CHAPTER II
RESEARCH METHODOLOGY

2.1 THE NATURE OF THE STUDY

The present study is an exploratory in nature. The study is designed on the survey method. This research study addresses the supply chain management in industrial productivity aspects of private sector. The government has put in maximum efforts to address the needs of increasing productivity through its plans and policies for the private sector. The development plans of India have focused on industrial development and the related issues were taken in consideration for the implementation in modifying relation of productivity.

A national policy on economic development has addressed various issues related to production and its linkage to foreign trade policy. As a part of these efforts the government has initiated various schemes which give support to private sector. Supply chain is one of the main promotional issues that an industrial productivity can increase as per projection of policies and plan. It involve management skills like

a) The ‘Material requirements planning’ (MRP-I)
b) The ‘Capacity requirements planning’ (CRP)
c) The ‘Distribution requirements planning’ (DRP)
d) The ‘Total Quality Management’ (TQM)
e) The ‘Just-in-Time’ (JIT)
f) The ‘Manufacturing Resource Planning’ (MRP -II)
g) The 5’S System
h) The Six Sigma
Industrial community continuously engage in the modification towards improvement of production through the techniques implemented by various angle such as educational promotions of management processes, financial institutions and commercial banks, local bodies, and other sources. This study is an attempt to study whether the supply chain mechanism have really achieved its end purpose and contributed to the development of the industrial productivity of Nasik district.

Supply chain management activities can play the significant role for the development of production of industries. SCM in Nasik is of no exception from this. Lack of Supply chain management activities is likely to affects the industrial development in any country as well as in India. But the existing literature on the promotional aspects of Supply chain management is very uncommon and even on the literature covering the marketing aspects of industries in India is not sufficient in compare to developed countries.

As a result, the study is exploratory in nature. It was assumed that supply chain management is a vital force for an effective production of industries and fulfil the supply. But Indian industrial pockets are far behind from the realization of the fact and due to that India could not take advantage of the full potential of the industrial sector. These causes also show that the industries did not developed significantly and failed in competition at international market. The present study on the Supply chain management in Nasik district is an attempt to highlight the issues related to Supply chain management activities. It has put forward some suggestions about the promotional measures which are best suited for attracting more industrial development through increasing production at national and international market and contribute more positively to the economy of the country. The attempt has also been made to identify the Supply chain
management activities approaches of the private sector industries in Nasik district.

2.1.1 SCENARIO OF INDUSTRIES IN NASIK DISTRICT

The study is mainly focused on eighteen years of period during the 1991 to 2008 for Nasik district. Hence, it is needed to show the Map and Scenario of Industries in the region. Industrial area for further clarification is explained by categories.

Major Industries are the HAL plant is an aircraft manufacturing plant located 10 miles (16 km) from Nasik employing about 7000 people. Manufacturers who have set up plants in the Nasik MIDC area include: Bosch India - previously MICO Bosch, Mahindra and Mahindra, CEAT, Thyssen Krupp, Samsonite, Atlas Copco, Crompton Greaves, ABB, Glaxo SmithKline, L and T, Schneider Electric, Jindal Steel, Kirloskar, Siemens, Matrix Laboratories Ltd., Visteon Automotive System India, and Warehouse.

IT Parks: recently the government decided to prepare IT parks in the city of Nasik. The V-Tech Park is one of the largest IT parks of Maharashtra. Nasik is also emerging as a BPO/IT destination and is in list of the selected II Tier cities for BPO/IT companies; companies like Datamatics, WNS, Winjit Technologies, I-Tech System, Nasik Online, Netwin and gloStream, which develops electronic medical record software and practice management solutions, have a presence in Nasik. Legrand at Sinnar.
**Data Centers:** ESDS Software Solution Pvt. Ltd. has come up with the first Data center in **Nasik.** It is a 4000 sq.ft. data center in an square acre land located in Satpur MIDC, NICE Area.

**Government industries:** The India Security Press – The India Security Press (the National Treasury Press) was the biggest employer in Nasik for many decades until the late eighties when a service-based economy started to thrive. The existence of the India Security Press is very beneficial to Nasik citizens. Hindustan Aeronautics Limited is located in Ozar Township about 20 km from the city, where it is designs, manufactures and overhauls a variety of aviation products from basic trainers to highly sophisticated supersonic fighters, helicopters, transport aircraft, engines, accessories and systems.

The issues of India’s Supply Chain Management reveals by improving Industrial Productivity. Further study includes the composition of nation’s Supply Chain Management in relation with the theories and determinant factors of the Supply Chain. The production of industries and its effect plays an important role in the market economy directly and indirectly. It may improve the regional development and nation’s economy.

This study based on investigative approach on the industrial productivity, review of Supply Chain Management of India and world, which includes eight categories of industries based on study region, their functions, principles and their regulations of business in depth. The study facilitates the further researcher, policy makers and Supply Chain Management related students of industrial organizations.
Fig. 2.1 shows the map of Nasik district as well as the cities which were selected for the study of the industries.

The study also tries to provide knowledge and support to the Nasik Industrial Corporation as well as cities similar to the Nasik region towards the management skills. The managing the flow of goods, information and money along the supply chain aspect of military science dealing with procurement, maintenance, and transportation along with all activities involved in management of product movement to right product, right place, right time.
2.2 OBJECTIVES OF THE STUDY

In private sector of Nasik district, most of the organizations have their formal setup for operating available resources. The productivity in the industries in the private sector depends on the proper practice of supply chain management.

Following are the objectives of the study:

1) To study the productivity of private sector industries in Nasik District.
2) To study the various tools of supply chain management in private sector industries in Nasik District.
3) To study the issues of supply chain management in private sector industries in Nasik District.
4) To suggest remedial measures or solutions to remove the drawback of supply chain management.
5) To suggest suitable tools of supply chain management for improvement in industrial productivity in private sector industries in Nasik District.
2.3 HYPOTHESES OF THE STUDY

Hypothesis is the relationship between two variables, which is to be tested. Thus a hypothesis may be defined as a proposition or a set of propositions set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of the established facts.

Following hypotheses are constructed for the study.

a) Supply chain management has a significant impact on cost savings and revenue improvement.

b) Effective supply chain management and industrial productivity are positively interrelated.

c) Industrial infrastructural environment in Nasik is suitable for improvement in Industrial productivity through supply chain management.

d) Productivity improvement and customer satisfaction are the driving forces behind many supply chain initiatives.
2.4 INTRODUCTION TO RESEARCH METHODOLOGY

Research can be defined as the search for knowledge, or as any systematic investigation, with an open mind, to establish original facts, usually using a scientific method. The primary purpose for basic research is discovering, interpreting, and the development of methods and systems for the advancement of human knowledge on a wide variety of scientific matters of our world and the universe.

In the context of planning and development, the quality of the supporting research is of utmost importance. It is therefore necessary to design and adhere to an appropriate research methodology. The research methodology may differ from problem to problem, but the basic approach remains the same.

‘Simulation approach’ in the context of business and social sciences applications refers to “The operation of a numerical model that represents the structure of a dynamic process. Given the values of initial conditions, parameters and exogenous variable, a simulation is run to represent the behavior of the process over time.” It involves the construction of an artificial environment within which relevant information and data can be generated. It permits an observation of the dynamic behavior of a system (or its subsystem) under controlled conditions. It is useful in building models for understanding future conditions.

Present study methodology adapted Quantitative Approach which involves the generation of data in quantitative form, subjected to Nasik district of Maharashtra state. It is rigorous quantitative analysis in a formal and rigid fashion survey research. Quantitative analysis represented from the entire region. The
data has generated with the use of scientific Interview schedule in the sample with SCM assessment of attitudes, and opinions.

Research provides the basis for nearly all difficulty of manufacturer, SCM operation. It collects information on the SCM and industrial structure of the district; which indicates what is happening in the economy and what changes are taking place. Research has its special significance in solving various operational and planning problems of Supply Chain Management. It helps to managerial staffs in industry that are responsible for taking decisions. Given knowledge of future demand, it is generally not difficult for a firm, or for an industry to adjust its supply schedule within the limits of its projected capacity. Demand and market factors have great utility in SCM. It ultimately results in a projected productivity on sales an estimate which in turn depends on SCM strategy of industries. SCM analysis has become an integral tool of productivity policy in present era. Once SCM forecasting is done, efficient production can be set up around which are grouped the operation plans of Industries.

2.4.1 SOURCE OF DATA

The research has been conducted surveys based on both primary and secondary data. As it was mentioned earlier that the existing literature on the Supply chain management activities aspects and even on the overall production aspects is not adequate, the study was done on the primary data collected through Interview schedule on the Supply chain management activities by districts industry. Secondary data was also used in this study. The basic statistics of industries are collected from the District Industries Centre, Nasik for the purpose of designing the research which is shown in Table no. 2.1.
A survey interview schedule is used to collect the primary data from the sample selected for this study. The eight relevant categories of the industries are taken in consideration for the supply chain management from Nasik district. These were interviewed for the collection of the data. To collect the primary data, the researcher took the help from MBA students studying in his Institute at Nasik. Secondary data was also used in this study. The required data was collected by the researcher through two sources.

Table no. 2.1

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of Industry</th>
<th>No. of industries</th>
<th>Effective</th>
<th>Non Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture Industries</td>
<td>46</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Automobile Industries</td>
<td>117</td>
<td>52</td>
<td>65</td>
</tr>
<tr>
<td>3</td>
<td>Chemicals &amp; Pharmaceuticals, Industries</td>
<td>127</td>
<td>40</td>
<td>87</td>
</tr>
<tr>
<td>4</td>
<td>Construction Industries</td>
<td>101</td>
<td>16</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>Electricals and Electronics Industries</td>
<td>293</td>
<td>42</td>
<td>251</td>
</tr>
<tr>
<td>6</td>
<td>Engineering and Fabrication Industries</td>
<td>791</td>
<td>56</td>
<td>735</td>
</tr>
<tr>
<td>7</td>
<td>Luggage industries</td>
<td>11</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Other Industries</td>
<td>1800</td>
<td>36</td>
<td>1764</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>3286</strong></td>
<td><strong>263</strong></td>
<td><strong>3023</strong></td>
</tr>
</tbody>
</table>

Source: DIC, Nasik-2009
| Table No.2.2 |
|------------------|-------------------|
| Distribution of industries on the basis of performance of Supply Chain Management practice |
| **Excellent** | **Feeble** |
| **A Agriculture & Fertilizer industries** | |
| 1 Agro chemicals of India. | 1 Vijay Trading Co. |
| 2 Multimol Micro Fertilizer India | 2 Supreme Agro Pvt. Ltd. |
| 3 Swaroop Agrochemical India. | 3 Jai Biotech India |
| **B Automobile & Auto components industries** | |
| 1 Mahindra & Mahindra Ltd, Nasik | 1 Business Combine Ltd (BCL) |
| 3 Gabriel India Ltd | |
| **C Chemical & Pharma. Industries** | |
| 1 Seagram Distilleries Pvt. Ltd. | 1 Graphite India Ltd |
| 2 Glaxo Smithline | 2 Niramay pharma |
| 3 Matrix laboratory | 3 Nobal drugs |
| **D Construction industries** | |
| 1 Ashoka buildcon Ltd | 1 Hindustan cement pipe & concrete works |
| 2 Everest India Ltd | 2 Krishna industries |
| 3 Sumanchandra Group | 3 Krishna land developers |
| **E Electricals & Electronics industries** | |
| 1 Scheinder electric Pvt. Ltd | 1 Starlite Lighting Ltd |
| 2 ABB Ltd | 2 TDK-EPC |
| 3 Crompton Greaves Ltd | 3 Jyoti Ceramic Ind. Pvt. Ltd. |
| **F Engineering & Fabrication industries** | |
| 1 Thyssenkrupp Electrical steel | 1 Viraj Engineering Pvt. Ltd. |
| 2 JSL Structure Ltd | 2 Shivam Paints Pvt. Ltd. |
| 3 Kirloskar Oil Engine | 3 Devendra Fabricators Pvt. Ltd. |
| **G Luggage industries** | |
| 1 Samsonite South Asia Pvt. Ltd. | 1 Shree Sanket Plastic Ind. |
| 2 VIP Ind. Ltd.. | 2 Metro Polymers Pvt. Ltd. |
| 3 Ideal Enterprises | 3 Shree Sai Enterprises |
| **H Others industries** | |
| 1 Dr. OGK’S Energy Innovations | 1 Wine-tech Engineers |
| 2 Ventura Textiles Ltd. | 2 Prothious Engineering Services |
| 3 Data Matics Global Services Ltd. | 3 The Standard Pulp & Paper Factory |
2.4.2 PRIMARY SOURCES

Primary data was collected through the following sources- Interview schedule, Interviews, Discussions, and Observations. From the record of MIDC Nasik, the researcher has selected six industries from each group as a sample for the study. The samples were selected using stratified random sampling method. Under stratified random sampling, lottery method was followed by the researcher. Therefore, total 48 industries were selected. These industries belong to in Nasik district which shown in table no.2.2.

After the selection of the industries, the researcher interviewed the Works manager, Production manager, Maintenance manager, Purchase manager. An interview schedule was prepared for the above authorities. They were interviewed, and at the time of their interview discussion and observation were done.

2.4.3 SECONDARY SOURCES

Secondary data was collected through annual reports of Industries, journals, periodicals, newspapers, literature review, textbooks, internet etc. After data collection, tabulation was made; thereafter analysis and interpretation were attempted. For the purpose of analysis and interpretation the methods and techniques like mean, chi-square, composite index for correlating SCM percentage structure with all variables, Graphical presentation and chart and table techniques of statistics were used. Thereafter the conclusions were drawn and suggestions were made.
2.4.4 SAMPLE SIZE OF THE STUDY

The eight categories of industries have been selected as a sample unit from the Nasik district based on DIC statistical data shown in table 2.1. By using this base data of the industries, the present study has been carried forward. These are represented by six industries of the each category. Out of selected six industries three industries are having effective supply chain management while three industries are without effective supply chain management. These effects are decided on the basis of free listing of industries after connotation of the experts from the district which is shown in table no.2.2. The total sample size of present study is comprises of forty-eight Industrial sample units with one hundred ninety two (192) individual’s responses by the manager from these companies. It is made clear with the table no.2.3.

**Table no. 2.3**

<table>
<thead>
<tr>
<th>Categories</th>
<th>No of Companies</th>
<th>Works manager</th>
<th>Production manager</th>
<th>Purchase manager</th>
<th>Maintenance manager</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agro base</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Automobiles</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Electricals &amp; Electronics</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Pharmaceuticals &amp; Chemical</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Engineering &amp; Fabrication</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Construction</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Luggage industries</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Others industries</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>192</td>
</tr>
</tbody>
</table>
The responses of the interviewed respondents were analysed to gain insights into both qualitative and quantitative aspects of the promotional activities used by their companies in terms of Supply chain management. Both qualitative and quantitative analysis of the collected data from the respondents’ companies has been made the structure of supply chain management. In quantitative analysis of the data, conventional statistical tools like percentage, simple averages etc. have been used for constructing effects on productivity of the industries in the study area. Another statistical tool, CHI-square has been used for the testing of hypothesis. These tools are shown significant effect on data of present study.

The present study is an exploratory in nature. The study is designed on the survey method. This research study addresses the supply chain management in the industrial productivity aspects of the private sector. This study is an attempt to study whether the supply chain mechanism has really achieved its end purpose and contributed to the development of the industrial productivity of Nasik district.

2.4.5 INTERVIEW SCHEDULE PREPARATION AND SAMPLE TESTING

The interview schedule was semi-structured. Most of the questions were close-ended. The entire process of coding was undertaken by electronic data processing. Responses to open-ended questions were examined and classified. All of the industries are choose for the study which comes under private sector. Therefore interview schedule was prepared for production managers and equivalent of these industries and data was collected through interview schedule. While interviewing observation of present SCM practices were carried out. The
understanding of each supply chain management practice was done through discussion with concerned authority.

Interview schedule: The Interview schedule was prepared after careful and comprehensive study to cover all aspects of supply chain management. The questions were asked mainly closed ended. Some opinion questions were also included in order to solicit the answers from the respondents. While framing the Interview schedule care was taken to see all questions relevant to the study. Thereafter a structured Interview schedule was formulated for the study. The Interview schedule was used for the interview. The respondents are categorized on the basis of managerial designation and their responsibilities in the industrial unit. The categorization mainly found suitable as Production managers, Purchase managers, Works managers and maintenance managers. These managers are the prime respondent for the interviews. Sample size was taken as per sample structure i.e. 192 total and proportionally divided in four categories. Though each categories share will come 48 respondents scheduled.

Following areas of the supply chain have been incorporated in Interview schedule for the better data form of the study region.

1) The Material requirements planning (MRP),
2) The Capacity requirements planning (CRP)
3) The Distribution requirements planning (DRP)
4) The Total Quality Management (TQM)
5) The Just-in-Time (JIT)
7) The 5’S System.
8) The Six Sigma.

The investigation was arranged with respondents using with Interview schedule. It was administered by the interview method with personal discussions.
It was necessary to create a rapport with the respondent first to get them to open out and give truthful replies according to study questions for the research purpose. The following aims of the question kept in mind during the preparation of Interview schedule.

a) General information about the respondents and industry;

b) Present and past situation of the supply chain indicators such as Material requirements planning (MRP), Capacity requirements planning (CRP) the Distribution requirements planning (DRP), Total Quality Management (TQM), the Just-in-Time (JIT), the Manufacturing Resource Planning (MRP II), 5’S System, Six Sigma;

c) Present and past situation of the productivity of the industrial unit and connectivity of supply chain management with its practices for the achieving the goals of development in the Nasik district;

Q101 to Q113: gave us a complete personal profile of the respondent. As the study is Industrial sector at management level of Nasik district, it gave us complete structures of the particular strata of managerial respondents of the Nasik district. It covered all personal aspects and background of the industrial management category. It gives us a complete idea of the maturity levels of respondent entering into Industrial management due to “management education”. This data was very vital as we could place the industrial management level people.

Particularly Q107-Q113 gathered the organization profile by respondent in Nasik district. It gave us general information about the industrial unit. This section provides information about the organization structure, the sector of activity, year of establishment, the size of the enterprise, the financial position,
product manufactured, nature of market, types of manufacturing system of the industries and problems faced by the industries. These helped us in getting an insight of industrial business environmental aspects related to the SCM.

Q.201 deals with personal opinion of believing management techniques. Q202 deals with personal thinking of Supply Chain Management (SCM) represent a significant change in how most organizations view themselves. Q203 deals with the observation information on supply chain are showing as a series of functions from the raw materials stage to the final customer. Q204 related to consider the potential for either its supplier or its customer to become a partner. Q205 on grouping of management functions supporting the complete cycle of material flow. Q206 reveals integrating the customer into the management of the supply chain has numerous advantages. Q207 reveals integration improves the flow of information throughout the supply chain. Q. 208 to 249 reveal the operational investigation regarding SCM. Overall questions reveal the SCM and business environment issues faced by them due to taking up managerial position in industries. The questions asked to get information about the levels of attitude towards the supply chain management and implementation skills in the industrial operation.

The pressure of SCM goes through multiple roles that a manager has to perform. The attitude of the management plays an important role on the impact of the increasing productivity. The information reveals the contribution of the supply chain management skill in the industrial operation.
The potential productivity of industries is carried on the basis of four categories of respondent’s operational correlation. The SCM managerial problems like labour problems, communication difficulties, leadership styles, decision making styles, public relations, meetings and training and problems related to license/quota have been constructed. Hence the Interview schedule has been able to solicit to make qualitative study of the research area.

2.4.6 PRE-TESTING OF THE INTERVIEW SCHEDULE

Interview schedule was put to test by administering to ten respondent, five from Nasik city and the remaining five-from the district which were selected for study. During the testing of Interview schedule, the questions were checked to find their suitability in terms of language, construction of the Interview schedule and the logical flow of questions. It would be help to the respondent to answer them and thus help in fulfilling the objective of the study. During this process the researcher found the need for modifying certain questions, further some questions had to be asked by the probing method as the earlier was direct question could not bring forth the real answer e.g. Q. 212, Q. 216, Q. 249 etc. Several ideas were put forth at the pre testing stage, which was the essential requirement for the study and had not been considered at the time of construction of the Interview schedule.

The necessary questions were then added or modified accordingly. This pre-testing exercise helped in getting ideas for formulating the plan for the fieldwork operation for the entire study. The survey conducted for this research encompassed a sample size of 192 responses, which reflect more than 11 percent for the study in the district. The final Interview schedule is attached at last.
2.4.7 DATA COLLECTION

Data collection was carried during the period of 15\textsuperscript{th} June 2008 to 10\textsuperscript{th} March 2010. List of respondent were not compiled and available at a single place. Nasik district has eighteen industrial nodes scattered over a wide area. The researcher had to use collection of list of industries and respondent from various sources including manual listing. It was very difficult to reach out to respondent. Overall 192 samples were investigated. As per sample structure of study four categories of managers from all selected industries were investigated. Selected industries are shown in the table no. 2.2.

After preparing of the Interview schedule 192 individual’s sample was targeted. After the selection of the industries, the researcher interviewed the following authorities of the industries.

- a) Works manager,
- b) Production manager,
- c) Maintenance manager,
- d) Purchase manager

At the time of their interview discussion was held with them and observations were also noted.

On the basis of collected data the researcher proved that how supply chain management is effective in the improvement of industrial productivity in Nasik district.

While interviewing respondents, observation of present practices was carried out. The understanding of each supply chain management practice is done through discussion with concerned authority.
2.4.8 DATA PROCESSING

The data thus collected is systematically coded, processed, tabulated, classified and analyzed by using electronic processing methods. The data collected was initially grouped on the basis of 8 categories of industries. The coding structure has been developed which is shown in following table no.2.4.

**Table no.2.4**

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Industries</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agro base</td>
<td>I-1</td>
</tr>
<tr>
<td>2</td>
<td>Automobiles</td>
<td>I-2</td>
</tr>
<tr>
<td>3</td>
<td>Pharmaceuticals &amp; Chemical</td>
<td>I-3</td>
</tr>
<tr>
<td>4</td>
<td>Construction</td>
<td>I-4</td>
</tr>
<tr>
<td>5</td>
<td>Electricals &amp; Electronics</td>
<td>I-5</td>
</tr>
<tr>
<td>6</td>
<td>Engineering &amp; Fabrication</td>
<td>I-6</td>
</tr>
<tr>
<td>7</td>
<td>Luggage industries</td>
<td>I-7</td>
</tr>
<tr>
<td>8</td>
<td>Others industries</td>
<td>I-8</td>
</tr>
</tbody>
</table>

During the entire analysis the same coding structures generated tabulation is used for further theoretical purpose. After the data collection, tabulation was made; thereafter analysis and interpretation were attempted. For the purpose of analysis and interpretation the methods and techniques like mean, chi-square, composite index for correlating SCM percentage structure with all variables, graphical presentation and chart and table techniques of statistics were used. Thereafter the conclusions were drawn and suggestions were made.
2.4.9 DESIGN OF RESEARCH

Following fig.No.2.2 shows the design of the research.

Figure No.2.2

Design of research

From above fig.no.2.2, the excellent effective supply chain management achieves higher productivity as well as the feeble effective supply chain management leads to lower productivity.
2.5 SCOPE AND LIMITATION OF THE STUDY

The scope of this research is restricted to the private sector industries in Nasik district. The study was made by the researcher for the period of 1991-2008. Therefore, the scope of this study is restricted to this period and private sector industry in the Nasik district only.

This research is restricted only to Nasik district. Therefore results and conclusions are related and suitable for Nasik district only; they may or may not be applicable to other areas of India or any other part of the world.

This research has been done for the period from 2006 to 2010; therefore whatever data was available in this period was utilized for the study. If there is some variation in the data, then the results and conclusions may not be the same.

The conclusions are drawn on the basis of the data and information given by the authorities (respondent) of the private sector industries in Nasik district. But because of secrecy 100% correct data was not given by them. Therefore if the data is inadequate and incomplete, there is a possibility of deficiencies in the conclusions. However, the researcher has tried at his level best to collect correct and reliable data from the respondents.
2.6 REVIEW OF LITERATURE OF THE STUDY

It is essential to link the present study with basic management concepts and theories available at national and international level. The researchers studied the topic of operation Management which conducted various aspects of the supply chain management with a limited period and limited commodities. Most of the studies are published in the form of articles, papers and reports. They focus on reviewing the business conditions that are determinants in selecting a supply chain for improving industrial productivity.

The term Supply Chain Management (SCM) has came to prominence in the past 25 years. Supply Chain Management extends the concept of functional integration. It shows the integration of traditional business functions, departments, and processes beyond a firm in the supply chain. Thus, individual members of a supply chain help each other to improve the competitiveness of the supply chain. It will improve competitiveness for all supply chain members. A strategic proactive approach to managing the supply chain is critical for survival. It is clearly indicating by the widely adopted SCM practices today. These practices are efficient Consumer Response, Quick Response, Collaborative Planning, Forecasting, and Replenishment. These are certainly proactive, co-operative activities that require joint forecasting, planning, information sharing, joint inventory management and control. These practices are eliminating wastes throughout the supply chain and enhance customer services for the purpose of obtaining competitive advantage for the supply chain members as well as the supply chain as a whole. Therefore, Christopher (1992) proposed the real competition is not of company against company, but rather supply chain against supply chain.
Despite the propagation of SCM literature, there have been limited studies to have developed the effectiveness of SCM-related concepts. The role of any scientific inquiry is to establish the relationships in the construction of the theory, some of which must be related to observable data. In other words, without operational concepts, we cannot further advance the phenomenon of scientific knowledge, nor promote the successful application of SCM practices.

Therefore the empirical research is required to test the structure of SCM. Strategic co-ordination and tactics of the traditional business functions within and across a particular company need to be organizing. The SCM as a whole for the purposes of improving the long-term performance may possible after smart works from the each members of SCM.

The performance of an organization depends to a large extent on the potentiality of productivity. The performance of an organization is important in transforming the national economy. The organization binds the supply and production is required for the sustainability of the organization. The effectiveness of supply chain management understands the impact of supply chain changes on the total cost or cash flow. Similarly it optimizes the supply chain effectiveness for better productivity. Supply Chain Management (SCM) has become a very prominent concern for both large and small companies as they strive for better quality and higher customer satisfaction.

Ajay Mittal, 2009, He focuses on the government interest with the supply chain management technology in his ‘Country Focus India’. At the end of 2008, India’s Ministry of Commerce granted Arshiya International formal approval to develop the first five Free Trade Warehousing Zones (FTWZ) planned by the
company in India. The zones are part of a US 1.2 billion $ for six-year project to create India’s first and only fully integrated supply Chain Company

Arshiya is a combination of the following strategically integrated logistics verticals: Free Trade and Warehousing Zones (FTWZs), Rail Infrastructure, Domestic District park, Logistics, Supply Chain Management, Transport & Handling and Information Technology. These verticals enable unparalleled operational expertise & solution capability across the entire supply chain spectrum. Arshiya has been accorded the status of “Star Export House” in accordance with the provisions of the Foreign Trade Policy.

Arshiya believes that no problem is insurmountable. There is always a way. There is a way to transcend boundaries to strengthen partnerships to keep bettering today’s solutions to change the face of logistics across the world.

The company has the key business entities like;

Arshiya FTWZ - Responsible for the implementation and operation of Free Trade and Warehousing Zones (FTWZs)

Arshiya Rail Infrastructure –Designed to provide pan-India rail freight operations and rail terminal facilities

Arshiya Domestic Distripark –Located as strategic hubs for warehousing and domestic rail consolidation across India

Arshiya Logistics – Provides logistics solutions including end-to-end freight management & transportation services in over 150 + countries world-wide

Arshiya Supply Chain Management – Provides end-to-end supply & demand chain solutions

Arshiya Transport & Handling – Focus on providing world class transportation and handling infrastructure and services

Arshiya Technology – Provides software solutions for supply chain management and business process outsourcing
“The demand for good logistics services was there and that side of the business was making more money,” explains Mittal. The supply chain management with getting a good understanding of the new supply chain concepts around at the time and regulated production, minimum order quantities, supply chain visibility, and so on. A financial perspective saw that progressing the company into supply chain management would mean switching from earnings out of margins on logistics operations to earnings out of adding value to supply chain processes. It is also started offering a full range of supply chain services to customers in a variety of industries. It started putting these staff on site with customers for balancing demand and production planning, and redesigning supply chains under long-term contracts. They were offering a full range of 3PL and 4PL services.” This literature has made dynamism with researcher for the present study.

Christian H. M. Ketels, 2003, Clusters are groups of companies and institutions co-located in a specific geographic region and linked by interdependencies in providing a related group of products and/or services. Because of the proximity among them – both in terms of geography and of activities – cluster constituents enjoy the economic benefits of several types of positive location-specific externalities. These externalities include, for example, access to specialized human resources and suppliers, knowledge spillovers, pressure for higher performance in head-to-head competition, and learning from the close interaction with specialized customers and suppliers. Clusters differ in many dimensions: the type of products and services they produce, the location dynamics they are subject to, their stage of development, and the business environment that surrounds them, to name a few. At a first level, clusters can be classified by the type of product and/or services they provide. There are clusters in automotive, in financial services, in tourism, in ceramic tiles, and many more.
Within these clusters, recent research has pointed out how different locations play different roles. It will explore the importance of accessibility in business location which mainly plays the SCM function. Researcher has developed logical concept for the present study.

**Sachin Nandgaonkar, 2010,** India has not commenced to play a big role in the manufacturing footprint of multinationals. Even if, you compare it to five years ago, things are improving. Underneath the surface set in motion to change rapidly. Whether it is due to driven by the emergence of a vast domestic market and relatively low-cost workers with advanced technical skills, more and more multinationals are setting up manufacturing operations in India. Author reveals the relativity of HR and marketing to the low cast. He has explored the studies of pioneer corporate in market.

Ford, Hyundai and Suzuki all export cars from India in significant numbers. LG, Motorola and Nokia all either make handsets in India or have plans to start, with a sizeable share of production being exported. ABB, Schneider, Honeywell and Siemens have set up plants to manufacture electrical and electronic products for domestic and export markets. In totaling, a clutch of globally competitive Indian manufacturing companies - many of them in the automobile industry - have inserted themselves into the global supply chain. This citation encourages to the researcher in present study towards the thinking of electrical and electronic industries role in the Nasik District through SCM.

**Arindam Bhattacharya, 2008,** "Over the past five or six years, many companies have restructured their manufacturing operations and implemented world-class practices." "Slowly but surely they have started building a globally
competitive manufacturing base in industries like pharmaceuticals, auto components, cars and motorcycles."

When India’s large business houses start entering an industry, something’s happening. Over the last few years, these groups, traditionally into manufacturing, entered retailing, insurance, and telecom, even healthcare. And now, some of these are entering supply chain and logistics.

Researcher feel the similar picture like below examples is given, which can be analyse by the proportional scale. After gone through literature of following example of the Industries such as **Petrochemical, Steel, auto industry**, researchers desire to evaluate this concept by conducting analytical studies of Nasik district on SCM.

**Petrochemical:** major Reliance Industries formed **Reliance Logistics**, headquartered in Mumbai. This division handles all the movements of petrochemical products for Reliance between Jamnagar, Hazira and Patalganga (near Mumbai) and eventually will service the Reliance petrol pump network. Industry players and analysts estimate Reliance Logistics turnover to around Rs 1,000 crore, assuming entire distribution expenses were to be equal to the logistics subsidiary revenues. The graphs would be higher if the money spent by the parent on inbound logistics; procurement and so on were added. Reliance Logistics has already started handling warehousing and trucking for companies like HLL and Cargill and ITC. The revenue from these services has to be added as well.\(^1\)

**Steel:** Major Tata Steel formed a joint venture with IQ Martrade and Holding GmbH of Germany to form TM International Logistics Limited (TMILL).
TMILL will handle all port operations for Tata Steel, initially from Haldia port, where it has a berth for 30 years to handle iron ore. TMILL plans to handle coal for Tata Power plants that import via Haldia and other ports. TMILL is also understood to have tied up with Coelrici, an Italian company for unloading of bulk cargo like iron ore at Sandheads, near Hoogly in west Bengal. In August ’04, TMILL was mulling chartering ships for importing limestone from Thailand, for which a JV with eastern Energy of Thailand, called Sheila Energy Inc has been formed. TMILL could be around Rs 750 crore in revenues, analysts estimated.ii

The auto industry: has also seen large groups enter logistics as a strategic business venture. The supply chain management is the most developed in the automotive industry. Due to its global nature, networking is one of the primary sources of competitiveness. The TVS group has a logistics division under TVS and Sons, which handled up to Rs 1,000 crore worth of warehousing and inbound logistics for clients like Ashok Leyland, Ford Motors, M&M and Sundaram Industries. This division arose because of the backward integration of the distribution systems of the various TVS companies, and today it is a profit centre in its own right.iii

Three years ago M&M formed the transport services group, TSG, under the automotive business, which was first started to support rural transportation. It eventually began to offer transportation, warehousing, IT and consulting services to the corporate sector as well, leveraging M&M’s understanding of the transport sector and vehicles (not only of M&M make) and how they could be used better aided by M&M’s ERP technology. This division does not own any vehicles, but coordinates the logistics requirements via associate service providers for
companies and was contributing over Rs 150 crore to M&M’s automotive business in 2002.

**Ashok Leyland:** launched Ashley Transport Exchange in December ’04, as a logistics subsidiary geared to provide ‘transport solutions’ to users. This intends to leverage the Ashok Leyland base of users. Ashley Transport Services has set up 40 company-managed KIOSKS at major transport centres in different parts of the country. The company intends to set up over 100 such kiosks across the country by the year-end. Each KIOSK will be equipped with state-of-the-art networking and communication facilities as also parking space for trucks and comfortable resting space for drivers. The Transport Exchange has already enrolled with it an active and growing database of over 20,000 transporters across the country and 500 major logistics and transport solution providers. It also intends to widen the base. The database will help Ashley to identify freight that needs to be transported and match the most suitable truck available for transporting the cargo. Sriram Recon, a company from the Sriram group of industries, is the largest player in reconditioned trucks as well as truck financing.

**Shipping** Related examples are in shipping as well. Companies like Essar Shipping have already stated the intention to evolve into a sea logistics services provider for global oil and gas companies, taking advantage of the trend of oil refiners outsourcing ancillary functions. Shipping may soon be only a part of the total logistics solutions that such companies provide. There are such examples in industries like steel and metals as well, where the revenues of logistics divisions and subsidiaries formed from parent companies would be over Rs 750 crore.

The key trend is that the line between users and service providers is blurring in most of the industries where logistics costs are high. These divisions
and companies would most likely use the Third Party (3PL) model, where they would not own many assets like trucks or warehouses, but strategically outsource to already existing players. In such a scenario, these will be able to provide end-to-end services, right from pick up to delivery. As Indian companies engage in more global trade, we should see the emergence of Indian global giants in the logistics space.

**Source of Service Providers’ In India:** There are sources of service providers of all kinds, sizes and competencies in India. That’s the sign of a market just opening up, and eventually we should see consolidation and the emergence of players with serious size and scale. The market is a pyramid right now. Every company is trying to move up the pyramid to the cream, because margins lower down are very low and can only be squeezed so much. The impact of the movement is visible in the formation of logistics divisions, ‘Less than Truck Load’ (LTL) and ‘Full Truck Load’ (FTL) movement focus. The formation of express and international logistics divisions of practically every company observe in Indian or overseas. Every company sees tremendous business opportunity in logistics and 3PL business. It will focus on present study for the similar logic.

**Anil Syal, GM, marketing, Safexpress, in Delhi,** Consumers are more open now to buy outsource SCM, 3PL and integrated solutions. The process though is slow but, yes, it’s happening. He adds, “There are various places in which logistics organizations work. One such in 3PL is ‘Specialist Logistics Park’. With specialist logistics parks, a logistics service provider brings in shared/multi-user facility of similar products range broadly; giving back to the clients pooled and shared expenses while also giving benefits of skilled manpower, better understanding of products and processes and most importantly
scalability.” Company’s role in the SCM market reflects quite positive in the growing stage. “In line with the Specialist Logistics Park philosophy, Safexpress has built a 100,000 sq ft apparel logistics park in Delhi and a 130,000 sq ft Automotive Logistics Park in Gurgaon. Safexpress rode the technology wave and invested more than Rs. 3 crore to ensure its customers get world-class information services. Safexpress has also invested in a state-of-the-art warehouse management system to help its 3PL client get best in-line services. Safexpress uses latest mobile and web-based computing modules to keep information flowing smoothly. Safexpress was the first company in India to set up a fleet of containerized vehicles in the express cargo business doing time-sensitive deliveries. Safexpress uses GPS-based tracking mechanism to keep its fleet in sight 24x7.”

**Manoj Agarwal, head, marketing and corporate communications, Gati,** “We are now focusing on warehousing as a key business driver. The logistics part of the business should come to us by default as we already provide these services. It’s in warehousing that we see the next big opportunity. We plan to be a Rs-100 crore player in warehouse management.” Interestingly, he plans to replace the traditional C&FA model that FMCG and many other industries work on. “We guarantee 10-15% cost savings over the existing warehouse bill for companies. We can do this by taking a whole new outlook -- warehousing should be value addition in spaces, not just storage.” He estimates the warehousing market to be around Rs 2,700 crore for just durables and FMCG, or 2-3% of the net revenues of these industries. Going forward, the company plans a network of ‘dormant’ warehouses near all the metros and Class A cities (a total of 23 locations). These warehouses will maintain a basic safety stock, over which other stock will come in, get value-added, and leave. The idea is that eventually companies can outsource the entire distribution and logistics to Gati. Funnily
enough, Gati has got feelers from major commercial vehicle manufacturers to maintain Gati’s fleet of trucks. This means that Gati outsources its physical assets to the very same customer who outsources to Gati! “The logistics business is getting more exciting day by day.”

**Manoj Chandra 2006**, “Warehousing is an integral part of the 3PL business of AFL. We currently have over 550,000 sq ft of warehousing space across 45 locations in India. AFL's Logistics Division is perhaps the only 3PL company in India, which has such a wide warehousing presence and capability across the country. We expect this to double by next year.” Typically, the new breed of warehousing company’s charge companies for the space they actually occupy on the floor, not a flat charge. This means considerable saving for off-season time and fair charges for peak-season storage, where more products are held, pending sale. There’s another angle to warehousing that’s emerging. Companies now look at total inventory available for sale as made of both inventory on road -advantage inventory with the trade. With increasing pressure from the trade to cut inventory and the company’s reluctance to stock, companies are turning to trucks as mobile warehouses. This is where an integrated service provider who provides seamless transport and warehousing gains over the traditional single-service trucker. Service level agreements now incorporate both trucking and warehouse management. Service providers now even customize software to enable their warehousing systems to ‘talk’ to their customers. They aren’t afraid of several different programmes running simultaneously.

The introduction of VAT causes mixed reaction in the service providers’ community. The present structure of state taxes and laws means setting up multiple warehouses in a state almost mandatory. After VAT, there could be just one warehouse in a state serving a host of smaller, transit warehouses in over 4-5 other surrounding states. The hub-and-spoke model, proven to be the most
efficient for logistics, will get a boost because of VAT. The complexion and nature of warehousing will change, but the requirement for break bulk and re-packing will still remain. The value of activity will be also higher, thereby offering service providers’ a means to shore up margins.

Safexpress, the Delhi-based 3PL, has also started leveraging consultancy. It has put in Rs 2 crore into a CRIE – Centre for Intelligence and Research Excellence – in its Safexpress Logistics Park there. This centre will generate models and route simulations for the company and its customers. It is also expanding its warehousing capacity across India’ its Ahmedabad hub will cross 1 lakh square feet in 2005, while others are being upgraded to over 15,000 square feet, much like Gati and TCI are planning.

Nimish Shah, regional director, western India, EGL-Eagle Global Logistics which is a major player in freight forwarding in India and works with over 700 customers with core focus on auto and auto ancillary logistics, based in Mumbai, “Our customers are projecting a 30-35% growth in 2005. We expect to grow with them. Exports will play a key role, and presently we derive 50% of our revenues from the exim business” Globally, Eagle derives 22% of its $3-billion annual sales from auto logistics, and with India set to become a key supplier to all global car companies, Shah knows 2005 will “be a bumper year”. Shah says the logistics business has to be rate driven to some extent, but beyond that it’s value-added services integration, IT, assurance and so on, that will be the key differentiator. In other words, the company will move up the chain, where margins are better, and longer-term stability is assured.

Vineet Agarwal, TCI’s executive director, TCI has been working actively for the last few years providing basic trucking services to more value-
added services, specifically integrated logistics management which includes end-to-end multi-modal transportation, warehousing and C&F services, order processing, international customs clearance and forwarding and others. He adds, “Several reasons are prompting the company to move to business segments like XPS and logistics, like unorganized trucking and road transport business with low margins; construction of the national highway networks which will increase the overall requirement for logistics services; impending implementation of VAT would lead towards a drive to outsource to third party logistics (3PL) providers. Focus on supply chain management as the next frontier for process improvements. India’s integration into the world economy has lead to a greater need for specialized and more efficient logistics systems”. Is the value added segment sustainable? Agarwal thinks so, “Customers are willing to pay more for a faster, door-to-door service which also uses air as a mode. The transportation portion of the business is a fixed cost since the scheduled vehicle will still leave irrespective of being empty or full. Overall growth in the market is also higher (about 20%) which avoids the typical fluctuations of the regular trucking business. This growth in revenues and profits is sustainable. XPS started in 1997 with zero revenues and has achieved revenues of Rs 140 crores in a short span of 7 years. The key factors that will affect profitability in the long run would be government policies and competition,” he said.

Sanjay Sinha, Head, Transport Solutions Group (TSG), M&M, “There is a demand for integrated, brand-assured services from large companies.” The model that M&M’s TSG follows is the Xerox model- the company makes money on the services, not the vehicles. The focus has shifted to solutions, not pieces. In other words, this is also moving up the chain into value-added solutions. TSG today provides solutions for both cargo and passenger segments. Today, M&M TSG handles the logistics for 20 large companies like P&G. TSG promises to
reduce down times, waiting times, loading times and consult on how best to optimize the logistics for a company. Consulting and a non-asset based business model are the two lynchpins for the TSG model.

Another company that plans to leverage its pedigree, brand and reach is the Rs 1,200-crore Reliance Logistics. It has a Re-engineering division, which is like a consulting division. This division provides the initial consulting for logistics free and once the customer agrees for a fuller interaction, can charge expenses, for their services. The company says that the idea is not to make the consulting arm a business by itself presently, but as a driver for the main division. They plan to take on two projects a month and each engagement – pro bono right now- can last 4-5 months. Again, this division is a move up the chain -- a differentiator for Reliance logistics, which claims that unlike a pure consultant, Reliance Re-engineering will carry the ball right from idea to implementation and, combined with the scale of Reliance Logistics, provide an unbeatable price and value equation.

For the logistics business, it plans a different strategy. The company says it plans to move down the chain, not up. That means, the company plans to take share from the unorganized sector of transport and trucking, rather than go into the express or cargo exim business. The belief stems from the fact that in the next two years, Reliance will put up 5,000+ petrol pumps across India (50 already exist in west India). These petrol pumps will use existing telecom (from Reliance Infocomm) for Internet, telephony and track and trace. The same Infocomm network will be able to support online billing, credit cards and even teleconferencing. The idea is that any trucker can walk into a Reliance petrol pump and take credit – in diesel or in money-, communicate with family and company and allow for tracking. The implications are tremendous. If the plan
goes to fruition, Reliance logistics will spend only incremental money to have a nationwide network up and running. The petrol pumps will stock auto ancillaries as well – a retail model. The company, therefore, targets the large bulk movement – the lowest strata of the value pyramid. But volumes will compensate, very much in keeping with the parent’s logic of affordable service and scale.

**Stuart Richardson, MD, Ireland, UK, Middle East, Africa and West Asia for Menlo Worldwide**, “With the imminent lowering of tariffs in the worldwide textiles industry, India is poised to become the dominant leader in apparel, automotive and garments sectors. This development, along with India’s growing prowess in high tech, auto and pharmaceuticals has given us confidence to invest in new facilities, expand to new locations and launch new supply chain services.” Today Menlo has 200 employees in India, and operates three logistics services and several service centres. Apart from these regular service providers, there also exist ‘point-to-point’ players who specialize in cargo movement between two centres e.g. like Delhi-Mumbai; Mumbai-Pune and so on. The organised players like TCI or Gati – who try to offer logistics services - often, have to make alliances with these truckers and service providers to stay in contention for business; this is because the point-to-point truckers have long-term relationships as well as lowest freight rates which players like TCI or Gati would never be able to match. Consequently, alliances are the name of the game. For example, at ports like Kandla and Bangalore, there are trucker unions which make sure any service provider has to use the union trucks for any material movement out of these areas. However, service providers have found the way out. The union trucks are only used until the end of the union’s territory, which in some cases may be just about 25-50 km from the origin. After this, goods are transferred to the service providers’ carrier. This, of course, means a loss of time, money and space (warehouses), but these are the peculiar conditions of road
transport in India. Such scenarios exist in sea/ports as well; as in air cargo. However, a time will come when these unions will also begin to align to large players and become a part of the chain, rather than remain stand-alone entities. That should remove a major structural deficiency in India’s logistics.

According to Contract Farming (CF), it basically involves four things - pre-agreed price, quality, quantity or acreage (minimum/maximum) and time (Singh, 2002). Contract Farming can be defined as a system for the production and supply of land based and allied produce by farmers/primary producers under advance contracts, the essence of such arrangements being a commitment to provide an agricultural commodity of a type, at a specified time, price, and in specified quantity to a known buyer. In fact, CF can be described as a halfway house between independent farm production and corporate/captive farming. Due to the efficiency (co-ordination and quality control in a vertical system) and equity (smallholder inclusion) benefits of this hybrid system, it has been promoted aggressively in the developing world by various agencies.

Nandgaonkar of BCG says recent improvements in infrastructure and a move toward greater efficiency in Indian export parks make him optimistic. He also sees the emergence of a new generation of young entrepreneurs with global ambitions in India and the advantage of well-regulated and efficient capital markets, rated among the best in Asia, also add to India's lure. In ten years, India will have a meaningful footprint in global manufacturing. "His opinion toward the effect of supply chain impact on manufacturing relating in India through a combination of growing domestic demand and skill-driven export competitiveness,". Investments in the manufacturing sector, reveals the numbers grow rapidly over the next five to ten years.
James B. Ayers, 2000, Every now and then, a periodical like MIIR, which focuses on information technology, should remind its readers of the need for holistic approaches. Consider this article just such an occasion. Focusing on only the information technology aspects of supply chain management, or SCM, will limit the effectiveness of IT professionals. While technology is an important component in structuring supply chains, there are others to consider. Professionals need at least peripheral awareness of the other fronts on which competitive battles are waging. These battles will likely affect their efforts. To support this proposition, author identified five management tasks that have changed with the emergence of supply chains as the basis for competing. Notice the assertion that organizations now compete on the strength of the supply chains they join or design themselves, and less on a traditional company-to-company basis. Also find the way tasks are performed would change. The tasks aren’t new; and much time, effort, and money have been expended in their execution. However, how managers perform these tasks will change; and they must equip themselves to handle those changesiv.

V. B. Angadi and Ashok K. Raina, 2007, The WTO organisation is not a complete success as it is a fact that the organisation is member driven and its treaties are through negotiations only. Hence because of the WTO there have been enhancement and growth in the global trade, earlier there were no definite guidelines as to the measures relating to the trade but the available needed framework and platform to operate the global trade is not so sufficient to fulfill the objectives of WTOv.

Ashutosh Kumar, 2007, Indian external trade (Import and Export) witnessed increasing trends was more pronounce in the post WTO period than the Pre- WTO period. The growth performance of exports particularly in agricultural
products expected to increase by developing countries like India. India needs to continue to lobby for a favourable deal on three contentions issues like Domestic support, Agricultural Market Access and Non-agricultural market Access that left in Doha round. The opening up of agricultural trade should looked as major opportunities for rising overall economy growth rate by exploiting India’s competitive as well as comparative advantage in agriculture for improving the efficiency of resources used in agriculture and for technologically upgrading the rural sector. India need to devise multi pronged strategy to face the emerging challenges faced under the WTO regime and make Indian agriculture sustainable and internationally competitive. vi

Sanjay Jain and M.C. Kapoor vii they have undertaken a pilot study of selected manufacturing Indian companys dealing in exports of their products. Little attention paid to developing an understanding of the companys' export attitudes and their international marketing planning and organizational activities, which found to be important determinants of companys, which required tremendous work in the similar field.

Pillania Rajesh K viii Indian economy and foreign trade are on a growth trajectory. The total value of India’s merchandise exports increased from US $ 1.3 billion in 1950-51 to US $ 63.8 billion in 2003-04 a compound rate of 7.6 per cent. Trade growth has picked up post liberalization of 1991 where composition of trade has dominated by manufactured goods and services. India’s services exports share in global exports is more than double that of Indian manufacturing exports. East Asian countries, particularly China have become a major trading block. There is huge untapped potential for Indian foreign trade in years to come.
S.J Patel reveals by his historical paper on Export prospects and Economic Growth: India: A Comment, in the economic journal September 1959. The evaluation of problems probable feature behaviour of India’s foreign exchange earnings pessimistic and from these estimates concludes the correct investment allocation in India; it must be slanted heavily towards increasing capacity in import competing industries. According to these concept policy implications has tried in many under developed countries during those period, which countries developed prominently in the future period.

Suresh D. Tendulkar He has done the empirical analysis and leads to conclude that international trading opportunities that can act as a powerful instrument in stepping up the rate of economic growth provided the internal main springs of the growth process could maintained and continually strengthened. The process of shedding more than four-decade long protectionist past would require reallocation of resources away from the inefficient import-substitution-oriented sectors towards export oriented activities. Recognizing this, he emphasizes that adequate social safety nets are essential for minimizing the transitory adverse effects of adjustment.

Debashis Chakraborty and Arup Guha according to them the usefulness of easing controls on capital flows in a country is a long-debated question. It is argued that the liberal capital control regime boosts the confidence of the international community on the domestic economy and becomes instrumental for ensuring higher capital inflows. On the contrary, it is widely held that controls on capital flows ensure a developing country against experiencing a sudden potential currency crisis and the macroeconomic scenario. The empirical findings suggest that India should move cautiously in this regard towards the India’s future foreign trade.
Mallick, Sushanta, Marques Helena\textsuperscript{xii} Analyses the impact of India's policy reforms on exchange rate pass-through into import and export prices, using panel data for pre- (1980–90) and post-reform (1991–2001) periods. While the pass-through into import prices has declined, the pass-through into export prices has increased during the 1990s. The results suggest that, relative to rupee depreciation, Indian exporters increased their USD prices around 20% in the 1980s, but decreased them by around 70% in the 1990s. Moreover, the number of sectors exhibiting some degree of pass-through increased in the 1990s relative to the 1980s. These changes may be attributable to the elimination of currency and trade controls, which increased competition among companies and fostered a concern with market share gains in the 1990s over an attempt to use depreciations to increase profits in the 1980s.

Dipak Basu\textsuperscript{xiii} examines how the economy could have behaved if the planning authority had replaced quantitative restrictions on the private sector by various financial controls, rather than privatization and destruction of the public sector. The external sector, particularly the foreign debt, is a crucial factor in India's future development prospects. Thus, the impacts of such a policy regime on the balance of payments and foreign debts are important. In order to analyze the situation, an adaptive-control model for the Indian economy was estimated. The reason behind this is that, in this framework, the model and its probability structure will change continuously as the optimization progresses, thereby adapting the parameters of the model to the planned solutions.

Kishor Sharma\textsuperscript{xiv} evaluates the Export growth of India and GDP growth over the past few decades. Several factors appear to have contributed to this phenomenon including foreign direct investment (FDI). However, despite
increasing inflows of FDI especially in recent years there has not been any attempt to assess its contribution to India's export performance one of the channels through which FDI influences growth. He investigated the determinants of export performance in India in a simultaneous equation framework. Results suggest that demand for Indian exports increases when its export prices fall in relation to world prices. Furthermore, the real appreciation of the rupee adversely affects India's exports. Export supply positively related to the domestic relative price of exports and higher domestic demand reduces export supply. Foreign investment appears to have statistically no significant impact on export performance although the coefficient of FDI has a positive sign.

**Rajesh Mehta and Ashok Parikh** examines the impact of liberalization on price elasticity's of imports at a commodity level for broad commodity groups and at an aggregate level for the Indian economy over the period 1993–1997. Liberalization implemented by reducing tariff and non-tariff barriers and relaxing exchange controls, tariffs and market-based exchange rate introduced in the import price of the commodity. Relative price (import/domestic) elasticity is for each commodity group using panel data of six countries over five years are estimated. For the Indian economy, relative price elasticity’s for each of the years at an aggregate level using data for twenty commodity groups as observations are obtained and shows that the price elasticity tends to rise with the increase in liberalization when tariff rates reduced.

**Mahvash Saeed Qureshi and Guanghua Wan** Examines by exploring the export performances and specialization patterns of China and India, assessed their trade competitiveness and complimentarily vis-à-vis each other as well as with the rest of the world. Analysis indicates that India faces tough competition from China in the third markets especially in clothing, textile and
leather products. There is a moderate potential for expanding trade between the two countries. India appears as a competitor mainly for its neighboring South Asian countries. Finally, the export structure of China is changing with the exports of skill intensive and high technology products increasing and those of labour-intensive products decreasing gradually. This suggests that challenges created by China in traditional labour-intensive products might reduce in long run.

Raj Agrawal evaluates substantial profitable opportunities among India, China and Asean countries by identifying the sector-specific opportunities that can drive trade and investment flows among these countries. Formulation of the key strategic issues for the promotion of trade and investment in this region increases regional cooperation in Asia. China, India and Asean should recognize that much of the future growth in the region could come from within, e.g. success of other regional trading blocs such as NAFTA and the EU. China, India and ASEAN form a huge market that is growing faster than any other region in the world. China, India and ASEAN, as regional trade partners offer a huge and attractive, geographically contiguous market, of more than 3.9 billion people.

Kaliappa Kalirajan according to him almost half a century, India maintained one of the restrictive trade regimes in the world. It imposed a system of high tariffs and stiff non-tariff barriers such as licensing and quotas, which virtually closed the economy from the international trade arena. India implemented economic reform since the middle of 1991, and has made drastic changes in trade policy to reorient itself to integrate with the global economy. While reviewing the trade policy a measure, an important empirical question that investigated, is how open has India’s trade been after a decade of economic reforms.
Kishor Bhanushali, he has analyzed the recent changes in the pattern of foreign trade. Information on various dimensions on India's foreign trades like imports, exports, balance of payment, composition of trade by commodities and countries, etc the researcher-collected data and analyzed to find out trends, patterns, and its impact on future. India's trading relations with Canada also analyzed. These types of analysis assist in the formulation of international policies. The analysis concludes with the favourable remarks in India’s foreign trade and the policy of India.

Peters and Waterman, 1982, observed that managers are getting more done if they pay attention with seven S’s instead of just two (the hardware criteria), and real change in large institutions is a function of how management understand and handle the complexities of the 7-S model. Peters and Waterman also reminded the world of professional managers that soft is hard meaning that it is the software criteria of the model which often are overlooked and which should have the highest focus when embarking on the journey to excellence.

Mark S. Fox, Mihai Barbuceanu, and Rune Teigen, 2000, investigates issues and presents solutions for the construction of such agent-oriented software architecture. The approach relies on the use of an agent building shell, providing generic, reusable, and guaranteed components and services for communicative-act-based communication, conversational coordination, role-based organization modeling, and others. Using these components, they show two nontrivial agent-based supply-chain architectures able to support complex cooperative work and the management of perturbation caused by stochastic events in the supply chain.

Harvey, 1994, understands globalization as processes that so revolutionize the objective qualities of space and time that we are forced to alter, sometimes in quite radical ways how we represent the world to ourselves. Thus: The time taken
to pass through space and the way commonly represents that fact to ourselves are useful indicators of the kind of phenomena researcher have in mind. As space appears to shrink to a ‘global village’ of telecommunications and a spaceship earth’ of economic and ecological interdependencies – to use just two familiar an everyday images – and as time horizons shorten to the point where the present is all there is …so we have to learn how to cope with an overwhelming sense of compression of our spatial and temporal worlds.

Dyer, Cho and Chu, 1998, Over the past decade, there has been an increasing emphasis on supply chain management as a vehicle through which companies can achieve competitive advantage in markets. A large number of examples in the 1990s, both successful and abortive, show how companies have made large investments to streamline their supply chains in order to improve customer satisfaction and increase their internal productivity.

Christopher (1998), it is not actually individual companies that compete with each other nowadays; rather, the competition is between rival supply chains. Those supply chains that add the most value for customers with the lowest cost in the chain make up the winning network of individual companies.

Supply chain management is, still in the early 2000s, a very popular development area among companies. Its importance is especially significant in the area of high-tech industry where product life cycles are short and product values are relative high. Likewise, the management of end-to-end supply chains in a business environment like the infrastructure business has a major financial impact on all parties involved in the chain. Just thinking about the current industrial dynamics of the hi-tech information technology markets it is relatively easy to argue that today the management of supply chains is
actually not a competitive advantage anymore; rather, it is a condition of being in the business for companies. However, although the importance of supply chain management is widely recognized, its explicit meaning is often blurred among companies. Therefore, it is now necessary to take a closer look at the concept of supply chain management and its key objectives play an important role in the production. Moreover, researcher need a solid conceptual basis for drawing any conclusions about the phenomena studied in this thesis.

Mentzer et al., 2001, All too often in the literature the term supply chain management is narrowly understood to be the same as logistics management. Although these terms basically represent the same management discipline, this work, however, maintains that there are fundamental differences between these two concepts. The concept of supply chain management has been derived from logistics management and it has a broader scope than tradition logistics within companies. In order to really understand the meaning of supply chain management and the differences between these two concepts, it is useful to shortly review the development of logistics in microeconomics over the past decades.

Ballou, 1992, Logistics management, as a discipline in management science and practice, has its roots back in the United States in the 1950-60s when the potential of efficient material distribution to decrease companies’ direct product costs was realized. He continues that, at that time, there were four key conditions that encouraged the development of physical distribution models: (1) shifts in consumer demand patterns and attitudes toward more demanding needs for high availability and variety of products, (2) cost pressures on industry, (3) progress in computer technology and (4) the influences of the military experience.
Physical distribution was considered to be a dominant theme in those days to respond to growing demand by companies to decrease costs in the logistics chain. Mainly due to the oil crises in the 1970s, when both transportation costs and interest rates – and thus also inventory carrying costs - rose at the same time, the importance of logistics to a company’s profits was really understood by top management. It was then soon realized that optimization of physical distribution alone was not good enough, but rather purchasing and material handling should be integrated very tightly into it. This integration process was leading to an evolution of logistics management that according to many sources can be considered to be the combination of two management disciples.

Bowersox et al. (1999) until the early 1980s the development of logistics systems in companies, however, was very much a cost-driven activity and the potential for customer satisfaction and new value creation were not fully understood. As Bowersox point out, the full appreciation of logistical performance as a way to sustain customer relationships, while already introduced in the 1950s, was widely neglected until the mid-1980s. At that time, Professor Michael Porter of the Harvard Business School argued that a company is able to gain a competitive advantage over its rivals in the same markets only by providing more value to its customers. In his famous book, Competitive Advantage, he introduced the new concept of value chain - and value system – that rapidly became a famous doctrine in management studies worldwide. Each activity in a company should add value to the value chain of a customer and, similarly, each company in a particular industry should add value to the value system. In the value concept, logistics plays a central role in creating value for the customer, as both inbound and outbound logistics are represented as primary
activities in the chain. At that moment, logistics was also seen as an activity that could greatly help companies in improving customer value, not only internal cost-efficiency.

Cooper, 1997, Thus it was in the late 1980s that supply chain management really started to be utilized in the literature. In addition, according to Cooper et al. (1997), supply chain management has risen to prominence over the last ten years. This work maintains that the value chain concept was a momentum for the development of supply chain management, which has its roots in the basic logistics management theories. It is useful for the present study.

LaLonde and Masters, 1994, a supply chain strategy should always include two or more companies in a supply chain entering into a long-term agreement. Many attempts in the literature to define supply chain management are often long, confusing statements that are inelegantly derived from the concept of logistics management. It is; thus, no wonder that these two concepts are often mixed.

Peters and Waterman (1982, p. 13) complemented the above eight attributes with the following overall conclusions. The excellent companies were, above all, brilliant on the basics. Tools didn’t substitute for thinking . . . Rather, these companies worked hard to keep things simple in a complex world. They persisted. They insisted on top quality. They interacts their customers. They listened to their employees and treated them like adults.

Tom Peters and Nancy Austin, 1985 A Passion for Excellence the findings from the first book were now simplified into the simple model or scheme, which involve; people, who practice; care of customers; constant innovation and leadership and maintain the supply chain. These all the character
binds together under the supply chain management. The first three factors by using management by wandering around at all levels of the organization.

Since, Peters and Waterman’s extracts of excellence characteristics several others have tried to identify such lists of excellence. Such lists typically describe the key enabler characteristics, which differentiate organizations with excellent results from organizations with mediocre or poor results. The British Quality Foundation (1998) published such a list in a report about Business Excellence, and the differentiating characteristics (criteria) were shown as follows:

- management commitment to the business excellence “journey”;
- effective strategic planning;
- An emphasis on people issues through empowerment and training;
- Unprecedented levels of employee participation through effective communication of and involvement in the organization’s goals, mission and objectives;
- Process understanding, management, measurement and improvement;
- Deliberately avoiding “jargon” to ensure a seamless integration of business excellence practices;
- Nurturing a culture which focuses implicitly and explicitly on anticipating and observing customers’ needs;
- Demonstrating concern for better environment management; and
- Making the internal spread of best practice contagious.

Hence a literature review is a body of text that aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources and as such, do not report any new or original experimental work. In the present study, a literature review usually leads a conceptual logic of the SCM operation and its impacts on productivity. Though, the above studies
were made by the eminent authorities. This study is different from the earlier study. In this study, the researcher has thrown a light on supply chain management in improving the productivity of industries in private sector of Nasik District. It is definitely beneficial to the private sector of Nasik District. As well as government can formulate its policy for the effective working of industries in private sector.

2.7 RATIONALE OF THE STUDY

The logic behind the study is focused on the role of private sector Industries through the policy and management programme of Supply Chain Management for the development of Nasik district Industrial Productivity. It is connected with Supplier, Producer, Distributor, Retailer and Customer Service. It supports to state, nation and foreign countries. Its impact on the business environment of the nation trade and economy should be understood. India has been trading with foreign countries from ancient times. The products of our country were famous all over the world.

The role of supplier and distributor in trade is a strategic issue for any country in the world. Supply Chain Management is considered as the engine of industrial growth and development. India is a strategic country in the Asian continent in respect of cheap supply and vast market potential. The economy has become stronger. The country has recorded continuous growth of 6 to 8 percent in GDP for the last 20 years and is likely to be 10 percent in near future. The production growth also is not less than 10 percent per annum. According to the World Bank projections by the year 2020, the Indian supply to foreign country performance will grow at the rate of around 20 percent per annum. It assumes
that the micro-region like study area will has growth nearly 10 percent of production.

The future of supply indicates that the largest economies of the world will be U.S, China, Japan, India, Germany, Indonesia and Korea. The requirement of the supply chain management undertaken towards courageous by the government, the position of privatization in India has been improving and shows encouragement in relation to the manufacturing field. It may impact on micro-region also. Nasik district is closely connected to Mumbai which is famous as the economic capital city, interactive as the world trade centre of India. It is obvious that the region like Nasik district improved the status towards the economic development of the state and nation. The economic development of any region depends on the improvement in production and supply. Therefore, to what extent production and supply in Nasik district has contributed to the economic development is the need of time to understand? Hence, the researcher has made an attempt to know the contribution of the supply chain management to the cluster economy of Nasik district.

The study on supply chain provides basic definitions and concepts for planning and controlling the flow of materials into, through, and out of an organization relation. It also explains fundamental relationships among the activities in the supply chain from suppliers to customers. The research deals with economic concepts of demand and supply, production by types of manufacturing systems, forecasting, master planning, material requirements planning, capacity management, production activity control, purchasing, inventory management, distribution, quality management, and Just-in-Time manufacturing. Hence, supply chain management helps to improve the productivity of every sector of industries.
2.8 SCOPE FOR FURTHER RESEARCH

This research has highlighted the importance of supply chain management for improving productivity if each and every activity is operated timely. But like any other research project even this research has certain limitations, one of them being that this study is limited to Nasik district private sector industries only. Here we must bear in mind that at the same time, Indian supply chain management can be extended at global level also.

Thus there is a lot of scope for further study. Some of the proposed areas for study are as follows:

i. To identify the importance of supply chain management for private sector industries at national level and international level.

ii. At micro level of supply chain management, the researcher can focus on the individual tools of SCM.

iii. We can identify the importance of supply chain management in agriculture, which is the backbone of Indian economy.

iv. We can identify the importance of supply chain management in Asian countries like China, Pakistan, Bangladesh, Sri Lanka, etc.
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