_{vi}$  and  $gv$  are the growth rates of sector  $v_i$  and the overall growth rate  $V$ , respectively ( $V = \sum v_i$ ), and the weights  $\rho_i$  are the sectoral output shares. By definition,  $\rho_i g_{vi}$  is the weighted contribution of the  $i$ th sector to overall growth. This provides information on the effect of and sensitivity of sectoral growth to aggregate output growth. From the table 3.15 one can conclude that, in the seventies the secondary sector, has led the growth of NSDP, with 46.74 percent share in the growth, but since the eighties, the tertiary sector has been the biggest

contributor to growth, contributing 67.69 percent in 1980s and 61.04 percent in the nineties. The export sector, which includes the deflated value in lakhs of rupees of exports of iron ore, manganese and bauxite produced in Goa as also mineral ore

**Table 3.15 Weighted Average Growth rates of Sectors and Sub-sectors (in percent)**

Sector	1970-79	1980-89	1990-99	1970-2003	Max. growth (Potential)
Agriculture allied activities	18.	-----	3.34	4.45	4.35
Agriculture	4.18	<b>4.13</b>	<b>3.31</b>	<b>4.80</b>	4.11
Forest logging	3.45	-3.16	-0.25	-0.91	2.94
Fishing	<b>4.53</b>	1.46	0.22	1.54	<b>11.90</b>
Mining.	0.157	-2.83	1.76	-----	4.60
<b>Sub total Primary</b>	<b>10.78</b>	<b>0.13</b>	<b>5.33</b>	<b>5.40</b>	<b>3.79</b>
Manufacturing.	<b>40.668</b>	<b>48.01</b>	<b>26.66</b>	<b>39.57</b>	12.79
Manufacturing-Registered	<b>47.60</b>	<b>48.09</b>	<b>26.61</b>	<b>43.35</b>	<b>14.13</b>
Manufacturing-Unregistered.	6.46	<b>-19.75</b>	5.17	2.37	14.10
Construction.	4.71	2.09	5.23	4.40	13.96
Electricity, Watersupply, Gas	-0.34	0.068	0.10	0.87	-----
<b>Sub total Secondary.</b>	<b>46.74</b>	<b>32.18</b>	<b>33.625</b>	<b>45.74</b>	<b>13.04</b>
Trade and Hotels.	9.19	3.51	<b>28.01</b>	<b>12.26</b>	<b>18.00</b>
Transport, Storage, Comm.	2.81	<b>28.95</b>	6.00	9.96	<b>15.49</b>
Railways.	0.34	0.02	0.27	0.378	<b>23.36</b>
Transport by other means.	2.08	<b>27.42</b>	-1.61	7.87	16.25
Communications & Storage	0.25	1.15	2.30	0.84	25.0
Finance Sector.	<b>12.77</b>	<b>15.31</b>	<b>26.14</b>	<b>15.08</b>	<b>11.58</b>
Banking & Insurance.	<b>9.32</b>	<b>10.65</b>	<b>25.22</b>	<b>9.96</b>	<b>14.22</b>
Real estate	3.89	3.98	2.845	3.77	8.63
Community Services	<b>18.42</b>	<b>17.14</b>	5.92	11.07	7.35
Public Administration	<b>12.49</b>	7.53	3.83	5.82	8.88
Other services	6.38	8.79	2.14	5.16	6.31
<b>Sub total Services Sector.</b>	<b>42.48</b>	<b>67.69</b>	<b>61.04</b>	<b>48.86</b>	<b>9.88</b>
<b>Total NSDP</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>8.28</b>
<b>Exports</b>	<b>-6.55</b>	<b>9.85</b>	<b>37.00</b>	<b>45.35</b>	<b>24.5</b>

Note the individual items do not add up, probably due to averaging, even after the data has been normalized. -  
 ----statistically insignificant.

produced in Karnataka and Maharashtra, bought by Goan mineral ore exporters, has shown a rising trend from a negative share of 6.55 percent in the seventies but rising to a positive 9.85 percent in 1980-89 and further rising to 37 percent in

1990-1999 period. The primary sector's contribution in the growth process has been small and has declined. Its share was 10.80 percent in the 1970s but fell to 0.13 percent in the eighties, and rose to 5.40 percent in the nineties. For the period as whole, its contribution is 5.33 percent.

Sub-sectoral analysis shows that in the seventies, main contributors were registered manufacturing (47.6 %) within the secondary sector, and community services (18.42 %) and finance sector (12.77%) in the tertiary sector. Community services grew rapidly due to the expansion of public administrative services and financial services grew due to growth of bank offices. Fisheries (4.53%) contributed to the primary sector growth, the latter having the least sectoral share. Forestry with a small share does not emerge as the leading sector, as under the growth rate analysis.

In the eighties, registered industry continued to predominate on the industrial growth scenario with the highest weighted growth share of 48.09 percent, followed by transport, storage sector at 29 percent mainly due to transport by other means contributing (27%). Community services and financial sector followed them with a share of 17 and 15 percent respectively. Financial services continued to grow, due to banking and insurance sector while community services grew due to 'other services' rising. Agriculture contributed towards the primary sector, though its share was small.

In the period 1990-91 to 1999, there was not much of structural change in the primary and the secondary sectors as compared to the service or tertiary sector.

There was a change in the growth centers of the tertiary sector with the trade and hotels share in the NSDP being the highest at 28.01 percent followed by financial sector, banking and insurance services growing at 25.22 percent. Thus within tertiary sector while community services share has declined and that of the transport sector has fluctuated, the finance sector, especially the banking sector has shown stable and rising contribution with every decade. Due to high growth of tourism, the growth centre of the tertiary sector, in the last one and a half decade has shifted to tourism services. Even if one observes the weighted shares of sectors, over the entire period it is clear that the industrial and service sectors followed by the export sector have been the major contributors of growth in Goa. The registered industries, finance, banking in particular, and trade and hotels emerge as the centers of growth, while primary sector though a low growth centre has some positive contribution from the agricultural sector. Since agriculture, mining exports, industry, tourism and banking services are important sectors in the economy from the long-term perspective, the study proceeds to analyze these sectors and the factors influencing these sectors of economy.

### **3.6 Summary of Findings**

From this chapter's analysis, the following findings emerge:

1. Goa one of the smaller developed state economies in India has experienced structural changes in its economy over the last four decades. It has a low natural growth rate of population, high literacy levels, a growing urban population and a large base of active population. Hence it can be said that Goa's population is going through a phase which in demography is known

as 'A Window of Demographic Opportunities', where the maximum number of population is in the most active and potentially productive age group as far as its contribution to economic activities and economic growth is concerned.

2. Despite of a large active population, the workforce participation rates of the economy have shown a decline over time. The share of main workers in the total workers has increased marginally, while that of marginal workers has gone up.
3. The occupational structure of the economy across time reveals that there has been a significant fall in the share of employment in the primary sector in the economy from 49 percent in 1971, to merely 19.63 percent 1999-2000, the secondary sector showing a moderate rise from 17 percent to 22.72 percent and the service sector employment rising from 34 percent to 57.06 percent in the same periods.
4. Based on the sectoral employment elasticity values, it is clear that the service sector has the highest employment intensity relative to other sectors, though its value is less than unity. The secondary sector has lower value indicating this sector is more capital intensive, whereas the primary sector has a very poor employment absorption capacity due to its falling share in the state output.
5. The changes in the sectoral shares of Goa's NSDP over the period 1970-71 to 2003-04 show that for every decade, the tertiary sector has been the major contributor of economic growth. The primary sector has declined in terms of growth rate and sectoral contribution, the secondary sector has been growing at a high rate though its share in NSDP has moved up

marginally in the 1990s and the service sector pre dominates the economy in terms of its large share and high growth rates.

6. Thus, Goa has witnessed a structural change in its economy, in terms of its income and more clearly in terms of its employment composition over time, emerging as service pre-dominant economy.
7. At the sub-sectoral level, over the entire study period, the registered industries, banking services, trade and hotels and exports emerge as the centers of growth, while primary sector though a low growth centre has some positive contribution from the agricultural sector.
8. An important observation of the study is that in the primary sector, the decline in the share of labor employment has been much more than that of its income share, while in the industrial sector, the share of its employment did not rise commensurately with that of the income share, possibly due to a capital intensive industrial structure emerging in the economy. These two facts seem to have acted as push factors, shifting labor into the service sector, where the share of employment has grown much faster than that of its output in the economy.

**CHAPTER 4**

**SOURCES OF ECONOMIC GROWTH:**

**A SECTORAL AND SUB – SECTORAL**

**ANALYSIS**

## CHAPTER 4

### **SOURCES OF ECONOMIC GROWTH: A SECTORAL AND SUB – SECTORAL ANALYSIS**

#### **4.1 Introduction**

The economic structure of Goa's economy has undergone a tremendous face change since liberation. From mining alone, the economic activity of the state has diversified into services like tourism, banking, insurance, transport, services etc. and manufacturing of electronics, pharmaceuticals, engineering, tools and the like.

Based on the previous chapter's findings, it appears that the pattern of employment and output growth in the primary sector and secondary sector in the economy of Goa have had a direct impact on the growth of the service sector, hence the present chapter attempts to analyze the important sub-sectors of the primary and secondary sectors to find out the factors influencing the emergent pattern of growth and its implications for the service sector. The study then proceeds to analyze the important leading sub-sectors in the service sector, which have helped in its growth. Finally, the chapter concludes with a quantitative analysis of the determinants of economic growth and of the leading sub-sectors in the economy, over the study period, 1970-71 up to 2003-04 in a multiple regression framework.

#### **4.2 The Agricultural Sector of Goa**

As in the rest of India, so also in the Union Territory of Goa, Daman & Diu, the

primary sector and agriculture in particular was a weak link of the economy before 1960. The Portuguese government, under its colonial rule up to 1961, had not done much for the development of agriculture, which was the main source of employment with more than 40 percent of the total working population dependent on it. Soon after liberation, especially after the third five-year plan, efforts of the then government to create the necessary infrastructure and financial support, helped to improve this sector. The main objective of the then government was to increase the food production in the local economy. For this purpose, short term and long-term measures were initiated. However, despite, huge public sector investment in this sector under the five-year plans, the income and employment potential has diminished over the years and primary sector has again turned into a weak sector of the economy. This has resulted in a decline in the employment in this sector.

**Table 4.1 Compound Growth Rates of Employment in Goa's Primary Sector (in percent)**

Type of workers	1961-71	1971-81	1981-91	1991-2001
1. Cultivators	-5.90	-0.36	-0.32	-1.14
2. Agricultural laborers	-0.26	-2.23	1.45	0.14
Total Agriculture(1+2)	-6.16	-2.59	1.13	-1.00
3. In Livestock	--	3.34	0.69	--
4. Mining	-6.29	1.57	-1.43	1.10*

--Not available. \*refers to 1991-99.

From table 4.1 it is clear that the agricultural employment in Goa showed a negative growth rate of -6.16 in 1961-71 period. In the seventies, this growth rate continued to be negative though it was less compared to the previous decade's growth rate. In the 1980s agriculture employment showed a positive growth rate of 1.13 percent but in the period 1991 to 2001, this sector's employment has again turned negative to -1.00 percent. The employment in livestock has also declined in the 1980s from 1970s. The mining sector employment growth rate shows

fluctuating trends due to its dependence on fluctuating export demand for mineral ore. In the 1960s, this sector showed a negative growth of -6.29 percent in its employment, which turned positive in the 1970s. However, in 1980s, its employment growth rate turned negative and in the 1991 to 2001 period, though its growth rate of employment was positive, it was merely a 1.00 percent growth in employment. Thus, based on the growth rates, it can be concluded that in the last decade, agricultural employment in Goa has declined and mining sector employment growth has been marginal, indicating a shift of labor from primary sector to the other sectors, particularly the service sector in the economy, given the moderate rise in the secondary sector employment.

#### **4.2.1 Causes for the Decline of Agricultural Sector in Goa**

Though agriculture is not the major economic activity of the Goa's economy today, it was a crucial sector in terms of its employment, during the pre liberation decade. However, over the last forty years, employment as well as output of this sector has been shrinking rapidly, and this has had an influence on the service sector growth in the economy. A pioneering study on the agricultural development in Goa since liberation, i.e., from 1961 till 1985-86, by Padoshi (1991) based on data from a sample survey of 150 agricultural households and secondary data on agriculture output, landholdings, and number of cultivators, net cultivated area and irrigated area found that the share of agriculture has declined continuously due to stagnation in agricultural productivity; the low paying capacity of agriculture, leading to large out-migration of labor from agriculture; under-utilization and non-utilization of agricultural land, due to growth of mining and construction industry; small land

holdings, skewed distribution of cultivated land and low irrigation and hence low intensity of cultivation. The above factors are retarding agricultural activity in the state economy. The author stressed land reforms, use of non-traditional inputs for promoting agricultural growth.

The present analysis tries to find out the reasons for the decline in agricultural sector for a longer period, i.e., from 1961 to 2001, with a focus on the factors, which have pushed labor towards the service sector, given the fact that labor force in the secondary has registered a moderate rise in their employment share. Hence, it is assumed that people engaged on farms have shifted to service sector more than to the manufacturing sector.

#### **i) Uneconomical and Unviable Landholdings**

One of the major reasons for the decline in agriculture as an occupation is the fact that around 82 percent of the farmers in Goa are holding fragmented pieces of agricultural lands admeasuring less than a hectare (ha). It is clear from table 4.2 that the share of the number of marginal land holdings in the total land holdings, has increased over the period, from 66 percent in 1970-71 to 78 percent in mid 70s and 80s and further to 80.84 percent in 1995-96 and to 81.27 percent in 2000-01. The number of small and marginal holdings together, shows that while 87 percent of the total land holdings in 1970-71 were below 2 ha in size, only 13.6 percent were greater than 2 ha in size and so economically viable . In 1980-81, the percentage of operational holdings below 2 ha. in size rose to 91.4 percent and in that year 78 percent of the operational holdings were below the average size of operational holdings of 1.19 ha. The trend has

**Table 4.2 Distribution of Number of Operational Landholdings by Major Classes (in 000's of ha.)**

Size Class	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96	2000-01
Marginal	45.3 (66)	56.83 (78.49)	57.9 (78)	58.21 (77)	57.85 (80.44)	56.92 (80.84)	50.954 (81.27)
Small	14.2 (21)	9.353 (12.92)	10.1 (13.37)	10.22 (13.51)	8.34 (11.59)	8.13 (11.55)	6.576 (10.49)
Semi-medium	6.0 (9.0)	3.847 (5.31)	4.12 (5.45)	4.62 (6.11)	3.55 (4.94)	3.465 (4.92)	3.192 (05.09)
Medium	2.7 (3.88)	2.1 (2.79)	1.85 (2.45)	1.91 (2.53)	1.53 (2.13)	1.413 (2.01)	1.458 (2.32)
Large	0.635 (.079)	0.508 (0.07)	0.62 (0.876)	0.663 (0.88)	0.650 (0.90)	0.476 (0.67)	0.51 (0.82)
Total	68.835 (100)	72.53 (100)	75.537 (100)	75.62 (100)	71.92 (100)	70.399 (100)	62.694 (100)

Source: Various issues of Agricultural Censuses, DPSE, Government of Goa Panaji. Note: Marginal - (< 1 ha), small - (1-2 ha), semi-medium- (2-4 ha), medium- (4-10 ha) and large-(10& above ha). Figures in brackets show percent to total.

continued in the 1990s, where 92.39 percent of the land holdings are small in size and only 7.61 percent holdings of greater than two ha which is considered as an optimum size. In 2000-01, nearly 93 percent of the total numbers of holdings were below the optimum farm size and 7 percent holdings were larger than two ha. Thus, a high proportion of rural households operate farms below optimum size, the problem is that of a large number of tiny farms, unviable for economical farming operations (D'Souza, 1991). Uneconomical holdings raise the average cost of cultivation, and hence the landowners might not be keen to cultivate the land. Landowners do not lease out their lands either, with the fear of losing land to the tenants and so prefer to keep it fallow rather than cultivating it at high costs or risking losing it out permanently.

If decadal time periods from 1970-71 till 2000-01 are compared, from table 4.3, one finds that the area under marginal land holdings was 22.53 percent in 1970-71, it rose to 24 percent in 1980-81 and to 33.25 percent in 1990-91, but in 2000-01, it declined to 31.00 percent of the total area of operational landholdings. The area under small

**Table 4.3 Distribution of Area of Operational Landholdings by Major Classes (in 000's of ha)**

Size Class.	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96	2000-01
Marginal	20.8 (22.53)	27.9 (34)	22.1 (24)	20.796 (26.62)	18.591 (27.95)	19.62 (33.25)	16.587 (31.0)
Small	19.9 (21.56)	15.6 (19)	14.1 (16)	13.761 (17.61)	10.967 (16.48)	10.76 (18.23)	8.296 (15.52)
Semi-medium	16.6 (17.98)	12.6 (15.235)	10.84 (12.1)	12.48 (15.51)	9.279 (13.95)	9.18 (15.56)	8.154 (15.24)
Medium	16.0 (17.33)	13.67 (16.54)	11.21 (12.5)	11.43 (14.63)	9.165 (13.77)	8.188 (13.87)	8.228 (15.38)
Large	19.0 (20.33)	12.95 (15.67)	31.53 (35.17)	20.024 (25.63)	18.527 (27.85)	11.27 (19.09)	12.227 (22.86)
Total	92.3 (100)	82.72 (100)	89.68 (100)	78.129 (100)	66.529 (100)	59.02 (100)	53.492 (100)

Source: same as in table 4.2. Note: Marginal - (< 1 ha), Small - (1-2 ha), Semi-medium- (2-4 ha), Medium- (4-10 ha), Large-(10& above ha). Figures in brackets show percent to total.

holdings sharply declined from 21.56 percent in 1970-71 to 16 percent in 1980-81. It increased marginally to 16.48 percent in 1990-91 but declined to 15.52 percent in 2000-01. The area under semi-medium and medium land holdings declined in the 1970s but increased in the 1980s and 1990s decade. The area under large operational holdings was 20.33 percent in 1970 and it went up to 35.17 percent in 1980-81 and declined to 27.85 percent in 1990-91 and further to 22.86 percent of the total in 2000-01. Thus, the area under marginal and smallholdings has shown a declining trend since the last decade, but the area of the more optimum farm sizes have shown a marginal increase and the large land holdings seem to have shrunk in proportion in the last decade. Comparing the number of operational land holdings with their respective area, leads one to analyze the average size of operational holdings by major size classes.

The average size of marginal land holdings in hectares, as can be seen from table 4.4, has shown a declining trend from 0.46 ha. in 1970 to 0.32 ha. in 2000-01, because, while the number of operational holdings of less than one ha. have increased, the area under such holdings has declined. The average size of small farms has also declined

**Table 4.4 Average size of Operational Landholdings by Major Classes (in ha)**

Size Class	1970-71	1976-77	1980-81	1985-86	1990-91	1995-96	2000-01
Marginal	0.46	0.49	0.38	0.36	0.32	0.34	0.32
Small	1.40	1.67	1.39	1.35	1.31	1.32	1.26
Semi-medium	6.15	3.27	2.63	2.62	2.61	2.65	2.55
Medium	5.926	6.51	6.05	5.98	6.00	5.79	5.64
Large	29.92	25.5	50.86	30.20	28.50	23.68	23.79
Total	1.34	1.14	1.19	1.03	0.93	0.84	0.85

Source: same as in table 4.2. Note: Marginal - (< 1 ha), small - (1-2 ha), semi-medium- (2-4 ha), medium- (4-10 ha) and large-(10& above ha).

marginally during the above period. Semi-medium sized land holdings had a sharp decline in their average size from 6.15 ha. in 1970-71 to 2.55 ha. in 2000-01. Medium sized land holdings had an average area of 5.926 ha. in 1970-71, which rose marginally in 1980s and in 2000-01, declined to 5.64 ha.. Thus, there was no observable change in the average size of medium land holdings. Large holdings had an average size of 30 ha. in 1970-71, which rose to 50.86 ha. in 1980 and then experienced a decline in the later years. The average size of a land holding has reduced from 1.34 ha. in 1970-71 to 0.84 ha. in 1995-96. Thus the average size of operational holdings which are marginal and small reduced slightly, whereas that of semi-medium and large sized holdings reduced by a larger margin. This indicates that the larger and viable sized holdings may turn unfeasible for mechanization and large-scale capital-intensive farming in the future.

#### **ii) Skewed distribution of Agricultural landholdings**

Unequal distribution of operational landholdings has led to the loss of participation by

farmers in cultivation. The distribution of holdings across land area is highly skewed and unequal. In 1970-71, smallholdings, which were 87 percent of total holdings, accounted for 44 percent of the total area under agriculture. In 1980-81, they were 91.4 percent of the total holdings, but accounted for only 40 percent of the total area. In 1990-91, they were 92.03 percent of total holdings, accounting for 44.5 percent of the total area. In addition, in 2000-01, though the smallholdings accounted for 46.52 percent of the total area, they formed 93.00 percent of the total number of holdings. In order to find out the extent of inequality, in the distribution of agricultural land holdings across the various classes, the Gini Coefficient (GC) is calculated. Through the Gini coefficient one can measure the extent of departure (inequality) from the ideal pattern of distribution (Rangacharyulu and Rao, 2000).

$$GC = \frac{\sum(P'_i * Q_{i+1} - P_{i+1} * Q'_i)}{10,000}$$

where

GC = Gini Coefficient value.

$P'_i$  = the cumulative percentage of the land holdings in the  $i$ th class.

$Q'_i$  = the cumulative percentage of the area operated in the  $i$ th class.

**Table 4.5 Value of Gini Coefficient for the Agricultural landholdings in Goa**

Year	1970-71	1980-81	1990-91	1995-96	2000-01
Gini Coefficient	0.56	0.64	0.597	0.533	0.625

From the table 4.5, it is clear that the degree of inequality in the land holding distribution in Goa for all the years, in percentage terms, has been to the extent of more than 50 percent. In 1970, the value of the GC was 0.56; it increased to 0.64 in

1980-81 but thereafter it declined to 0.597 in 1990-91 and further to 0.533 in 1995-96, but increased to 0.625 in 2000-01. Thus, there is considerable inequality in the pattern of land holding distribution in Goa, which is another cause for its lower growth rate. A major factor, which has influenced the inequity in the distribution of agricultural landholdings, is that large landholdings continue to have ownership as their pre-dominant form of land tenure.

### iii) Delays in the Completion of Irrigation Projects

Lastly, if one analyses the public expenditure under various five-year plans and annual plans allocated for Goa's agriculture sector, vis-a vis the income generated from the sector, using growth rates, one can conclude that the capital investment output ratio for this sector is very high. This is mainly due to the delays in the completion of medium and major irrigation projects like Salaulim and Tillari. For instance Salaulim project was originally estimated to cost Rs. 9.61 crore, however there has been massive escalation in its cost which has now crossed Rs. 100 crore (Angle, 2001). This project is supposed to create an irrigation potential of 14,326 hectares of land, but so far it has been able to create a irrigation potential of 5,229 hectares, since the 1970s.

**Table 4.6 Public Expenditure on Agriculture and Irrigation (growth rates in percent)**

Time Interval	Public expenditure on Agriculture & allied activities	Public expenditure on irrigation	Income from agriculture
1966-67 to 2004-05	7.67	---	---
1970-71 to 2004-05	7.37	---	1.51
1980-81 to 2004-05	7.61	8.07	2.51
1990-91 to 2004-05	8.18	5.47	3.20
1966-67 to 1986-87	8.58	----	---
1987-88 to 2004-05	7.91	6.51	2.77

--- continuous data not available

Similarly, the Tilarí dam project has yet to be operational and has led to huge cost over runs. While the government expenditure under various plans for agriculture and allied activities has been growing in the range of 7 to 8.58 percent (table 4.6), the growth rate of expenditure under irrigation, has reduced from 8.07 in the period 1980-81 to 2004-05 to 5.47 percent in the period 1990-91 to 2004-05. Despite large investment spending, the income generated from agriculture has not crossed 3 percent in the above period, indicating, high costs to the public exchequer. Due to delays in the completion of the irrigation projects, the percentage of irrigated area to net sown area has been in the range of 25 to 26.00 percent since the last decade.

#### **iv) Rising cost of farm inputs**

One of the major inputs of agriculture, i.e labor, has become so scarce, that the cost of this input has discouraged farmers to diversify their activities. Other inputs like fertilizers, insecticides and farm machinery have become costly, despite government subsidies for some farm inputs. Agriculture has become a supplementary rather than a main activity. The complications arising out of the Tenancy Act, has reduced the trend of leasing farmland to tenants. The above factors have led a movement of labor as also land into other more lucrative and remunerative businesses such as tourism, real estate and construction.

Thus uneconomical size of operational landholdings, skewed distribution of landholdings, long delays and cost over runs in the major and medium irrigation projects and high cost of farm inputs have pushed resources away from this sector towards the service sector.

### 4.3 The Mining Sector

The Mining belt of Goa covers an area of approximately 700 sq kms and is mostly concentrated in the four talukas of Bicholim, Salcete, Sanguem and Quepem. The state of Goa is richly endowed with industrial mineral deposits of iron ore, manganese ore, bauxite, silica, limestone and the like. However, the chief minerals of the state are iron ore, manganese ore and bauxite. It may be noted that that prior to liberation mining activity developed due to the private sector and private entrepreneurs initiative and capital investment. Though this trend continued even after 1961, mining industry developed under the control of the Mines Department. The speedy development of the mining industry has to be attributed to a very liberal policy of the government converting concessions into long leases, low taxation on mineral exports and a nominal duty on import of mining machinery. An added comparative cost advantage to this sector was the cheap cost of transporting the ore from the pitheads to the export point or ports through navigable rivers. This placed Goa or rather India as a competitive exporter of ore aboard. However, since iron ore derives its demand from demand for steel, in the earlier decades due to world recessionary trends in steel industry, exports also fluctuated. Work stoppages also reduced ore production, in some years. The Goan iron ore is 100 percent export oriented. Iron ore exports commenced in the late 1940's with around 30-40 thousand tones of iron ore exported through Mormugao Port. By 1960s, this figure was around 65 thousand tones and by 1990s an average export of 14.8 million tones of iron ore was undertaken. The highest volume being 40.53 (Goan & Non-Goan origin) million tones exported in the year 2006-2007. After liberation from the Portuguese rule, iron ore accounted for foreign exchange of Rs.18.31 crores. 40 years later the same commodity has earned Rs. 4500 crores.

While iron ore exports from the rest of the country have to be canalised through the MMTC with the exception of Kudremukh Iron Ore Ltd., the Goan mine owners are permitted to make direct shipments to Japan, China, South Korea, Taiwan, Middle East, Pakistan and Europe (Goa Mineral Ore Exporters Association, [GMOEA] 2006).

The importance of this sector in income, foreign exchange earnings and employment generation, when manufacturing had not developed has been commendable. Mining sector triggered many backward and forward linkages in the economy, especially transport, trade, shipping, hotels. This industry considered to be the backbone of the Goan economy; has contributed greatly to the state income and has been responsible for the opening up and development of remote areas of the state with modern communication facilities and has helped Goa to establish itself as an important player in the iron ore export trade of India. Goa's entire minerals production is meant to cater to the international demand and over 60 percent of the country ore export is from Goa. Goan exports of mineral ore in value terms, over the three decades have shown a rising trend, with growth rates rising from -1.23 in 1970s to 5.27 in 1980s and to 12.63 in the 1990s, as is seen in table 4.7.

But minerals being a non-renewable resource, over a period of time the local mining production has turned stagnant and mining companies in Goa meet the export demand by importing mineral ore from Karnataka and Maharashtra. Over the entire period from 1970-71 to 2003-04, the value of local mining production has shown an insignificant growth rate (table 4.7). Even in the decade from 1970 to 1980, the growth rate was less than one percent and further it turned negative in the

period from 1980 to 1990 at -3.55 percent. The growth improved in the next decade to 3.66 percent. Despite of a low growth rate of mining output, its exports have shown a rising trend, mainly due to the growing share of Non-goan mineral ore, bought from mines of neighboring states, to meet the export demand as also the depreciation of rupee in the last one and a half decade, which increased the value of mineral exports from Goa.

**Table 4.7 Average Share and Average Annual Growth rates of Goa's Mining Production & its Exports in value terms**

Period/share growth rates	1970-79	1980-89	1990-99	1970-2003
Mining Output Share in NSDP	10.00	4.26	3.79	5.66
Mining Export's share in NSDP	39.5	27.06	24.67	28.58
Growth rate of Mining Output	0.10	-3.55	3.66	--
Growth rate of Mining Exports	-1.23	5.27	12.63	10.78

Source: Data from various issues of Statistical Pocket books, DPSE Goa, Angle (2001) and GMOEA. Note: Growth rates are statistically significant at one percent.—statistically insignificant.

In 1961 mining was one of the largest employer giving jobs to 12.1 percent of the work force, this percentage declined to 6.38 percent in 1971 and in 1981 to 5.33 percent and in 1991 to 4 percent and still further to 3.42 percent in 1999-2000. Decline in this sector employment has been mainly due to capital-intensive nature of mining operations, Goan mineral ore exporters are using, in order to with-stand international competition. The share of mining as also of exports in the NSDP has shown a gradual decline over the decades, indicating a slow down of the boom in this sector over time.

#### **4.3.1 Causes for the Decline of Mining sector in Goa**

i) Competition from countries like Australia and Brazil with high-grade ores and

who enjoy economies of scale plus state of the art technology and infrastructure have posed a threat to the Goan iron ore industry with its low grade ore coupled with small-scale mining operations.

ii) Most of the Goan iron ore ranges between 58 percent to 62 percent Fe content. Nowhere else are such ores considered marketable. In fact, in other parts of the country such type of ore is treated as rejects. Goan ores, therefore, have to go through an elaborate process of beneficiation / concentration to render them marketable. Stringent demands have resulted in the Goan Mining Industry to consistently improve on its mining methods keeping abreast of technological advancements raising their cost of production. In addition, the rising oil prices and new expensive technologies are turning to be a detriment due to our small-scale restrictive operations.

iii) Restrictive Environment legislation including a ban on mining in forest areas where most of the proven reserves lie pose a problem to the future of the industry in Goa. Further regulatory restrictions lie in the area of the riverine transport infrastructure in the expansion of construction of existing and new jetties, maintenance of ore stockpiles sited on the riverbanks under the Coastal Regulatory Zone legislation.

iv) Added to this is the problem of small sized leases. Further more the lease periods are for very short durations of 20 years only, this naturally acts as a deterrent to investment in sophisticated technologies and expensive machinery.

v) Despite the above-mentioned constraints, to compete with the other international iron ore exporters from Australia and Brazil, the Goan mining companies are using the capital-intensive mining machines, which are imported from Japan, substituting labor largely. This has led to a fall of labor employment in this sector. Mining industry deploys heavy modern equipment in the form of earthmovers, ripper dozers, hydraulic excavators, wheel loaders, dumpers etc., at the mines. The extracted ore is then moved to washeries and beneficiation plants to upgrade the ore to 62 percent / 64percent. A fleet of about 3000 trucks are used by the industry, processed ore is then transported to the river side jetties on the river Mandovi and Zuari and mechanically loaded onto self propelled barges (fleet of 232 in 2004) for delivery to the port of Murmagoa and the Panjim Outer harbors where ore is loaded vide the MOHP or Tran shippers respectively onto vessels for onward dispatch to destination ports in China, Japan, Europe. Despite of capital investment in this sector, this sector has not reaped large economies of scale due to small-scale operations compared to the big suppliers from Australia and Brazil who enjoy economies of scale in production due to their mass scale mining operations.

vi) Goa's mining sector depends on exports and any fall in demand in future will lead to a scale down of production operations, which over the past few years have averaged at 18 million tons. In the event of a fall in world demand, the big suppliers are likely to slash prices to retain their markets. Thus from a sellers market it would become a buyer's market.

However, despite the set backs and competition mining is an important contributor to the total exports and to the per capita income level of the economy and is a big

source of foreign exchange earnings. In absolute terms, the mineral exports of Goa in the country's total mineral ore exports has gone up but in percentage terms, it has declined from 31.5 in the 1960s to 21 percent in 1990s and early 2000. Stiff competition in export markets has led to the drop in the share of mining in the state income and capital-intensive nature of mining operations has reduced employment, pushing labor and resources away from this sector.

#### **4.4 Growth of the Industrial Sector in Goa**

Before Goa's liberation, its economy had hardly any large-scale industry except mining. A few small-scale units were there but their output and employment generation capacity was very limited. However, with liberation of the territory this scenario changed. The economy could not concentrate only on mining activity as it was risky, minerals being a non-renewable resource and importing most of the goods from other states was expensive and would lead to inflationary trend and higher costs of living for the local population. Therefore, it was very vital to make the economy strong and stable. This was attempted through the process of industrialization and it was expected that the multiplier effect of this process would help in the expansion of output, employments and income levels in the economy.

Due to the efforts of the then government and semi-government agencies and some private sector initiative, a number of industries, especially in the small-scale sector came up. As infrastructural facilities especially electricity supply to industrial users, increased there was a rise in the number of small-scale units by ten fold in the post liberation decade. Gradually sophisticated large scale manufacturing units

in pharma, pesticides and fertilizer industry started coming up. To provide an impetus to industrial growth the government set up an Industrial Development Corporation. The corporation started its activities in 1966, by setting up two industrial estates, one at Corlim and the other at San Jose de Areal. The Union Territory of Goa, Daman and Diu were declared a backward area in respect of industrial development and hence became eligible to receive concessional finance from the Central government schemes. Under a scheme of the Planning Commission, Goa district was selected for intensive development of industries in rural areas. Gradually development Finance Institutions like IDBI, IFCI, MSFC and other state agencies were instrumental in boosting investment in the industrial sector. Over the years MSFC, SBI and Commercial banks provided most of the finance to industries.

As per the Annual Survey of Industries, in a span of five years, i.e from 1964 to 1968 the number of registered units increased from 63 to 90, the employment figures went up from 2407 to 3777 and value added by manufacture increased from Rs. 42.72 lakhs to Rs. 100.67 lakhs. By 1970, 500 small-scale industries with a fixed capital investment of Rs. 3.00 crores and labor force of 6250 persons with an output of a value of Rs. 3.5 crores were functioning in Goa. The Economic Development Corporation (EDC) the premier development bank in the state set up in 1975 helped in attracting a number of large-scale industries in the areas of electronics, pharmaceuticals, engineering, etc., and in training entrepreneurs. Besides this the Central Government declaration that almost the whole of Goa as an industrially backward region continued and hence industries setting up in Goa become eligible for 15 percent and later 25 percent capital subsidy, soft loans and

tax concessions. Later on, the state government itself started operating this scheme. Thus, due to a strong institutional and financial support of the state, the industrial growth in the economy took off at a rapid pace. The industrial structure has diversified from the manufacture of traditional products like food products, beverages, textiles, wood furniture to electronics, chemical products, refined petroleum products, batteries, machinery optical instruments and the like. The manufacturing activity in particular has grown rapidly in the last thirty years.

#### **4.4.1 Contribution of the Industrial Sector to the Economy**

The contribution of the industrial sector in the economy can be known through its contribution to the Net State Domestic Product and total employment. The industrial sector is the second largest sector after the service sector. Table 4.8 shows that in the 1970s, the share of the secondary sector in the total NSDP was 19.50 percent, of which 14 percent was contributed by the manufacturing sector. In the 1980s, this share rose by two folds, to 28.17 percent and in 1990 to 1999, it declined to 26.62 percent. The manufacturing sector share was contributed almost equally by unregistered and registered industries in the 1970s. However, after 1980, registered industries have dominated the share in the manufacturing and secondary sectors' output. The construction sector in every sub-period has had a smaller share in the secondary sector's output and electricity, gas and water supply have a share of less than two percent in the total. The latter is because Goa does not produce electricity and gas but purchases these utilities from other states.

If the pre-statehood and post statehood periods are compared, one finds that the share of registered industry has nearly doubled in the post statehood period. The unregistered industry showed a decline in its share of output in this period. The construction industry has a small share in the NSDP, but it has increased marginally in the post statehood period. The share of Electricity, Gas & Water

**Table 4.8 Average Shares of the Sub- Sectors of Secondary Sector (in percent)**

Sub-Sectors	1970-79	1980-89	1990-99	1970-86	1987-2003	1970-2003
1. Manufacturing	13.90	28.17	26.62	20	27.47	23.73
1.1 Registered	6.67	21.15	22.87	12.15	23.31	17.73
1.2 Unregistered	7.23	7.02	3.75	7.85	4.15	6.00
2. Electricity, Gas & Water Supply	1.41	-1.59	0.69	-0.03	1.79	0.87
3. Construction	4.19	4.20	5.09	4.24	5.50	4.87
Secondary sector (1+2+3)	19.50	30.87	32.41	24.16	34.76	28.93

supply has improved from -0.03 percent in the pre-statehood period to 1.79 percent in the post statehood period. Over the entire period under study, the manufacturing sector has the highest share of 23.73 percent, contributed mainly by the registered industries with a share of 17.73 percent towards the industrial output.

If the role of the industrial sector in employment is examined, it can be seen from table 4.9, that manufacturing sector had the highest share in total employment till 1993. In 1961, its share was 7.27 percent, which increased to 12.0 percent and 13.13 percent in 1971 and 1981 respectively. However, thereafter there was a continuous decline in this share to 9.87 percent in 1999. On the other hand, the construction industry had a high labor absorption trend, its share in employment, which was only 1.6 percent in 1961, gradually rose to 6.07 percent in 1991, and in 1999, this sector's share doubled to 12.85 percent. The Electricity, Gas & Water Supply have an insignificant share in the total employment in the economy.

**Table 4.9 Sub-sectoral Shares in the Secondary Sector Employment (in percent)**

Sub-Sectors	1961	1971	1981	1987	1991	1993	1999
1. Manufacturing	7.27	12.0	13.13	12.34	12.2	11.05	9.87
2. Electricity, Gas & Water Supply	---	0.38	0.53	1.11	---	2.62	---
3. Construction	1.6	4.45	4.81	5.0	6.07	8.26	12.85
Secondary sector (1+2+3)	8.9	16.8	18.47	17.45	18.27	21.93	22.72

Source: Census of India (1961, 1971, 1981, 1991), CSO (1999), NSSO (2000). --- not available.

The secondary sector as a whole has improved its share in the employment from 8.9 percent in 1961 to 22.72 percent in 1999.

In terms of compound growth rates, from table 4.10 it is clear that there has been a continuous decline in the growth rate of manufacturing sector's employment, implying a capital-intensive pattern of production emerging in the sector. The growth rate of employment in the Electricity, gas and water supply sector was 6.90 percent in the period 1971-1981 and based on the limited data, which is available, the employment growth rate in this sector rose to 15.82 percent. This is mainly due to rise in the government recruitment in the Electricity department. The growth rate of employment in the construction sector shows fluctuations, a sector, which mainly employs migrant labor from neighboring states of the economy. However, in the post state hood period the growth rate in employment of construction

**Table 4.10 Sub-sectoral Secondary Sector Employment Growth rates (in percent)**

Sub-Sectors	1961-71	1971-81	1981-91	1987-93	1993-99
1. Manufacturing	5.04	4.23	2.40	0.83	-1.85
2. Electricity, Gas & Water Supply	--	6.90	--	15.82	---
3. Construction	10.89	0.42	3.87	10.47	6.26

Source: Same as in table 4.10 ---not available.

sector was much higher than that of the manufacturing sector. Thus, in terms of employment construction sector has grown in importance. Thus, manufacturing

sector's share and growth rate in employment has decreased, while its share in income has gone up, over time. Yet the manufacturing sector, dominates the secondary activities and since manufacturing mainly comprises the registered industries, it would be worthwhile to study how this sector has contributed to the growth of manufacturing sector in detail.

For the present analysis, data has been collected for the period 1970-71 to 2003-04, on some key variables relevant to the manufacturing sector, from various reports of the Annual Survey of Industries (ASI), covering all factories registered under Section 2m (i) and 2m (ii) of the Factories Act, 1948 i.e., those factories employing 10 or more workers using power; and; and those employing 20 or more workers without using power. The performance of the registered industrial sector in the economy is analyzed using six key economic variables i.e. the number of factories, amount of fixed capital, total number of workers, number of employees, the gross output and the net value added and structural ratios such as net value added per worker, wages per worker, number of workers per factory, fixed capital per factory and fixed capital per worker an important technical coefficient viz. fixed capital to gross output, for the pre statehood and the post statehood periods and for the entire period of 1970-71 to 2003-04 to find out the trends in growth.

**Table 4.11 Average Annual growth rates of Key variables of Goa's Registered Factory Sector (1970-71 to 2003-04)**

Variables	1970-1986-87	1987-2003-04	1970-2003-04
Number of factories	4.19	6.88	4.23
Total Fixed capital	8.23	15.00	7.73
Total Workers	5.49	5.28	4.04
Total Employees	6.32	5.48	4.48
Gross output	18.44	12.95	12.39
Net Value added.	18.06	13.21	13.00

Source: Government of Goa, (2000, 2005a) Growth rates are statistically significant at 1% level of significance.

If one analyses the table 4.11, it can be observed there has been a rise in the growth rate of the number of factories from 4.19 percent to 6.88 percent. Similarly, the average annual growth rate of fixed capital, which was 8.23 percent in the pre-statehood period, has increased sharply to 15.00 percent in the post statehood period. The growth rate of workers as also employees in the factory sector has shown a decline. The growth rate of gross output as also of the Net Value added has decreased in the post statehood period compared to the pre-statehood period from nearly 18 percent to nearly 13 percent. However, over the entire period, the gross output and net value added have grown at impressive rates of 12.39 and 13.00 percent respectively. The Fixed Capital of the organized manufacturing sector shows an average annual growth rate of 7.73 percent, while number of workers and number of employees grew at lower rates of 4.04 and 4.28 percent respectively during the above period; indicating a capital intensive type of growth in the factories sector. Even the Small Scale Industries (SSIs) show a trend of capital-intensive industrial growth. The employment growth rate was 3.13 percent in the pre-statehood period, but there is negligible growth in employment in the small-scale sector in the post statehood period. On the other hand, the growth rate of investment capital in the sector was statistically insignificant in the pre-statehood period, but this has gone up to nearly 6.00 percent in the post statehood period. The small-scale sector in the post statehood period has seen a negative growth of units due to industrial sickness, negligible employment growth and a

**Table 4.12 Average Annual Growth rates of Registered SSIs in Goa (1970-71 to 2003-04)**

Variables	1970-1986-87	1987-2003-04	1970-2003-04.
Number of Small-scale units	8.68	-2.53	2.89
Employment	3.13	--	2.33
Investment capital	--	5.97	9.05

Source: Directorate of Industries, Panaji- Goa. -- statistically insignificant

high growth in investment capital. Over the entire period, the fixed capital has grown at 9.05 percent whereas the growth rate in employment has been only 2.33 percent. The growth in the number of small-scale units also has been low at 2.89 percent.

#### **4.4.2 Sources of Growth in the Registered Industries**

A look at the various structural ratios shows the probable sources of growth in this sector. The real test of industrial sector performance can be gauged by observing the structural ratios and technical coefficients of the sector over time.

##### **i) Value Added per Worker**

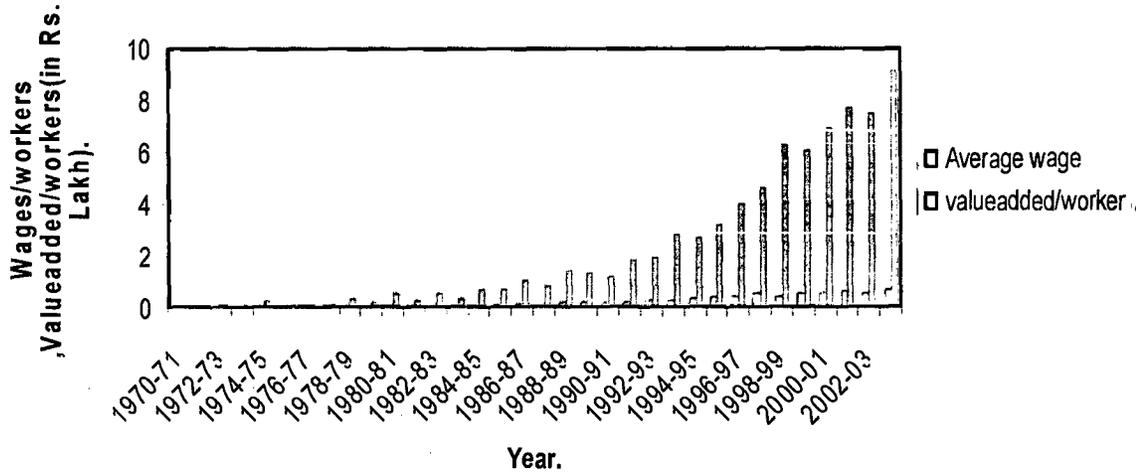
Value Added per worker is considered as a partial indicator of productivity. As the value of raw materials, fuel and other supplies may vary owing to variation in cost, contributions in the form of value added per worker can be a better performance indicator of labor productivity. Figure 4.1 shows that the Value added per worker has been rising over the period of time especially in the 1990s. This indicates a rise in the labor productivity of this sector. On the other hand, the average wage received by workers, shown in the same figure, has increased to a small extent, indicating the lower costs to the industrial sector of hiring labor.

##### **ii) Workers per factory**

The number of workers per factory has direct and indirect implications on the

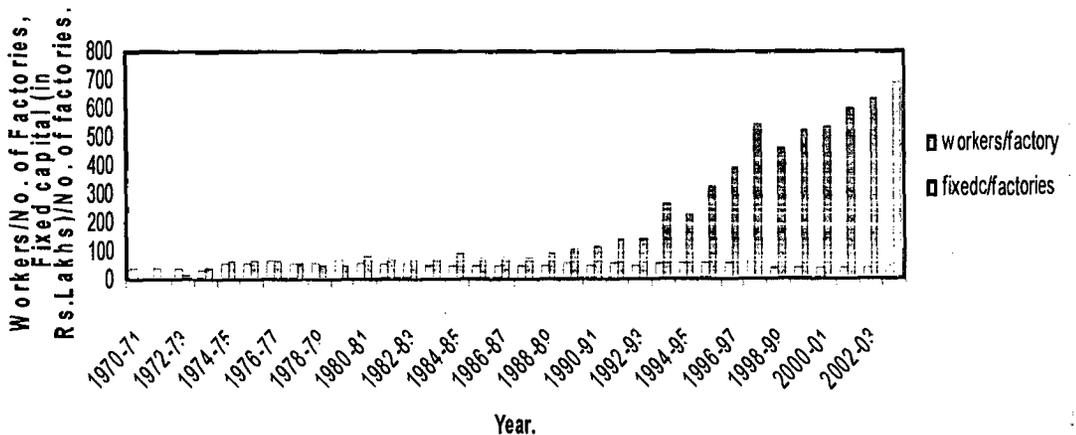
performance of the industrial sector. It not only reflects the concentration of

Figure 4.1 Vaue Added per worker and Average wage in the Factory Sector (1970-71 to 2003-04)



workers in the workplace, but also has an impact on productivity. Figure 4.2 shows that the average factory size as reflected in the number of workers per factory has remained steady, with a slight decline in the early 2000, a pointer towards a lower ratio of workers per factory and hence a capital intensive type of industrial structure.

Figure 4.2 Workers per Factory and Fixed capital per Factory (1970-71 to 2003-04)



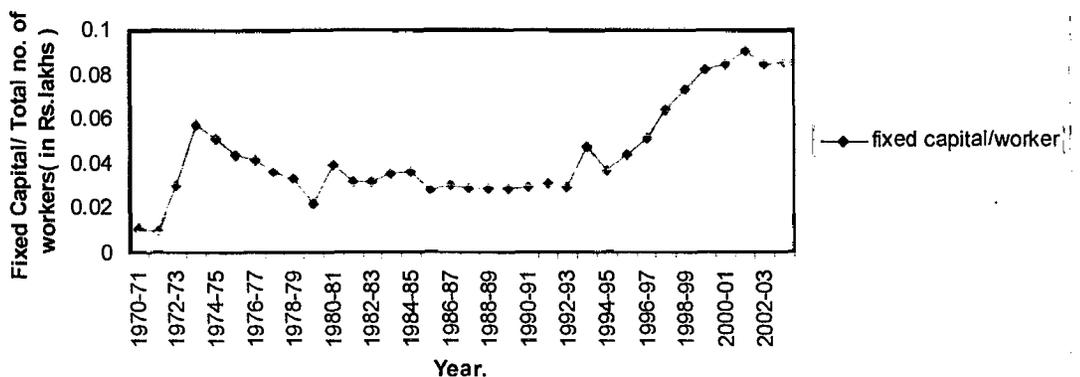
### iii) Fixed Capital per factory

Fixed capital per factory measures the average size of a factory's investment. From the figure 4.2, it is clear that in Goa, over the years the average size of factory in terms of investment has increased, particularly since the 1990s decade, indicating a capital pre-dominant industrial structure.

### iv) Capital Intensity

Empirical findings of sectoral studies reveal that capital intensity and average firm size can have a significant positive impact on labor productivity (Crovers, 1996). Fixed capital per worker can be a close measure of capital intensity and mechanization in the production process. Figure 4.3 shows an increase in capital intensity especially from the 1990s in the factory sector, indicating capital deepening in the factory sector. With more capital per worker, the labor productivity is expected to rise.

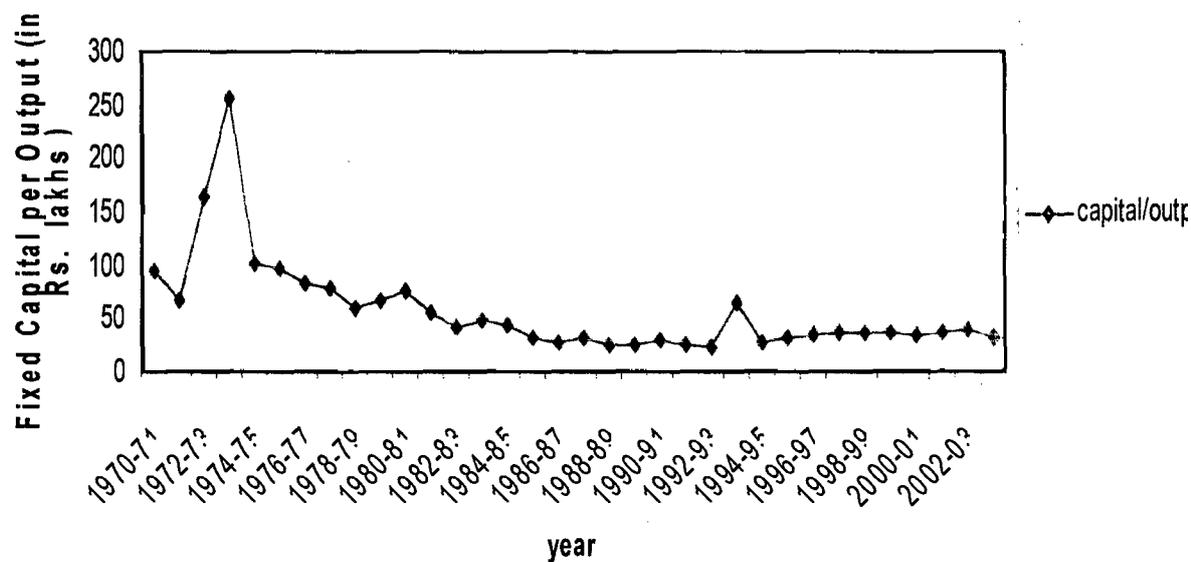
Figure 4.3 Capital Intensity in the Factory Sector(1970-71 to 2003-04)



### v) Capital Output ratio

Investment in fixed capital is made for building capacity, for innovation and for diversification of output. In all these cases the use of fixed capital is justified if it leads to higher growth in the value of output. Thus, change in the capital output ratio is one of the best ways to identify whether the investment in fixed capital has proved efficient or not. Figure 4.4 shows a steady decline in the capital output ratio of the factory sector, which can be attributed to the general improvement in the quality of investment.

**Figure 4.4 Capital Output Ratio in the Factory Sector (1970-71 to 2003-04)**



The high capital intensity of the factory sector is due to presence of a few large-scale capital-intensive units in Goa in the pharmaceutical industry, fertilizer, metal and rubber manufacturing industries in the private sector and a few capital goods industries in the public sector. Thus, it can be concluded that the registered industries in Goa have emerged as a leading sector of the economy mainly due to the initial governmental support as also higher labor productivity, more capital

availability per factory as also per worker and general improvement in the quality of investment coming into the sector. However, the lower requirement of labor in this sector has shifted this factor in search of alternative occupations to the other sectors, especially the service sector. Since the service sector has been the engine of economic growth in Goa, the next section is an analysis of the two most important contributors to service sector growth, i.e the tourism services and banking and insurance services in Goa.

## **4.5 Growth of Tourism in Goa**

### **4.5.1 Early Developments**

Goa's varied natural endowments and unique cultural heritage make Goa a major tourist attraction in India and abroad. Tourism was adopted as a major sector for Goa's development, not only to generate more income, output and employment but also for avoiding industrial development of the kind which would generate social costs in the form of pollution of the quality of air, water and habitat. Hence, the government planned to develop tourism since 1962, as in order to service the tourism industry; development had to begin with the provision of basic infrastructure, especially at important places of tourist interest. Later on with the large participation of the private sector in the hotel and transport industry as also the rapid growth of wholesale, retail trade, commerce the growth of tourism overtook the growth of mining and public administrative services which had in the decade of 1970s contributed towards growth of the NSDP and the service sector growth in Goa.

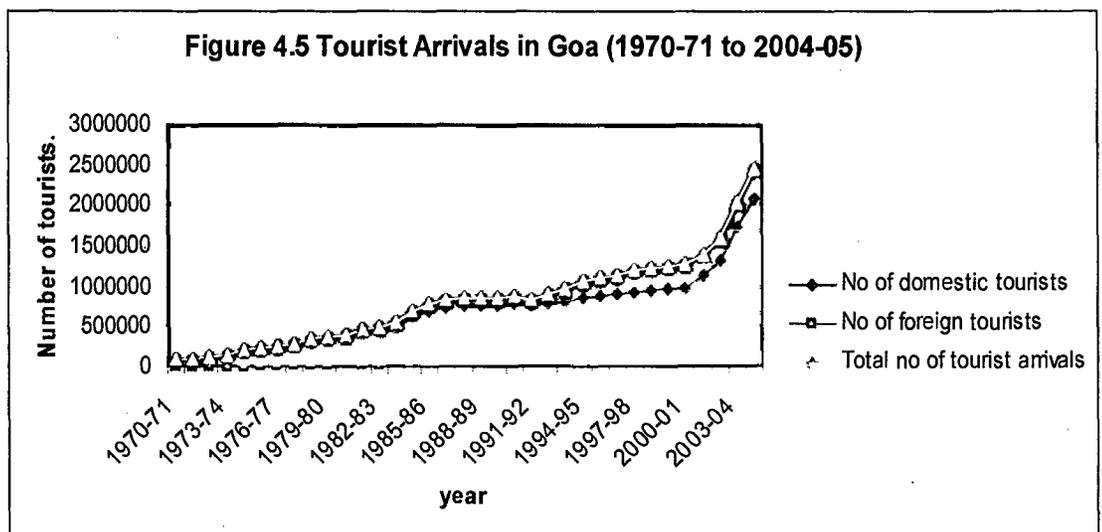
Prior to liberation tourism was almost absent in Goa. In 1960, a centre of Information and Tourism was started. Tourists were mainly Goans who used to come in holidays from the rest of India and the Portuguese colonies abroad. A few foreigners used to come on official visits. After liberation, the gateway of tourism opened, with more than a lakh of them coming every year. The then government developed the essential infrastructure services initially. During the third five year plan an allocation of Rs. 26.75 lakhs was utilized for tourism infrastructure development. The Central government provided Rs 10.44 lakhs during the third five-year plan and Rs.26 lakhs during the fourth five-year plan for the development of tourism (Government of Goa, Daman & Diu, 1971). Thus with the initial public investment the tourism sector grew rapidly there after. The Government declared many tax holidays and concessions to the hotel industry, which attracted many deluxe hotels in Goa for promoting high-end tourism. Thus the initial public investment, created a climate conducive for private investment and growth in the tourism sector in Goa.

#### **4.5.2 Factors of Tourism Growth in Goa**

##### **(i) Growing Domestic and Foreign Tourist arrivals**

Tourist arrivals in Goa have shown a continuously rising trend since 1961. In 1964 the total number of tourists, which visited Goa, were 50,000 most of them were domestic tourists. However, the tourist influx into Goa increased in ten years, to 2 lakhs in 1974-75. The total number of tourist arrivals was 3.84 lakhs in 1980, this figure jumped to 7.75 lakhs in 1985, further to 8.78 lakhs in 1995 and 20.8 lakhs in

2004. The year, 1985 was crucial for Goa, from the point of view of foreign tourism, as charter flights from abroad started in 1985, which marked the onset of high-end tourism. Until then the tourism activity was not gaining much in terms of foreign exchange earnings. The decade of 1990s, saw a rise in the growth rate of tourism, the highest annual percentage growth took place in 1994 with tourist arrivals of 10.59 lakhs. By 2004, the number of tourists visiting Goa has reached almost 21 lakhs, with an annual percentage change of 20.07 percent from 2003. Over the last 40 years, the number of domestic tourists coming to Goa has been



more than that of the foreign tourists, but the domestic tourists' share is declining from 95 percent in 1969-70 to 85 percent in 2004-05. In addition, the share of foreign tourists though fluctuating is on the rise to 15 percent in 2004-05 from merely 5 percent in 1969-70. But the average annual growth rates of domestic and foreign tourist arrivals given in table 4.13 show some different results. The rapid growth of tourist arrivals took place in the decade after Goa attained liberation. Domestic tourist arrivals showed an average annual growth rate of 19.40 percent and foreign tourist arrival had a higher growth rate at 22.57 percent during 1970-1979. In the next decade i.e from 1980 to 1989, the growth of domestic tourism

**Table 4.13 Average Annual Growth rates of Tourist Arrivals (in percent)**

Period	Domestic Tourists	Foreign Tourists	Total Tourists
1970-1979	19.40	22.57	19.63
1980-1989	9.47	16.85	10.10
1990-1999	3.00	14.00	5.00
1970-1986	15.00	19.42	15.36
1987-2004	5.16	8.89	5.68
1970-2004	8.21	13.19	8.78

Source: Various issues of Statistical Pocket Books, DPSE, Panaji and Tourist Statistics Government of Goa (2002, 2003b, 2004a, 2005b), Department of Tourism, Panaji.

declined to a low of 9.47 percent compared to the previous decadal growth rate, similarly the foreign tourism growth had declined to 16.85 percent, though this was higher than the growth rate of domestic tourism. In the time period from 1990 - 1999, domestic tourist arrivals showed the lowest growth rate of 3.00 percent, compared to its previous decades' growth rates. Foreign tourist arrivals also showed the lowest growth rates compared to their growth rates in the 1970s and 80s, at 14.00 percent, yet this growth rate was higher compared to the growth rate at which domestic tourist arrivals grew. Thus in every decade, the foreign tourist arrivals showed a higher growth rate relatively to their domestic counterparts growth rate. A similar trend can be observed for prestatehood and post statehood periods. Over the entire period, the rate of growth of foreign tourists is higher at 13.19 percent than that of their domestic counter parts, which was 8.21 percent and is expected to be so in the near future. If the total tourist arrivals are taken, the highest growth was in the 1970s and over the decades, the growth rate of total tourist arrivals is on the decline to 5.00 percent in the 1990s. The growth rate of tourist arrivals was higher in the pre-statehood period compared to the post statehood period. Foreign tourism has grown due to charter tourism. The numbers of charter flights have rapidly increased from 24 in 1985 to 299 in 1993 and by 2004, the number of flights went up to 684. The number of charter flight tourists

has also grown from 3568 in 1985 to 58,369 in 1993-94 to more than 1.58 lakhs in 2004-05. The percentage of charter flight foreign tourists as a percentage of the total foreign tourists is rising. The charter tourists were a small fraction i.e 3.8 percent of the total foreign tourist arrivals to Goa in 1985, but this percentage has grown to 43 percent in 2004-05, indicating a trend of high-end tourism setting in Goa.

**Table 4.14 Growth rates of Charter flights and Passenger Arrivals (in percent)**

Period	Charter flights	Passengers
1985-1994	33.14	31.56
1995-2004	6.35	6.41
1985-2004	20.18	16.26

Source: same as in table 4.13.

The table 4.14 shows that average annual growth rate of charter flights was 33.14 percent in 1985-1994 period and the growth rate of charter tourists was a high of 31.56 percent. However, the next decade saw a sharp fall in growth rates of both charter flights as well as charter tourists. International shocks like the September 11 terrorist attacks in 2001, the outbreak of SARS in Asia and South East in 2002, and Tsunami which took a big toll of life in 2004, could be some reasons why there was a slow down in the foreign tourism in Goa and in India, in the last four to five years. But for the entire period, from 1985-2004, one finds a charter flights as well as charter passengers have shown high growth rate of 20.18 percent and 16.26 percent respectively.

If the foreign tourists are considered by their country of origin, there has been a change in the countries from where foreign tourists come. For instance, in the early 1970s, Goa received most of the foreign tourists from U.S.A, U.K, and Germany with the maximum number of tourists from USA until the year 1974-75. Thereafter

the largest number of tourists has been coming from U.K. except, during 1979 up to 1982, when Germany topped in the category of foreign tourist arrivals. During the period from 1994 to 2004, Goa has been receiving the largest number of tourists from U.K, mostly charter tourists with an average annual arrival of 1.14 lakhs, followed by Germany with an average annual arrival of 24.4 thousand

**Table 4.15 Foreign Tourist Arrivals in Goa by Country of Origin (in percent)**

Countries	1994-95	2004-05
U.K.	<b>74.00</b>	<b>41.00</b>
Finland	-	<b>9.66</b>
Germany	<b>14.90</b>	<b>7.29</b>
Russia	-	<b>7.05</b>
U.S.A	1.50	1.68
Sweden	-	2.66
France.	1.88	2.22
Switzerland.	3.64	2.60
Portugal	-	1.05
Others	4.08	24.79

Source: same as in table 4.14. - Negligible.

tourists. Though Goa is a former Portuguese colony, the tourists' arrivals from Portugal are 3111 on an average from the period 1994-2004. In the recent past tourists from Finland, Russia and Germany are increasing in number. However, Goa continues to receive the maximum number of foreign tourists from U.K, every year. Table 4.15 shows that in 1994-95, 74 percent of the foreign tourists were from U.K followed by tourists from Germany with a share of 15 percent. In 2004-05, though U.K topped the list of foreign tourist arrivals there was a decline in their share to 41 percent in 2004-05. Similarly, the share of German tourists dropped to half of its share a decade ago. This was due to the rise in the share of foreigners

from Finland and Russia. Thus, one finds foreign tourists from U.K predominate; yet new destination tourists have also started visiting Goa. This goes to point out that Goa is becoming known as a good tourist destination across the globe.

### **(ii)Public Sector Investment in Tourism**

The investment in tourism infrastructure, generally takes in the five areas of hotels, restaurants, transport facilities, boutiques and entertainment or leisure or sports facilities. While hotels and restaurants can be treated fully as tourist oriented, not all the other above-mentioned activities can be treated as generating exclusively tourist-oriented activities. It is difficult to estimate the extent of investment in these activities, solely attributed to tourism. In Goa, the growth of Tourism infrastructure during the pre-state hood period can be mainly attributed to direct government investment in hotel and transport sector, mainly through the budgetary route and the setting up of Goa, Daman and Dui Tourism Development Corporation, now Goa Tourism Development Corporation (GTDC). In the post-statehood period, the government boosted private sector participation in hotel industry by giving long-term loans to the latter, through the development Finance institutions like Economic Development Corporation (EDC) and Maharashtra State Finance Corporation (MSFC).

The budgetary expenditure of the government under tourism shown in table 4.16 reveals that, the growth rate of its revenue expenditure under the head tourism for the entire study period is 12.18 percent. During pre-state hood, it was 16.74 percent and it increased to 20.00 percent in post-statehood period. Capital expenditure

during post-statehood period was 10.51 percent, which was lower than that of the current expenditure. Total budgetary expenditure, shows a growth rate of 12.96 per in the three decades. During pre-statehood, the growth rate was higher at 17.78 percent and in post statehood period the growth rate declined to 15.69 percent. Thus, one can conclude that the growth rate of budgetary support for the tourism sector in Goa has declined to some extent in the post –statehood period.

**Table 4.16 Growth Rates of Budgetary Expenditure under Tourism (in percent)**

Period	Revenue Expenditure	Capital Expenditure*	Total Expenditure
1970-2003	12.18	-	12.96
1970-1986	16.74	-	17.78
1987-2003.	20.00	10.51	15.69

\*Capital expenditure growth rate is calculated for post statehood period, as continuous data for pre-statehood period is not available.

GTDC was set up by the government way back in 1982, with the underlying objective of providing tourist facilities and services to middle and lower income group tourists, as they constitute the bulk of the tourist traffic. In 1982, GTDC made a modest beginning with 92 rooms and 224 beds. By 2005, it had 15 properties accounting for 1340 beds, which is about 5 percent of the total bed strength in the State. There has been a clear increase in the assets owned by GTDC over the period since its inception until 2003-04, from Rs. 0.84 lakhs in 1982 to Rs. 2351 lakhs respectively. However, the utilization of the created assets has been declining as can be seen from the decline in the occupancy rates of GTDC. One of the reasons for this is the mushrooming of small lodging boarding; in the major cities of Goa. These offer the low-end tourists' accommodation at comparatively cheaper rates than GTDC. Goa's premier Development Finance Institution, the Economic Development Corporation (EDC) has lent large funds to the hotel industry. EDC has been a major investor in the Hotel industry in Goa. Financing a

single project in 1975, of Rs. 2.5 lakhs, EDC financed 13 projects worth Rs. 24 lakhs in 1978. Its major loan financial assistance took off from 1985-86, the year high-end tourism or charter tourism started in Goa. A large part of loans was sanctioned in the decade of 1990s, mainly to private hotels in Goa. Similarly, the Maharashtra State Finance Corporation (MSFC) has given a major part of its total financial assistance to the hotel industry. Although MSFC financed a number of projects in late 1970s and early 1980s, the largest loans in terms of value have been financed during post state hood period. Thus, Government assistance from both the Centre and State Governments has facilitated the growth of hotels and restaurants in the private sector in the state. Hotels are the most important component of any tourism infrastructure, which has dominated the tourism industry of Goa.

### **(iii) Growth of Hotels and Restaurants**

The growth of the tourist inflow to Goa has directly influenced the growth of the hotel industry. The number of hotels increased from 49 in 1964 to 138 in 1975-76 i.e. an average annual growth rate of 16.51 percent. The number of starred hotels increased marginally from four in 1965-66 to seven in 1975-76. The beds in all hotels also increased from 1048 in 1964 to 3671 in 1975-76 and to 3870 in 1976-77 (Government of Goa, Daman and Diu, 1978). By 1980, the number of hotels went up to 196, of which 12 were star hotels and 184 were non-star hotels, with 6587 bed capacity. According to 1988 data, 11,140 beds were in operation distributed across 281 hotels and lodges in Goa. In 1993, the total number of beds in hotels in Goa were estimated to be 15,100 and the total number of rooms were around 7500, of these 1686 (22.48%) were in the Star Category hotels and the

remaining, 55 percent were in the approved ABC category hotels and the remaining were in the unapproved category. The status of accommodation of domestic and foreign tourists, talukawise, from the Tourism Maser Plan 2011, shows that in the year 1994, there were 400 hotels with 17500 beds, with 16.90 beds per 1000 tourists. In 1996, the hotels increased to 436, with a bed capacity of 18391 with 16.0 beds per 1000 tourists. Tiswadi has the highest number of hotels, followed by Salcete and Bardez talukas. Since Goa has been projected essentially as a beach leisure resort, 77 percent of the hotels and resorts have come up along the coastal belt with 73 percent of the total bed strength. In fact, statistics reveal that 77 percent of the domestic tourists and 95 percent of the foreign tourists prefer to stay in coastal areas (Kamat, 1997). The total number of hotels (including star category hotels)/paying guest houses with rooms/beds capacity in the state of Goa as on 2005, show that the number of hotels has risen to 2156, an almost 10 fold rise from the time of statehood. The number of rooms is 19312 and the number of beds is 36618. Of the total number of hotels in Goa, 78 are in the star category with 5836 rooms and 11441 beds. It is worth noting that along with the star and good category hotels there has been a mushrooming of hotels, joints and restaurants in the informal sector too. The number of hotels in the informal segment was 2336 in 1970 and it has increased to 3733 in 1998 as given in table 4.17. There has been a

**Table 4.17 Number of Tourism based Enterprises in Goa's Informal Sector**

Sector	1980	1990	1998
Wholesale and Retail Trade	13,892	20,691	26805
Hotels and restaurants	2,336	2929	3733
Total	21,628	23,620	30,538

Source: Government of Goa, Daman & Diu (1980), Government of Goa (1990 & 1998).

twofold rise in the number of wholesale and retail trade between the same periods.

Thus, the informal sector has also contributed to the growth of tourism services.

#### (iv) Tourist Transport Services

Since Goa is geographically very small, with distances, which can be easily covered by road transport the public road transport system has grown very fast. This system in Goa comprises of buses, motor cabs (taxis), auto rickshaws and pilots (motor cycle taxis). It is estimated that about two-thirds of the bus operators are in the private sector. The state owned Kadamba Transport Corporation (KTC) operates parallel to the private sector and is in direct competition, except on Margao-Panjim and Vasco- Panjim routes, which are nationalized. The Corporation, which has a fleet strength of 331 buses, operates services within Goa state as well as from places like Mumbai, Pune, and Bangalore etc.. Though the residents of Goa use the intra-state services of KTC, the inter-state services cater mainly to the tourist population. A large number of private tour operators also run bus services from Maharashtra, Karnataka etc. to Goa. The major sources of tourist transport within Goa are tour and travel agencies and tourist taxis. The dichotomy is not mutually exclusive, for some tour and travel agencies operate tourist taxis too. Tour and travel agencies generally provide facilities for internal sightseeing and for long distance transportation of tourists through the operation of a sizeable fleet of buses, owned by them or on contract. They also act as booking agents. Besides these, there seems to be also an unspecified number of private vehicles operating on the sly, as alleged by the licensed operators (Institute of Social Science, 1989). Another mode of transport, which has found favor with the tourists, is the motorcycle taxi, popularly known as pilots. This two-wheel single seater facility is found to be the cheapest mode of internal transport, among tourists. In 1966, total number of taxis was 622 and buses were 517. In 1972, the

number of taxis increased to 1049, buses to 880 and rickshaws were 43. There has been a steady growth in all the types of tourist vehicles. In 2000, the number of taxis increased to 6788, buses to 2798, auto rickshaws to 3061 and motorcycle pilots to 4913. The GTDC also organizes sightseeing tours to various spots in Goa. The Corporation has a fleet of 17 coaches comprising of mini-buses, luxury – coaches, air-conditioned coaches etc., with a total capacity of about 350 seats. In 2004-05, the tourist taxis were 9036, followed by motorcycle taxis, which were 6343, while the total number of buses was 5267 and autos were 3420. Thus, the growth in various modes of tourist transport services has helped to boost this industry further.

#### **(v) Electricity Supply**

Electricity is one of the major areas of priority for the state economy, as Goa does not generate its own electricity but the requirement of power is met by supplies from Korba and Vindhyachal NTPC station in the Western grid and from Ramagundam NTPC station in the Southern grid. The total peak power in 1992-93 was 152 MW. The total power allocated to Goa, from the western grid is 306 MW and from the southern grid 100 MW. The state has been allocated an additional 57 MW of power. The demand for power for the last decade indicates a growth rate of ten percent every year and the same would continue in the future. It is observed that among the various sectors, industry and domestic sector have been the major consumers of power, followed by commercial sector. The power consumption, of the commercial sector, which mainly includes tourism sector, has growing at the rate of 8.50 percent in 1970-2003 period. The consumption of electricity in hotel

industry is of the order of 50 million units, which is around 8 percent of the total consumption (Kirloskar Consultants, 1994). Overall, the power requirements of the hotel sector have been fulfilled by adequate supply of power, although the quality of power supply supplied especially to the airports needs to be improved.

Thus, tourism industry in Goa has developed rapidly due to public investment, financial support from banks and financial institutions, growth of hotels and tourist transport vehicles and adequate electricity facilities.

#### **4.6 Growth of Banking and Insurance Services in Goa**

Finance and credit play a vital role in the socio-economic development of a region. Lack of adequate finance has been one of the main problems confronting the growth, establishment and survival of small enterprises whether they are engaged in agriculture, industry, trade or any other type of service (Government of Goa, Daman & Diu, 1978). The role of banks in economic development of a state or nation is to ensure a steady supply of funds, by stimulating and channeling the savings of surplus units for productive real investment. Thus, banks transform financial assets into real assets in an economy contributing to its capital formation and long-term growth.

##### **4.6.1 Growth of Banking in Goa**

When Goa was a Portuguese colony, there was hardly any formal credit institution. Merchants and proprietors used to lend out cash for social and religious

ceremonies as well as for purchase of necessities and luxuries. Banco Nacional Ultramarino with its Head Office in Lisbon was the only commercial bank operating in Portuguese enclaves in India with four offices in Goa. To help the local people and religious institutions, another Bank called Caixa Economica was established in 1947 authorizing it to accept deposits.

Immediately after liberation, in 1961, The State Bank of India (SBI) opened its first office in Panaji on January 2, 1962. Other commercial banks followed in quick succession within ten years, more than 130 offices of commercial and cooperative banks started functioning in the Union Territory of Goa, Daman and Dui. Sixty percent of the bank offices were in the rural areas. The spurt in the growth of banking in Goa was especially after the nationalization of major scheduled commercial banks in 1969. By 1981, the bank offices were 242 and in 1991, there were 311 banks in the economy. Today there are 337 commercial and 128 Cooperative banking offices, 5 Financial Institutions and SBI is the Lead Bank of Goa.

The average annual growth rates of the number of banks, bank deposits, bank advances and Credit Deposit (CD) ratio over the entire time period from 1970-71 to 2004-05, in table 4.18, show that the number of bank offices grew at 4 percent, with deposits growing at a high rate of 17.11 percent in real terms, but credit or advances grew at a lower rate at 15.00 percent. As a result, the credit deposit ratio has registered a negative growth rate of 1.82 percent. In the seventies due to spurt in the growth of bank branches, the growth rate of new offices was high at 9.27, with deposits growing at 9.75 percent and credit growing at 6.21 percent.

However, the credit deposit ratio recorded a negative growth of -3.32 percent. In eighties, though there was hardly any perceptible growth in the number of branch offices, deposits and credit growth rates reached double-digit growth rates of 14.86 percent and 12.74 percent respectively. In the nineties, with deposits growing at an all time high, growth rate of 16.08 percent and credit at a rate of 12.83 percent. However, the credit deposit ratio showed a negative growth rate of -2.88 percent. Thus, in every decade, there has been an upward movement in the growth rate of bank deposits as well as bank credit, since the bank credit has been growing at a

**Table 4.18 Average Annual growth rates of the Number of Banks, Bank Deposits, Advances and C/D ratio (1970-71 to 2004-05) (in percent)**

Item	1970-79	1980-89	1990-99	1970-2004
Bank Offices	9.27	0.47	3.63	4.00
Deposits	9.75	14.86	16.08	17.11
Credit	6.21	12.74	12.83	15.00
C/D Ratio	-3.33	-1.87	-2.88	-1.82

Note: The Deposit and Credit figures are deflated by the NSDP deflator.

lower rate than that of bank deposits, the credit deposit ratio has shown a negative growth rate in every decade as also for the entire period under study. There are certain factors, which have influenced the growth of deposits and credit and banking services in the economy.

#### **4.6.1.1 Factors influencing Deposit Growth**

Bank deposits, which were Rs. 13 crores in 1961-62, touched a figure of Rs. 68.5 crores in 1971. Per capita deposits were Rs.700, one of the highest in India. The population served by one banking office was 6000. By 1981, total bank deposits reached Rs.349.01 crores and by 1991, the total deposits were Rs. 1933.22 crores.

In 2004 the number of bank offices have reached 465, holding public deposits of Rs.13, 014.82 crores. During this period, the total deposits with commercial banks and cooperative banks especially urban cooperative banks increased substantially, partly due to higher marginal propensities to save out of higher income levels of the local population and partly due to the large inflows of remittances of Goans working in Gulf countries since the 1980 until the present period. The Non Resident Emigrants (NRE) deposits during the period 1992-93 to 2002-03, grew at an annualized rate of 19.7 percent. NRE deposits, which were 25.37 percent of the total deposits increased to 29 percent of total bank deposits in the economy during the above-mentioned period. Tourism, manufacturing and mining exports also contributed to the growth of deposits in the state. This can be concluded from the fact that in the 1990s till mid 2000, the coastal talukas of Salcete, Tiwadi and Bardez held the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> rank respectively in deposit mobilization. The fourth ranked taluka is Mormugao, the main port for transportation and exports of mineral exports. In 2004-05, these four talukas held 88 percent of the total deposits of the banking system with Salcete having the highest share of 28 percent, followed by Tiwadi at 26.4 percent, Bardez 21.8 percent and Mormugao 11.7 percent (Government of Goa, 2005c). Thus, tourism, industry, mining exports and remittance income have largely contributed to deposit expansion in Goa.

#### **4.6.1.2 Factors influencing Growth of Bank Credit**

During the year 1961 gross credits advanced by banks in Goa were Rs 3crores but total advances steadily increased from Rs. 35.2 crores in 1971 to Rs.132 crores in 1981 to Rs 700 crores in 1991 and finally by 2004 the total bank advances and loans have touched Rs.3674 crores. In the 1960s and 1970s banks were not able to

grant loans to farmers as under the Tenancy Act, where ever the government is the owner of the agricultural lands on which tenant farmers, were allowed to cultivate farm lands, the latter were not permitted to mortgage lands to commercial banks, as they were not the owners of that land, though short term crop loans were given by banks to these tenant farmers. Banks granted liberal credit to retail trade, hotels, distributive activity and small services in 1970s. Also medium term loans were given for mechanization of mines, acquisition of earth moving equipment to the mining industry. Small-scale units received financial assistance of Rs. 1.5 crores in the 1970s. However, the trend of banks not giving credit to agriculture sector has changed. The sector wise commitment of financial institutions under their annual credit plans, shows that in every period, the highest share of funds has been assigned to the service sector, followed by the industry sector and the lowest share has gone to the agriculture sector. This pattern of credit deployment is in tandem with the structural and growth pattern of the state economy, which has seen the rise of service and industrial activities. The reports on Credit Deposit ratio in Goa from 1992 till 2004, showing the taluka wise credit advanced by all the banks, indicates that Tiswadi taluka, famous for tourism ranked highest, followed by Salcete, which is an important centre for industrial as well as tourism activity. Mormugao, a busy export port and Bardez, a tourist attraction were ranked third and fourth respectively. In 2004 the highest share of credit of the total advances went to Tiswadi (40 percent), followed by Salcete (20 percent), Mormugao (15 percent) and Bardez (11.0 percent).

Analysis of the performance of sector wise bank credit committed by all the financial institutions and banks in particular in table 4.19 reveals that in 1985-86,

the agricultural and allied activities received 25 percent share in the total credit, while industry got a lower share of 12.51 percent and the service sector received the largest percentage of total credit at 62.06 percent. By 2000-01, there was a change in this sectoral shares of credit, with a sharp fall in the funds allotted to agricultural sector (7.85 %), followed by a rise in the credit allocated to the industrial sector (32.59 %) and a fall in the share going to the service sector (59.55 %), though the latter continued to enjoy the major share of total credit allocation. In 2004-05, there was a marginal rise in the credit to agriculture and allied activities to 8.89 percent due to the initiative of the NABARD to finance many self-help groups for self-employment generation under various Central Government schemes. There was a marginal rise in the share of industrial credit to 33.48 percent as also in the credit committed to the service sector (60.54 %). Thus, sectoral shares of credit committed and allocated reveals that majority of the funds have been going to the service sector due to the latter's rapid growth,

**Table 4.19 Sector-wise Commitments of all Financial Institutions under Annual Credit Plan for Goa (Rs. in lakhs)**

Sector	1985-86 (31/01/86)	2000-01 (31/03/01)	2004-05 (31/03/05)
1) Agriculture & allied activities	771.53 (25.42)	2603 (7.85)	4171.48 (8.89)
i) Crop loans	240 (7.90)	735 (2.22)	1569.82 (3.34)
ii) Term loans	531.53 (17.52)	1868 (5.63)	2601.66 (5.55)
2) Industries (SSI etc)	379.68 (12.51)	10807 (32.59)	14326.02 (33.48)
3) Services	1883.32 (62.06)	19744 (59.55)	28385.96 (60.54)
Total	3034.53 (100)	33154 (100)	46883.46 (100)

Source: State Bank of India (1985, 2000 and 2004).

followed by the industrial sector and agriculture has received the lowest share of total credit in the economy. The recovery of credit from the service sector is higher

than the other sectors. It is observed that recovery of funds is around 50 percent or less, for agriculture, in case of industry, it is 57 to 76 percent but in case of services, it is 68 to 90 percent. This is another reason why banks may be encouraged to allocate and disburse more credit to the service sector. Thus, finance and banking services do have linkages with the tourism, and manufacturing sectors. Though this is the truth, a unique feature of the banking sector in Goa is its low credit to deposit ratio, as mentioned in the earlier part.

#### **4.6.1.3 Factors determining the Credit – Deposit (CD) Ratio**

Though the growth of credit has been moderate, the credit deposit ratio in the economy has been stagnating around a low of 30 percent. The CD ratio for Goa shows that it grew rapidly from below 10 in 1962-63 to 55 in 1975-76, but thereafter it declined gradually in the eighties and increased in the early nineties, and thereafter it was stagnant at around 30, until 2004-05. There is also a regional disparity when it comes to deposit and credit mobilization. Most of the banking facilities are growing in urban and coastal areas especially after the entry of private sector banks.

A number of reasons have been ascribed to the low C/D ratio. Firstly the money coming in through large exports of iron ore, manganese ore etc. as also from tourism have created high deposits. In addition, the regular inflow of remittances from Non Resident Emigrants (NREs) which account for 30 percent of the total deposits (Economic Survey 2003-04) is not matched by off-take of credit. In fact, the C/D ratio excluding the NRE deposits is much higher than with it. Another

reason is that many factories operating in Goa have their head offices and finance departments out of Goa. Hence, money borrowed by them is not reflected in credit disbursed by branches in Goa. Thus to that extent there is an under estimation of the credit given by banks. In addition, local governments being against the setting up of large-scale units due to the fear of pollution have allowed small-scale units. Many of the small-scale units being sick and facing problems, banks find it risky to lend and the ones, which are viable their credit requirements are not very large. This is also a reason for low off take by SSI sector. In addition, banks have to compete with development banks like EDC, MSFC that give soft loans to industry under various government schemes. This is also a reason why bank credit to industry is on the lower side. Of course, recently with the growth of large-scale pharmaceutical industries, the share of bank loans to manufacturing sector has increased. However, banks in Goa are now diversifying their loan portfolio by providing personal loans and housing loans. In 2005, banks in Goa had 44 percent of their total outstanding credit due from the industry and 22 percent of the credit was due from clients who took personal loans. Thus, banking services do have linkages with the service sector and the industry.

#### **4.6.2 Growth of Insurance Services**

Insurance services in Goa have grown rapidly due to the high per capita income levels and higher propensity of saving among people. Both life insurance as well as general insurance businesses is performing well in terms of the number of policies sold and the value of premium receipts. The insurance services show linkages with other sectors in the economy. Table 4.20 clearly points out that the share of general

insurance policies in the total insurance business has been the highest in every decade as also over the entire period i.e. from 1970 to 2000. Under general insurance policies, Automobile insurance has been the highest contributor, and its share has gone up in every decade.

**Table 4.20 Share of Various Insurance Policies in the Total Insurance Policies**

Type of Policy (number)	1970-80	1980-1990	1990-2000	1970-2000
1. Life	24.80	21.9	31.19	25.96
2. General	<b>75.19</b>	<b>78.09</b>	<b>68.80</b>	<b>74.04</b>
2a. Fire	12.50	12.27	8.45	11.07
2b.maritime	5.51	4.99	2.25	4.25
2c. Automobile	<b>43.22</b>	<b>50.87</b>	<b>51.68</b>	<b>48.59</b>
2d. Miscellaneous	13.96	9.95	6.41	10.11
Total (1+2)	100	100	100	100

Source: Various issues of Statistical Pocket books, DPSE-Panjim.

Even in terms of the share in total premium, the trend is that the share of general insurance in the total has been the highest in ever decade as also over 1970- 2000 period. However, within general insurance, the contribution of the maritime sector was highest in 1970s and 1980s due to mining exports and by 1990s; the automobile insurance premium share had the highest share, due to rise in the

**Table 4.21 Share of various Insurance Premia in the Total Insurance Premium**

Type of Policy ( number)	1970-80	1980-1990	1990-2000	1970-2000
1. Life	41.32	24.85	22.75	29.64
2. General	<b>58.68</b>	<b>75.15</b>	<b>77.24</b>	<b>70.36</b>
2a. Fire	4.91	11.52	13.06	9.83
2b.maritime	<b>32.23</b>	<b>28.93</b>	18.90	<b>26.69</b>
2c. Automobile	15.76	26.74	<b>34.20</b>	<b>25.57</b>
2d. Miscellaneous	5.78	7.95	11.08	8.27
Total (1+2)	100	100	100	100

Source: same as in table no. 4.20

demand for four wheelers by consumers. Over 1970-2000, share of maritime insurance premium is the highest, closely followed by automobile sector. Thus, insurance services have linkage with the shipping and automobile industry. Thus financial services in Goa appear to have linkages with the tourism, industrial and export sectors.

## **4.7 Determinants of Economic Growth and Sub-Sectoral Growth in a Multiple Regression frame work**

Based on the above in-depth analysis of the overall economic growth and sectoral growth, the determinants of the economic growth and the leading sectors in the economy are being identified with the help of co-integration and multiple regression analysis.

### **4.7.1 Data, Models and Methodology**

In the present study, the determinants of economic growth for the Goan economy over the long term period, 1970-71 to 2003-04, are found out by taking the per capita income (pcy) of the economy as a proxy for economic growth and regressing it on the annual index of industrial production (iip), value of annual iron ore exports deflated by the NSDP deflator (exp), total number of hotels as a proxy for tourism services (hot) and the banking sector output per bank, as a proxy for the banking and finance sector (bank/branch). The banking sector output per bank is taken as a ratio to reduce the multicollinearity problem.

Similarly the determinants of registered industries, trade, hotels and restaurants, banking and insurance sub-sectors which are the leading sectors of the economy, are identified for the period under study, i.e. 1970-71 to 2003-04. The export sector though an important contributor towards the economy's growth, is excluded from the present analysis as demand for exports and subsequently export earnings are dependent mostly on the external factors such as international demand for steel,

iron ore, changes in the exchange rate, cost of shipping, state and central government policies towards mining, etc., data on which are difficult to get for the time period under study. Firstly, based on the qualitative analysis in the foregoing sections, the annual index of industrial production (iip) is taken as a representative of the registered industries and is regressed on the banking sector output per bank (bank/branch), value added per laborer in the registered industries sector (va/l) and the fixed capital per registered factory (fc/f). To find out the factors determining tourism growth in the economy, the NSDP under trade, hotels and restaurants (thr) is taken as the dependent variable and the explanatory variables are government expenditure under the head tourism (gexpdt), total number of vehicles (tveh) including taxis, rickshaws, pilots and buses, as the data on number of vehicles used only by tourists is not available for the entire study period. Besides this, number of hotels(hot), index of annual tourist arrivals (ita), banking sector output per bank (bank/branch) (since in the qualitative analysis, it was observed that tourism based talukas are receiving large credit from banks) and electricity used by commercial sector(elec), as a proxy for infrastructure availability are used in the model. Lastly the banking and finance sector is analysed, by taking the total NSDP generated by the banking and insurance services (bank) as the dependent variable and is regressed on the NSDP under trade, hotels and restaurant services(thr), index of industrial production(iip), deflated exports (exp) and NSDP generated by transport, storage and communications sector(tsc), given the latter is also an important producer service in the economy. All variables are in real terms and to obtain measures of elasticity and ensure normal distribution of residuals, a logarithmic specification has been employed. To rule out the possibility of spurious results, Augmented Dickey –Fuller (ADF) test is employed, the results of which are shown

**Table 4.22 Unit Root Tests for the variables (1970-71 to 2003-04)**

Variables	Model, lags	at levels (actual)	Critical values	Model, lags	at d1 (actual)	Critical values
pcy	None, 1	5.165	-1.61	C+T, 0	-8.66***	-4.27
iip	None, 0	8.647	-1.61	C+T, 0	-6.15***	-4.27
exp	None, 0	1.193	-1.61	None, 0	-5.70***	-2.64
hot	None, 2	1.701	-1.61	None, 0	-2.86***	-2.64
bank/branch	Constant, 0	-1.00	-2.615	None, 0	-5.35***	-2.64
va/l	None, 1	6.236	-1.61	C+T, 0	-9.29***	-4.27
fk/f	None, 1	4.186	-1.61	C+T, 0	-8.86***	-4.27
bank	None, 0	0.306	-1.61	C, 0	-5.23***	-3.65
tsc	None, 0	3.415	-1.61	C, 0	-6.16***	-3.65
thr	C+T, 4	-1.473	-3.22	C, 1	-3.06**	-2.96
gexpdt	None, 1	1.907	-1.61	C, 1	1.185	-2.61
elec	None, 5	- 4.94***	-2.65	None, 6	-2.246**	-1.95
tveh	None, 0	3.56	-1.61	C+T, 0	-5.82***	-4.27
ita	C, 0	- 6.66***	-3.646	None, 1	-7.35***	-2.64

Note: in the above table d1 stands for first difference, C for Constant, C+T for constant + trend. Lags and models are selected based on SIC. \*\*\*, \*\* means statistically significant at 1% and 5 % respectively.

in table 4.22. Based on the findings, it can be concluded that the electricity consumed by commercial sector and the index of annual tourist arrivals are stationary at levels or integrated of order zero while is government expenditure on tourism is non-stationary even after first differencing. The rest of the variables are all-stationary after first differencing or integrated of order one.

To avoid spurious regression results, variables in each equation are tested for co-integration. A regression is known as a co-integrating regression, if the dependent and independent variables although non-stationary, show residuals which are stationary in levels. In such a case, the variables involved in the regression are said to be co-integrated or moving together in time. In a long run relationship of

cointegration between only two variables, it is necessary that both must be integrated of the same order if the error term is to be  $I(0)$ . If the number of variables is greater than two (that is more than one explanatory variable), there must be either none or at least two explanatory variables integrated to an identical order, higher than the order of integration of the dependent variable (Charemza and Deadman, 1997). Since all the variables in the present study, except government expenditure fulfill this condition, this variable is dropped from the analysis and the rest of the variables are tested for co-integration. All variables in each equation are found to be co-integrated. This ensures that the results in the present model may not be spurious.

#### **4.7.2 Estimation and Empirical results (period 1970-71 up to 2003-04)**

##### **4.7.2.1 Determinants of Economic Growth**

Based on the trace test and eigen value tests in table 4.a, in the Appendix I, one can conclude that the variables explaining the per capita growth in the economy over the long term period are co-integrated.

$$\ln pcy = \beta_1 + \beta_2 \ln iip + \beta_3 \ln exp + \beta_4 \ln hot + \beta_5 \ln bank/branch.$$

$$\ln pcy = 6.5 + 0.15 \ln iip + 0.10 \ln exp + 0.17 \ln hot + 0.09 \ln bank/branch.$$

$$(34.81)^{***} \quad (4.94)^{***} \quad (3.76)^{***} \quad (5.17)^{***} \quad (3.48)^{***}$$

**Adj R2 =0.98, DW = 1.69. \*\*\*, statistically significant at 1 percent**

Thus, the economic growth in Goa is explained by the service, industry and export sectors, with tourism services being the main explanatory variable. With a one percent rise in the number of hotels, the per capita income grows by 0.17 percent, a

one percent growth in industrial production, raises growth by 0.15 percent, similarly a one percent rise in exports leads to rise in per capita income by 0.10 percent and banking services raise the income level by 0.09 percent.

#### 4.7.2.2 Determinants of Tourism or Trade, hotels and restaurant services.

All the variables from the qualitative analysis explaining growth of tourism services in the economy have been included, except government expenditure on tourism, since the latter is non-stationary and is having a higher order of integration I(2), than that of the dependent variable thr, which has an order of I(1), hence, this variable is excluded from the model. The results of cointegration are given in table 4.b in Appendix I.

$$\ln thr = \beta_1 + \beta_2 \ln hot + \beta_3 \ln ita + \beta_4 \ln elec + \beta_5 \ln tveh + \beta_6 \ln bank/branch$$

$$\ln thr = 1.93 + 0.46 \ln hot + 0.77 \ln ita + 0.15 \ln elec - 0.04 \ln tveh + 0.29 \ln bank/branch$$

(0.45) (5.51) \*\*\* (2.00)\* (2.058) \*\*\* (-1.479) (3.91) \*\*\*

Adj R2 = 0.94, DW = 1.13. \*\*\*, \* statistically significant at 1 and 10 percent respectively.

The tourism sector has index of tourist arrivals, number of hotels, banking services output per bank and commercial usage of electricity as the major determinants of growth. With a one percent rise in number of hotels, tourism output rises by 0.46 percent, with a one percent rise in banking output per bank, the tourism sector grows by 0.29 percent and though tourist arrivals have a larger impact on this sector (0.77 percent), the result is significant at 10 percent level of significance.

With a one percent rise in commercial electricity consumption tourism services rise by 0.15 percent.

#### 4.7.2.3 Determinants of Industrial Growth

The independent variables explaining industrial growth in Goa, are found to be cointegrated with the variable representing industrial growth, as shown in table 4.c in Appendix I

$$\ln iip = \beta_1 + \beta_2 \ln va/l + \beta_3 \ln fc/f + \beta_4 \ln bank/branch$$

$$\ln iip = 3.17 + 0.65 \ln va/l + 0.06 \ln fc/f + 0.18 \ln bank/branch$$

(5.58)    (7.719) \*\*\*    (0.48)    (1.88) \*

Adj R2 =0.967, DW = 1.40. \*\*\*,\* statistically significant at 1 and 10 percent respectively.

In case of the industrial sector, value added per laborer and banking services emerges as the determining factors. With a one percent rise in value added per laborer the industrial output rises by 0.65 percent and with a one percent rise in banking output per bank, industrial production rises by 0.18 percent, though the latter is significant at 10 percent level of significance. Thus, labor productivity and credit are major factors of industrial production in Goa.

#### 4.7.2.4 Determinants of Banking and Insurance Services Growth

Banking services, one of the most important sectors, contributing to the growth of the economy and of the service sector in particular, is tested with its explanatory

variables for cointegration and the results show there are cointegrating equations, which exist among the variables based on the trace test and the max. eigen value test as given in the table 4.d in Appendix I.

$$\ln \text{bank} = \beta_1 + \beta_2 \ln \text{iip} + \beta_3 \ln \text{exp} + \beta_4 \ln \text{thr} + \beta_5 \ln \text{tsc}.$$

$$\ln \text{bank} = -1.81 + 0.26 \ln \text{iip} - 0.179 \ln \text{exp} + 0.90 \ln \text{thr} + 0.31 \ln \text{tsc}.$$

(-0.965)      (1.844) \*      (-1.18)      (3.88) \*\*\*      (1.80)\*

Adj R2 =0.92, DW = 1.62. \*\*\*, \* statistically significant at 1 and 10 percent respectively.

For the banking sector, trade and hotels or the tourism sector emerges as the most important determinant of growth, with a one percent rise in this sector's output, banking output rises by 0.90 percent, followed by transport services, which raise banking output by 0.31 percent and industrial output which raises banking output by 0.26 percent.

#### 4.8 Salient Observations

The objective of this chapter is to find out factors, which have influenced the lagging and leading sectors of the economy, with a special focus on the emergent sectoral pattern of growth and its implications for the rapid growth of the service sector. Finally, the chapter identifies the determinants of the economic growth and of the leading sub-sectors in the economy.

The following points emerge from the analysis:

- 1) The sectoral analysis of the economy shows that it is the primary sector and agriculture and mining sectors under it, which are the lagging sub-sectors of the economy over the entire period of study and the leading sub-sectors are registered industries under secondary sector, banking and insurance services, tourism services under service sector and exports of iron ore.
- 2) The income and employment of the agricultural sector has fallen over the time period under study mainly due to the uneconomical, very small size of land holdings, inequitable distribution of landholdings, difficulty in leasing out farm lands, inadequate irrigation facilities despite huge public investments; delays in completion of irrigation projects, cost over runs and high cost of farm inputs. The above factors have led to the movement of labor towards alternative career options like retail trade, government services, tourism services, creating scarcity of labor and high input costs in the sector.
- 3) The mining sector employment has declined in importance due to low grade of iron ore, which requires elaborate processing to improve its quality, fluctuations in export demand for mineral ore and the labor displacing capital machinery used by mine owners in Goa in recent times, in order to compete with the big exporters from Australia and Brazil. This has led to a shift of labor from mining to other labor-intensive activities, mainly the service sector.
- 4) The industrial sector has shown a high growth rate due to the high labor productivity in this sector and capital efficiency. Though the share of output in this sector has grown at high rates, the employment in the manufacturing industry has declined, indicating a capital-intensive pattern of production structure emerging. This has reduced work force requirement in industry and pushed labor out of this sector to

the service sector. Thus, changes in the production sector have implications for the growing of service sector employment and output in Goa.

5) The tourism sector has developed due to large number of tourist arrivals, initial government investment, and growth in the number of hotels, sufficient infrastructural facilities and tourist transport services. Banking services are found to be growing due to tourism, industry and mining exports.

6) Multiple regression analysis, also points out that economic growth in Goa over the entire study period has been driven by, tourism, industry, banking and exports. Tourism has tourist arrivals, hotels, electricity and banking output as important determinants. Industrial growth has been mainly determined by high value added per labor and banking services and banking sector growth is mainly determined by tourism, transport and industrial output. Thus, banking and tourism along with industry are the key sectors of growth with a feed back relation among them.

**CHAPTER 5**

**SERVICE SECTOR GROWTH AND**

**SUSTAINABILITY:**

**AN INTERSECTORAL LINKAGE ANALYSIS**

## CHAPTER 5

# THE SERVICE GROWTH AND SUSTAINABILITY: AN INTERSECTORAL LINKAGE ANALYSIS

### 5.1 The Service Sector

Services are a pre-requirement for the running of any economy. Producers and exporters of a various goods and products will not be competitive without access to efficient banking, insurance, accountancy, telecommunications or transport services. Services have helped in reducing production costs and led to consumer savings, faster innovation and technology transfer, thus contributing to the long-term investment and growth of economies. Moreover, the rapidly expanding service sector is contributing more to economic growth and job creation worldwide than any other sector. India too is no exception to this global phenomenon. According to official estimates, the GDP originating from the service sector in the Indian economy, has maintained an impressive growth rate of over 8 percent per annum during the period 1993-94 to 2004-05, in contrast to an average growth of 2 percent in agriculture and a little less than 7 percent per annum in industrial GDP, though the employment growth in the service sector has not been high.

In India, national accounts includes the following activities under the service sector: (1) trade; (2) hotels and restaurants; (3) railways; (4) other transport including tourist assistance as well as activities of travel agencies and tour operators; (5) storage; (6) communication; (7) banking and insurance; (8) real estate and ownership of dwellings; (9) business services including accounting,

software development, data processing services, business and management consultancy, architectural, engineering and other technical consultancy, and advertising and other business services; (10) public administration and defense; (11) other services including education, medical and health, religious and other community services, legal services, recreation and entertainment services; and (12) personal services and activities of extra-territorial organizations and bodies. All these various services are grouped by the Central Statistical Organization (CSO) under four major industrial categories for which it regularly publishes the GDP series, and these are (i) trade, hotels and restaurants; (ii) transport, storage and communication; (iii) financing, insurance, real estate and business services; and (iv) community, social and personal services (Shetty, 2007). At the state level similarly service sector estimates, which form a part of the Net State Domestic Product are computed based on methodology and guidelines provided by the CSO, Government of India and all the States and Union Territories follow it. The production approach, the income approach and the expenditure approach are used to estimate the Net State Domestic Product. The income approach is followed in respect of the service or tertiary sector.

The service sector covers a broad range of activities ranging from intermediary services or producer services, like communication, distribution, transport, banking and insurance demanded by the manufacturing sector and many of which have high value potential, to consumption related services like laundry, hotels and restaurant services, tourism etc., to public or government services. Growth and predominance of the service or tertiary sector in an economy could be of two types depending on which category of sub- services from those mentioned above are

contributing to growth. Firstly, it could be an engine of growth resulting from an increase of skill intensive, high value added activities such as software, communications and financial services- the high value producer services. Secondly, it could be a reservoir of the residual that is a sector, which absorbs the shocks of both agricultural and industrial sectors leading to the growth of low skilled service activities (Babu, 2005). The latter is generally associated with public administrative services, as in such services the existing employed persons are generating higher income from the same real volume of services.

## **5.2 Trends in the Growth of Goa's Service Sector Economy**

Many scholars have discussed and written on various aspects of Goa's economy, but all these are qualitative in nature. In addition, one does not find any quantitative study done, on the service sector of the economy. The present study is an attempt to fill this gap. The study covers the period from 1970 until 2003-04. Continuous time series of Goa's regional income from 1961 till 1969 is not available, so the decade after liberation is excluded from the present study. The data on Net State Domestic Product (NSDP) by industry of origin has been compiled from various statistical pocket books published by the Department of Statistics, Planning & Evaluation, Government of Goa. Economic Survey of Goa 2005-06 has also been used. All the figures used, are in real terms, converted into 1993-94 base year prices, using splicing technique, which is explained in chapter III of the thesis. All the variables are expressed in their log forms.

Goa's service sector is the major driving force of its economy and the growth of

the service sector has been faster than the other two sectors over the past few decades. For a proper understanding of the exact growth centers within the service sector and its possible linkages, the various sub-sectors under the service sector can be classified as per RBI classification (RBI 2002). This is taken as a standard grouping and sub-sectors such as trade, transport and communication, banking and insurance, real estate and business services are classified as 'producer services', while hotels and restaurants and other services as 'consumer services'. 'government services' comprise public administration. In the present study, this classification is adopted with minor variations. Since in Goa other services, especially the health and educational services are provided by the government largely, hence they are included in government instead of the consumer services category, as is done by RBI classification. Again, since no separate data on trade is available, it is clubbed with hotels and restaurants and is treated as part of consumer services. Thus, trade, hotels & restaurants are 'consumer services', transport, communication, storage, finance, banking and real estate form the 'producer services' and community, social and personal services are the 'government services'. The average shares of these various categories of services in the service sector output are given in table 5.1.

A decade wise analysis shows that while in 1970s, government services had the highest share of 34 percent in the total services, by 1980s, though government services continued, having the highest share, the share of consumer services, due to the rapid growth of tourism, also showed an almost equal share of around 26.5 percent. And by 1990s, the share of producer services especially, that of the finance and banking sector, showed the highest share of 31.95 percent, followed

by trade and hotels, with a 28.09 percent share in total services, the latter mainly due to growth of tourism.

**Table 5.1 Average Shares of Sub-Services in Goa's Service Sector (in percent)**

Sectors	1970-79	1980-89	1990-99	1970-86	1987-2003	1970-2003
1.Trade,Hotels &Restaurants (Consumer Services)	21.0	26.3	28.09	24.41	26.15	25.28
2. Transport, Storage etc. (Producer Services)	25.0	23.0	19.11	22.65	20.80	21.74
2.1 Transport by Other means.	21.83	21.21	17.21	20.00	18.29	19.14
2.2Railways.	1.76	0.13	0.43	1.10	0.47	0.78
2.3 Storage	00	0.08	0.06	0.04	0.07	0.07
2.4 Communication	1.42	1.58	1.41	1.51	1.97	1.75
3.Finance, Banking& Real Estate (Producer Services)	20.04	24.20	<b>31.95</b>	21.77	<b>31.00</b>	26.35
3.1Banking &Insurance.	9.00	10.77	20.54	9.38	19.00	14.18
3.2 Real Estate, Ownership of dwelling.	11.00	13.43	11.41	12.39	11.95	12.17
4.Community, Social& Personal Services (Government Services)	<b>34.0</b>	<b>26.50</b>	20.85	<b>31.16</b>	21.67	<b>26.41</b>
4.1 Public Administrative services	14.00	10.51	8.66	12.45	9.01	10.72
4.2 Other Services	20.00	15.99	12.19	18.71	12.66	15.69
Total Service Sector	100	100	100	100	100	100

Over the three decades the share of government services and transport, storage and communication services have declined, while that of the banking and trade, hotels and restaurant services have increased. If one analyses the pre-statehood and post statehood trends for services, one finds that, before statehood, government services were the major services contributing 31.16 percent, followed by trade, hotels & restaurants with a share of 24.41 percent, towards total services output, and in the post statehood period, finance and banking services, with 31.00 percent of the

service output followed by trade, hotels & restaurants with a share of 26.15 percent were the leading sectors. If the entire period under study is taken, the finance, banking & real estate services and government services have almost an equal share at a little over 26 percent, closely followed by consumer services at 25.28 percent and transport services at 21.72 percent. Within the Transport sub-sector, transport by other means has been the major contributor, under finance and real estate sub-sector, real estate services contributed more compared to banking in the 1970s and 1980s, but banking and insurance services, had a higher contribution since the 1990s. Under government services, other services have a higher share than public administrative services in the economy in every period.

If the growth rates, given in table 4.1 in chapter 4 are compared, it is clear that in 1970s, producer services of banking and insurance showed the highest growth rate of 14.52 percent. This was mainly due to rapid expansion of bank branch network in Goa in the years following liberation. This was followed by growth in public administrative services, at 12.97 percent. In the 1980s, producer services like transport services, registered the highest growth, with transport by other means growing at 14.68 percent, followed by banking at 11.36 percent. In 1990s, banking services and trade, hotels & restaurants showed the highest growth rates, in the 1990s.

Since the average shares and growth rates show slightly different results regarding the leading sub services under the service sector of the economy except for the 1990 decade, the weighted average growth rates of the services, following the Chenery and Syrquin method have been calculated in the table 5.2. In this method,

the sectoral shares of the sub services in the total service sector are taken as weights, which are multiplied with the average annual growth rates of each sub sector and divided by the overall growth rate of the service sector. The resulting values have then been normalized to add to 100 percent, though the individual items under sub sectors do not add to their sub sector totals.

**Table 5.2 Weighted Average Growth rates of Sub-Services under Service Sector (in percent)**

Services	1970-1979	1980-1989	1990-1999	1970-86	1987-2003	1970-2003.
1. Trade, Hotels, Restaurants.	21.14	5.50	<b>46.05</b>	19.42	<b>36.84</b>	<b>25.23</b>
2. Transport, Storage & Communications	6.50	<b>44.15</b>	1.27	8.41	12.44	20.82
2.1 Transport by Other means	4.81	<b>41.81</b>	0.45	5.73	6.11	16.43
2.2 Railways	0.787	0.031	1.98	1.85	0.87	0.831
2.3 Storage	0	0.084	-0.03	0.067	0.01	0.03
2.4 Communications	0.568	1.635	2.63	1.85	4.45	2.574
3. Finance & Real Estate Services	<b>29.415</b>	23.77	<b>42.88</b>	<b>20.43</b>	<b>36.45</b>	<b>30.72</b>
3.1 Banking & Insurance	<b>28.907</b>	16.39	<b>41.04</b>	10.03	29.66	19.88
3.2 Real Estate, Ownership of dwelling	9.001	6.226	4.67	10.40	8.60	7.825
4. Community, Social & Personal Services	<b>42.942</b>	<b>26.572</b>	9.79	<b>51.73</b>	<b>14.27</b>	<b>23.23</b>
4.1 Public Administrative Services	<b>27.00</b>	11.66	6.38	<b>28.04</b>	7.67	12.23
4.2 Other Services	14.79	<b>13.90</b>	3.49	23.47	6.54	10.84
Total Service Sector (1+2+3+4)	100.00	100.00	100.00	100.00	100.00	100.00

Until 1960-61, Goa was under the colonial rule of the Portuguese Government and it was deprived of many developmental goals and had to depend on the outside world for most of its goods and services. As a result, the economy was an import

based trading economy; hence, trade and commerce had the highest share among all the services. After liberation, in December 1961, the then government policy to expand public administrative services and social services led to a change in the composition of services. In the next decade i.e. from 1970 to 1979, the service sector share was 42 percent in Net Domestic Product and the highest contributor in terms of growth to the service sector was the community, social and personal services at nearly 43 percent, with public administrative services at 27 percent share. The second major contributor to service sector growth was the finance and real estate services with a weighted growth rate of 29.41 percent due to the rapid expansion of bank branch network and banking contributing at 29 percent. In the decade of 1980s, there was a change in the growth centers, with transport services growing the highest at 44.15 percent due to the growth of transport by other means. In the 1980s the State's public bus transport services, Kadamba bus services started which led to a growth of bus services. Tourism growth also led to the expansion of bus fleets by GTDC and private tour operators. Community and social services were the next highest growing services at 26.72 percent, with other services contributing the most at 13.90 percent. The 1990-1999 sub-period, showed that trade and hotel services had the highest share of 46.05 percent followed by the rise of financial services with banking having a weighted average growth rate of 41.04 percent. Thus in the 1990s, tourism and banking services dominated the service sector growth, while the public administrative services have shown a lesser share. A pre-statehood and post statehood period comparison shows that during the pre-statehood time period community, social and personal services had the highest share of 51.73 percent, contributed by public administrative services at 28 percent, while in the period since statehood, trade, hotels & restaurants and banking

services are leading the growth of service sector at 36.84 and 36.45 percent respectively. Over the entire time horizon of 1970-71 till 2003-04, the financial services have the highest weighted average growth rate of 30.72 percent, due to the growth of commercial and cooperative banking in the economy. The second highest weighted average growth rate is of the tourism-based sector i.e. trade, hotels and restaurants at 25.23 percent. The community and social services and the transport services closely follow this. Thus, producer services of banking and consumer-based services viz, trade; hotels and restaurants are the largest contributors to service sector output in Goa in the recent past.

### **5.2.1 Employment Structure in the Service Sector**

The present analysis intends to understand changing structure of the service sector employment in Goa over the past forty-five years, based on the Census and the NSSO data. The general economic tables published by the Census of India for the years 1961, 1971, 1981, 1991 and the NSS quinquennial employment and unemployment surveys for the years 1987-88 (43<sup>rd</sup> round), 1993-94 (50<sup>th</sup> round) and 1999-2000 (55<sup>th</sup> round) are utilized for the purpose. The share of employment in various sub-sectors of the service sector is given in table 5.3. Within the sub-sectors under the service sector, the share of employment in the community, social and personal services in every decade has been the largest, its share has increased in every census year, from 9.3 percent in 1961 to 21.31 percent in 1999-2000, though the NSSO estimates for 1987 and 1993-94 show a slightly smaller share. In 1961 and 1971, transport services had the second highest employment share of 6.2 and 9.02 percent

respectively, but from 1981 onwards trade and hotel services have the second highest share of employment at 8.5 percent, further rising to 12.01 percent share in 1993-94 and 18.56 percent in 1999-2000. However, the share of transport services has increased from 6.00 percent in 1987-88 to nearly 12 percent in 1999-2000, it is lesser than that of the trade and hotel services. The employment share of trade and hotels is on the rise in every period except in 1993-94. In 1999-2000, community and social services contributed the highest to the total service sector employment, followed by trade and hotels in the state economy. From the sectoral share, let us now move to growth rates in table 5.4.

**Table 5.3 Sub-Sectoral Shares of Employment in Services (percentage of total workers)**

Sub-Sector.	1961	1971	1981	1987-88	1991	1993-94	1999-00.
1.Trade,hotels &restaurants	5.2	8.0	8.5	12.15	14.0	12.01	18.56
1.1 Trade.	---	---	---	8.85	---	8.59	---
1.2 Hotels& Restaurants	---	---	---	3.30	---	3.42	---
2.Transport, Storage& Communication	6.2	9.02	7.12	6.0	8.0	8.22	11.94
3.Finance &Real Estate	---	2.0	2.0	2.0	2.11	4.70	5.8*
3.1 Banking &Insurance	---	---	---	1.00	---	3.00	---
3.2 Real Estate	---	---	---	1.00	---	1.70	---
4.Community ,Social & Personal services	9.3	15.0	17.05	16.27	21.0	19.73	21.*
4.1 Public Administration	---	---	---	4.71	---	6.05	---
4.2 Other Services	---	---	---	11.56	---	13.68	---
Total Service sector	20.7	34.02	34.67	36.42	45.1	44.66	57.62

Source: Census of India (1961, 1971, 1981, 1991), CSO (1999) & NSSO (2000). --- Not available.\* own estimates using simple extrapolation made, due to data being provisional.

The compound annual growth rates of the various sub-services show that in the decade of the sixties and that of the seventies the growth of employment in the community services due to the government services was highest, at 5.01 percent and 4.47 percent respectively. However, in the period from 1981 to 1991, the growth rate of jobs in trade and hotels was the highest at 6.66 percent, followed by, community services at 5.98 percent and financial and real estate services at 5.15 percent. If the post state hood period is taken i.e from 1987-1999, it can be observed that from 1987 to 1993 the growth of employment in financial services and transport was more, but if the later half of the period is taken (1993-1999), trade and transport services have the highest employment growth rates, though the share of transport services in workforce is small. The growth rate of financial services declined because with automation and computerization, in the banking industry, many of its staff has taken Voluntary Retirement. In this period, the retirement age of government employees was reduced from 60 to 58 years and hence the employment growth in the community and public services was merely 1 percent. Thus if the sub services under the service sector are observed , it is clear that in terms of

**Table 5.4 Growth rates of Employment in Service Sector**

Sub sectors.	1961-1971	1971-1981	1981-1991	1987-1993	1993-1999
Trade,Hotels &Restaurants	4.01	4.21	6.66	2.64	7.21
Transport, Storage& Communication	3.62	1	2.39	8.53	6.11
Finance&Real Estate	---	3.62	5.15*	21.53	3.30
Community, Social & Personal services	5.01	4.47	5.98*	6.19	1.006

\*own estimates using simple extrapolation made due to non-availability of data for the mentioned sub- services in 1991 census. --- not available.

income, the government services and banking services contributed the most in the earlier decades, while in the recent years banking and trade and hotel services contributed mainly to service sector output. However, in terms of employment, the share of government services is pre-dominant in every decade, though in the recent years the share of employment in trade and hotels has also registered a rising trend. Banking services though are leading contributors towards service sector output; their share in the service sector employment is low. From this, it is apparently clear, that most of the employment within service sector is either in government services or in the tourism sector.

### **5.2.2 Employment Elasticity of the Service Sector**

In order to get an insight into the employment absorption of the sub-services, the employment elasticity, measured as a ratio of employment growth rate to income growth rate (Bhattacharya and Mitra, 1993) is calculated. Generally if, the service sector employs a lower proportion of labor force, compared with its contribution to national income, the growth process of service sector is termed as 'jobless', (as in the case of the Indian economy) which is reflected in the declining employment elasticity. Higher the value of elasticity more is the employment intensity of a sector. In the table 5.5, in the period 1961-71 the employment elasticity of the community, social and personal services has been highest, i.e. a 1 percent growth in income in this sector led to a 3 percent rise in employment in this sector. The trade, hotels & restaurant services had the second highest elasticity value at 0.70. In the next decade, trade and hotels had a highest employment elasticity of nearly

unity, followed by the community services. Trade and community services continued with higher elasticity values even in the next decade. In the nineties, there was a slight change in the employment elasticity trend, with community services having the highest elasticity value of close to one, followed by transport services. Though employment under the community services which are mostly provided by the government, grew at one percent during 1993-99, its growth rate was over 6 percent during 1991-93 period and hence the growth rate of employment for 1991-99 under this sub service was 4.50 percent, whereas income under this sub sector grew at 4.88 percent and hence this service shows the highest elasticity, close to unity. Trade and hotel services showed a decline in their employment elasticity value, because in this period the income from this sub-sector grew at a much higher rate than that of its employment. However, for most of the time, it has been the community services or those provided by the government, trade, and hotelling services, which have absorbed majority of the service sector labor force.

A point worth mentioning now about high labor absorption capacity of a sector is that, normally it has been found that sectors with high employment elasticity are mostly found in the informal sector or unorganized sector where, labor productivity is low.

**Table 5.5 Employment Elasticity of Sub-Services**

Period	Whole sale trade, Hotels & Restaurants	Transport, Communication, Storage	Finance & Real Estate	Community, Social & Personal Services
1961-71	0.70	0.38	---	3.00
1971-81	0.95	0.63	0.62	0.62
1981-91	1.51	0.16	0.63	1.06
1991-99	0.40	0.59	0.53	0.92

Source: Same as in table 5.2

Increase in employment in the trade and hotel sector in Goa has mainly been due to the growth of informal labor employment, which is typically characterized by employment growing more than the income (except in 1991-99 sub period, in case of Goa) unlike in the organized service sector, where generally, income grows more than employment (Bhattacharya and Mitra, 1989). The little increase in service sector employment is often because of the proliferation of low paid jobs, especially in the large private unorganized sector within services (Chandrasekhar and Ghosh, 1999; Joshi, 2004). An interesting feature about the Goan tourism employment is that this industry is largely operating in the informal or unorganized sector. The total employment in the informal sector under tourism has shown a continuously rising trend with an employment figure of 24,675 in 1977, given in table 5.6. By 1980, informal employment in tourism had more than doubled to 53,133. In 1990 persons, working in this sector was 56,138 and by 1998, it increased to nearly 77,280 persons. In 1977, 57.45 percent of informal sector jobs were in the trade and hotel sector, in 1980 it went up to 83.64 percent, in 1990 to

**Table 5.6 Distribution of Employment\* in some Tourism based (Informal) Sectors**

Sectors	1977**	1980	1990	1998
Wholesale & Retail trade	8010	35201	35998	48797
Hotels and restaurants	6165	9238	11909	14661
Transport	8730	5604	5793	10505
Storage	275	1188	695	507
Communications	1495	1902	1743	2810
Total	24675	53133.	56,138	77,280

Source: Government of Goa, Daman & Diu (1977, 1980), Government of Goa (1990 & 1998).

\* includes number of establishments and Own Account Enterprises. \*\*includes number of establishments only.

85.34 percent and 1998, 82 percent of the informal sector tourism employment was found in trade, hotels and restaurants. Even in the earlier decades majority of the jobs were in these sectors. Based on NSSO estimates for 1998-99, and Economic Census report of 1998, it is observed that the total employment in trade, hotels & restaurants sub-sector in Goa was 99,533 in 1998-99, of which 63,458 persons, i.e. nearly 63.75 percent; were employed in the informal sector. Thus, one can conclude that there has been a lot of proliferation of informal and temporary workers in tourism, and this is mainly because tourism is a seasonal activity in Goa and hence the hotel owners minimize their operational costs by hiring labor during the busy tourist season, thereby keeping their fixed costs lower. Since tourism is concentrated in Goa's informal sector, it indicates lower productivity to some extent.

Another sub service, which is found to have high employment absorption, is the public administrative services and government services in general, where the existing employed persons are generating higher income from the same real volume of services. As Ashok Mitra (1988) rightly points out, "for public administration and defence, expenditures determines income and additional outlay emerges as additional output, the capital output ratio is low and a large part of the relevant expenditure does not lead to capital formation and therefore has no long term significance for growth, for the rate of income growth to continue, expenditure has to be repeated year after year". This indicates that government services, which require lower skill-based services may not be highly productive. Thus service sector employment in Goa, may be characterized by jobs which

require lower skills and hence are not very high labor productivity and value addition based in nature.

### **5.3 Determinants of Service Sector Growth in Goa**

The output and employment structure of the service sector in Goa, bring out the fact that tourism based services, government services and banking services have an important role to play in the growth of this sector. In order to find the exact determinants of service sector growth over the study period 1970-71 to 2003-04 as also in the pre-statehood and post statehood period, a multiple regression analysis is undertaken.

#### **5.3.1 Variables, Methodology and Model Estimation**

In the present study, it is assumed that government services drove services growth in the pre-statehood period whereas tourism based consumer services of trade and hotels determined service sector's growth in the post statehood period, while in the long term banking, tourism and government services contributed to the growth of services on Goa. Hence in the present model or equation, NSDP of the service sector in real terms(*ser*) is chosen as the dependent variable and the explanatory variables are number of government employees, as a proxy for government services(*govt*), number of hotels as a representative variable for tourism services(*hot*) and for the banking services the banking sector output or income per bank branch office is taken (*bank/branch*). The latter variable is taken to reduce the

problem of multicollinearity. Before proceeding with regression, the variables are tested for stationarity and cointegration.

Based on the ADF test results given in table 5.7, it can be concluded that all the variables are non-stationary in levels and stationary after first differencing, except the variable, the number of government employees, which is stationary at levels. The variables are then tested for cointegration to run the regression model. The trace test and eigen value test results shown in the Appendix II in table 5.a indicate that the variables in the said equation are cointegrated. Since the variables are cointegrated, the study proceeds with regression analysis of the service sector growth for the entire period under study and for the pre and post statehood period.

### 5.3.2 Empirical Results

For the entire period, service sector growth is explained by government services, banking and tourism services.

**Table 5.7 Unit Root Tests for the variables (sample period 1970-2003)**

Variables	Model, lags	at levels (actual)	Critical values	Model, lags	at d1 (actual)	Critical values
ser	C+T,0	-0.24	-3.20	C+T, 4	-4.036**	-3.58
govt	C, 0	-3.84***	-3.646	None,0	-3.093***	-2.64
hot	None, 2	1.701	-1.61	None, 0	-2.86***	-2.64
bank/branch	C, 0	-1.00	-2.615	None, 0	-5.35***	-2.64

Note: in the above table d1 stand for first difference, C for Constant, C+T for constant + trend. Lags and models are selected based on SIC.

#### i) Entire Period: 1970-71 to 2003-04

$$\ln \text{ser} = \beta_1 + \beta_2 \ln \text{govt} + \beta_3 \ln \text{hot} + \beta_4 \ln \text{bank/branch}$$

$$\text{Ln ser} = 0.47 + 0.74 \ln \text{govt} + 0.30 \ln \text{hot} + 0.31 \ln \text{bank/branch}$$

$$(0.55) \quad (7.658) *** \quad (7.15) *** \quad (6.92) ***$$

Adj R2 =0.977, DW = 1.00. \*\*\* statistically significant at 1 percent.

With a one percent rise in the number of government employees, the service sector output rises by 0.74 percent and a one percent rise in the banking output per bank, raises services income by 0.31 percent, while number of hotels raises the service sector output by 0.30 percent. Thus, it seems that services sector growth in Goa over the long term is being mainly determined by government services, followed by banking and consumer based tourism services.

**ii) Prestathood Period: 1970-71 to 1986-87**

$$\text{Ln ser} = \beta_1 + \beta_2 \ln \text{govt} + \beta_3 \ln \text{hot} + \beta_4 \ln \text{bank/branch}$$

$$\text{Ln ser} = 2.91 + 0.58 \ln \text{govt} + 0.24 \ln \text{hot} + 0.129 \ln \text{bank/branch}$$

$$(2.47)** \quad (2.60) ** \quad (1.17) \quad (2.71) **$$

Adj R2 =0.95, DW = 1.94. \*\* statistically, significant at 5 percent.

The pre-statehood period analysis shows that government services and banking determined services growth in Goa. This is quite in line with the results of the weighted average growth rates of sub services, which show that government services and banking services are the largest contributors to service sector growth. In this period, a one percent rise in government services led to service sector output rising by 0.58 percent and a one percent rise in banking sector's output per unit led to service sector output rising by 0.129 percent.

iii) **Post statehood Period: 1987-88 to 2003-04**

$$\text{Ln ser} = \beta_1 + \beta_2 \ln \text{ govt} + \beta_3 \ln \text{ hot} + \beta_4 \ln \text{ bank/branch}$$

$$\begin{array}{ccccccc} \text{Ln ser} & = & 2.82 & + & 0.56 \ln \text{ govt} & + & 0.29 \ln \text{ hot} & + & 0.246 \ln \text{ bank/branch} \\ & & (0.39) & & (0.766) & & (5.61) & & (2.26) \end{array}$$

\*\*\*                      \*\*

**Adj R2 =0.89, DW = 1.40. \*\*\*, \*\* statistically significant at 1 and 5 percent respectively.**

In the post statehood period, hotels and banking explain the service sector growth, which is again in line with the trends of the weighted average growth rates. In the present equation, a one percent rise in the number of hotels raises the services output by 0.29 percent and a one percent rise in the banking output per branch raises the service sector output by 0.246 percent. This shows that in recent time period, tourism and banking services have determined service sector growth. Thus, service sector growth in Goa has been mainly driven by government services, followed by banking and tourism services in the entire long run period under study.

Of course, in the recent past it has been the tourism-based services, which have emerged as the leading services, driving service sector output as also employment. However, tourism activity being seasonal in nature it is necessary to examine whether such a service growth pattern led by tourism services is stable or not.

#### **5.4 The Extent of Instability in Goa's Service Sector Growth**

To assess the fluctuations in growth, an instability index is calculated.

Measurement of instability in time series data requires an explicit assumption of what constitutes the acceptable and the unacceptable components. A systematic component, which can be predicted, does not constitute instability and hence, it should be eliminated, from the data. The remaining unpredictable component represents the instability captured by the error term. In this study, Instability index (I) suggested by Parthasarathy (1984) is used where; the instability index is calculated using the following statistic from the residuals ( $e_i$ ) of the exponential trend equation for the various sectoral real incomes and for the state economy's NSDP

$$I = \sqrt{\frac{\sum_{i=1}^{n-k} e_i^2}{n-k}} \quad (1).$$

where

$e_i$  = residual of  $i$ th observation.

$n$  = number of observations.

$k$  = number of parameters estimated.

$I$  normally takes values above 0 upto 2.00, with values below 0.10 showing low instability and values between 0.10 and 2.00 indicating high instability.

Though the service sector is the major sector of the economy, it has not recorded the highest growth rates over the period under study. However, one striking feature about this sector growth is it has been showing a consistently rising trend, implying some sustainability and stability in this sector, whereas the industrial sector and the export sector show a fluctuating trend, with extremes in growth rates. This fact is confirmed when; the extent of instability in these four important sectors is examined along with the overall NSDP of the economy in table 5.8 with the

instability index. In the seventies the industrial sector, which registered the highest growth rate also showed the highest instability of 0.140285, mainly due to a spurt in the number of large-scale capital-intensive industrial units. By the 1980s, the service sector had the highest growth rate, but showed the lowest instability index value of 0.0727 among the various sectors. In the 1990s, the export sector, which showed the highest growth rate also showed the highest instability, of 1.159782. The latter has been mainly due to the fact in the 1990s, due to devaluation of the Indian rupee; there was a surge in export earnings. In addition, international competition from Argentina, Brazil etc., who are bigger players in the mineral ore export market, world over, created more uncertainty

**Table 5.8 Index of Instability for the Major Sectors in Goa (1970-71 to 2003-04)**

Period	Primary	Secondary	Service	Exports	NSDP
1970-1979	0.05135	0.140285	0.057424	0.129490	0.047120
1980-1989	0.07865	0.1355358	0.0727074	0.124850	0.079730
1990-1999	0.03000	0.185331	0.069882	1.159782	0.023100
1970-2003	0.07821	0.166565	0.115689	0.341363	0.092369

Note: Data on exports, relates to value of total mineral ore exported from Goa annually in Rs lakhs and is collected from the Statistical Year books of the Goa Mineral Ore Exporters Association from 1970-71 to 2003-04. The export figures are deflated by the NSDP deflator to get, values in real terms.

for Goan exporters of iron ore and it is also seen that the market for mineral ore exports has virtually become a buyer's market due to the presence of a few large buyers from China and Japan, who command more bargaining power in the mineral ore export market. Thus, exports being dependent on external factors show high instability. However, in every sub-period, including the last sub-period, which showed the highest contribution from the tourism related services, viz, the trade, hotels & restaurants sub-services, the value of instability index of the service sector has been lower than the instability index values of the secondary and export sectors. For the entire period under study, the export sector shows the highest instability, with an index of 0.341363, followed by the industrial sector with an

index of 0.166565, followed by the service sector with a value of 0.115689. Though the primary sector is least volatile, its growth rate being negligibly low, is not very relevant. Among the remaining sectors, service sector is less volatile and less unstable. Its stability has also contributed to the stability of the NSDP, since this sector contributes nearly 50 percent of the state income. Since its growth rate has shown a consistently growing and stable trend, the next section analyzes the growth and demand potential of the service sector and its sub services.

### **5.5 Growth and Demand Potential of Services**

The growth and demand potential of service sector is assessed with the help of income and price elasticity respectively. To find the responsiveness of the service and its sub-sectors with respect to income and prices, a double log function is used, as follows:

$$\text{Log SNDPs} = \beta_0 + \beta_1 \log \text{NSDP} + \beta_2 \log (\text{PDEFs} / \text{PDEFnsdp}) \text{ ----- (2).}$$

where,

SNDPs = Real NSDP of the Service sector, as a proxy for expenditure or demand for services.

NSDP = Real NSDP of the state economy.

PDEFs = Price deflator in the Service sector and

PDEF nsdp = Price deflator of overall NSDP (Pillai and Shanta, 2005).

As for the service sector, price deflators for all the sub-services are also calculated. Price deflator for a particular service is calculated by dividing its output at current prices by its output at constant prices of 1993-94 base year. Similarly, the price

deflator of NSDP is calculated by dividing NSDP at current prices with NSDP at constant 1993-94 base year prices for the entire period, 1970-71 upto 2003-04. The ratio of price deflator of a service to the price deflator of NSDP reflects the trends in the relative price level and helps to capture the price elasticity of a service, in a double log regression model. In this model (2)  $\beta_1$  shows the income elasticity of demand for services and  $\beta_2$  shows the price elasticity of demand for services.  $\beta_1$ , shows the growth potential and  $\beta_2$  shows the demand potential of the concerned service. Similarly, income and price elasticity of various groups, viz Producer, Consumer and Government services, within the service sector are estimated.

Fisher (1939) and Clarke (1940) were among the early economists to note that a rising share of the service sector in total income is very often associated with economic growth. Thus if with a given percent rise in the income in the economy, demand or output for services rises more than proportionately, then one can conclude that services have a high growth potential. Growth in the service sector output in turn contributes to higher growth, implying that this is a circular process. It is also observed that at higher income levels demand for luxury services, like, air travel, hotels, leisure etc., rises. Since the demand for luxuries is price inelastic, it implies that increases in the price of such services, decreases their demand less than proportionately and hence increases the value of such services' output. Let us examine these two propositions with respect to Goa's service sector in general and its sub sectors. The table 5.9 shows that the service sector as a whole and consumer and producer services, are relatively income elastic, whereas the government services are relatively inelastic to income. With a 1 percent rise in income, demand for services rises by 1.06 percent. Income elasticity is highest for

consumer services, i.e. with a 1 percent rise in income; the demand for consumer services rises by 1.15 percent, implying growth potential of consumer services is the highest. This is, quite in line with the Engel's law, which states that with the rise in per capita incomes levels, income elasticity of demand for durable goods and certain services, like travel, hotels etc., go up. In Goa, it is mainly tourism, and tourist income, which has boosted consumer services. But for government services, income elasticity is less than one, which is quite obvious as dependence on subsidized government services, like public health, education, etc reduces, once people shift in higher income brackets, and substitute, government services with private services. The price elasticity for the service sector as a whole shows statistically insignificant results but for the consumer, producer and government services, the results are significant and they show a price inelastic demand.

**Table 5.9 Income and Price Elasticity for the Various Services in Goa (1970-71 to 2003-04)**

Sector	Income Elasticity	Price Elasticity	Adj R2
1. Service sector	1.06 (48.55)***	-0.16 (-1.24)	0.99
1.1 Consumer Services	1.15 (23.80)***	-0.30 (-4.49)***	0.95
1.2 Producer Services	1.12 (26.42)***	-0.50 (-2.81)***	0.97
1.2.1 Transport	1.002 (20.88)***	-0.66 (-5.19)***	0.93
1.2.2 Banking	1.54 (23.24)***	-0.54 (-4.66)***	0.94
1.2.3 Real Estate	0.68 (14.69)***	-0.03 (-0.413)	0.95
1.3 Government Services	0.82 (37.21)***	-0.70 (-7.46)***	0.98

\*\*\* and \*\* means values are statistically significant at 1% and 5% respectively.

Consumer services, mainly consisting of tourism services, have an inelastic demand, as tourists; do not have much of an option, once they come to stay in Goa, but to consume the services at the prevailing market prices. With a one percent rise

in price of these services, demand falls by only 0.30 percent. Similarly, producer services also have a price elasticity of -0.50, indicating an inelastic demand. Within producer services, transport and banking services show an inelastic demand with price elasticity values of -0.66 and -0.54 respectively, while real estate does not show statistically significant results. Producer services are inelastic because, Goa depends virtually for most of the goods, like milk, vegetables, food grains, garments and consumer durables on neighboring states; as such, the locals have lesser availability of substitutes and hence have to pay the price demanded by the suppliers. Government services have an elasticity value of -0.70 percent. Thus, the results confirm the fact that as income rises, the demand for services, especially consumer services and producer services rise by a higher percentage and demand for consumer services is price inelastic. Thus consumer and producer services in Goa have a high growth potential and most of the services in Goa being price inelastic have adequate demand potential even if prices rise.

### **5.6 Sustainability of Service Sector's Growth in an Inter Sectoral Linkage Framework**

The service sector in Goa has experienced quite a phenomenal expansion, right since 1970s until recent times, with the service sector contributing over 50 percent towards its Net State Domestic Product and the total employment. Though services in general and tourism and banking services in particular in Goa, have a high income and demand potential, tourism services are essentially seasonal and consumer based in nature. And if such seasonal kind of services are increasingly contributing to service sector's growth in the last more than one and a half decade, it is pertinent to find out

whether such a pattern of service sector growth is sustainable and does it also benefit other sectors of the economy, especially the commodity sectors of the economy, such as agriculture and industry through its linkages. Hence the present section tries to test the sustainability of service-led growth of the Goan economy, in terms of the inter-sectoral linkages, during the time period, 1970-71 to 2003-2004, as also Goa's pre-statehood period (1970-71 till 1986-87) and its post statehood period (1987-88 till 2003-04). To find out whether the service sector and its leading sub-services exhibit growth linkages with the other sectors in the economy Granger Causality tests are used. Johanson's Cointegration test and Vector Error Correction Model (VECM) have been used to test the hypothesis that sustainability of the service sector is dependent on long-term equilibrium relationship(s) with at least one of the commodity sectors in the economy.

Linkages among various sectors in an economy are generally examined in three ways. The first and very widely used method is based on the input-output tables, which make an estimation of the importance of the input (good or service) in question and how changes in its supply conditions might affect the structural change in the development process. But preparations of these tables require voluminous data at the disaggregated level, which is difficult to collect on an annual basis. Moreover, I-O table results are generally static and generally relate to the reference period (Sonis et al 1995; Zakariah and Ahmad, 1999). The second method involves econometric models, like those with simultaneous equations framework, encompassing various sectors in an economy to identify the key sectors and generate dynamic forecasts and policy simulations. However, models based on this method; generate estimated parameters, which are not invariant in the

presence of policy changes and hence are not useful for forecasting purposes. In addition, if in such methods variables used, are not tested for stationarity, they may give spurious results. Taking into account the concept of stationarity in models, the new models that have come are Granger Causality models and VECM. Granger Causality models are based on purely statistical and rigorous causality tests carried out on various sectors. They focus on identifying the 'key' or causal sectors, by testing the linkage between two sectors or variables at a time. However, a more dynamic model, which, includes multi variables and combines the features of Simultaneous equation models and Granger Causality model is the VAR/ VECM model. The latter helps to identify short run and long run equilibrium relationships between two or more variables or sectors in an economy involving even lagged values of variables.

In the Indian context, at the national and state level, various scholars have used all these techniques. The I-O approach has been used by many (Dhawan and Saxena, 1992; Bhowmik 2000, 2006, Handsa 2002). Econometric models have been estimated by a plethora of economists (Ahluwalia and Rangarajan, 1986; Pani, 1984; Storm, 1997; Palanivel and Klien, 1999; Dholakia 2002; Sastry et al 2003 and Bhattacharya et al 2004), statistical causality tests have been used by Chowdhury and Chowdhury(1995) and VECM has been used by Bathla (2005). There has been no study till date on intersectoral dynamics of Goa's economy, except one, wherein inter-industry flows, for Goa, were calculated using I-O method, in 1978 by the Hyderabad Staff College (Government of Goa Daman & Diu, 1978). However, all- India I-O matrix had been used for Goa, which did not clearly reflect the specific structural features of the economy. The present study is

an attempt to fill the gap on inter-sectoral linkages with special reference to the service sector.

### **5.6.1 Inter Sectoral Growth linkages Methodology and Model Estimation**

The study proposes to test the hypothesis that the primary, secondary and export sectors have no growth linkages with the service sector at the sectoral level, implying that consumer services based tourism led growth in Goa is, not sustainable but autonomous and cannot generate growth impulses in the other sectors in the economy, with the help of Granger causality and VECM. It also tries to test whether sub services, especially the leading services, i.e. trade and hotels and banking services have linkages with the other sectors in the economy in a Granger causality framework. However, before, proceeding with the tests, each variable in the analysis is tested for stationarity.

#### **5.6.1.1 Stationary and Non-Stationary data**

Testing stationarity of time series data has gained centre stage in the recent literature of empirical economics. Until recently, it was assumed that a time series especially, a macroeconomic series is Trend Stationary (TS), comprising stationary fluctuations about deterministic linear or exponential trends. Numerous researchers adopted this view, in their empirical work. But since 1980s, there have been many studies, both theoretical and empirical, suggesting that macro economic data may be non- stationary and requires differencing to induce stationarity and are therefore Difference Stationary(DS). In other words, majority of the time series data contain

unit root/s. One of most pioneering studies in this area is the theoretical work done by Dickey and Fuller (1981) on the econometrics of integrated time series, which made testing for the presence of unit roots, very simple, through their DF tests initially, and later ADF tests. Nelson and Plosser (1982) using the U.S macroeconomic data and similarly many other researchers, tested and could not reject the hypothesis of integration for their series.

It is difficult to precisely, know the nature of the Data generating Process (DGP) of any time series. Hence, one cannot immediately conclude whether a time series is TS or DS. A time series is a set of data in time with a definite ordering given by the sequence in which the observation occurred. The time ordering of the data matters a great deal, since the moments of the distribution of a time series variable often changes through time. That is, the mean, variance and so on of the underlying distribution from which an observation is drawn is not constant, but depends on the point in time at which the observation is made. For example, in a growing economy the level of most macroeconomic aggregates like production, consumption or the volume of trade will increase over time. If the data increases with time i.e. if the moments are not time invariant, then the variable is non-stationary (Mukherjee et al, 1998). Many socio-economic and financial data are non-stationary and this has a serious consequence, that regression, calculated with such series may be spurious, secondly results from such models, cannot be used for forecasting purposes, as non-stationary time series behaves in a particular manner only in that time span, hence it is not possible to generalize about its conclusions to other time series. There are two cases when data is termed as non-stationary:

- 1) Data shows stochastic trend.

2) Data shows Deterministic Trend.

A random or stochastic process is a collection of random variables ordered in time. If  $Y$  denotes a random variable and if it is continuous, it is denoted as  $Y(t)$ , but if it is discrete, as most of the economic data are, it is denoted as  $Y_t$ . If  $Y$  is the GDP of a nation, then,  $Y_1, Y_2, Y_3 \dots Y_n$ , denote GDP from the year 1 to  $n$ , assuming, annual data. In addition, various values of GDP annually are actual realizations out of all the possible values, which could occur. The distinction between the stochastic process and its realization is akin to the distinction between population and sample in a cross section data. Just as one uses, sample data, to draw inferences about a population, in time series the realization is used to draw inferences about the underlying stochastic process. A stochastic process can be Non-stationary in two cases, depicted through the classic model of a Random Walk, which has two variants

1) Random Walk without Drift (RWOD) and

2) Random Walk with Drift (RWWD).

A random walk is essentially a stochastic process. A stochastic process is called Stationary, if its mean, variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed. In time series terminology, such a stationary process is known as a weakly stationary or covariance stationary or second order stationary process. Covariance or Auto Covariance at lag  $k$  is the covariance between two  $Y$  values of,  $k$  periods apart.

Mean:  $E(Y_t) = \mu$

Variance:  $\text{Variance}(Y_t) = E(Y_t - \mu)^2 = \sigma^2$

Covariance:  $\gamma_{\kappa} = E((Y_t - \mu)(Y_{t+\kappa} - \mu))$ .

A RWOD usually takes the form described in equation (3):

$$Y_t = Y_{t-1} + u_t \dots\dots\dots (3)$$

Where  $u_t$  is a white noise with mean zero and variance is  $\sigma^2$ .

A series is a RWOD if the value of  $Y$  at time  $t$  is equal to its value at time  $(t-1)$  plus a random shock or AR (1) model.

$$Y_1 = Y_0 + u_1.$$

$$Y_2 = Y_1 + u_2 = Y_0 + u_1 + u_2.$$

In general,  $Y_t = Y_0 + \sum u_t$ .

So its Mean:  $E(Y_t) = E(Y_0 + \sum u_t) = Y_0$ .

Variance:  $\text{Var}(Y_t) = t \sigma^2$ .

Therefore, the mean of  $Y$  is constant, but as  $t$  increases its variance increases, indefinitely. Therefore, a random shock does not die but continues.

The second case is that of a RWWD and is given by equation (4) as follows.

$$Y_t = \delta + Y_{t-1} + u_t \dots\dots\dots (4).$$

Where  $\delta$  is a drift parameter.

$Y_t$  drifts upwards or downwards depending on whether  $\delta$  is positive or negative.

Mean:  $E(Y_t) = Y_0 + t \cdot \delta$ .

Variance:  $\text{Var}(Y_t) = t \sigma^2$ .

Thus, in this case, the mean as well as the variance increase with time. In the equation (3) and (4), the time series models are called Difference Stationary process (DSP) since their differences can be stationary. Whereas a model, which shows a time series, where mean is a function of time is called a Deterministic Trend or Trend Stationary Process (TSP), as it is stationary around a mean value.

Such a series has trend in its mean but no trend in its variance. Such a model can be predictable. It is given by the equation (5) as follows (Gujarati 2003):

$$Y_t = \delta + \beta T + u_t. \dots\dots\dots (5)$$

The issue whether a time series is DSP or TSP is extremely important because the dynamic properties of the two processes, are different and a wrong choice of the stationary process creates a serious problem. A TSP implies that cyclical fluctuations are temporary around a stable trend while DSP implies that any random shock to the series has a permanent effect. The cyclical components of a TSP are derived from the residuals of a regression of the series on the variable time and a DSP involves regression of the series on its own lagged values and time. A mixed stochastic –deterministic trend process is also possible. That is the process may be described as follows as given in equation (6)

$$Y_t = \delta + \beta T + Y_{t-1} + u_t. \dots\dots\dots (6)$$

If non-stationarity is a problem, how does one solve it? It is by transforming non-stationary data into stationary data. As mentioned earlier, stationary data is time invariant in its mean, variance and covariance and contains no trend. Since non-stationary data contains trend, a convenient way of getting rid of a trend in a series is by using first difference rather than levels of variables in analysis. Non-stationary data series are called integrated processes. For instance, a RWOD Model is non-stationary, but its first difference is stationary. So RWOD is Integrated of order 1, or  $I \sim d(1)$ .

$$Y_t = Y_{t-1} + u_t$$

$$\Delta Y_t = Y_t - Y_{t-1} = u_t.$$

$\Delta Y_t$  is stationary, similarly for RWWD

$$\Delta Y_t = Y_t - Y_{t-1} = \mu + u_t.$$

Sometimes the error terms are not white noise and are correlated then also first differencing of  $Y_t$  gives stationary data, provided the past values of error terms have a reducing effect on the current values of error terms (Charemza and Deadman 1997). Some times it is necessary to difference the data twice to turn it Stationary, in such a case it is said that the time series is Integrated of the order two or  $I \sim d(2)$ . Most economic data are generally  $I \sim d(1)$ , that is they become stationary after first differencing. Suppose it is assumed that a time series is a RWOD then the equation would be as given in equation (7),

$$Y_t = \rho Y_{t-1} + u_t \dots \dots \dots (7)$$

where  $u_t$  is having standard normal distribution. If OLS is used, to find the value of the cofficeint of  $Y_{t-1}$  and if it denoted by the symbol  $\rho$ , and its value was one it would mean  $Y_t$  is non-stationary and if its value was  $< 1$ , it would mean  $Y_t$  is stationary under the normal t test. However, T test gives spurious results. So the testing procedure should therefore be conducted with the use of a model which is stationary when estimated under the null hypothesis. An appropriate answer has been given by Dickey Fuller (DF) test, where the null hypothesis for equation (7) is  $\rho - 1 = 0$ , the so called unit root test. This test is based on the estimation of a regression equation equivalent to that in (7) namely

$$\Delta Y_t = \delta \cdot Y_{t-1} + u_t \dots \dots \dots (8).$$

This equation can be rewritten as

$$Y_t = (1 + \delta) Y_{t-1} + u_t \dots \dots \dots (9)$$

which is the same as equation (7) with  $\rho = (1 + \delta)$ , hence if in (9),  $\delta$  is negative, then in equation (7)  $\rho$  becomes smaller than one. The DF test consists of testing the negativity of  $\delta$  in OLS of (8). Rejection of the null hypothesis  $\delta = 0$ , in favor of the alternative hypothesis that,  $\delta$  is negative or  $\rho < 1$ , means that  $Y_t$  is integrated of the

order 0 or it is stationary. If the null hypothesis that  $\delta = 0$  in equation (8) cannot be rejected then variable  $Y_t$  might be integrated of order higher than zero or might not be integrated at all. Therefore, the next step is to test whether the order of integration is one. If  $Y_t \sim I(1)$ , then  $\Delta Y_t \sim I(0)$  hence we can repeat the test using  $\Delta Y_t$  instead of  $Y_t$ . DF equation is now:

$$\Delta \Delta Y_t = \delta \Delta Y_{t-1} + u_t \dots \dots \dots (10).$$

DF test can also be used to test order of integration for a variable generated as a RWWD.

$$\Delta Y_t = \mu + \delta \cdot Y_{t-1} + u_t \dots \dots \dots (11).$$

Statistical inference about a stochastic trend is often combined with a deterministic trend. A straightforward modification of the DF equation, which accounts for both drift and linear deterministic trend, is as follows

$$\Delta Y_t = \mu + \alpha t + \delta \cdot Y_{t-1} + u_t \dots \dots \dots (12).$$

Here simultaneously one can test for the absence of a Stochastic trend ( $\delta < 0$ ) and the existence of a deterministic trend ( $\alpha \neq 0$ ). The test used for checking whether data is stationary or not is Dickey Fuller Test. However, the Dickey Fuller Test has a substantial weakness; it does not take account of possible autocorrelation in the error process  $u_t$ . If  $u_t$  is auto correlated (that is it is not white noise) then the OLS estimates of equation, (8) and its variants are not efficient. Therefore, ADF advocated by DF (1981) is to use lagged Left Hand Side (LHS) variable, in the equation as additional explanatory variable to approximate the autocorrelation. This is generally regarded as the most efficient test. The ADF equivalent of (8) is as follows:

$$\Delta Y_t = \delta \cdot Y_{t-1} + \sum_{i=1}^k \delta_i \cdot \Delta Y_{t-i} + u_t \dots \dots \dots (13)$$

Similarly, equations (9) and (10) can be augmented by lagging L.H.S variable to the set of regressors (Charemza and Deadman 1997). In practice the choice of augmentation (that is the length and elements of the autoregressive component in (13)) is of utmost importance. A simple route is by choosing a maximum lag length and then sequentially dropping lag length, if relevant  $t$  coefficients are insignificant. Another better way, is selection of appropriate lag. Thus in the Unit Root Test, one has to specify five things to carry out a unit root test. First, choose the type of test, either the Augmented Dickey-Fuller (ADF) test or the Phillips-Perron (PP) test. Second, specify whether to test for a unit root in the level, first difference, or second difference of the series. One can use this option to determine the number of unit roots in the series. If the test fails to reject the test in levels but rejects the test in first differences, then the series contains one unit root and is of integrated order one  $I(1)$ . If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains two unit roots and is of integrated order two  $I(2)$ . It is unusual for an economic series to be integrated of an order higher than two. Third, specify whether to include a constant, a constant and linear trend, or neither in the test regression. The choice is important since the distribution of the test statistic under the null hypothesis differs among these three cases. Fourth, one has to specify the order of serial correlation to account for in the series. For the ADF test, you specify the number of lagged first difference terms to add in the test regression. For the PP test, you specify the lag truncation to compute the Newey-West heteroskedasticity and autocorrelation (HAC) consistent estimate of the spectrum at zero frequency. Akaike Information Criterion (AIC) and the Schwarz Criterion (SIC) are utilized to select the lag length. However, whichever test is used, the residuals should be white noise. Thus

to specify the model, which provides the best adjustment in the present study we make use of AIC and SIC, in order to select the model that minimizes the criteria values. To detect auto correlation in the error terms jointly, the LM test is used and the probability of the Q statistic is computed. If the calculated t value exceeds the table value, then we reject the null hypothesis of no autocorrelation, implying that there is a problem of correlation between the error terms when considered simultaneously.

### 5.6.1.2 Granger Causality Tests

In the study, the familiar concept of causality as proposed by Granger (1969) is adopted. Granger proposed for a pair of linear covariance –stationary time series X and Y: X causes Y, if the past values of X can be used to predict Y more accurately than simply using the past values of Y. Formally, X is said to cause Y if  $\sigma^2 (Y_t: Y_{t-i}, X_{t-j}) < \sigma^2 (Y_t: Y_{t-1})$  where  $\sigma^2$  is the variance of forecast error and  $i, j = 1, 2, 3, \dots, k$ . Testing for Granger causation involves determining whether lagged values of variable X has any influence in explaining variable Y when lagged values of Y are present. Consider the following equations (14) and (15)

$$Y_t = A_1(L) Y_{t-1} + A_2(L) X_{t-1} + u_t \dots \dots \dots (14)$$

$$X_t = B_1(L) Y_{t-1} + B_2(L) X_{t-1} + u_t \dots \dots \dots (15).$$

$A_1(L), A_2(L), B_1(L)$  and  $B_2(L)$  are polynomials in the lag operator, L. If lagged values of the variable X do not significantly explain the variable Y in the presence of the lagged values of Y, then it is said that “X does not cause Y in the Granger sense”. If lagged Y’s do not explain X in the presence of lagged values of variable X, then “Y does not cause X in the granger sense. In other words if

$A_2(L)$  is zero in equation (14), but  $B_1(L)$  in (15) is not, then  $Y$  is casual and there is unidirectional causality from  $Y$  to  $X$ . If on the other hand  $B_1(L)$  is zero but  $A_2(L)$  is not then  $X$  causes  $Y$ . If both  $A_2(L)$  and  $B_1(L)$  are zero then there is no causation among  $X$  and  $Y$ . Finally, if both  $A_2(L)$  and  $B_1(L)$  are not zero, then variables  $X$  and  $Y$  are mutually causal. Granger (1988) argued that the standard causality tests are valid if the time series involved are not co-integrated. That is, if a linear combination of the non-stationary variables is non-stationary, then Standard Granger causality test should be adopted, after making the variables stationary. If a linear combination of the non-stationary data is stationary, then an additional channel to check for causality is through the Error Correction term even if the lagged values of the explanatory variables are statistically insignificant and show no causality. Engel and Granger (1987) argued that so long as variables are co-integrated causality must exist at least in one direction. In a regression of  $Y$  on other variables (including its past values) if we include past or lagged values of another variable  $X$  and it improves the prediction of  $Y$ , then we can say that  $X$  (Granger) causes  $Y$  and  $X$  is the leading variable. A similar definition applies for  $Y$  (Granger) causes  $X$ . If  $X$  is found to Granger-cause  $Y$  but not vice versa, and then it implies that  $X$  is strongly exogenous in the equation for  $Y$ .

### 5.6.1.3 Johansen's Co-integration Tests & VECM

The long-run equilibrium relationship between primary, secondary, exports and service sectors are examined using NSDP data from 1970-71 to 2003-04 in a log-linear specification. This is to test the hypothesis that if the service sector has long-term equilibrium relationship with the commodity sectors in the economy, this

growth is sustainable and widespread in the economy. There are several methods of testing for the co-integration relation. The most commonly used methods for a two variable model is the residual based error correction model proposed by Engle and Granger (1987), which depends on the application of the Augmented Dickey Fuller (ADF) test on residuals of the co-integrating regression. A different approach to testing for cointegration is generally required when we have more than two variables in the model. One of the most common approaches to multivariate cointegration is the Maximum Likelihood (ML) test approach of Johansen (1988), Johansen, and Juselius (1990). This test involves testing the characteristic roots or eigenvalues of the  $\pi$  matrix (coefficients on the lagged dependent variable). There are two test statistics for cointegration under the Johansen approach, the trace test and the max-eigen value test. Trace test is a joint test where the null is that the number of co-integrating vectors is less than or equal to 'r'. The max- eigen value test conducts separate tests on each eigen value and has its null hypothesis that the number of co-integrating vectors is 'r'. If the test statistic is greater than the critical value from Johansen's tables, reject the null hypothesis that there are r co-integrating vectors in favor of the alternative that there are r+1 for trace or more than r for max-eigen value test. A linear combination of the specified series is called co-integration equation that implies a stable long-run linear relationship.

If variables are not cointegrated, VAR is modeled. However, if variables are found to be co-integrated, then a VAR is misspecified and so a Vector Error Correction Model (VECM) is used (Ansari and Ojemakinde, 2004). The last step in co-integration analysis involves application of error-correction mechanism. If the time series variables have unit roots, then we need to take first difference of the

variables in order to obtain a stationary series. Since the procedure of differencing results in loss of valuable long-run information in the data, an error correction (EC) term is introduced in the theory of co-integration that integrates or ties short run dynamics of a series to its long run value. The residuals obtained from the linear equation are introduced as explanatory variable into the system of variables in levels. The error correction term, thus, captures the adjustment towards long-run equilibrium. The error correction term tells us the speed with which our model returns to equilibrium following an exogenous shock. It should be negatively signed, indicating a move back towards equilibrium; a positive sign indicates movement away from equilibrium. The coefficient should lie between 0 and 1, 0 suggesting no adjustment one time period later, 1 indicates full adjustment. The error correction term can be either the difference between the dependent and explanatory variable (lagged once) or the error term (lagged once), they are in effect the same thing. The coefficient of the error correction term shows the speed of adjustment of a system converging to its long run equilibrium. Since, the relationship among services and manufacturing, primary, and exports sector is multidimensional, a VAR/VECM is used. The advantage of this methodology is that it allows all the variables in the system to interact with it and with each other, without having to impose a theoretical structure on the estimates. Vector Error Correction (VEC) model is a restricted VAR designed for use with nonstationary series that are known to be cointegrated. The VEC has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. The cointegration term is known as the error correction

term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

Unit root results based on Augmented Dickey Fuller Test, for the Primary (PRI), Secondary (SEC), Export (EXP) and the Service (SER) sectors along with the sub-services of the Goan economy for the entire period, 1970-2003 are presented first. In order to specify the model, which provides the best adjustment the Akaike Information (AIC) and the Schwarz Bayesian Criteria (SBC,) is used in order to select the model that minimizes the criteria values. For detecting error autocorrelation, the LM test is used and the probability of the Q statistic, originally proposed by Lyung Box (1978) is computed, taking into account the correlograms generated from the estimation process. The service or the tertiary sector is included in detail by taking all its sub sectors as given in the System of National Accounts Statistics. Thus, four broad components of the services viz. (a) Trade-Hotel-Restaurant (THR), (b) Transport- Storage- Communication (TSC), (c) Financial-Insurance, Real Estate, Business (FBR) and (d) Community-Social-Personal Services (CPS) are also examined. Based on RBI guidelines, one can classify, THR as consumer services, TSC and FBR as Producer services and CPS as government services. In view of varied nature of services, one can group them into two i.e. marketed and non-marketed services. Marketed services may indicate NSDP derived from a, b and c sectors and non- marketed services can represent social, community and other services that are provided by the government to the society. The Secondary sector, Export and Primary Sectors, are more likely to have value addition based linkages with marketed services, rather than non-marketed services,

but in Goa, the government has been instrumental in providing many services, hence the community, social and personal services, are included in the analysis.

The co-integrating equation specified for the major sectors in the economy is:

$$aPRI_t + bSEC_t + cSER_t + dEXP_t = 1$$

The above co-integrating vector can be normalized as:

$$aPRI_t + bSEC_t + cSER_t + dEXP_t - 1 = 0$$

$$PRI_t = (-b/a)SEC_t + (-c/a)SER_t + (-d/a)EXP_t + (1/a)$$

Or

$$PRI_t = d^* - a^*SEC_t - b^*SER_t - c^*EXP_t$$

where,

PRI = primary sector output.

SEC = secondary sector output.

SER = service sector output.

EXP = export sector output

$a^* = b/a$ ,  $b^* = c/a$  and  $c^* = d/a$  and  $d^* = 1/a$ .

### 5.6.2 Empirical Results

The unit root ADF tests in table 5.10, confirm that the real NSDP series of primary sector, secondary sector, export sector and the service sector and sub-services are difference-stationary and integrated of order one for 1970-2003 period as also for post state hood and pre-statehood periods taken separately.

In order to know the inter-sectoral linkages, as also the linkages between the other sectors and the service sector in detail, Granger Causality tests for the various services have been used. From the table 5.11, it is clear that, over the

**Table 5.10 DF/ADF tests for various Sectors of Goa's economy( 1970-71 to 2003-04)**

Sector	Model	DF/ADF tes	lag	Critical value	AIC	SIC	QStat,P#, lag	DW
PRI	C	-5.8355***	2	-3.670	-2.658	-2.471	3.18, (0.204) 2lags	1.94
SEC	C	-5.1914***	4	-3.689	-1.124	-0.838	7.55, (0.11) 4lags	1.63
SER	C	-6.8952***	0	-3.653	-2.458	-2.367	1.89, (0.179) 1lag	1.90
THR	C	-3.0598***	1	-2.960	-0.880	-0.741	3.087, (0.079) 1lag	1.90
TSC	C	-6.1642***	0	-3.653	-0.280	-0.189	0.5969, (0.44) 1lag	1.97
FBR	C	-5.4999***	0	-3.653	-0.819	-0.728	0.00 (0.976) 1lag	2.00
CPS	C	-4.4510***	0	-3.653	-3.111	-3.019	1.510 (0.219) 1lag	1.99
EXP	C	-5.8816***	0	-3.562	0.320	0.412	0.2348 (0.628) 1lag	1.96

C means Constant. \*\*\*, \*\*, \* are MaKinnon (1996) one-sided p values, at 1%, 5% and 10% level of significance respectively. # shows probability value.

entire period under study, the intersectoral linkages, are nearly absent between most of the sectors. There is no causality between the primary and secondary sector, the primary and service sector for the entire period considered under study, as also, during the pre-statehood and post-statehood periods. Primary sector exhibits a unidirectional causality towards, the export sector, for the period 1970-2003 and the post statehood period. The linkage between the sectors is due to the production of mineral ore, in the primary sector, which is in anticipation of the export demand. The secondary and service sectors do not show any inter linkage, during the entire period of 1970-2003, though; there is unidirectional

**Table 5.11 Granger Causality Tests between the Sectors - 1970 to 2003, 1970-1986 and 1987-2003**

Sectors	Direction	1970-2003		1970-1986		1987-2003	
		F test	lags	F test	lags	F test	lags
1.PRI&SEC	PRI to SEC	0.33630	1	0.00191	1	1.38576.	1
	SEC to PRI	1.15252.	1	1.14386.	1	0.22055.	1
2.PRI & SER	PRI to SER	2.85770	1	0.00156.	2	1.14967	1
	SER to PRI	0.03728.	1	0.12554.	1	0.32613.	1.
3.PRI & EXP	PRI to EXP	<b>3.94777*</b>	1.	0.86697.	1.	<b>3.29655*</b>	1
	EXP to PRI	0.01568.	1.	0.92598.	1.	0.12636	1.
4.SEC & SER	SEC to SER	0.93051.	1.	0.00466	1.	<b>7.28551**</b>	1.
	SER to SEC	2.31294.	1.	<b>3.20556*</b>	1.	0.00448.	1.
5.SEC & EXP	SEC to EXP	0.06255	1.	0.00695.	1.	0.00713.	1.
	EXP to SEC	0.37015.	1.	0.17576	1.	2.04927.	1.
6.SER & EXP	SER to EXP	1.74771.	1.	<b>9.6576***</b>	1.	0.19712.	1.
	EXP to SER	0.31917.	1.	0.13040.	1.	0.28218.	1.

\*\*\*, \*\* and \* shows statistical significance at 1%, 5% and 10% levels respectively. The lags are based on AIC and SIC criterion.

causality from service sector to the secondary sector in the pre-statehood period and from the secondary sector towards service sector output, during the post-statehood period. This is mainly because initially it was the various services, which boosted growth of many industries in Goa. During the post-statehood period, the growth of pharmaceutical and electronic industries may have boosted the demand for many producer services. The secondary and exports sector are not linked, as Goa's exports, are resource based, mineral ore. The service or the tertiary sector also does not seem to be having linkages with the export sector, except during the pre- statehood period, when the linkage is from exports to the service sector; mainly due to mining activity. Thus in Goa, the intersectoral linkages are not very strong in the economy. A linkage, in the long run can be found only from primary to export sector, due to the dependence of exports on local mining activity. The service sector showed a linkage with the export sector and secondary sector, during the pre-statehood period, while in the last two

decades, due to industrial growth, secondary sector is showing a one-way causal linkage with the service sector. Though long-term linkages are found only with respect to primary and exports, the service sector has linkages with the export as well as manufacturing sector over shorter periods.

Turning to the linkages sub services have with the other sectors in the economy, it is clear that though the primary sector does not show linkages with the tertiary sector as a whole, it does have linkages with some important sub-services within the service sector as shown in table 5.12. While there is a one-way dependence of primary sector on THR services for the entire period, the causation is reversed, in the statehood period. TSC services have linkage with the primary sector, mainly

**Table 5.12 Granger Causality Tests between Primary Sector and Sub-Sectors of Service Sector**

Sectors	Direction	1970-2003		1970-1986		1987-2003	
		F test	lags	F test	lags	F test	lags
1.PRI & THR	PRI to THR.	0.03728	1.	0.46140.	1.	<b>11.3851***</b>	1.
	THR to PRI	<b>2.95604*</b>	1.	0.0184.	1.	0.56563.	2.
2.PRI & TSC	PRI to TSC	<b>3.9505**</b>	1.	2.01713.	1.	0.03577.	1.
	TSC to PRI	0.6220	1.	<b>8.52418**</b>	1.	0.29466.	2.
3.PRI & FBR	PRI to FBR	0.21636.	1.	1.91448.	1.	0.79269.	1.
	FBR to PRI	0.02067.	1.	0.535012.	1.	0.13769.	1.
4.PRI & CPS	PRI to CSP.	0.54617.	1.	1.47900.	1.	0.22092.	1.
	CSP to PRI	0.00291	1.	1.08990.	1.	0.02027.	1.

\*\*\*, \*\* and \* shows statistical significance at 1%, 5% and 10% levels respectively. The lags are based on AIC and SIC criterion.

due to the mining activity, during the entire period under study as also during the pre-statehood period. However, with mining showing a negative growth rate in the recent past the linkage between the two sectors, in the post statehood period has weakened. Primary sector shows no causality, with financial services and community and social services in any of the periods, under study. Thus, primary sector shows linkages with THR and TSC services, over the entire period and also over shorter time periods.

**Table 5.13 Granger Causality Tests between Secondary Sector and Sub-Sectors of Service Sector**

Sectors	Direction	1970-2003		1970-1986		1987-2003	
		F test	lags	F test	lags	F test	lags
1. SEC&THR	SEC to THR	0.92518	1.	0.04131.	1.	0.56135	1.
	THR to SEC	0.48874	1.	0.17894.	1.	0.61753	2.
2. SEC&TSC	SEC to TSC	0.35423	1.	0.51840	1.	0.75627	1
	TSC to SEC	0.00029	1.	0.23164.	1.	0.18702	2.
3. SEC&FBR	SEC to FBR	0.08149	1.	0.97406	1.	<b>3.000*</b>	1.
	FBR to SEC	0.91086	1.	<b>3.24831*</b>	1.	0.16048	1.
4. SEC & CPS	SEC to CPS	<b>3.0673*</b>	1.	1.57621	1.	0.82484	1.
	CPS to SEC	0.00332	1.	0.00735	1	0.00133	1

\*shows statistical significance at 10%. The lags are based on AIC and SIC criterion and indicate the lags, for the causal dependent variable.

From the table 5.13 it is observed that, there are no strong linkages in Goa, between the secondary and the THR and TSC services over 34 years. However,

there is a linkage from financial services to the secondary sector, during the pre-statehood period. This is mainly because of the Financial Institutions, which started in this period and gave large-scale financial assistance, for industrial projects in Goa. This causation is reversed in the post statehood period, as the industrial sector's growth has contributed to the growth of banking and financial institutions in Goa in the recent past. In addition, there is a unidirectional link from the secondary sector to the community services for the entire period. This is because industrial growth in Goa led to the growth of recruitment of staff in various departments like Directorate of Industries, Directorate of Mines, and Directorate of Labor Welfare to deal with industrial policies, safety standards, industrial pollution and labor welfare.

**Table 5.14 Granger Causality Tests between Exports and Sub-Sectors of Service Sector**

Sectors	Direction	1970-2003		1970-1986		1987-2003	
		F test	lags	F test	lags	F test	lags
1.EXP&THR	EXP to THR	2.07032	1	1.89129	1	<b>3.82394*</b>	1.
	THR to EXP	0.16342	1	0.19967	1	0.09311	2.
2.EXP &TSC	EXP to TSC	1.80865.	1.	0.42765.	1.	0.90813	1.
	TSC to EXP	0.03805.	1.	2.27587	1.	0.05977	2.
3.EXP&FBR	EXP to FBR	0.03910	1.	<b>23.9736***</b>	1.	1.57836.	1.
	FBR to EXP	<b>3.31702*</b>	1.	2.34705.	1.	0.09041.	1
4.EXP&CPS	EXP to CPS	0.26572	1	0.05000	1	0.41190	1
	CPS to EXP	0.04326	1	0.01890	1	0.06792	1

\*\*\*, \*\* and \* shows statistical significance at 1%, 5% and 10%, levels respectively. The lags are based on AIC and SIC criterion, and indicate the lags, for the causal dependent variable.

If the linkages between the export sector and the various sub-services are analyzed, one finds from table 5.14 that exports show one-way linkage with the THR services, in the post-statehood period. Transport sector shows no linkage with exports in any of the periods. Nevertheless, FBR shows strong linkages with exports. There is one-way linkage from FBR to exports during the period 1970-2003 and during the pre- statehood period the linkage is reversed. This is because mining and export of mineral ore were major economic activities in Goa, in the 1970s and this contributed substantially to Goa's income, output and employment. Growth in this activity boosted the financial and banking activity in Goa. Due to instability and fluctuations in export sector's income in the last decade, the linkages of export sector with financial and banking services have weakened. There is no linkage between exports and the community and social services.

If the linkages within the service sector are tested, it is evident from table 5.15 that, the sub sectors within the service sector, show linkages, for the entire period, i.e. 1970-2003. Trade, hotels and restaurants, show one-way causality towards transport storage and communications, although, they may not be linked over shorter periods. There is a unidirectional causality from trade and hotel services to the finance and banking services. The transport, storage, communication, finance, and banking services show bi-directional linkages, for the entire period. In the pre-statehood period, the direction of linkage is from transport services to finance and banking, as transport services was the dominant sector in the 1980s, which drove service growth and in the 1990s, it was the finance and banking sector, which showed a very high growth rate, facilitating the transport activity. Community and personal services show two way causality with trade and hotels and one-way

causality towards transport storage and communication services from 1970-71 to 2003-04. The latter is due to growth of public services in the urban areas, which led to growth of small hotels and public and private bus services for the movement of government employees from the rural areas to urban areas where their offices are located. Thus in Goa, the intrasectoral linkages within the service

**Table 5.15 Granger Causality Tests between the Sub-Sectors of Service Sector**

Sectors	Direction	1970-2003		1970-1986		1987-2003	
		F test	lags	F test	lags	F test	lags
1. THR & TSC	THR to TSC	<b>3.29918*</b>	1	0.0276	1.	0.12852.	1
	TSC to THR	2.67391	1	1.38096	1.	0.67493	2
2. THR & FBR.	THR to FBR	<b>5.16946**</b>	1	1.35563	1.	1.60743	1.
	FBR to THR	0.13560	1	0.40075	1.	0.14879	2.
3 TSC & FBR	TSC to FBR.	<b>6.86829**</b>	1	<b>4.23603*</b>	1.	3.0000*	1.
	FBR to TSC.	<b>4.71353**</b>	1	0.97332	1.	<b>4.63076**</b>	1.
4. CPS & THR	CPS to THR.	<b>2.99869*</b>	1	0.37636	1.	2.60246	1.
	THR to CPS.	<b>3.26095*</b>	1	0.47189	1.	1.8184	1.
5. CPS & TSC	CPS to TSC.	<b>3.56609*</b>	1	0.00088	1.	<b>5.40995**</b>	1.
	TSC to CPS	2.08139	1	2.000	1.	1.53886	1.
6. CPS & FBR	CPS to FBR.	0.80873	1	0.13059	1.	1.15671	1.
	FBR to CPS.	0.48789	1	0.78794	1.	0.003650	1.

\*\*\*, \*\*, \* shows statistical significance at 10%, 5% and 1% levels respectively. The lags are based on AIC and SIC criterion.

sector are more than the inter sectoral linkages. It is mainly; tourism based services, namely, trade, hotels and restaurants, which have a linkage with other sub-services and are facilitating service growth. The primary sector has linkage with trade and hotels and transport, storage services; the secondary sector has a linkage with the community and personal services and whereas the export sector shows linkage with the finance services over the entire period under study. The secondary sector shows linkages with financial and banking services, over the sub periods.

Thus, though the commodity sectors do not show linkages with the service sector as a whole they have linkages with the major sub-services in the long run. Hence, it can be concluded that service sector growth is sustainable due to the linkages important sub-services are having with the other sectors in the economy. However, that there is no long-term relationship of between the service sector as a whole and other sectors in the economy is a pointer to the fact that these inter-sectoral linkages are limited and not widespread. The nature of inter-sectoral relationships is further tested with the help of VECM.

### **5.6.3 Long run Analysis based on Co integration and VECM**

Long run intersectoral relationship between the service sector, primary, secondary and export sectors is analyzed using Johansen tests and Vector Error Correction Model (VECM). If there exists a long-term relationship between the sectors, then the variables are called co-integrated. The real NSDP series of the service, primary, secondary, and exports sectors is used in the present model. All the variables based

on ADF tests are I(1). The Cointegration test specification based on SIC and AIC criteria, assumes deterministic trend in data, since NSDP series exhibit trend, with intercept and no trend in the Co integrating equation. Johansen's tests show two different results in table 5.16. While the trace test shows the presence of one co integrating equation, the max-eigen value test shows that there is no co integrating equation. In such a case, to test that there is a cointegrating relationship, a VECM model is used. The results in table 5.17 show that though the error correction term for the service and primary sector are significant, they show positive values, implying movements away from long-term equilibrium. Thus, though the sectors appear to be co-integrated, there is no long term equilibrium between the sectors in the economy.

**Table 5.16 Cointegration Tests results**

Trend assumption: Linear deterministic trend				
Series: LOGSER LOGSEC LOGPRI LOGEXP				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.548561	49.55173	47.85613	0.0343
At most 1	0.379302	24.10164	29.79707	0.1962
At most 2	0.238726	8.840501	15.49471	0.3803
At most 3	0.003498	0.112118	3.841466	0.7377
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.548561	25.45009	27.58434	0.0915
At most 1	0.379302	15.26114	21.13162	0.2710
At most 2	0.238726	8.728383	14.26460	0.3095
At most 3	0.003498	0.112118	3.841466	0.7377
Max-eigenvalue test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values				

The LM test shows no autocorrelation problem. The VECM shows that there is no pattern among these sectors to show a move towards equilibrium, following an

exogenous shock to the system. In fact, the coefficient of the error correction term suggests a movement away from equilibrium by 11.67 percent and 15 percent for the service and primary sector respectively. Thus, current changes in the service sector or primary sector do not adjust to the long-term trends in other independent variables of the service or primary sector's equation.

**Table 5.17 Vector Error Correction (VECM) Results**

Error Correction:	D(LOGSER)	D(LOGSEC)	D(LOGPRI)	D(LOGEXP)
CointEq1	0.116712	0.169457	0.153229	-0.275155
	(0.04775)	(0.12644)	(0.05005)	(0.20712)
	<b>[ 2.44437]</b>	<b>[ 1.34025]</b>	<b>[ 3.06161]</b>	<b>[-1.32851]</b>
D(LOGSER(-1))	-0.373807	-0.715093	-0.310984	-0.434888
	(0.18596)	(0.49243)	(0.19492)	(0.80665)
	<b>[-2.01013]</b>	<b>[-1.45217]</b>	<b>[-1.59542]</b>	<b>[-0.53913]</b>
D(LOGSEC(-1))	-0.083695	-0.235493	0.151186	-0.013483
	(0.07197)	(0.19057)	(0.07544)	(0.31218)
	<b>[-1.16296]</b>	<b>[-1.23572]</b>	<b>[ 2.00417]</b>	<b>[-0.04319]</b>
D(LOGPRI(-1))	0.539586	0.531146	0.186503	0.702493
	(0.17463)	(0.46242)	(0.18304)	(0.75750)
	<b>[ 3.08990]</b>	<b>[ 1.14862]</b>	<b>[ 1.01889]</b>	<b>[ 0.92739]</b>
D(LOGEXP(-1))	0.002812	-0.039568	-0.001636	-0.090325
	(0.04141)	(0.10965)	(0.04340)	(0.17962)
	<b>[ 0.06790]</b>	<b>[-0.36086]</b>	<b>[-0.03768]</b>	<b>[-0.50287]</b>
C	0.092304	0.176838	0.016715	0.122922
	(0.01599)	(0.04234)	(0.01676)	(0.06935)
	<b>[ 5.77331]</b>	<b>[ 4.17692]</b>	<b>[ 0.99741]</b>	<b>[ 1.77243]</b>
Adj. R-squared	0.254704	0.072017	0.168333	0.088760
Sum sq. resids	0.093191	0.653461	0.102390	1.753489
S.E. equation	0.059869	0.158534	0.062754	0.259696
F-statistic	<b>3.118844</b>	1.481158	2.254909	1.603912
Log likelihood	48.01540	16.85329	46.50926	1.060019
Akaike AIC	<b>-2.625963</b>	-0.678331	-2.531829	0.308749
Schwarz SC	<b>-2.351137</b>	-0.403505	-2.257004	0.583574
Mean dependent	0.067777	0.109135	0.015379	0.097468
S.D. dependent	0.069348	0.164571	0.068812	0.272050
Determinant resid covariance (dof adj.)		1.86E-08		
Determinant resid covariance		8.10E-09		
Log likelihood		116.4843		
Akaike information criterion		-5.530270		
Schwarz criterion		-4.247752		

One can thus conclude based on the granger causality tests and VECM that there is not long term equilibrium relationship between the service sector and the primary, secondary and export sectors in the economy, though the service sector shows linkages with secondary sector and exports sectors over sub periods. The other sectors also show some linkage with the major sub-services in the economy over the entire period as also over shorter time periods. But the sectoral linkages

### 5.18 VEC Residual Serial Correlation LM test Results

H0: no serial correlation at lag order h		
Lags	LM-Stat	Prob
1	8.958993	0.9151
2	6.628129	0.9798
3	14.86760	0.5344
4	18.12156	0.3168
5	14.54423	0.5582
6	10.16356	0.8579
7	18.42175	0.2998
8	14.38565	0.5700
9	29.51421	0.0207
10	9.117768	0.9085
11	16.72746	0.4034
12	11.95586	0.7470
Probs from chi-square with 16 df.		

between the sub- services are strong and trade hotels and restaurants, emerge as the leading services and have an influence over growth of all other services in the long run. Thus, it is tourism, which has been mainly driving service led growth in Goa, with some linkages with the primary, secondary and export sectors too, and in the post-state hood period, the registered industrial sector has developed linkages with the banking services. Based on this, it can be concluded that service sector has linkage with the commodity sector and hence service led growth is sustainable, although its growth inducing effect on other sectors is limited. To have sustainable development in the long run, the inter-sectoral linkages, especially with the primary and export sectors needs to be strengthened.

## 5.7 Major Findings, Observations and Conclusions

The major findings of this chapter are as follows:

1. The service sector has been the major contributor of economic growth over the entire period under study.
2. Weighted average growth rates indicate that in the 70s the community, social and personal services were the leading sub-services, while the 1980s showed transport storage and communication as the highest contributors to service sector growth and in the 1990s trade, hotels and restaurants showed the highest share in the service sector growth, followed by finance and banking services.
3. During pre-statehood, government services drove service sector growth while in the post statehood trade, hotels, and banking services were the leading sub services. Over the entire period, banking services, followed by trade and hotels and government or public administrative services were the three important sub-services.
4. The employment distribution within the service sector clearly brings out the fact that majority of the persons in this sector are either employed in the government services or in trade and hotels. The employment elasticity values for these two sectors are also found to be higher than that of other sub-services.
5. Growth of employment in tourism industry has been mostly in the informal sector, since tourism being a seasonal activity; hotel owners minimize their operational costs by hiring temporary staff. Growth in the number of government services has led to proliferation of low skilled jobs. Service

sector employment in Goa is thus characterized by growth in informal and low skilled jobs.

6. Multiple regression analysis also point out that in the long run, government employees, banking sector output and number of hotels have determined growth of service sector, while in the pre statehood period it has been government employees and banking output and in the post statehood, hotels and banking services have determined service sector growth. Thus, the Bacon Eltis view on service sector growth holds true in case of Goa's service sector growth.
7. Despite the fact that tourism activity, which is seasonal in nature, has an influence on service sector growth, this sector's growth shows the least extent of instability compared to that of the other sectors in the economy.
8. Based on income and price elasticity values for sub-services, tourism services and producer services are found to be highly income elastic and price inelastic, indicating high growth and demand potential respectively.
9. Testing the sustainability of service sector growth in an intersectoral dynamic framework based on Granger causality tests indicate that though service sector does not exhibit linkages with the other sectors in the economy over the long run period under study, there are inter-sectoral linkages over sub-periods. Also sub-services show linkages with the export, primary and secondary sectors over the long run. Intra- sectoral linkages within services show strong linkages of all sub-services with trade, hotels and restaurants over the long run, indicating tourism services are the leading sub-services under the service sector.

10. VECM also shows no long term relationship between the service sector and the primary, export and secondary sectors of the economy.
11. Service sector growth led by tourism exhibits linkages with the commodity sectors and is sustainable to that extent, though these linkages are not widespread, benefiting the rest of the sectors in the economy.

**CHAPTER 6**

**CONSEQUENCES OF SERVICE LED GROWTH**

**IN GOA**

## CHAPTER 6

# CONSEQUENCES OF SERVICE SECTOR LED GROWTH IN GOA

### 6.1 Introduction

Goa is one of the most peaceful and highly developed smaller states of the Indian economy. The Twelfth Finance Commission, Government of India, has ranked the state high on the Human Development Index as well as on the Infrastructure Index. Similarly, the National Commission of Population ranked Goa first on its Composite Index with a value of 83.71. This clearly indicates that the economy has provided its citizens good socio-economic and physical infrastructural facilities, which has helped in achieving a good quality of life to them. In terms of per capita income, also the economy ranks the highest in India with a real per capita income of Rs.30,506 in 2003-04 (Government of Goa, 2006). Over the period from 1970-71 to 2003-04, Goa has turned into a service pre-dominant economy, with the share of primary sector in the state income going down and the shares of the industry and the service sector growing, with the highest contribution coming from the service sector. The service sector has also been the largest provider of employment followed by the industrial sector.

While the service sector growth has brought about a lot of economic prosperity, it has also led to many adverse consequences. Some of the major outcomes of the present pattern of growth have been a concentric type growth and development pattern, creating regional imbalances, widening of the gap between labor supply and matching job availability leading to the problem of unemployment especially

among the educated, growth of petty jobs in the unorganized sector, higher costs of living and adverse impact on the fiscal health of the economy due to a large army of public servants.

## **6.2 Service led Growth: Issues and Consequences**

A unique characteristic of Goa's economy is that it represents the case of a small open economy, which is dependent on the foreign sector for most of its inputs as well output and hence its growth and sustainability is subject to stability of external factors. For instance, mining activity depends on migrant labor for manual work on mining sites. In addition, large ships used for exporting iron ore are from other countries. Similarly, the mineral ore exported is also dependent on foreign buyers. Tourism, the largest economic activity is also dependent on tourist arrivals from other parts of India and abroad. So also, the state depends on neighboring states of Maharashtra and Karnataka for the supply of many vital inputs to the tourism industry such as, food grains, milk, meat, vegetables, fruits and flowers. The manufacturing sector is also dependent on other states for its major raw materials and final output, since the local market in Goa is too small to fully absorb whatever is produced by the industry except for products related to the tourism and mining industry. Goa is also dependent on other states for electricity and gas supply. Due to this the inter-sectoral linkages between the sectors in the economy, which should ideally be strong for sustainable growth, are quite weak. Even then, the service led growth appears to be quite sustainable. This is because the linkages within the sub-services of the service sector are strong and show a feed back effect and in the post statehood period one finds, service sector has linkages with the industrial sector.

While the service sector has a high growth potential, it has generated some long-term problems, which are discussed in the following section.

### 6.2.1 Regional Imbalances

Both planned and unplanned economic development often promotes investment in areas where economic infrastructure is already available. This results in higher growth and development of these regions, which are advanced, may be, at the cost of other regions. The resulting regional disparities tend to accentuate the increased capacity of the developed regions to draw upon resources both natural and human, of less developed areas. This is perhaps one of the features of Goa's economic growth too, which has resulted in increased regional disparities between the coastal and hinterland talukas of the state. The inter-taluka inequalities are evident in every aspect of development. In order to gain an understanding of differences in the level of economic progress among talukas, a simple method<sup>1</sup> is used. In this method let  $x_{ik}$  represent the size or value of the  $i$ th development indicator in the  $k$ th taluka of a state ( $i=1,2,3,\dots,m$ ) and ( $k = 1,2,\dots,n$ ). Then

$$y_{ik} = \frac{x_{ik} - \min_k x_{ik}}{\max_k x_{ik} - \min_k x_{ik}} \dots \dots \dots (1)$$

where  $\min_k x_{ik}$  and  $\max_k x_{ik}$  are respectively the minimum and maximum of ( $x_{i1}, x_{i2}, \dots, x_{in}$ ) and  $y_{ik}$  is the index value of a particular development parameter. If however  $x_i$  is negatively associated with development, like for eg, the infant

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<sup>1</sup>This method is analogous to the one proposed by Morin and Liser (1977) and used by Mukherjee (1980) for inter-state comparison and by Chelliah and Shanmugam (2002) to calculate HDI for inter-district comparison of Tamil Nadu state.

mortality rate or unemployment rate, which should decline as the taluka develops then (1) can be written as

$$y_{ik} = \frac{\max_k x_{ik} - \min_k x_{ik}}{\max_k x_{ik} - \min_k x_{ik}} \dots \dots \dots (2)$$

Obviously the scale values  $y_{ik}$  vary from zero to one. The value zero for a particular indicator does not mean no growth in the absolute sense. It is a relative value which indicates that compared to the taluka with the highest value for a particular development parameter, the taluka with a value of zero has negligible score.  $y_{iks}$  are basically index values of development indicators relating to the agricultural sector, industrial sector, tourism sector, Infrastructure sector and Human Resources of the economy arrived at using the formula mentioned in (1). The list of the indicators is provided table 6.a in Appendix III. There are two indicators for agricultural sector, two for industrial sector, four for tourism sector, six under Infrastructure and six under Human resources. The choice of the number of indicators though arbitrary, has been made after considering, the relevance and appropriateness of an indicator in reflecting the true level of growth of a taluka. For instance, the number of factories registered in each taluka, though available has been excluded, since there are many cases where the factory has been registered but has been shut down due to losses or loan default. Hence, this indicator does not figure in the list of indicators. Of course, if a simple composite aggregate indicator is to be used then some more research and analysis of available information is necessary to determine the number of indicators to be taken in each sector. A simple average of these indicator values (with equal weights) for a particular sector, with respect to each taluka gives a development index of one sector.

$$DI = \frac{y1t + y2t + y3t + \dots + yot}{n} \dots\dots\dots (3)$$

Where DI = development index of one sector.

N= number of indicators in a sector.

Similarly a simple arithmetic average of all the sectoral development indices gives the Composite Development Index (CDI), which is as follows:

$$CDI = \frac{DIa + DIi + DIto + DIif + DIh}{\text{number of sectors}} \dots\dots\dots (4).$$

Where DIa = Development Index of Agriculture sector.

DIi = Development Index of the Industrial sector.

DIto = Development Index of the Tourism sector.

DIif = Development Index of the Infrastructure services.

DI h = Development Index of the Human Resources.

The taluka wise values in respect of each development indicator and the sectoral developmental indices as well as the Composite development Index along with the ranks are shown in table 6.b and table 6.c respectively of Appendix III and the results and findings that emerge are discussed below.

The Agricultural Development Index is highest in Satari (0.71) followed by Quepem (0.70), Bardez (0.62) and Sanguem (0.614). Bardez, although an urban taluka emerges with a high value due to highest value for grossed cropped area, while Quepem is second in ranking due to its highest energy consumption for irrigation purposes. In the industrial sector, Salcete has the highest rank with an index value of 1.0 or 100, followed by Ponda (0.914) and Mormugao (0.67). This is mainly due to the growth of important industries in industrial estates like Verna in Salcete. Ponda has a high value due to the growth of many small-scale industries in 1997 in Kundaim, Madkai and Bethoda industrial estates. Mormugao due to its

large Port activity related to Exports has witnessed growth of many ancillary units to export activity. In sharp contrast, Pernem and Canacona turn out to be industrially backward talukas, with very low index values and hence rank 10<sup>th</sup> and 11<sup>th</sup> respectively as far as industrial development is concerned. Bardez, Salcete and Tiswadi have the first, second and third rank respectively in the Tourism development. This is evident, as the three coastal talukas of Goa are famous for their scenic beauty and beaches. This has led to the growth of various category hotels, from deluxe five star and luxury hotels to beach side restaurants and shacks and other tourist amenities. Satari, Pernem and Canacona have the lowest values as far as tourism growth is concerned. Similarly, in case of Infrastructural Development Index, shows the coastal talukas of Salcete, Bardez and Tiswadi having the first, second and third rank respectively with Salcete having an index value of 0.87, Bardez with 0.71 and Tiswadi with a value of 0.58. Ponda ranks fourth in infrastructure growth among all the talukas with an index value of 0.37. Sanguem, Quepem and Canacona have very low values for Infrastructure development. In contrast, Satari though a remote and backward taluka does reasonably well on infrastructural front. The Human Resource Development Index shows that the coastal talukas again perform better than the rest of the talukas, with Salcete having the highest rank and value of 0.78 followed by Bardez (0.69) and Mormugao (0.64). Tiswadi is ranked fourth due to its relatively high Infant mortality rate. But Canacona, Pernem and Sattari are among the lowest in the ranking of human resource development. If all the sectors together are taken and the Composite Development Index is calculated, Salcete, Bardez and Tiswadi get the first, second and third ranking. Sanguem, Pernem and Canacona are the lowest on the overall development front. This trend has not changed much since the

1970s, when the then planned and unplanned efforts led to the growth of Salcete, Bardez and Tiswadi talukas and after thirty-seven years, more and more activities and resources have come into these talukas. In addition, the backward and remote talukas are continuing to be so on most of the developmental fronts. Thus, the findings of the study show the growing regional (taluka level) disparities in economic and human resource development of Goa, with the coastal talukas of Salcete, Bardez and Tiswadi doing very well in most of the indices and are disproportionately developed, whereas the remote talukas of Canacona, Pernem and Sattari are very poorly developed. The analysis also throws light on the fact that the coastal talukas being predominantly urban and remote talukas being rural, this pattern of development has also increased the rural urban development gap. Thus, urban talukas where secondary and tertiary activities are concentrated are growing at the cost of rural and backward talukas and this inequality has not reduced over time.

### **6.2.2 Imbalance in the Supply and Demand for Labor**

Goa has a large base of active population i.e. those between the age group 15-59 years. Coupled with this is the high literacy rate, adequate facilities for school as well as higher education, high enrollment at primary and middle school stages of education, which have created a potential labor force, which is literate and educated. However, due to the emergent pattern of growth, the requirements of labor market in the economy, especially in the private sector have been for manual labor in the mining, construction and hotel industry, semi skilled and skilled workers in the tourism industry and engineers and diplomas in the mining,

shipping and manufacturing industry and commerce graduates in the banking sector. In the government services too, the vacancies are for clerical work, which do not require high intellectual skills. Because of this pattern of growth, petty and low skilled jobs especially in the informal sector are on the rise and due to lack of adequate job opportunities in the organized high value added sector like IT, business and soft ware services, the state is losing out its intellectual and skilled personnel to other states. In addition, the unemployed youth with non-professional degrees are unprepared to take up low-level jobs in the labor market, which has led to the influx of migrant labor. The educated youth want secure white-collar jobs or desk jobs, preferably in the government sector, which are not always available, since the various government departments are already saturated with employees. Due to the attitude and preferences, goan labor is slowly losing jobs to migrant labor. According to a study, 80 percent of the workforce even in the hotel industry is migrant population. The mismatch between the output of the educational system and the requirements of the job market in Goa, has resulted in about a lakh persons without employment on the live registers of the state employment exchange shown in table 6.1.

**Table 6.1 Number of applicants on the Live Register of Employment Exchange**

Level of Education	Number of applicants
1. Below Matriculate	15218
2. Matriculates	34085
3.HSSC	28734
4. Graduates	17802
5.Post-Graduates	2005
6. Diploma holders	3591
Total	101435

Source: Government of Goa (2006).

There are also persons who are unemployed and have not registered with the exchange. According to the 2001, population census, Goa's population is 13,

47,688. The decadal growth rate of 1991 and 2001 population, gives a growth rate of 14.89 percent. Assuming the same growth trend, in 2005-06 the population would be around 15.5 lakhs. Out of this figure, assuming 40 percent of the population is non-working, leaves the remaining 60 percent to be the employable and able bodied persons, which is 9, 30,000 persons. The Economic Survey of Goa, 2005-06 and Labor Commissioner's office estimate labor force engaged in all the non-agricultural activities to be 5, 71,929. The labor force in the Agriculture and Allied activities can be estimated as follows. The workforce engaged in this sector declined from 64 percent in 1961 to 16.6 percent in 2001. The growth rate in four decades is minus 47.4 percent. The decadal negative growth rate is 18.56 percent and for half a decade it would be 9.28 percent. In 2005-06 i.e. five years after the last census, it must be 7.21 percent (16.6-9.28). Today therefore 7.21 percent of the population is engaged in this sector i.e. 1, 11,755 persons. Adding the workforce in non-agricultural activities gives the total number of employed persons in the state, which is 6, 83,684. Assuming Non-Resident Goans working in Gulf and abroad are one lakh the total works to be 7, 83,684 employed. If the number of employed persons is subtracted from the workforce it is 1, 46,316, (9, 30,000- 7, 83,684) persons who are unemployed. which is around 10 percent of the population. It is also quite close to the unemployment rate (usual status) of the National Sample Survey's 60th Round (January-June 2004), which is 11.10 percent. Out of these 1, 01,435 are on the live register and 44,881 are not.

### **6.2.3 Growth of Employment in the Informal Sector**

The informal sector employment generally consists of employees without formal

contracts, worker benefits or social protection employed by formal /informal enterprises/employers or by households. The latter are mostly casual laborers, temporary or part time workers; paid domestic workers; unregistered or undeclared workers; and industrial out workers (also called home workers) (Chen et al 2006). A further analysis reveals that the coverage of social security schemes has been extremely sparse among the economically and socially vulnerable sections (Sakthivel and Joddar, 2006). State-wise estimates in India show that unorganized segments constitute around 70 to 80 percent of the total non-farm workforce even in the industrially advanced states, like Maharashtra and smaller states like Goa and Himachal Pradesh. The informal sector in Goa has contributed significantly to its total employment but workers under it do not enjoy any social security net, job security and protected employment.

Based on the data from the Economic Census reports of Goa for 1977,1980,1990 and 1998, it can be easily observed that in Goa the informal sector employment, especially in the non-agricultural sector has been rising over a period of time. If the persons employed in the informal sector as a percentage of the total workers (main and marginal) in the economy is taken one finds that informal workers were 43.42 percent of the workers in 1981 and by 1991, their share rose to 53.13 percent. According to the 55<sup>th</sup> round of NSSO on Employment and Unemployment workers in the unorganized sector, comprise 75.36 percent of all workers while organized workers are only one fourth of the total workers 24.64 percent in Goa.

In Goa, the informal sector is dominated by services in the community and social

sector, the trade, hotel and tourism sector and the manufacturing and repair works sector. Thus informal service sector in the economy seems to have picked up momentum due to; (i) the large public sector presence in community services which led to the expansion of employment in this sector initially, but later many private sector enterprises, came up in the decade of the 1990s to provide personal services like laundries, hair dressing salons, tailors and domestic services, (ii) the forward and backward linkages in tourism, trade and transport resulting in the growth of hotels and restaurants, (iii) the increase in consumer demand in favor of durable goods and the inability of the manufacturing sector (due to the state's industrial policy) to meet the growing demand has resulted in the increase in regional trade and transport, (iv) the durable goods and vehicles accumulated by the households in the 90s have generated the growth of services in the informal sector for the repair, maintenance and servicing of these goods and (v) the mushrooming of private institutions in health and education has also contributed much to the growth of other services during the period. However, this pattern of growth has led to more demand for consumer-based goods and services rather than producer goods. Thus, growth of tourism services, manufacturing, and repairs services has created a large informal sector economy in Goa.

#### **6.2.4 Marginalization of Agriculture**

Over the last forty years, the importance of agriculture in the State income as well as employment has been continuously declining. Some of the major reasons cited for this decline are high literacy rates, availability of clerical and white collared

jobs in the government services, education sector and hotel industry, creating scarcity of agricultural labor and resultant high costs in the sector.

Due to tourism and rapid urbanization, there has been a tremendous pressure to convert land for non-agricultural use. As a result, land available for cultivation has declined as can be seen from the land utilization pattern over time and hence the same limited cultivated land is used for sowing more than once. Table 6.2 reveals that the land not available for cultivation has almost doubled from 5.5 percent in 1961 to 10.28 in 2003-04. Similarly, cultivable waste land which can be potentially cultivated has declined from 25 percent in 1960-61 to 14.5 percent in 2004-05. This has been mainly due to the practice adopted by some farmers not to cultivate

**Table 6.2 Land Utilization Pattern in Goa (1960-61 to 2004-05)**

Year	1960-61	1989-90	1998-99	2000-01	2004-05
total geog area sq kms	370672.3 (100)	361113 (100)	361113 (100)	361113 (100)	361113 (100)
area under forest	105295.4 (28.4)	105294.0 (29.16)	125473 (34.75)	125473 (34.75)	125473 (34.75)
land not available for cultivation	36609.0 (5.5)	33137.0 (9.18)	37137 (10.28)	37137 (10.28)	37137 (10.28)
other uncultivated land	95193 (25.80)	79341.0 (21.97)	56690 (15.70)	57302 (15.87)	64892 (17.97)
i) permanent pastures	1305.0 (0.4)	1305 (0.36)	1305 (0.36)	1305 (0.36)	1305 (0.36)
ii) land under trees	595.2 (0.2)	580 (0.16)	580 (0.16)	580 (0.16)	580 (0.16)
iii) Cultivable waste	93,292.8 (25.2)	77456 (21.45)	54805 (15.18)	55417 (15.35)	52275 (14.5)
net area sown	133574.8 (36)	143341 (39.69)	141813.0 (39.27)	141201 (39.10)	133611 (37.0)
area sown more than once in ha	5602.4 (1.50)	12249 (3.39)	29355 (8.13)	30155 (8.35)	35589 (9.9)
gross cropped area in hectares	139177.3 (37.5)	155590 (43.08)	171168 (47.40)	171356 (47.45)	168634 (46.86)
Cropping intensity= gross cropped area/net sown area * 100	104	108.5	121	121	126.648

Source: Directorate of Agriculture, Government of Goa and Government of Goa, (2004b)

their plots and turn them into fallow land, which are sold for real estate purposes at attractive prices. If the net sown area is taken, it was 36 percent of the total surface land in 1960-61, it increased to 39.69 percent in 1989-90 and thereafter it declined marginally. By 2004-05, the net sown area was 37 percent. Due to this, the area sown more than once has gone up. Hence, the gross cropped area, which was 37.5 percent in 1960 increased to 43 percent in 1989-90 and further to 47 percent in 2004-2005. The cropping intensity also has increased from 104 in 1960 to 108 in 1989-90 to 126.64 in 2004-05.

### **6.2.5 Higher Cost of Living**

A consequence of a relative decline in agricultural growth as also agriculture and allied activities is that the economy of Goa has become excessively dependent on its neighboring states of Maharashtra and Karnataka for many of its food stocks, dairy and poultry products, consumer goods and garments. This has no doubt boosted the transportation and distribution services, but has led to increase the final value of a good paid by the local consumers. Tourism has also been responsible for a general higher cost of living for the local population. The rising trend in prices can easily be gauged from the movements in Consumer Price Index (CPI) for the urban white collared employees as also for the Industrial workers in the economy in the last decade.

Taking 1982 as the base year index, the 1991-92 value of CPI for industrial workers was 222 (Government of Goa, 2001), indicating that the cost of a fixed basket of goods and services consumed by industrial workers in Goa increased by

122 percent compared to the base year (1982-83) prices and this rise was by 420 percent in 2000-01. Thus in 18 years the price level went up more than four fold for the manual industrial workers. The CPI for middle class workers in 1991-92 was 245 and it rose to 469 in 2000-01. The percentage increase between these two time periods was 91 percent for white collared employees, but much higher at 134 percent for the industrial workers. A percentage break up of the various components of the two types of CPI shows the items on which people spend their income. In the early 1990s, the CPI for industrial workers reveals that the expenditure on food, pan and supari was more, but by 2000-01 housing seems to have dominated the basket of expenses, given the rise in the value of land and property in Goa due to growth of real estate business.

In case of middle class urban employees, food is the major item of expenditure in the 1990s and it continues to be even in 2000-01. Housing which was another major expense for urban households, seems to have declined in importance in 2000-01, while the expenditure on clothing has gone up slightly in 2000-01. Thus one can conclude that the basic amenities i.e. Housing, food and clothing have become more expensive and have contributed to the rise in the CPI. Though the economy has one of the highest growth rates of real per capita income in the country, yet the inflation rate seems to have over taken the income growth rate.

#### **6.2.6 Public Services and the Fiscal Health of the economy**

After Goa's liberation in 1961, the state policy of massive public investment in economic and social overhead capital such as public works, irrigation, electricity distribution, education and health services, led to the creation of new departments

and hence large recruitment of personnel for administrative and operational purposes. There was also a huge recruitment of primary teachers in the various government schools. The total number of state government employees in 1962-63 was 9060 and by 1970-71 the number grew to 15683. By 1998-99, this number multiplied over five times from the 1962-63 levels to 49,016. It is estimated that in 2004, the total number of employees directly and indirectly under the government are 45,935. More than 90 percent of these were and are regular or permanent employees. On the other hand, the non-regular employees are a small fraction of the government staff. Due to this large number, the salary payment and the pension payment as a share of the revenue expenditure of the state has gone up, over the decades. The figures mean that in a state already having a bloated bureaucracy, a major part of the government's expenses goes to keep its machinery moving, not to build up assets. In 2004-05, salary, pension and interest payments consumed 43 percent of the revenue receipts, leading to a substantial rise in unplanned and non-developmental expenditure.

During 1993-94 to 2005-06, pension payments have grown at 21 percent, due to the implementation of the Voluntary Retirement schemes and increase in the number of retirement of employees on superannuation in the 1990s. The growth rate of payments towards salaries was 10.30 percent, mainly due to the implementation of the Fifth pay Commission pay scales in the state.

There has been a substantial rise in the revenue deficit from Rs.14 crores in 1997-98 to Rs.226.1 crores in 2000-01. Thereafter it has shown a decline. Because of the rise in revenue deficit there has been a continuous rise in fiscal deficit. In 2004-05, the fiscal deficit has reached Rs.-549.9 crores. The revenue deficit as a percentage

of fiscal deficits increased from 11 percent in 1997-98 to 61 percent respectively in 1999-2000. This is precisely the period when the salary payments under the revenue account shot up, due to the revised pay scales implemented by the government. The fiscal deficit as a proportion of the GSDP has also increased from -2.54 percent in 1997-98 to -5.48 percent in 2000-01. Thus, a large army of employees in the various public services has cost the exchequer.

### **6.2.7 Demand –Supply Gap in Tourism Sector**

The tourism sector, which has become the ‘engine of growth’ of the service led economy, is going to face bottlenecks in its growth, if there is unplanned expansion. The Goa Tourism Master Plan (GTMP) prepared for the state’s tourism development, has made forecasts of foreign tourists and domestic tourists visiting Goa and estimated that foreign tourists’ arrivals will grow at 6.53 percent, a lower rate of 2.63 percent for domestic tourists and 3.67 percent for total tourists.

For this the report suggests the state should diversify from beach tourism to eco-tourism, business tourism, heritage tourism, adventure tourism, health tourism, monsoon tourism, festival tourism and educational tourism and adopt suitable marketing policies for which the state should have Rs 5724 crore, which could be financed as follows as shown in table 6.3.

**Table 6.3 Sources of Financing the Goa Tourism Master Plan**

Grants from Central Government	Rs.2233crore
Grants from Goa government	Rs. 657 crore
Assistance from financial institutions	Rs.2834 crore
Total Cost	Rs.5724 crore.

The following projects are suggested to be considered for private participation.

**Table 6.4 Projects open for Private participation**

Areas	Project Cost (Rs in Crore)
1. Air Port Development.	600
2. Golf course	20
3. Sea Resort	10
4. Artisan cum Craft Park	3.0
5. Water Park	15.0
6. Floating Restaurant cum sea cruise	10
Hotel & Travel Management Institute	1.0
Total	659.

The above projections require 39 percent central government assistance and 49 percent assistance from financial institutions. However, an analysis of the central government funds show that over the years, especially after statehood there has been a decline in the growth rate of the Central plan assistance to the state for tourism.

Also given the projection that Goa will need Central plan assistance of Rs. 2233 crore over the next sixteen years till 2021, the annual average plan assistance needed is Rs. 139.5 crore. Whereas if one observes the Tenth five year plan, central assistance for tourism for the five year period 2002-2007 is Rs. 150 crores, so the annual average expenditure for tourism in the above period works out to be Rs. 5 crores. Thus, it is a difficult proposition to get Rs.139.5 crores for tourism development growth alone from the centre every year. Hence, the state must try to spend its own resources for tourism growth. However, even the latter is, difficult, as, over the years, the average annual growth rate of the state government's budgetary expenditure, both on the current as well as the capital account for

Tourism industry has declined from 17 percent to 15.69 percent from pre-statehood to post statehood period.

To generate large financial resources, the state government cannot rely excessively on long-term State financial institutions given the precarious condition of some of them. Given the huge investments requirements, the state, firstly needs to increase its tourism receipts, secondly it could invite private participation, domestic and foreign to invest in areas like eco-tourism, business tourism, health tourism and infrastructure.

### **6.3 Summary Observations**

Following observations can be made from this chapter

1. While the Service led growth pattern has a high growth potential, it has generated some long-term problems in the economy. The urban talukas where secondary and tertiary activities are concentrated are growing at the cost of rural and backward talukas and this inequality has not reduced over time.
2. The coastal talukas of Salcete, Bardez and Tiswadi are doing very well in most of the development indices and are disproportionately developed, whereas the remote, rural talukas of Canacona, Pernem and Sattari are very poorly developed. Thus, the service led growth has created and persisted regional imbalances.
3. Service pre-dominant growth has led to growth of low skilled and petty jobs creating a mismatch between the output of the educational system and the requirements of the job market, resulting in high unemployment.

4. Services growth has been more conspicuous in the informal sector, which is characterized by inadequate social security for employees, temporary nature of work, contract labor and the like. The major industry which is the tourism and hotel services being seasonal in nature, 80 percent of the labor in this sector is estimated to be temporary or informal. Community services and manufacturing repairs services which provide a large number of informal jobs have given rise to petty services.

5. Due to marginalization of agriculture, Goa has become excessively dependent on its neighboring states of Maharashtra and Karnataka for many of its food stocks, consumer goods, garments and many other capital goods. The transportation and distribution services increase the final value of a good paid by the consumer. Tourism has also been responsible for a general higher cost of living for the local population. The CPI in the last decade has been regressive, shows housing has become costly for the lower income segment, and food and clothing prices have become more expensive for the urban middle class families.

6. Growth of government employees over the years and especially in the recent past has led to rise in the revenue account expenditure of the state and this in turn has resulted in larger revenue deficits as well as fiscal deficits, adversely affecting the fiscal health of the economy.

7. The tourism industry, which is driving service sector growth, also suffers from shortage of long term funds for development.

**CHAPTER 7**

**MAJOR FINDINGS, IMPLICATIONS AND**

**CONCLUSIONS**

## CHAPTER 7

### MAJOR FINDINGS, CONCLUSIONS AND SUGGESTIONS

#### 7.1 Major findings of the study

The present thesis is an attempt to analyze the sectoral and structural changes in the economy of Goa with special reference to its service sector. The study tries to find out the leading and lagging sectors and sub- sectors of the economy over the study period 1970-71 to 2003-04. The thesis aims to study growth, sustainability and stability of the service sector, a sector which contributes 50 percent of the state income and over 50 percent of the total employment in the state economy. The study also tries to critically examine the issues and consequences emerging out of such a service led pattern of growth.

Having introduced the basic research problem in chapter 1 along with the objectives, hypotheses, methodology, significance, scope and limitations of the study, chapter 2 proceeds to give a brief review of literature on various aspects related to the service sector and economic growth.

Chapter 3 aims at analyzing the structure and pattern of Goa's economic growth, over the study period 1970-71 to 2003-04 and finding out the important contributors of the growth process, at the sectoral and sub-sectoral level, to determine the sources of economic growth. Chapter 4 studies the important sub-sectors of the primary, secondary and service sector; the factors responsible for their nature of growth, with a special focus on the implications of the emergent

pattern of growth on the service sector. Chapter 5 is a detailed study of the service sector in Goa. The income and employment structure of this sector are analyzed for the period 1970-71 to 2003-04, as also for the pre-statehood and post statehood period. The employment elasticity of sub services are analyzed to find out their employment absorption capacities, given service sector is the largest employer. The factors determining service sector growth for the study period and for the pre-statehood and post statehood are found out. Lastly, the service sector's growth and demand potential, stability and linkages with other sectors in the economy are studied to find out the sustainability of service sector growth. Chapter 6 is a critique of the service led pattern of growth in Goa.

The analysis undertaken in various chapters 3, 4, 5 and 6 has many important findings. The major findings emerging from the study are summarized as follows:

- a. The occupational structure of the economy during the study period reveals that there has been a significant fall in the share of employment in the primary sector in the economy, the secondary sector showing a moderate rise and the service sector employment has been rising substantially in the above-mentioned periods.
- b. Based on the sectoral employment elasticity values, it is clear that the service sector has the highest employment intensity relative to other sectors, though its value is less than unity. The secondary sector has lower value indicating this sector is more

capital intensive, whereas the primary sector has a very poor employment absorption capacity due to its falling share in the state output.

- c. The changes in the sectoral shares of Goa's NSDP over the period 1970-71 to 2003-04 show that for every decade, the tertiary sector has been the major contributor of economic growth. The primary sector has declined in terms of growth rate and sectoral contribution, the secondary sector has been growing at a high rate though its share in NSDP has moved up marginally in the 1990s and the service sector pre dominates the economy in terms of its large share and high growth rates.
- d. At the sub-sectoral level, over the entire study period, the registered industries, banking services, and trade and hotels emerge as the centers of growth. The primary sector and agriculture and mining sectors under it, are the lagging sub-sectors of the economy over the entire period of study and the leading sub-sectors are registered industries under secondary sector, banking and insurance services, trade and hotel services under service sector and exports of iron ore under the export sector. Though the local mining output has declined, mineral exports show a rising trend, due to growing share of Non-goan mineral ore imported from Karnataka and Maharastra as also

due depreciation of the rupee, during the last one and a half decade which increased the value of mineral exports from Goa.

- e. The income and employment of the agricultural sector has fallen over the time period under study mainly due to the uneconomical size of land holdings, inequitable distribution of landholdings, difficulty in leasing out farm lands, inadequate irrigation facilities; delays in completion of irrigation projects, cost over runs and high cost of farm inputs.
  
- f. The mining sector employment has declined in importance due to low grade of iron ore, fluctuations in export demand for mineral ore and the use of labor displacing capital machinery in order to compete with the big exporters from Australia and Brazil. This has led to a shift of labor from mining to other labor-intensive activities, mainly the service sector.
  
- g. The industrial sector has shown a high growth rate due to financial assistance from banks, high labor productivity in this sector and capital efficiency. Though the share of output in this sector has grown at high rates, the employment in the manufacturing industry has declined, indicating a capital-intensive pattern of production structure emerging. This has reduced work force requirement in industry and pushed labor out of this sector to the service sector. Thus, changes in the

production sector have implications for the growing of service sector employment and output in Goa.

- h. The tourism sector has developed due to large number of tourist arrivals, initial government investment and the flow of development finance to the tourism sector, growth in the number of hotels, sufficient infrastructural facilities, and tourist transport services. Banking services are found to be growing due to high deposits especially from non-resident Goans, credit lent to the service sector, tourism and transport services in particular. Industry and mining exports are also receivers of bank advances.
- i. Multiple regression analysis is taken up to understand the factors, which determine economic growth, and growth of the leading sub-sectors i.e., trade, hotels and restaurants, registered industries and banking and insurance services. The major finding of regression is that economic growth in Goa over the entire study period has mainly been driven by growth of hotels or tourism services. This is followed by industrial production, banking services and exports earnings.
- j. At the sub-sectoral level, output from trade, hotels and restaurants is mainly determined by index of tourist arrivals and number of hotels. Banking output and electricity supply also

have some impact though to a limited extent. Industrial production been mainly determined by high value added per labor and banking services, and banking and insurance services have trade, hotels and restaurants as the main determining factor, followed by transport storage and communication services and industrial output. Thus, banking and tourism along with industry are the key sectors of economic growth with a feed back relation among them.

- k. The service sector's income trends show that the banking services, followed by trade and hotels and government or public administrative services were the three important sub services which contributed to service sector growth over the entire period. During pre-statehood, government services drove service sector growth while in the post statehood trade, hotels, and banking services were the leading sub services.
- l. The employment distribution within the service sector clearly brings out the fact that majority of the persons in this sector are either employed in the government services or in trade and hotels. The employment elasticity values for these two sectors are also found to be higher than that of other sub-services.
- m. Growth of employment in tourism industry has been mostly in the informal sector, since tourism being a seasonal activity;

hotel owners minimize their operational costs by hiring temporary staff. Growth in the number of government services has led to proliferation of low skilled jobs. Service sector employment in Goa is thus characterized by growth in informal and low skilled jobs.

- n. Multiple regression analysis also point out that in the entire study period, government employees is the main determinant of service sector output, followed by banking sector output per capita and number of hotels. While in the pre statehood period it has been government employees followed by banking output, in the post statehood, hotels and banking services have determined service sector output. Thus, there is some evidence of the Bacon Eltis view on service sector growth holding true in case of Goa's service sector .
  
- o. Despite the fact that tourism activity, which is seasonal in nature, has an influence on service sector growth, this sector's growth shows the least extent of instability compared to that of the other sectors in the economy.
  
- p. Based on income and price elasticity values for sub-services, tourism services and producer services are found to be highly income elastic and price inelastic, indicating high growth and demand potential respectively.

- q. Testing the sustainability of service sector growth in an intersectoral dynamic framework based on Granger causality tests indicate that though service sector does not exhibit linkages with the other sectors in the economy over the long run period under study, there are inter sectoral linkages over sub periods. Also sub-services show linkages with the export, primary and secondary sectors over the long run. Intra- sectoral linkages within services show strong linkages of all sub services with trade, hotels and restaurants over the long run, indicating tourism services are the leading sub-services under the service sector. VECM also shows no long-term relationship between the service sector and the primary, export and secondary sectors of the economy.
- r. The major findings of the 6<sup>th</sup> chapter are that the coastal talukas of Salcete, Bardez and Tiswadi are doing very well in most of the development indices and are disproportionately developed, whereas the remote, rural talukas of Canacona, Pernem and Sattari are very poorly developed.
- s. Service pre-dominant growth has led to growth of low skilled and petty jobs creating a mismatch between the output of the educational system and the requirements of the job market, resulting in high unemployment.

- t. Services growth has been more conspicuous in the informal sector, which is characterized by inadequate social security for employees, temporary nature of work, contract labor and the like. The major industry which is the tourism and hotel services being seasonal in nature, 80 percent of the labor in this sector is estimated to be temporary or informal. Community services and manufacturing repairs services which provide a large number of informal jobs have given rise to petty services.
  
- u. Marginalization of agriculture has made Goa's economy excessively dependent on its neighboring states of Maharashtra and Karnataka for many of its food stocks, consumer goods, garments and many other capital goods. Tourism has also been responsible for a general higher cost of living for the local population.
  
- v. The Consumer Price Index in the last decade has been regressive and shows housing has become costly for the lower income segment, and food and clothing prices have become more expensive for the urban middle class families.
  
- w. Growth of government employees over the years and especially in the recent past has led to rise in the revenue account expenditure of the state and this in turn has resulted in larger

revenue deficits as well as fiscal deficits, adversely affecting the fiscal health of the economy.

- x. The tourism industry, which is driving service sector growth, also suffers from shortage of long term funds for development.

## **7.2 Conclusions**

From the above analysis and findings certain valid conclusions can be drawn. Firstly, it can be concluded that the economy of Goa has undergone a structural change with a decline in the primary sector's contribution towards the growth process and a rise in the secondary sector and more prominently the service sector activities and their contribution in the state income. The change is such that the registered industry, mining exports, banking services and trade and hotel services have become leading sectors of the economy over time while agriculture sector and mining sector have turned to be the lagging sectors of the economy.

Secondly, the primary sector has suffered due to the problems faced in the agricultural sector and stagnation of mining sector's output. Further more, high costs in agriculture and capital-intensive character of mining has pushed labor away from these sectors towards alternative career options like retail trade, government services, tourism services, in the service sector, given the moderate rise of jobs in the secondary sector. The registered industry has grown due to high labor productivity, but due to its capital-intensive production processes, labor has got pushed out towards other activities in the recent times. Thus, there is prima facie evidence to conclude that the decline in employment in agriculture, registered

industry and mining have acted as a push factor and contributed to service sector growth. Trade, hotels and banking have emerged as a pull factor in Goa's economic growth. It can be concluded from multiple regression analysis that tourism is the major determinant of economic growth in Goa, though industrial production, banking and exports also influence growth. In addition, trade, hotels and restaurant services and industrial production seem to have a spill over effect with banking services output.

Thirdly, the study of the service sector shows that both in terms of its income as well as employment, trade and hotels and government services have emerged as the key contributors to service sector growth in the economy, though banking and insurance services are a key contributor in terms of income of the service sector. This service sector growth in Goa, has promoted low skilled employment in the public services and informal sector jobs in the hotel and tourism industry. Based on the pre-statehood period and post state hood period analysis on the service sector growth determinants in Goa, it can be observed that government services have driven growth in the pre-statehood period while tourism based services have predominated in the post statehood period. Banking services have also emerged as important sub-services due to their linkages with trade and hotels, transport services and industrial sector, which implies that producer services are also growing in importance.

Fourthly, despite tourism-based services, which are seasonal in nature, influencing service sector growth, the latter is least unstable compared to the other sectors in the economy. Also, trade, hotels and restaurant services exhibit high growth and

demand potential. Thus, it can be concluded that the tourism is a major pull factor in the service sector growth.

Fifthly, Granger Causality test and VECM results show that there is no clear long term equilibrium relationship between the service sector and the primary, secondary and export sectors in the economy, though the service sector shows linkages with secondary sector and exports sectors over sub periods. Based on the argument of Subramanian (2006) that growth momentum of an economy is sustainable, if the major sub-services in the service sector consist of services linked to commodity production and the empirical finding that in case of Goa's economy, its primary, secondary and export sectors show long-term linkages with major sub-services in the long-term period and over sub-periods, it can be concluded that the service sector has linkage with the production sector and hence service led growth can be sustainable, although its growth inducing effect on other sectors is limited. Moreover, the sub- sectoral linkages within the service sector are very strong, with all the sub-services having linkages over the entire study period with trade, hotels and restaurant services.

Lastly, the service sector led pattern of growth has had some adverse impact on the economy. It can be concluded that this pattern of growth has created and persisted the regional inequalities in the economy, unemployment, marginalization of agricultural activities, excessive dependence on neighboring states for essential food products and agricultural commodities, higher costs of living, growth of informal sector employment, burgeoning of the public services sector and inadequate attention to the tourism industry.

### 7.3 Implications of the study and Suggestions

The structural changes taking place over the years have its own implications.

Since the tourism sector has emerged as a major pull factor in service sector growth, there is, need to develop the tourism sector in a more planned manner. The main concern should be how to attract more tourists into Goa given the competition from other states. In fact, the promotion of eco-tourism in the western Ghat talukas of Sanguem and Sattari can spread the benefits of tourism to the most remote areas of the economy. Goa should try to attract foreign investment in required areas and enter into exchange programs, have training programs, especially in the areas of eco- tourism, health tourism and business tourism in association with those countries, which have been successful in these types of tourism activities like some of the Latin American countries.

Goa being the permanent venue for the International Film Festival in India has the onus of promoting a realistic brand name of Goa to the world. The stakeholders should market Goa as a potential excellent destination for business tourism, film industry growth and attract investments to provide state of art infrastructure and transport facilities. The state needs to attract high quality investment into the tourism sector, given the precarious state of its finances.

In the last one and a half decade, service sector has grown not only due to consumer services, but also due to producer services, like banking, which show

linkages with the industrial and export sector. If service sector growth path is to be made strong and sustainable, the productive linkages need to be strengthened.

However, the decline in employment in agriculture, industry and mining sectors has helped the growth of service sector initially, in order to sustain the growth of service sector in the long run the linkages with the above sectors need to be strengthened.

There is need to develop agricultural sector, a sector in which the economy has had a comparative cost advantage, though its share in output and employment has declined. Due to tourism and rapid urbanization, there has been a tremendous pressure to convert land for non-agricultural use. Given this situation, any increment to crop production in the state would have to be through vertical growth and not horizontal expansion. In other words, the available land resources, have to be utilized optimally to give the best possible production and productivity per unit area with the available technologies. Also government, local bodies and farmers themselves should undertake training and education to the farmers to improve their farm practices. There is an urgent requirement to improve the agricultural sector and generate linkages with the food and tourism industry, so that the income distribution between the rural and urban talukas becomes less unequal and the economy becomes less dependent on other states for food supplies. Development of agriculture-allied activities like dairy and poultry farming will also boost the rural sector growth; reduce the cost of food items to the general population.

One cannot deny the fact that mining exports are still a major economic activity in Goa and it appears that the growth of mining sector is essential for the growth of the service sector. There is need to continue the support given to the mining sector.

It is also necessary to improve the industrial development scenario in Goa for the service sector growth. Since most of the employment in service sector is temporary and informal, economy should diversify its activities and attract high value and skilled based industries like Information Technology, off shore business services and entertainment services to absorb the skilled manpower in the economy. Thus, if the state economy is to sustain and accelerate its economic growth in the future, the tourism sector needs to be developed through diversification and strengthen its linkages with the agricultural sector, mining exports should continue to increase and the industrial sector should grow at a faster rate. Besides, industrial sector needs to attract high value skilled-based services to utilize the skills and talents of the existing labor force.

#### **7.4 Limitations and Scope for Future Research**

Though the present study aimed at studying the economy of Goa in a detailed manner, many aspects like the structural changes of the economy in terms of changes in the capital stock, social infrastructure, total export earnings and import payments, remittance earnings of Non Resident Goans, the migrant population could not be covered due to lack of availability of time series data for the above variables.

Also due to the absence of input output tables at the sectoral and sub-sectoral level for the economy of Goa, the exact backward and forward linkages among sectors could not be estimated. In fact there is a need to develop such tables for the state economy to assess the various inter and intra- sectoral flows and identify the sectors which need to be strengthened. Detailed sectoral analysis of some important sectors in the economy like industry, tourism, banking, mining and the like can be taken up with a focus on specific strategies to further strengthen these sectors. Specific studies based on primary data on the significance of migrant population in growth, the estimation of remittance income, the impact of high end tourism on the economy and the like can be taken up for future research.

However, it is evident that the economy of Goa will continue to develop based on its service economy. Hence, there is a need to accelerate the development of the service sector, in a way that will benefit not only this sector but also the other productive sectors in the economy.

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## Appendix- I

**Table 4.a Cointegration Results for variables in the Economic Growth Regression Equation**

Trend assumption: No deterministic trend (restricted constant)  
 Series: pcy, iip, exp, hot, bank/branch  
 Lags interval (in first differences): 1 to 1

**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.848805	161.8588	76.97277	0.0000
At most 1 *	0.777568	101.4050	54.07904	0.0000
At most 2 *	0.620149	53.30463	35.19275	0.0002
At most 3 *	0.389110	22.32942	20.26184	0.0256
At most 4	0.185317	6.558600	9.164546	0.1518

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.848805	60.45389	34.80587	0.0000
At most 1 *	0.777568	48.10033	28.58808	0.0001
At most 2 *	0.620149	30.97521	22.29962	0.0024
At most 3	0.389110	15.77082	15.89210	0.0522
At most 4	0.185317	6.558600	9.164546	0.1518

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Table 4.b Cointegration Results for variables in the Tourism sector  
Regression Equation**

Trend assumption: Quadratic deterministic trend

Series: thr, bank/branch, hot, ita, elec, tveh

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.921833	211.4461	107.3466	0.0000
At most 1 *	0.836129	129.8812	79.34145	0.0000
At most 2 *	0.666514	72.00359	55.24578	0.0009
At most 3 *	0.590603	36.86268	35.01090	0.0313
At most 4	0.201527	8.284448	18.39771	0.6537
At most 5	0.033269	1.082724	3.841466	0.2981

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.921833	81.56491	43.41977	0.0000
At most 1 *	0.836129	57.87762	37.16359	0.0001
At most 2 *	0.666514	35.14091	30.81507	0.0139
At most 3 *	0.590603	28.57823	24.25202	0.0126
At most 4	0.201527	7.201724	17.14769	0.6909
At most 5	0.033269	1.082724	3.841466	0.2981

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values



**Table 4.c Cointegration Results for variables in the Industrial sector****Regression Equation**

Trend assumption: No deterministic trend

Series: iip, bank/branch, fk/f , va/l

Lags interval (in first differences): 1 to 1

**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.766958	67.86333	40.17493	0.0000
At most 1	0.317247	21.25420	24.27596	0.1147
At most 2	0.228032	9.042285	12.32090	0.1666
At most 3	0.023479	0.760279	4.129906	0.4408

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.766958	46.60913	24.15921	0.0000
At most 1	0.317247	12.21191	17.79730	0.2830
At most 2	0.228032	8.282006	11.22480	0.1572
At most 3	0.023479	0.760279	4.129906	0.4408

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Table 4.d Cointegration Results for variables in the Banking sector  
Regression Equation**

Trend assumption: No deterministic trend

Series: bank, iip, exp, thr, tsc

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value
None *	0.925697	175.7208	60.06141
At most 1 *	0.825325	92.53359	40.17493
At most 2 *	0.434524	36.69903	24.27596
At most 3 *	0.392935	18.45625	12.32090
At most 4	0.074702	2.484455	4.129906

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value
None *	0.925697	83.18723	30.43961
At most 1 *	0.825325	55.83456	24.15921
At most 2 *	0.434524	18.24278	17.79730
At most 3 *	0.392935	15.97180	11.22480
At most 4	0.074702	2.484455	4.129906

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

## Appendix -II

**Table 5. a Cointegration Results for variables in the Service sector**

### Regression Equation

Trend assumption: Quadratic deterministic trend

Series: ser, hot, bank/branch, govt.

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.651490	69.40790	55.24578	0.0018
At most 1 *	0.510786	35.67703	35.01090	0.0424
At most 2	0.307806	12.79847	18.39771	0.2538
At most 3	0.031554	1.026010	3.841466	0.3111

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.651490	33.73087	30.81507	0.0214
At most 1	0.510786	22.87856	24.25202	0.0751
At most 2	0.307806	11.77246	17.14769	0.2551
At most 3	0.031554	1.026010	3.841466	0.3111

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

## Appendix –III

**Table 6.a List of Development Indicators for the Talukas of Goa.**

Sl.No.	Category	No	Development Indicators	Total No. of Indicators.
1.	Agriculture (AG)		<ol style="list-style-type: none"> <li>1. Gross Cropped Area (in ha)(GCA)</li> <li>2. Energy consumed for irrigation (mkwh) (EI).</li> </ol>	2.
2.	Industry (IND)		<ol style="list-style-type: none"> <li>1. Estimated average number of daily workers employed in registered factories.(W)</li> <li>2. Energy consumed for industrial purposes (mkwh).(EIND)</li> </ol>	2.
3.	Tourism (T)		<ol style="list-style-type: none"> <li>1. Number of hotels, lodges, paying Guesthouses (H)</li> <li>2. Energy consumed for commercial purposes (mkwh)(EC).</li> <li>3. Domestic Tourist arrivals(DT).</li> <li>4. Foreign Tourist arrivals(FT).</li> </ol>	4.
4.	Infrastructure (INF).		<ol style="list-style-type: none"> <li>1. Number of scheduled Commercial Banks (CB).</li> <li>2. Number of Co-operative banking offices (COB)</li> <li>3. Number of towns electrified(TE)</li> <li>4. Number of villages electrified(VE).</li> <li>5. Number of post offices in use(PO).</li> <li>6. Number of telephones in use(TEL).</li> </ol>	6.
5.	Human Resources (HR).		<ol style="list-style-type: none"> <li>1. Density of Population persquare km(DP).</li> <li>2. Infant mortality rate (per 1,000 live births)(IMR).</li> <li>3. Total Literacy rate (in percent)(TLR).</li> <li>4. Combined gross enrollment ratio in primary, middle, high and higher secondary schools to the total taluka population (in percent)(CGR).</li> <li>5. Number of beds in government hospitals (BGH).</li> <li>6. Number of beds in private hospitals (BPH).</li> </ol>	6.
	<b>Total</b>			<b>20.</b>

**Table 6.b Index Values of Selected Indicators of Development for Talukas in Goa**

	Tiswadi	Bardez	Pernem	Bicholim	Satari	Ponda	Sanguem	Canacona	Quepem	Salcete	Mormugao
GCA	0.476	1.00	0.71	0.57	0.66	0.54	0.648	0.36	0.40	0.79	0.00
EI	0.43	0.24	0.24	0.45	0.76	0.58	0.58	0.23	1.00	0.16	0.00
W	0.347	0.60	0.003	0.24	0.27	0.978	0.08	0.00	0.068	1.00	0.71
EIND	0.326	0.26	0.014	0.38	0.08	0.85	0.17	0.00	0.14	1.00	0.63
H	0.206	1.00	0.14	0.007	0	0.015	0	0.028	0.00	0.26	0.16
EC	0.67	1.00	0.038	0.103	0	0.15	0	0.015	0.06	0.53	0.25
DT	1.00	0.93	0.03	0.003	0	0.18	0.013	0.027	0	0.94	0.396
FT	0.60	1.00	0.04	0.001	0	0.007	0.0027	0.07	0	0.93	0.151
CB	0.84	1.00	0.013	0.08	0	0.27	0.027	0.00	0.05	0.92	0.40
COB	0.86	0.60	0.05	0.16	0.10	0.71	0.08	0.00	0.11	1.00	0.38
TE	0.50	1.00	0.10	0.30	0	0.30	0.10	0.00	0.10	0.80	0.20
VE	0.32	0.39	0.28	0.22	1.00	0.31	0.57	0.00	0.43	0.48	0.006
PO	0.42	1.00	0.24	0.18	0.24	0.60	0.05	0.02	0.00	1.00	0.13
TEL	0.55	0.65	0.05	0.07	0.35	0.016	0.04	0.23	0.106	1.00	0.28
DP	0.54	0.63	0.16	0.24	0.03	0.35	0.00	0.038	0.12	0.65	1.00
IMR	0.00	0.90	1.00	0.87	0.86	0.97	1.00	0.95	0.94	0.91	0.98
TLR	0.94	1.00	0.556	0.83	0.147	0.75	0.81	0.00	0.006	0.66	0.75
CGR	0.72	0.36	0.00	0.50	0.74	0.46	0.14	0.43	0.87	1.00	0.50
BGH	1.00	0.15	0.017	0.02	0	0.06	0.038	0.00	0.002	0.46	0.17
BPH	0.56	0.78	0.015	0.12	0.004	0.47	0.00	0.07	0.12	1.00	0.43

**Table 6.c Ranking of Talukas in Goa by Sectoral and Composite Index values**

	Tiswadi	Bardez	Pernem	Bicholim	Satari	Ponda	Sanguem	Canacona	Quepem	Salcete	Mormugao
Dla	0.45	<b>0.62</b>	0.475	0.51	<b>0.71</b>	0.56	0.614	0.29	<b>0.70</b>	0.475	0.00
Rank	9	<b>3</b>	7	6	<b>1</b>	5	4	10	<b>2</b>	8	11
Dfi	0.336	0.43	0.008	0.31	0.175	<b>0.914</b>	0.125	0.00	0.104	<b>1.00</b>	<b>0.67</b>
Rank	5	<b>4</b>	10	6	7	<b>2</b>	8	11	9	<b>1</b>	<b>3</b>
Dlt	<b>0.618</b>	<b>0.98</b>	0.06	0.03	0	0.088	0.0039	0.03	0.015	<b>0.66</b>	0.24
Rank	<b>3</b>	<b>1</b>	6	8	11	5	7	9	10	<b>2</b>	4
DIInf	<b>0.58</b>	<b>0.77</b>	0.12	0.17	0.28	0.37	0.14	0.008	0.133	<b>0.87</b>	0.24
Rank	<b>3</b>	<b>2</b>	9	7	5	4	8	11	10	<b>1</b>	6
Dlh	0.63	<b>0.64</b>	0.29	0.43	0.297	0.51	0.33	0.248	0.346	<b>0.78</b>	<b>0.64</b>
Rank	4	<b>3</b>	10	6	9	5	8	11	7	<b>1</b>	<b>2</b>
CDI	<b>0.52</b>	<b>0.69</b>	0.19	0.292	0.29	0.486	0.24	0.11	0.26	<b>0.76</b>	0.37
Rank	<b>3</b>	<b>2</b>	10	6	7	4	9	11	8	<b>1</b>	5