CHAPTER - 1

The Problem, Objectives and Scope of the Study

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The Problem, Objectives and Scope of the Study

1.1. Introduction

The development dynamics of the regional economy of Kerala are formulated by the interaction of a variety of unique historical, geographical, cultural and economic environment\(^1\). The much celebrated 'Kerala model of development\(^2\)', that high level of living could be attained even with low level of per capita income has its genesis in the socio-politico-cultural movements in Kerala and the interventionist policies of the state governments in the realm of education, public health, and infrastructure and radical redistributive reforms in agriculture. The high Physical Quality of Life Index (PQLI) of Kerala on par with the developed Western nations, with low income per head was viewed as an inexpensive model\(^3\) of 'development without growth\(^4\)' that could be emulated by the developing countries of the world over. There are a number of studies\(^5\) on Kerala economy that explain the present state of affairs and explore the reasons behind the co-existence of low income and high PQLI. However, the continued development debacle of the economy has raised doubt about the 'model' and researchers have shifted emphasis to the sustainability of the Kerala model of development\(^6\).

The extensive discussions, deliberations and policy recommendations regarding the stalemate of agricultural sector in Kerala in particular and in India in general are now related to the sustainability of growth. Studies on selected crops and agricultural sector as a whole that explored the causes for the chaos invariably conclude that the agricultural scenario in the region has been characterised by long run incapability to deliver to the needs of the state, particularly since the turn of the mid seventies. Several factors stemming from the socio-politico-economic, ecological-environmental were cited as the forces that led to the stagnation in agriculture.
1.2. The Context

The long run sustainable growth and development of a national or regional economy depends on the volume of output produced of all sectors – agriculture, industry and the service sectors. In the agriculture sector of the state it has been observed that:

- Net Area Sown has been declining continually particularly of land under paddy cultivation.
- Current fallow and fallow other than current fallow has been increasing.
- Output of majority of crops has been falling; and
- Productivity too registered a downtrend especially after the 70s.

Still, the significant role of output growth of agricultural sector in the growth of the national or regional economy cannot be underrated. Output will increase due to an (i) increase in the factor inputs and (ii) efficient utilisation of inputs in production. Why did output and yield of crops in Kerala fall? Is it due to the use of less input or inefficient utilisation of inputs?

A regional economy like Kerala with limited land resources for cultivation has no option but to rely up on improving the efficiency in the input utilization. This is all the more important when the share of arable land has been falling at an alarming rate every year due to factors operating from the environmental to the economic front. Hence productivity increase is the way out for improving the output of agricultural sector.

The history of developed nations has amply demonstrated that they have enjoyed a positive growth trend in productivity. In the West there has been increased awareness of the productivity element in the dynamics of growth ever since the Classical writers. However, serious attention was paid to the productivity theme only during the later half of the 19th Century. In India, scholars only recently started thinking and working on the productivity theme. There are studies on productivity at micro level as well as at macro level covering the sectors in isolation.

However, studies that focus exclusively on the productivity performance of sector, particularly of agricultural sector of a regional economy are relatively very few. In the context of Kerala there are no studies that exclusively focus on the productivity
performance of the agricultural sector as such. Many studies, which were aggregative in nature or dealt with individual crops, invariably found that low productivity was the reason behind the retardation of output growth. And almost all studies were based on land productivity. No serious attempt was there to compute the TFP of crops. Each crop with its own geophysical characteristics responds to fertilizers, climate and other factors differently. Therefore, productivity analysis across crops is called for under a common methodological and analytical frame work. It is in this backdrop the present study is framed.

1.3. The Problem

The signs of continuous sluggishness have been reflecting upon the performance of agricultural sector, particularly crops sector of Kerala. Several factors have been identified as agents for improving agricultural production. Both institutional and technological factors work behind a thriving agricultural sector. Land reform measures are one of the important institutional changes that invigorate agricultural development. Kerala is one of the regions where state directly intervened in the redistribution of land by legislative measures and made land available to the ‘tillers’ of the soil. The other institutional mechanism is related to the provision of credit. Kerala is considered to be one of the best in regard to provision of credit in the country. Thus land reform measures and institutional credit system may be reckoned as favourable factors for the growth of Kerala’s agriculture. Other crucial factors that govern the growth of agricultural sector are a vibrant market for agricultural labour and the technological change. Kerala has well-organised and spirited agricultural labour market that is controlled by labour unions that were able to raise agricultural wages. Many research studies in the remote and recent past on the crops sector as a whole and on specific crops in particular concluded that the prime factor behind the diffidence of agricultural sector was the absence of productivity growth and stagnant technology in the sector.

Now it is a known and established empirical fact that agriculture in the state has been sinking. And almost all studies in the Kerala context have recorded that the productivity of agriculture in the state has been falling. There are some relevant questions that arise in this context. What were the dynamic factors that historically contributed to low productivity, particularly land productivity? Is low productivity common to all crops or limited only to certain crops? What has been the contribution of
productivity growth to total output growth of the agriculture? What have been the sources of total factor productivity growth in the crop sector of the state? The present study focuses on these questions.

1.4. Objectives

Technological change in agriculture is reflected directly on the productivity of crops. It enhances the productivity of land and improves the capability of agricultural labour. Technical change in agriculture ranges from the use of high yielding varieties of seeds, irrigation, fertiliser and machines such as pump sets, mechanical devises for tilling the soil, sowing and harvesting for raising per hectare output. Therefore, the study of productivity, both partial and total productivity of crops is also a study of the technological change in the crop sector.

No study seems to have so far made an inquiry into the dynamics of productivity factor in the crops sector of the state. The present study is therefore relevant in this context. Specifically, the study seeks answers to the following questions:

1. How productivity level, both partial and total productivity of crops in the state changed over the years?
2. How much was the contribution of land productivity to total output of crops? What was the relative contribution of the area expansion and productivity improvement to the growth of output?
3. What were the factors that determined the productivity, both partial and total productivity of crops in the State?
4. What was the role of technology in influencing the factor productivity and returns to scale?

In the backdrop of questions raised above the following specific objectives are framed:

1. Estimate the growth rate of productivity of crops in the state, besides the growth rate of area and output of important crops.
2. Quantify the share of area and productivity in the total output of crops and
3. Identify the determinants of crops productivity.
4. Estimate the TFP of crops and discover its sources.
Further, we propose to test the following hypotheses.

1. The agricultural sector of the state remained stagnant, particularly since the mid 70s with zero or negative growth rate of area, output and productivity of crops.

2. The intensity of stagnation was different across crops.

3. The roots of stagnation lie in the absence of effective technical change and operation of scale factor.

1.5. Significance of the Study

Agricultural sector is the primary sector whose growth will act as a catalyst to the growth of other sectors. Theorists have propounded the growth stages in that an economy’s growth is transited from agriculture through industry to the service sector. So far as the state economy is concerned there is virtually no growth in the agricultural sector and in the manufacturing sector. The growth of the economy is mostly contributed by the service sector. However, one cannot neglect the primary sector if one seeks long run sustainable growth of the economy.

The performance of the agricultural sector, especially in developing countries often depends on environments outside the reach of policy-makers. The weather, world prices (depending on how much the world demands of agricultural products and how much the rest of the world delivers), external trade barriers, terms of trade and global market access all play pivotal role in influencing agricultural outcomes. Consequently, the agricultural sector is arguably more susceptible and more reliant on a fair global policy changes than any other sector. Apart from that, most development economists and development agencies agree that the neglect of the agricultural sector during the process of industrialization can constrain the whole development process. In a study, Martin and Mitra (1999) examined the growth of convergence of TFP in agriculture and manufacturing in 50 countries of different levels over the period of 1967 to 1992 and found that at all levels of development technical progress was faster in agriculture than in manufacturing. Their analysis suggests that a large agricultural sector need not be a disadvantage in terms of growth performance. Thus, their result weakens the case for often advocated discriminatory policies against agriculture. In Indian context, on studying the nature and direction of the linkages between agricultural and non-agricultural sectors in 14 states in India, using Granger Causality test, Kalirajan and
Sankar (2001) found that Kerala has a bi-directional causality (linkage) indicating strong interdependence between agriculture and manufacturing sectors.

Though there are several studies on national perspective, studies that deal with the performance of agriculture in regional standpoint are not many. Boyce (1986) dealing with the agriculture in West Bengal and Bangladesh; Renuka Pillai (2001) examining the agricultural productivity differentials in West Bengal and Orissa; Kannan and Pushpangadan (1999) and Sivanandan (1985) are a few studies on the growth performance of the agricultural sector in Kerala.

Studies on agricultural sector at regional perspective are important in many respects. There are regional variations of several factors influencing agriculture in India. There is wide variation of agro-climatic settings, resulting in regional disparity in cropping pattern and cropping intensity. Level of production and productivity varies across crops and across regions depending on the level of technological change. Institutional environment that contribute much for agricultural production also differs from region to region within a vast country like India. The existing land and labour relations, credit market, level of industrial development, infrastructural set up are all institutional factors that work behind regional differences.

1.6. **Scope and Limitations of the Study**

The definition of agriculture used in this study is restricted to the crop sector of the state. Though a study of agricultural sector encompasses several aspects from agricultural production to marketing this study takes into account only the production side of the crop sector. The eleven crops included were grouped into seasonal, annual and perennial crops. It examines such questions as whether the crop sector was subject to stagnation or to cyclical fluctuations; what were the factors contributing to the land productivity of crops in the state from 1960-61 to 2004-05.

To measure technical change, total factor productivity in crop production in the state is used though TFP captures all the factors including technical change that contributed to the growth of output. The study is based mainly on time series data relating to selected crops on output, area, yield, fertiliser consumption, rainfall, irrigation, and other inputs. Though there are several economic factors that influence the productivity behaviour, only wages and prices are incorporated in the model as data on them are readily available. Cost of cultivation data were used for estimating the
total factor productivity. Cost of cultivation data relates to the performance of sample farms selected from different parts of the state that are assumed to be replicating the true plight of crop situation in the state.

1.7. Terms and Concepts used

1. Technology – Technology is useful knowledge\textsuperscript{16} pertaining to the art of production.
2. Technical change – A shift up (down) in the production (cost) frontier over time due to improvement in education of labour force and all sorts of things\textsuperscript{17} is referred to as technical change.
3. Productivity – It is a measure\textsuperscript{18} of the change in output that is not accounted for by the growth of inputs used for production.
4. Productivity growth – It is measured by the difference between growth rate of output and growth rate of inputs.
5. Partial factor Productivity – Productivity change due to change in only one factor, keeping other factors fixed. Land productivity, a partial factor productivity measure is obtained on dividing the output by land area.
6. Total Factor Productivity – It explains the level of productivity at a point in time. It is a static concept.
7. Total Factor Productivity Growth – It indicates the change of productivity over time. It is a dynamic concept.
8. Growth accounting – It involves compiling detailed accounts of inputs and outputs, aggregating them into input and output indices to calculate a TFP index\textsuperscript{19}.
9. Stagnation – A situation in that estimated growth rate is significantly non-positive.

1.8. Scheme of the Study

The report is organised into 8 chapters. Besides the introductory chapter, in chapter 2 review of the studies undertaken at the international, national, and regional levels on the productivity theme is attempted. In chapter 3 the methodology and tools applied and the theoretical frame of the study, the data and variables used are explained. In chapter 4 we attempt to measure the growth rate of area, output and productivity of crops and try to decompose the effect of output growth on area, yield and interaction effects and tries to identify the factors that worked behind the land productivity of crops in the state. The cyclicality of area, output and yield of selected crops is examined in chapter 5. The determinants of long run productivity of crops are
identified in chapter 6. In chapter 7, we make an attempt to measure and disentangle the total factor productivity of crops into technical change and returns to scale using cost function approach. In chapter 8, we recapitulate the main points, summarise the major findings, give suggestions and indicate the direction of future research on the agricultural productivity theme.

Notes and References


4The important works are:
   (i) CDS (1975) *op.cit*,


6During 1950s the Organization of European Economic Cooperation (OEEC) was actively involved in promoting the knowledge of productivity. Though there were attempts to study productivity growth in the United States at macro level by the Bureau of Labour Statistics and individual researchers like Fabricant, a systematic work in the sphere of productivity economics started with the work of Kendrick.J: (1961) *Productivity Trends in the United States* (For NBER), Princeton University Press, Washington, D.C.

7One of the earlier studies in India at macro level was by B. H. Dholakia (1974) which probed the sources of growth based on the methodology of E. F. Denison. The study dealt with the period from 1948-49 to 1968-69.

8The various studies at the regional, national and international level will be discussed in the section on literature overview.

9Among the several studies please see


For the details of growth accounting and issues related to TFP indices please see


