REVIEW OF LITERATURE
Due to the rapid expansion and growth of the world economy, most of the companies are generally affected by the higher competition; higher and better product's standard, and better quality. Therefore, the companies have to respond for developing many aspects of management. For example decreasing the product life cycles, reducing the costs, and to add value to the process. Hence supply chain is one of significant key of this development process in which many manufacturers try to improve this process to become more efficient and successful.

Going by the definition of Supply chain it is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer (Christopher 1998).

Supply Chain Management (SCM) in general, is a synthesis of what was previously considered to be management of number of separable business functions on the one hand and several relatively independent domains on the other (Capar et al 2004). SCM arose through the gradual integration of logistics, distribution, marketing, operations, product design, product development and operations as channel members came to realize that they are part of a value chain extending from raw material extraction to finished goods consumption and that all channel participants could benefit by smoothing the flow of product, information and title (Brown et al 2005). It elaborates as getting the right things to the right places at the right times for maximum profit. Many important strategic decisions impact the supply chain: how to coordinate the production of goods and services, including which suppliers to buy materials from; how and where to store inventory; how to distribute products in the most cost effective, timely manner; and how and when to make payments (Siems 2005).

A Supply Chain?

A network of organizations designed to design products, secure raw materials, convert them into products and deliver them to consumers.
Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to consumer. Supply chain management requires coordinating and integrating these flows both within and among companies to be successful. It is also said that the ultimate goal of any effective supply chain management system is to reduce inventory and to ensure efficacious supplies.

Supply chain management can be divided into three main flows:

a) The product flow
b) The information flow
c) The finances flow

- The product flow includes the movement of goods from a supplier to a customer, as well as any customer returns or service needs.
- The information flow involves transmitting orders and updating the status of delivery.
- The financial flow consists of credit terms, payment schedules, and consignment and title ownership arrangements.

The main and practical aim of supply chain management is to have the right products in the right quantities (at the right place) at the right moment at minimal cost and is translated into the interrelated issues of customer satisfaction, inventory management, and flexibility. Customer satisfaction depends high degree on the flexibility of the supply chain, i.e. its ability to respond to changes which are in demand. Flexibility is generally imperfect because of long lead times, uncertainties, and unforeseen event. To counterbalance this lack of flexibility companies will keep inventories at various levels of the supply chain. Balancing the costs of imperfect customer satisfaction and holding inventory is a classic issue of logistics and supply chain management which is a matter of challenge to the policy makers of the company.

The management of Supply Chain consists of member from both internal and external to the organization and shares some vested interest in the ultimate success of the chain in meeting needs and expectations of the customer at the same time.
increasing chain profitability (Giri et al 2006). The supply chain must reflect the following:

- Continuity of trust and relationship among the chain members
- Reliability and quality of products and services
- Responsiveness to the needs of the customers
- Flexibility and adaptability to changing environment and technological breakthrough.
- Directed to optimize systems performance
- Facilitate and give push to innovation and differentiation
- Promote renewing, learning, creation and transfer of knowledge.

The Review of Literature was undertaken in the various areas of Supply Chain Management, especially in Food related areas and in the non Food related areas. Both the areas dealt in details about various aspect/ elements of Supply Chain such as generation of demand to the full filling of the demand of the Consumer & Customer both. The review of Literature could give an effective insight into the core areas of SCM such as Product Planning Forecasting, Collaboration of demand, Order processing, Planning and induction, Transportation, Warehousing, Distribution and reaching to the end consumer and final step of feedback & responding accordingly.

Although various studies & Literature could give a fair insight on the gaps which existed in the elements of SCM and which prompted & gave reasons to do this study. But the studies which played a major role in deciding this study & its objective were about the concept of Food Security in its realistic terms and to solve and meet the challenge of ensuring availability of food to all sections of society.

According to the World Food Summit (WFS) the definition of food security is a situation that exists when ‘all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life’ (FAO, 1996). The several interrelated dimensions, of Food Security is food availability and accesses to food are the most common defining characteristics. The Concept of food security has been examined at the global, regional, national, household, and individual levels and according to FAO estimates the number of undernourished people during 2001–2003 are 854.
million (820 million in the developing countries, 25 million in the transition countries, and 9 million in the industrialized countries) (FAO, 2006).

The Food insecurity can either be on short term, e.g., a famine from crop failure, or long term under nutrition, i.e., chronic. The chronically poor experience multiple deprivations over a long period (Radhakrishna, Rao, Ravi, & Reddy, 2007).

The Estimates of chronic poverty vary between 300 and 422 million, of which nearly half are in South Asia and one-third in India (Hulme, Moore, & Shepherd, 2001).

Based on country-specific situation causes, the nature and the magnitude of food security can differ between countries (Lutz, 2000; USDA, 1998; Masika, Haan, & Baden, 1997). Thus each nation needs to adopt a strategy consistent with its resources and capacities to tackle the problems of hunger and food insecurity.

National Food Security refers to a nation’s capacity to ensure household/individual food security without undue departure from other policy goals. It is a position when a country achieves self-sufficiency in the production of staple foods or has the financial resources to import such staples (FAO, 2000). However, some level of domestic production ensures against risks such as import interruptions and poor harvests in exporting countries.

National Food Security can be monitored in terms of demand and supply indicators (von Braun, Bouis, Kumar, & Pandya-Lorch, 1992).

Adequate food supply can ensure greater food security, but poverty and chronic malnutrition can exist even in countries with a food surplus. Notwithstanding substantial increases in global food production in the past 50 years, food security as determined by access to food with essential nutrients and inequalities in food entitlements continues to present major hurdles (Pretty, Thompson, & Hinchcliffe, 1996). Thus, the challenge is not only to increase food production but also to ensure that all sections of the population have an access to food that satisfies essential nutritional requirements. Subsistence production needs to be increased while cash income, savings, and investments should also grow, placing more reliance on markets.
Production must also be responsive to changing urban market demand (Hulse 1999). Despite this, it has been recognized that to achieve food security at the household and individual levels it is important to realize food security at the national level.

Increased food availability is a necessary condition for achieving food security in food deficit countries (George, 1999).

Household food security has been defined as an access to food that is adequate in terms of quality, quantity, safety, and cultural acceptability for all the household members (Gillespie & Mason, 1991; quoted in Nawani, 1994).

Most of the world's food insecure lives in the rural areas, and rural residents, even those who are not farmers, are dependent on employment and income generated through agricultural activities. This necessitates a special emphasis on agricultural and rural development. Thus, public policy in most low-income developing countries focuses on increasing food production and ensuring better access to food through generating agricultural development and job opportunities in the agricultural sector (OECD, 2000; Scherr, 1995). Like other developing countries, food security concerns are of utmost importance in India as well because a large percentage of its population is poor. The agriculture sector has an important role to play as about 70% of its population depends heavily on this sector for its livelihood and income. Supply chain management is one of the key activities that ensure the success of a company (Cambra and Polo, 2008; Quayle, 2003).

Increasingly complex, dynamic and competitive markets require a global vision of the supply chain that integrates all the agents and elements of the system (Lee et al., 2010; Closs and Mollenkopf, 2004; Alvarado and Kotzab, 2001).

It is important to consider all the existing flows in the supply chain, from the origin to the final customer, and in the demand chain, from the market to the producers (Collin et al., 2009).

Considering customers' preferences and needs is a key factor to understand the firms' success. Working together, demand and supply chains create the demand-supply chain and, when it is adequately managed, supply is well synchronized with
demand and provides value for all consumers and suppliers (Cambra and Polo, 2008; Hoover et al., 2001).

When it comes to the design of the complete supply chain there are key factors and processes that need to be taken into account. These suggest to identify the key concepts of the supply chain and to analyze them from a double perspective: specifically, for each concept, and globally, within the whole chain.

While the management of information flows has always been a key aspect of supply chain management, the rapid growth of web-based information transfer between companies, their suppliers and their customers has decidedly increased the importance of information management in creating effective supply chains. Indeed Internet has emerged as a most cost effective means of driving supply chain management (Johnson 2002).

Ismail Capar, Fusun Ulengin, Arnold Riesman (2004) study, broadly defined SCM as synthesis of what was previously considered to be management of a number of separable business functions on the one hand, and several relatively independent theoretic domains on the other. Among others these domains include; purchasing, inbound/ outbound logistics, inventory control, contracting, manufacturing/outsourcing, performance/efficiency theory, relationship management, information systems, systems theory, mathematical and computer modeling, optimization etc.

The literature of SCM has exploded during the last decade. It has become a major subtopic of production and operations management. Although today, SCM encompasses all activities involved in producing and delivering a final product or service, from the various sub-tiers to end-customers, its theoretic framework emanated from multi-echelon inventory models (Clark and Scarf 1960).

Several trends in logistics management have emerged subsequently. Each of these broadened while improving the focus of the previous. The notion of cost-cost tradeoffs was introduced showing that the lowest total cost might not be achieved by pursuing the lowest cost of each logistics process constituent. Hence, the concept of logistics integration was introduced by Bower sox (1969).

In their practices, many companies recognized the fact that in optimizing logistics costs it was compulsory to include all relevant sub-tiers inside and outside of the firm,
in terms of physical and information flows. These include all suppliers, and the entire distribution network. The challenge for logistics managers became to integrate logistical performance across all operating facets of a business. Meanwhile, researchers such as Houlihan (1985, 1988), Lee and Billington (1993), Cooper and Ellram (1993), and Thomas and Griffin (1996) started to introduce and implement the SCM concept.

The important idea captured at least in part by "supply strategy" (or "strategic supply management") is that a mode of thinking and action which encompasses, and seeks to exploit, interlocking relationships could potentially be used as a powerful lever for competitive advantage (Ketchen and Giunipero, 2004).

Some purchasing specialists see SCM as about developing relations with suppliers (Giunipero and Brand, 1996), while others say that good supplier management is not enough; there is an additional requirement for a wider, more integrated, all-encompassing perspective embracing all processes from sourcing through make and transportation and on to merchandising to final customers (Davis, 1993).

Harland (1996) describes supply chain management as managing business activities and relationships (1) internally within an organization, (2) with immediate suppliers, (3) with first and second-tier suppliers and customers along the supply chain, and (4) with the entire supply chain.

Scott and Westbrook (1991) and New and Payne (1995) describe supply chain management as the chain linking each element of the manufacturing and supply process from raw materials through to the end user, encompassing several organizational boundaries. According to this broad definition, supply chain management encompasses the entire value chain and addresses materials and supply management from the extraction of raw materials to its end of useful life.

Baatz (1995) further expands supply chain management to include recycling or re-use. Supply chain management focuses on how firms utilize their suppliers' processes, technology, and capability to enhance competitive advantage (Farley, 1997), and the coordination of the manufacturing, logistics, and materials management functions within an organization (Lee and Billington, 1992).
A narrower definition of supply chain management: the integration of the various functional areas within an organization to enhance the flow of goods from immediate strategic suppliers through manufacturing and distribution chain to the end user (Houlihan, 1987, 1988).

The development and mechanics of supply chains have become very complex, and Blackhurst et al. (2005) showed as to how supply chain complexity can make the modeling of the chain a multifaceted task. The authors have concentrated only on those articles which focus on the multi-faceted aspects of the Supply Chain and examine the inter-dependence and co-ordination of two or more facets of the Supply Chain.

Contributing to the SCM literature today, are knowledge domains such as operations research (OR), operations management, management science (MS), system dynamics, economics, marketing, and information technology. Among others, the following OR/MS and Operations Management subfields impact SCM:


(ii) location models (Cohen and Lee 1988, Geoffrion and Graves 1974, Revelle and Laporte 1996);


There are also some exemplary contributions to the SCM literature from outside the traditional OR/MS industrial engineering fields. Among these are:

(i) Forrester (1961) contributed to the SCM literature from the economics and system dynamics point of view. He analysed the growth, decline, and growing variation in a supply chain which is known as “bullwhip effect” (Lee et al. 1997);
(ii) Cachon and Zipkin (1999) applied the Nash equilibrium for competitive inventor policies in a two-stage supply chain;

(iii) Postponement (Alderson 1950). Today postponement is widely used in inventor control and production system (Jones and Riley 1984, Zinn and Levy 1988, Zinn and Bowersox 1988, Lee and Billington 1995, Aviv and Federgruen 2001);

(iv) Price incentives (Blattberg et al 1981);
(v) Relationship management (Pyke and Johnson 2002);
(vi) Social responsibility (Carter and Jennings 2002).

As important as it is to publish the results or findings of good research in a given field of knowledge it is also important to systematically review the totality of such publications on some periodic basis (Goff man 1980, Abbott 1988, and Gupta 1997). Systematic reviews of the literature represent research on research or what is sometimes called Meta Research (MR). The objectives of this MR are to unify the domain of SCM knowledge and or to expand or generalize it while at the same time consolidating this field of knowledge and practice. There are at least two efficient and effective ways of consolidating knowledge in a given field. One of these is to create taxonomy and the other is to create a generalized framework (a general model or theory) that subsumes all existing models facts or theories within the field.

The above two modes are not mutually exclusive. In fact they are complimentary. At times, as was the case with the Periodic Table of Chemical Elements (Mendeleev 1889), an underlying theory is imbedded within a taxonomy and such is the case with SCM.

A taxonomy for a given field of knowledge displays the field's domain in terms that are easy to understand, to communicate, to teach, to learn, and to work with. The taxonomy can be used:

1. To efficiently and effectively classify any and all contributions/for purposes of storage, recall, sorting, and or statistical analyses and because such classification
results are meaningfully machine readable they in turn clearly enable further meta
research publications (Reisman 1992).

2. To identify voids in the literature and hence directions/specifications for research
in need of being performed publications (Reisman 1988, 1989)

3. Classification of papers based on taxonomy makes similarities and differences
among the respective studies very clear. Significantly, it does so in a most
efficient and effective manner.

The evolution of SCM from the early articles of Clark and Scarf (1960) up to and
including June 2003 shows at least 2909 articles¹. Consequently, the time is now ripe
for a general mapping of this literature in a manner that will vividly provide a
panoramic view of what exists and will clearly identify any existing gaps in the state

Hau L. Lee, Kut C. So, Christopher S. Tang (2000), article investigated the value
of (demand) information sharing in a bi-level SC using EDI technology. Demand
faced by the retailer is correlated over a time horizon and each member uses the
periodic inventory review policy. The authors compare the effect of information
sharing on buyer-vendor decisions. The model used for the problem is a stochastic
model with an approximate solution and the results are compared based on inventory
and cost reductions. Hence, the paper is classified as:

Fangruo Chen, Yu-Sheng Zheng (1998), study explained supply chain is
mathematically modeled to determine (Q, R) values for a continuous inventory review
system with Poisson end-item demand. The authors offer a coordinated decision
making strategy for overall supply chain in a full demand information-sharing
environment. They present a stochastic model solved by a multi stage algorithm,
which uses approximation and heuristics. In addition, they present an exact solution
methodology.

Stephen C. Graves, Sean P. Willems (2000), article presents a mathematical
formula for determining how much inventory should be kept in each stage and
member of a complex supply chain with an application at Eastman Kodak. WIP,
subassemblies, and pipeline inventories are managed with a periodic inventory review
policy. All information is presumed known by the central decision maker who makes
a coordinated decision. It is a dynamic programming model solved with existin methods. The efficiency measure is a single-valued exact solution.

Marshall Fisher (1997) paper classifies SC strategies and relationships amon operational performance, customer satisfaction related performance measures, an product properties which can be applied to all SC structures. Moreover, the autho shares the experience of different cases and classifies the products as either functional or innovative. Other topics discussed in the article are product design for manufacture and distribution, base stock continuous inventory control application, qualitative forecasting, and pricing.

Frank Chen, Zvi Drezner, Jennifer K. Ryan, David Simchi-Levi (2000), paper presents both a mathematical and a simulation model for one vendor, one buyer and a serial supply chain. They determine how much inventory should be kept based on a time series forecasting method. Two cases (information not shared and information fully shared), are compared resulting in a ratio-form model. The model is solved by approximation and a lower bound is derived for the exact solution with a single-valued measure.

Michael J. Fry, Roman Kapuscinski, Tava Lennon Olsen (2001), study uses mathematical model is used to evaluate the effect of contract on coordination of production and delivery in a two stage - one buyer one vendor- supply chain. The authors assumed demand distribution to be known and seek to find purchase timing and quantities and how much inventory should be kept under a periodic inventory review policy. The article evaluates the optimal replenishment and production policies when buyer and vendor fully share information but decisions are made in an uncoordinated fashion. They propose a stochastic model for this problem and solve it with previously known solution methods. Results are compared according to single valued measures.

Harland, C.M., Lamming, R.C., Zheng, J., and Johnsen, T.E. (2001), reviewed current supply network literature and analysing responses to a survey the authors developed a taxonomy which considers supply source selection, partnership, risk and benefit sharing, inventory management, demand management, and decision making.
Dennis Kehoe and Nick Boughton (2001), using previous classifications of inventory management and supply chain management the paper presents a classification which considers different types of supply chain structures to identify features of manufacturing planning and control systems based on internet as an enabling technology.

Kenneth Lynch (1994) about the urban fruits and vegetable supply in Dar-es-salam is fruits and vegetable market at Dar-es-Salam which is former colonial capital of Tanzania where the fruits and vegetables entering in the city would be sold to licenced whole salers in Kariaboo Market who in from sell it to sns whole saler or retailer which is done in an open market condition with prices varying according to demand and supply.

The similar way is adopted in the illegal market also (Maliyam kono and Bagachona1990) has spoken about this in details about formal and informal sectors of economy.

Omera Khan, Bernard Burness (2007) explained in the “Risk and Supply Chain Management: creating a research agenda” that there are a number of key debates in the general literature on risk, especially in terms tested empirically the risk Management Process.

Seyad Mohamed of Aghazadeh (2004) “Improving logistic operations across the food industry supply chain” concludes the way to improve the logistic operations by improving.

1) Management and staff performance
2) Improve information system (CIMS)
3) Improve fore-casting and procurement
4) Improve Distribution, Improve Staff Performance.
5) Further relationship has the key to increase profitability.

Due to technological changes manufactures, distributors and operators have come together for better supply chain solutions.

Jesus Cambria – Fierso and Bentez RR, (2010) found the core SCM concept to a leader distribution firm and also the concept of thinking global and acting local is very much pertinent to application in the Management of Supply Chains.
Supply Chain Management First appeared in early 1980s with a focus on logistics and inventory reduction. It aims at managing an entire supply chain as a competitive unit rather than simply managing the individual parts. The concept of SCM requires a much more comprehensive view of the chain. The process begins by examining why the chain exists and what it has to do to compete. Thus Supply Chain Activities in the Past were:

- Production (conversion) activities seen as core to company success
- Used inventory to buffer production activities from environment
- Relationship with suppliers was one of having many suppliers competing aggressively for orders based on price

The present form of supply chain encompasses more marketing orientation with emphasis on:

- Information & Markets
- Planning & Decision Making
- Relationship Management
- Product / Service Design
- Conversion
- Logistics
- Quality
- Performance Measurement
- Risk Management

The Pressure for Change can be attributed to:

Consumer pressure for variety for more new products etc., continual demand for lower prices, Pressure for shorter lead times, Global sourcing, Emphasis on quality, Advances in information technology, Recognition of core competencies - FOCUS

Supply Chain Philosophy stresses on integrated approach - Think of performance of entire supply chain rather than of individual components. This would provide a base for the understanding about individual player needs and goals, and the fact that
• Every player in the supply chain influences the ability of the entire chain to compete.
• Costs at any level affect supply chain costs.
• Each member has particular abilities and by working together to take advantage of member abilities the entire chain will benefit.

Key to Supply Chain Management

Supply Chain Management (SCM) is a key element in developing a strategic competitive management. It will manage all aspects of a relationship with suppliers. SCM focuses on maximizing the value of a manufacturer’s supply base by providing an integrated system. It shares information and links the mutual processes to achieve the best goal of the manufacturer with its suppliers. It also focuses in both sides of organization’s structure. On external side, it enables the sharing of strategic data across supply chain partners to reduce the time and costs of production. On internal side, SCM integrates the planning, producing, procurement, and inventory process. It encourages the company to work closely and efficiently.

Benefits of Integration

In the past, most enterprises are functionally oriented which cannot allow different departments communicate with each other in the same language. Inventory, production, and transaction data are entered manually into the separate system. It will obstruct the supply chain and creates the late response for decision-making process.

We can list the following major benefits of integration:

1. Tangible benefits: Inventory reduction, personnel reduction, productivity improvement, order management improvement, financial-close cycle improvement, IT cost reduction, procurement cost reduction, cash management improvement, revenue/profit increases, transportation logistics cost reduction, maintenance reduction, and on-time delivery improvement.

There are two key dimensions to improvements in supply chain management.

**Dimension 1 - Operating Efficiency**

"Doing Things Right"

- Concerned with optimization of current supply chain processes such as reducing costs and lead times, increasing product variety and process flexibility, increasing customer service
- Gains can be made “internally” and by working with “external” partners

**Dimension 2 - Strategic Effectiveness**

"Doing the Right Things"

- Concerned with leveraging the capabilities and creating competencies across supply chain members to attain competitive advantage through new market, products and service
- Identifying opportunities and mobilizing supply chain resources to take advantage of the opportunities

Thus it is evident that SCM will be an increasing part of the business organizations of tomorrow
NEED FOR THE STUDY

Gaps in the existing studies show that there is a need to make a fresh attempt to understand the impact of SCM as a strategic tool for Food Corporation of India. A number of improvements could be incorporated on account of gaps in the existing literature. The need for the study can be encapsulated in the following points:

1. Most of the studies reported in the literature have been conducted in the developed countries. Since there is a significant impact of environment especially of political, culture, paying capacity, economy, habits etc. on customer behavior, therefore, the concepts and practices pertaining to SCM as a strategic tool in Food Corporation of India context will have to be different.

2. The concept of supply chain in post 1991 era has shown its importance and results and particularly in the Public Sector Organizations with the changing times and the efficiency in many areas has increased. Food Corporation of India (FCI) being a Public Sector Organization too has to match the modern day challenges with the implementations and help of Supply Chain Elements.

3. Hardly any detailed study has been reported on Food Corporation of India. The need for such a study arises as SCM services now occupy the prime position in Food Corporation of India.

4. Increased competition because of domestic and international private players requires Food Corporation of India to adopt the SCM strategy for efficacious supplies to targeted Public Distribution System (PDS) even while playing an important role in the global market. In order to counter competition, Food Corporation of India have to undertake continuous information gathering, analysis, timely decision making and dissemination and use it to obtain a cutting edge in the present business scenario.

5. There are also methodological lacunae, which could be improved. The definition of concepts of ‘SCM’ and ‘type of technology’ need to be defined in organizational context of Indian scenario. In recent times there has been an increase and decisive role of Information and Communication Technology (ICT).

6. The volume of procurement has increased and at many places (states) at many a times has been at unexpected levels and more so the ‘procurement period’ has
become shorter causing burden on the entire supply chain of Food Corporation of India and Targetted Public Distribution System (Targetted Public Distribution System).

7. There had been increased pressure on Food Corporation of India and Targetted Public Distribution System functionaries to minimize loss and improve the quality as consumer has become much educated and aware.

Hence, the proposed study would be a systematic attempt to analyze diverse dimensions of SCM as a strategic tool for Food Corporation of India for efficacious supplies to targeted Public Distribution System (PDS).