Chapter I

Introduction

Public sector is a unique feature of many developing countries in the world. In India, it is accepted as consistent with the ideology of mixed economy. Since independence, this concept has been nurtured and promoted with great interest by the successive Governments. Among the various public sector enterprises, electrical undertakings run by the states occupy a significant place.

Industrialisation is an important means of modernization. The increased pace of industrialisation in India, in its wake, highlighted a number of managerial problems. Among them, the problem of inventory management is significant. The need for efficient management of available resources in any business organisation requires no emphasis and a public sector electrical undertaking which is expected to be run efficiently on business principles is no exception. The electrical undertakings run by the states are silent spectators witnessing the ever increasing cost of input which contributes to nearly 60 per cent of the total
cost. All the powers of the Government to increase the price of the finished products remain ineffective on account of the acute competition in the business. Left with no choice, the public sector electrical undertakings are forced to manage its available resources more efficiently.

The role of capital is crucial in the context of industrial development. It is all the more true in the case of capital scarce countries like India. The capital raised by a firm is invested in fixed assets and current assets for carrying on its activities. The portion invested in current assets is called the working capital and the inventory constitutes the largest proportion of it. Thus inventories call for efficient management. Good inventory management is good financial management also. One must agree with the observation that "when you need money, look at your inventories before you look to your bankers."¹

Efficient use of capital in an undertaking helps to provide maximum customer service and earn profit in the process. These objectives can be achieved with the given amount of capital, either by maximizing the output or by maximizing the margin of profit or by a combination of both. It would mean that the management must try to make this capital work as fast as possible, which is often difficult
to materialize. It is also impossible to raise the margin of profit extensively due to competition in business. Thus capital turnover and productivity of capital often become totally ineffective.

Several modern techniques have been developed and employed by managers as a solution to this problem. Among these, inventory management is the most effective. It enables a manager to increase productivity of capital by reducing material costs, preventing blocking up of large working capital for long periods and improving capital turnover.

The concept of inventory management has been one of the many analytical aspects of management. It involves optimization of resources available for holding stock of various materials. Lack of inventory can lead to stock-outs, causing stoppage of production and a very high inventory will result in increased cost due to cost of carrying inventory. Thus optimization of inventory should ensure that inventories are neither too low nor too high.

Inventories like finished products, work-in-progress, components, raw materials, stores, spares etc., account for 80 per cent or more of the working capital in some of the
industries (Table 1.1). It would appear that any effort for rationalization of inventories will bring about an appreciable saving. But a scientific system of control can reduce investment in inventories considerably, sometimes as much as 50 per cent or even more.²

Table 1.1

Percentage of Inventory on Working Capital

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of industry</th>
<th>Total Working Capital (₹ in lakhs)</th>
<th>Investment in inventories, finished goods, and work-in-progress (₹ in lakhs)</th>
<th>Percentage of (3) to (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sugar</td>
<td>8,016</td>
<td>7,675</td>
<td>96</td>
</tr>
<tr>
<td>2.</td>
<td>Starch</td>
<td>213</td>
<td>197</td>
<td>92</td>
</tr>
<tr>
<td>3.</td>
<td>Paints &amp; Varnish</td>
<td>356</td>
<td>323</td>
<td>91</td>
</tr>
<tr>
<td>4.</td>
<td>Cement</td>
<td>1,801</td>
<td>1,679</td>
<td>93</td>
</tr>
<tr>
<td>5.</td>
<td>Cotton Textiles</td>
<td>19,668</td>
<td>18,563</td>
<td>94</td>
</tr>
<tr>
<td>6.</td>
<td>Chemicals</td>
<td>3,826</td>
<td>3,117</td>
<td>81</td>
</tr>
<tr>
<td>7.</td>
<td>Iron and Steel</td>
<td>3,974</td>
<td>3,131</td>
<td>79</td>
</tr>
<tr>
<td>8.</td>
<td>Bicycles</td>
<td>452</td>
<td>403</td>
<td>89</td>
</tr>
</tbody>
</table>

In accordance with the study made by the Industrial and Mining Team of the Committee on Plan Projects, the management of some public sector industrial and other undertakings has accepted the reduction in inventories (Table 1.2).

Table 1.2

Reduction in Inventories Accepted by the Management of Some Public Sector Industrial and Other Undertakings

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Class of Inventory</th>
<th>Average stock before study (in time supply)</th>
<th>Average stock agreed to after study (in time supply)</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Finished Goods</td>
<td>3.28 months</td>
<td>1.40 months</td>
<td>57%</td>
</tr>
<tr>
<td>2.</td>
<td>Spares Parts</td>
<td>14.50 months</td>
<td>8.00 months</td>
<td>44%</td>
</tr>
<tr>
<td>3.</td>
<td>Finished Goods</td>
<td>2.23 months</td>
<td>0.50 months</td>
<td>80%</td>
</tr>
<tr>
<td>4.</td>
<td>Spares Parts</td>
<td>30.00 months</td>
<td>7.50 months</td>
<td>75%</td>
</tr>
</tbody>
</table>


This study examines the working of the inventory management departments of the public sector electrical industrial units in Kerala and suggests methods to improve their efficiency. In this chapter, various aspects of inventory management, its scope and need in industry are detailed.
Historical Aspect

In olden times an individual's wealth was usually assessed by the size of his blocks, granaries and warehouses. But with the advent of modern industrialisation, wealth has become more identified with money. There has been a strong tendency towards holding the means to purchase goods and services rather than goods themselves. Inventories are now often referred to as the graveyard of business as surplus stocks have been the principal cause of business failures.

Modern managers have made a complete change in the outlook of inventory holdings on account of: 4

(1) increasing size of the business establishments,
(2) wide variety and complexity of modern requirements and
(3) urgency of modern requirements.

In the U.S.A., there are so many professional societies concerned with inventory management. The biggest of these is the National Association of Purchasing Management, which has roughly twice the membership of the American Production and Inventory Control Society, the second ranking organisation. While each of these groups is concerned with the broad problems of materials management, it is
significant that each focuses its major emphasis on a segment of the materials management process—purchasing in one case and production and inventory control in the other.\(^5\)

In contrast to the situation in the United States, inventory management is firmly established in Japan, where the Material Management Society is the major organisation of this type.\(^6\) Similarly, the Institute of Purchasing and Supply, which is identified as the British equivalent of the National Association of Purchasing Management has been set-up to provide greater emphasis to materials management activities other than purchasing.

Inventories in India, whether in the private sector or in the public sector are much higher than those in the United States and Western Europe mainly on account of the substantial different procurement positions. But even with regard to the nationally available materials the supply position is difficult and the means of transport are inadequate.

Inventory management has been attracting the attention of managers in India for a long time. But with the credit squeeze measures announced by the Government of India and the consideration of the Tandon Committee for inventories,
top management is deeply involved in developing suitable norms for inventory control. Tandon Committee appointed by the R.B.I. dealt with prescribing inventory norms towards industries for the smooth running with no stock out.7

Meaning and Function

Inventories are resources of any kind having an economic value. It consists of raw materials, work-in-progress, finished goods, consumable and stores. Thus inventory control is planning and devising procedures to maintain an optimal level of these resources.

Inventory functions as a bank and decouples successive stages of operation.8 Materials, manufacturing and marketing departments are the three operating sub-systems. Finance and personnel control are the non-operating sub-systems. The material sub-system procures the input, the manufacturing sub-system converts it and the marketing sub-system sells the output. The other sub-systems like finance and personnel control serve the needs of the three operating sub-systems.

Need for Inventory

Primarily, inventory is held for transaction purposes.9 Today's inventory is tomorrow's consumption. A business
cannot maintain a given volume of sales without maintaining sufficient inventory to satisfy its customers. In the field of production, an enterprise cannot ensure uninterrupted production unless it maintains adequate inventory of raw materials.

Inventory is also held as a precaution or as a contingency for increase in lead time or consumption rate. Sometimes, there is speculative element in the reasons for holding inventory. It largely takes into account the expectation of changes in price/cost over a period of time. Finally, inventories are held to decouple the materials department from the consuming department.

Background and Problems

Most of the public sector electrical industrial units in Kerala have been working under conditions of stress and strain with erratic market fluctuations and stiff competition since 1982. Owing to cut-throat competition in the metre, transformer and cable markets, prices of these goods are falling down. But at the same time prices of raw materials and components that go into the making of these goods are alarmingly on the increasing side. These peculiar phenomena have thrown the electrical industry in the State of Kerala out of gear.
As a result of the adverse working conditions and unfavourable and unworkable prices, most of the public sector electrical industrial units in Kerala have been incurring losses since 1982. At this juncture, certain drastic measures are highly essential to revive and rejuvenate these industrial units.

The inventory management policy of the public sector electrical industrial units in Kerala has direct influence on its profitability and risk. The liquidity of an electrical unit can be strengthened by increasing the level of investment in inventory. But increased liquidity through increased levels of inventory decreases its returns because more funds will be tied up in current assets than are absolutely necessary. To raise the rate of return, the liquidity will have to be sacrificed by reducing the level of investment in inventories to the minimum. The inventory management of the public sector electrical industry in Kerala, therefore, involves a risk return trade off. This is the problem of the study.

Literature Survey

A number of surveys and studies have already been made in the area of inventory management practices in Indian
industry. Most of these studies are directly or indirectly connected with the inventory management practices of public and private sector industries in India. But there is no single scientific study which deals with the inventory management in the public sector electrical industry in Kerala. A brief review of the available literature is presented in the following paragraphs.

The Bureau of Public Enterprises\(^{10}\) (1978) highlighted the present status of spare parts management in public enterprises. The study states that every unit should endeavour to have a spare parts planning cell entrusted with long-term and short-term planning for spare parts. It also throws light on the training of personnel in spare parts management and selective control of spare parts.

The faculty members of the Administrative Staff College of India\(^{11}\) (1977) reviewed the Tandon Committee norm of spare parts inventory management practices in India. The review shows that the Tandon Committee norm of spare parts inventory of five per cent of total inventory is irrelevant to most of the industries, since the bulk of their inventory is in spare parts only.

Mathew's\(^{12}\) (1978) study "Materials Management Practices in Public Sector Undertakings in India," concludes with the
statement that the functions concerned with materials have to be toned up to achieve increased profitability.

The study conducted by Mathew\(^{13}\) (1982), "Materials Management in State Road Transport Undertakings in India with Special Reference to K.S.R.T.C.," highlights the need for integrated organisational set-up for the materials department. It is found in this study that an integrated organisational set-up for the materials department enables reduction in the overall cost of materials. He also suggests further research in this area.

The faculty members of the Jamnalal Bajaj Institute of Management\(^{14}\) (1972) conducted a study,"Control Practices in Indian Industry." The coverage of the study had to be restricted because of lack of response from most companies. Of the 224 companies approached only 36 responded; and among them only 13 reported using inventory control techniques. The findings of the survey indicate that while most organisations are still guided by rules of thumb and intuition in deciding as to how much capital is to be invested in inventories, there is a gradual shift towards more scientific methods for determining inventory levels.

The Institute for Financial Management and Research\(^{15}\) (IFMR-1980) emperical study analysed the pattern of
inventory ratios in public sector undertakings and public limited companies in the private sector. The analysis of inventory ratios shows that there is considerable scope for reducing the spares inventory in the engineering and process industries and for reducing consumables in the process industry.

Daniel and Viyyana Rao\textsuperscript{16} (1990) found in their study "Materials Management in Andhra Pradesh State Road Transport Corporation (APSRTC)" that since the transport undertakings involve huge expenditure on materials front, even as little as one per cent improvement in the efficiency will result in substantial gain. In their view, some of the inventory problems concerning planning of purchases and transportation can be successfully handled—through Programme Evaluation Review Technique (PERT), Critical Path Measurement (CPM), and Operations Research (OR) even in times of uncertainties.

Suresh\textsuperscript{17} (1986) in his article "Materials: A Potential Area for Improving Profits" points out that the control of material costs makes the organisation stand competitive and be on the top in the world of business.

Murali and Sinha\textsuperscript{18} (1991) state in their article "Inventory Management: A Probe and Scope in Coal Mining Industry" that a dynamic approach to the various aspects of
inventory management will invariably lead to the achievement of real and permanent reduction in the cost of production of coal.

Xiao-Gao Liu, et. al.\textsuperscript{19} (1993) in their article "Role of Maintenance Manufacturing Management" point out that properly designed maintenance programmes can enhance the overall system performance of an industrial unit by reducing the need for inventory, smoothing production flows and/or improving product quality.

Prem Vrat Saurabh Mittal and Kavi Tyagi\textsuperscript{20} (1993) in their article, "Implementation of JIT in Indian Environment" state that there is a need to improve the work environment before JIT can be implemented in India.

Ghosh\textsuperscript{21} (1987) in his article "Management of Spare Parts Inventory" points out that with the availability of infrastructure facility all over the country and the introduction of new concept like spare parts bank, the difficulty of managing spare parts inventory will be eased out.

Sankaran Venkateswar\textsuperscript{22} (1991) in his article "Manufacturing Environment in the 1990s and Beyond" states
that inventory management can be simplified through the incorporation of Advanced Manufacturing Technologies (AMT) and philosophies into the strategic plan of the organisation.

Sukumaran Nair\textsuperscript{23} (1995) in his article "Flexible Specialisation and Developing Economics" emphasises that the just-in-time character of flexible specialisation enables economies to maintain low level of inventories.

Objectives of the Present Study

The above review shows that the studies on the present practices of inventory management in industries in India are profuse, while an analytical study comprehending the inventory management practices in the public sector electrical industry in Kerala is highly essential. The present investigation aims to fill in this lacuna with the following objectives in view:

1. Get an overall view of the system of inventory management in the public sector electrical industry in Kerala.
2. Assess the positions and levels of inventory in the electrical undertakings.
3. Analyse the inventory management policies and practices followed by the electrical undertakings.
(4) Analyse the organisational set-up for materials in the electrical undertakings.

(5) Examine the liquidity of the electrical undertakings.

(6) Examine whether there are any selective and analytical techniques of inventory management in the electrical industry run by the State of Kerala and if so, to analyse its working and management attitudes towards it.

(7) Compare and contrast the inventory policies of one undertaking with those of the others.

(8) Suggest measures based on the findings of the study for the improvement of the working of the system, wherever possible.

Hypotheses

The following hypotheses are formulated for the study:

(1) The existing organisational set-up, practices and systems are inadequate to ensure efficient management of inventories in electrical industry.

(2) Inventory constitutes the largest proportion of the working capital in electrical undertakings run by the State of Kerala.

(3) Efficiency in management of inventories leads to improvement of profitability of the concern.
(4) Introduction of scientific inventory techniques has a favourable effect on the workings of inventory departments.

(5) There is no uniform inventory policy on the working of the material departments of the various electrical undertakings.

(6) The inventory cost of the public sector electrical undertakings in Kerala is much higher than that of the private sector electrical undertakings.

(7) The financial performance of the public sector electrical undertakings is not at all satisfactory on account of the high raw material costs, heavy borrowings and huge interest burdens.

Scope and Methodology

The scope of this study is limited to the assessment of savings in inventories of electrical products due to inventory management.

The electrical industry in various sectors has grown considerably and consequently the working capital blocked up in inventories has also gone up. With rapid modern development in management, various effective tools and techniques have been evolved for efficient management of inventories. Many firms have taken advantage of these new
developments and restructured their inventory management department in tune with the modern trend and have obtained the benefits of cost reduction. Some firms are in the process of getting their personnel trained while many others have not yet initiated to tone up their inventory divisions and get their personnel trained. As a result, the inventories in various forms still remain high in these firms and a major opportunity for cost reduction is being lost.

Electrical undertakings of private sector in Kerala are careful to make at least some savings in inventories by effecting both internal and external economies, as otherwise their very existence itself will be threatened. The internal economies in the public sector are not so effective as those of the private sector on account of social responsibilities and obligations. Most of the public sector undertakings in Kerala were making heavy losses until a few years back and even now the return on their investment is nowhere comparable to that of the private sector.

There are possibilities to reduce the cost of purchased materials by competitive bidding, value analysis etc., while savings in the cost of holding inventories can arise out of economic ordering, reducing deterioration and obsolescence
in storage etc., and thereby reducing the working capital blocked up.

The above methods have been used with great success in foreign electrical firms and in the private sector electrical undertakings in Kerala. And there is good scope for further improvement of these techniques in electrical undertakings run by the State to arrive at suitable recommendations to increase their efficiency and profitability. This is essentially the scope of the study.

Data Sources

There are only five public sector electrical undertakings in Kerala. The various units and factories of these undertakings have been selected for the purpose of study. Details of these undertakings are given in chapter three.

The investigation is mainly analytical; both primary and secondary data are used. The primary data were collected through field studies and interviews using schedules. Secondary data were collected from various published sources like newspapers, magazines, industrial directories, etc. Materials supplied by the previous research activities have also been of great help.
Information on inventory and data regarding recurring expenditure are collected from each unit for various time periods.

Period of Study

The study covers a period of ten years from 1980-81 to 1989-90.

Method of Analysis

The methodology followed is to project the cost reduction of the inventory department on the basis of data collected and to validate this projection with the aid of analysis and survey.

Ratio analysis is the primary method used in this study. The collected data are analysed with the help of various inventory and financial ratios to highlight the different aspects of inventory management. Standard accounting and statistical tools are also used wherever necessary. The results of the analysis are presented in the form of time series tables.

Limitations of the Study

The main limitation of the study is that the data obtained relate to the period 1989-90 and earlier and the
current position is not available. However, it would not substantially affect the findings since no major changes have taken place with regard to the objectives and programmes of the inventory department of the public sector electrical undertakings in Kerala during this period.

Another limitation is that uniform norms cannot be applied to evaluate different inventory management organisations as the structure and geographic locations under which they work are very much different from the rest of the organisations.

Chapter Scheme

The thesis is organised under eight chapters. The first chapter presents the various aspects of inventory management, function and need of inventory, justification for the present study and a brief outline of the research topic, area of the study, objectives, hypotheses, and the methodology of the study. The second chapter presents the organisational set-up for materials as seen by the researchers. Electrical industry in India—an overview is presented in the third chapter. The fourth chapter examines the relationship of the working capital and inventory to the public sector electrical industry in Kerala. While the fifth chapter describes some concepts about inventories, the
sixth chapter presents the tools and techniques of inventory management. This is followed in the seventh chapter by an analysis through inventory ratios. The last chapter presents a summary of the findings and conclusions of the study.
Notes

1 Rathnam, P.V. and Lalitha, P., Rathnam's Inventory Management (New Delhi: Kitab Mahal, 1990) p.2.


4 Chadda R.S., op.cit., p.108.


6 ibid., p.48.


