Supply Chain Management in Agriculture: A Case Study of Eastern U.P. With Special Reference to Sugar Industry

SUMMARY
of
THESIS

SUBMITTED TO
DEPARTMENT OF RURAL MANAGEMENT
SCHOOL FOR MANAGEMENT STUDIES
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY, LUCKNOW

FOR THE AWARD OF THE DEGREE OF
Doctor of Philosophy
in
MANAGEMENT

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2019

SUMMARY

CHAPTER I

INTRODUCTION

1.1.0 INTRODUCTION

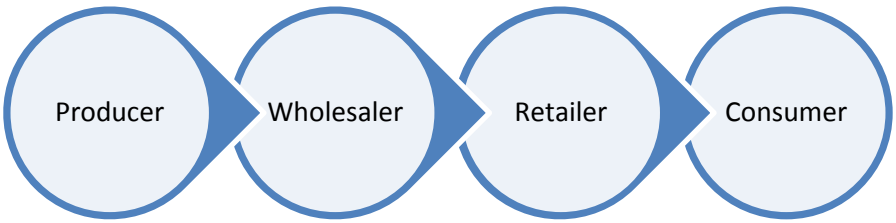
This study is concerned with Supply Chain Management (SCM) in the arena of agriculture and agriculture based industry. To study the SCM in agriculture Sugar Industry of Eastern Uttar Pradesh has been chosen. The basic focus of the study is to study the impact of SCM on Performance, Socio-economic Condition of the farmers and Organizational Competence of Sugar Industry of Eastern Uttar Pradesh. There are three objectives of the study first objective is "to study the impact of the determinants of Supply Chain Management on the Performance of Sugar Industry of Eastern Uttar Pradesh", second objective is "to study the impact of the determinants of Supply Chain Management of Sugar Industry on the Socio-economic Condition of the farmers of Eastern Uttar Pradesh" and third objective is "to study the relationship between the determinants of Supply Chain Management on Organizational Strategic Competence of Sugar Industry of Eastern Uttar Pradesh". This study has been divided in six chapters, viz. Introduction, Review of Literature, Research methodology, Data Analysis and Interpretations, Findings and Discussions, Conclusion and Implication.

1.2.0 SUPPLY CHAIN MANAGEMENT

The term 'supply chain' has limitation of a huge number of definitions most of which are inconsistent with each other and focused on particular perspectives or characteristics. (Christopher, 1992) provides a reasonably generic definition, unfolding a supply chain as a 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 consumers. This definition considers of a multiple set of firms working upstream and downstream with often multiple firms functioning at each stage in the chain (for example alternative competing suppliers).

The basic drivers of the Supply Chain Management are the flow of material, flow money and flow of information. In real sense Supply Chain Management (SCM) is the managerial and operational strategy which removes each and every hurdle at each and every link in a supply chain so that overall cost may be optimized while delivering best value to the customers and ensuring best returns, information, competence and continuous up gradation of overall supply chain.

Figure 1.1 General Supply Chain of a Product



1.2.1 SUPPLY CHAIN MANAGEMENT IN AGRICULTURE:

Supply chain refers to linkages through which a product is transmitted to customer from the producer. For agriculture supply chain connotes linkages that take a product from farm to fork. Generally in supply chain of a product producer, wholesaler, retailer and consumer are the stake holders. Supply Chain Management in agricultural is basically concerned with the management of agricultural inputs suppliers (credits, seeds, fertilizers, minerals, manures, pesticides and insecticides, etc.), produce (farmers, cultivation, irrigation and harvesting, etc.), agro-products (storage and transportation, etc.) and flow of cash and information. The basic concept (Flow of material, flow of Money and flow of information) of each and every supply chain remains same but SCM is some or other ways unique for each and every product depending upon its nature, cost, value, availability and government policies etc. Agriculture has varieties of products that differ in nature, cost, value and durability like vegetables and fish are perishable in nature and have different supply chain as comparison to grains which more durable in nature. Vegetables need cold storage to be preserved but grains need only warehouses to be preserved.

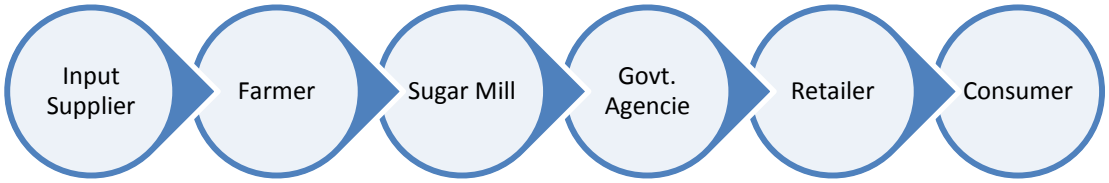
For Supply Chain Management in Agricultural backward and forward integration are very important as it provide inputs to farmers and help them in selling their produce in the different Mandies and markets. Backward integration implies the relationship building with different input supplier (seed, fertilisers, manures, pesticides, insecticides, credits, labours, government subsidies, information regarding weather and different crop diseases, etc). Forward integration is concern with relationship management with different channel partners that help the farmers in selling their produce in different markets at optimum price. The participants in forward integration are adhatiya (middleman), information provider of different markets and their existing prices, wholesalers, retailers and modern retailers like fresh stores, Field Fresh, Choupal Fresh, Choupal Sagar, Adhar and Nature Basket and Global Green, etc. In nut sell it can be said that Supply Chain Management will be as strong as its weakest link. And every link to be strong the backward and forward integration should be strong. So, good relationship management with every stakeholder of supply chain is of strategic importance as it is a key to be successful.

1.2.2 SUPPLY CHAIN OF SUGAR INDUSTRY: Supply Chain Management of Sugar industry is different from other industries as sugar being an essential commodity declared by government of India from independence in the interest of whole population of the country specially to protect the interest of the poor and the destitute. Farmers directly supply sugarcane to sugar mills. The prices of sugar and sugarcane are regulated across the entire supply chain leading to market imbalance due to dependence of the industry on the Government subsidies to meet its overall operating expenditure and making payments to the sugarcane farmers. With the view to avoid these problem and difficulty, the rules and regulations have been liberalized time to time since 1993. De-licensing of the industry in 1998 and removal of control on storage and distribution 2002 were the most pertinent regulatory landmarks.

Each sugar mill is entitled to command a particular area around it. Sugarcane farmers and Sugar mills are abide by law to sell and buy from each other. Law enforces every Sugar mill to procure all the cane supplied to them, even in case it surpasses its necessity. It is mandatory for sugar mills to sell 10 percent of sugar as levy to Government of India. The price of levy sugar is predetermined and much lower than

the market. Specification for monthly release quotas for free sale of sugar is also made by government. Supply Chain of sugar industry start from input supplier to the farmers of sugarcane and it end with the ultimate user of the sugar. A pictorial representation of Supply Chain of Sugar Industry has been given below in Figure 1.2.

Figure 1.2 Supply Chain of Sugar Industry



1.3.0 ORGANIZATIONAL PERFORMANCE

The word Performance is very easy to read but its meaning is so intricate to define specially in the business and strategic management field. The reason behind the intricacy to define performance is the huge number of parameters to be considered in performance due to the nature mission and vision of an organization. For instance for some organization only profit making is the performance, some others understand cost minimization and customer satisfaction as performance and some organization consider social welfare (like increasing no. of employees, providing products to customers at lower prices and providing quality products, etc.) as performance and many more. In this study four categories of performance measures viz. Accounting Measures, Operational Measures, Market Based Measures and Survival Measures have been included.

1.4.0 ORGANIZATIONAL STRATEGIC COMPETENCE

Organizational Strategic competence connotes the ability of an organization to put a strategy right for reaping advantages over its rival. Strategy is a pure military term which has its origin in battles. It was assumed that term strategy was coined by Sun Tzu in late 500 for him strategy was responding quickly to the environment in order to appropriately meet changing condition. In the business word strategy connotes the

plan of action design to achieve the basic objectives of an organization. So Organizational Strategic Competence is the ability of an organization to apply its plan of action in such a way that produces advantages over its rival organizations. Organizational Strategic Competence can only be achieved by developing skills and knowledge of the employees of the organization. In this study Employees' Skills and Employees' knowledge have been considered as measures of organizational Strategic Competence.

1.5.0 SOCIO-ECONOMIC CONDITION

Socio-economic Condition refers to economic and sociological combined total situation of an individuals or aggregate of economic and sociological combined total situation of individuals of a particular area. In simple words Socio-economic Condition connotes to individuals levels of income, wealth, education and prestige, etc. In this study the seven measures (Education, Health, Social Obligation, Social Recognition, Women Empowerment, Income and Employment) of Socio-economic Condition of farmers of Eastern Uttar Pradesh have included.

1.6.0 RATIONALE OF THE STUDY:

The present study will bring out the problem and prospect of "Supply Chain Management in Agriculture: A Case Study of Eastern U.P. With Special Reference to Sugar Industry." The study is related to the application of Supply Chain Management in the field of agriculture and intent of the study is to describe what the impact Supply Chain Management has on Organizational Performance, Organizational Strategic Competence and Socio-economic Condition of famers of Eastern Uttar Pradesh. The importance of the study can be understood as that this is a known fact that the agriculture especially the agriculture of sugarcane has been one of the most pertinent driver of the rural economy of Eastern Uttar Pradesh but since last few decades the contribution of agriculture of sugarcane and sugar industry to rural economy have continuously been decreased. Many researchers contend that Supply Chain Management has the tremendous ability to enhance the performance and to create strategic competence to organizations. This study is an earnest attempt to examine and explain how the application of SCM in agriculture and agriculture based industries will contribute the Organizational Performance, Organizational Strategic Competence and Socio-economic Condition.

CHAPTER II

REVIEW OF LITERATURE

2.1.0 INTRODUCTION:

The previous chapter was related to the introduction of the study in which Supply Chain Management, Organizational Performance, Organizational Strategic Competence and Socio-economic Condition have been discussed in detail. This chapter is devoted to review of literature related to Supply Chain Management and its impacts on Organizational Performance, Organizational Strategic Competence and Socio-economic Condition.

2.2.0 REVIEW OF LITERATURE

Literature on Supply Chain Management is very much scattered and the concept is not unanimous. Although the basic concepts of supply Chain Management remains more or less same for every product but it is unique in some or other way for each and every organization depending upon the nature of product, geographical setting and area of operation, etc. of the organization. Various researchers and scholars have defined it differently as per their understanding and area of research.

In the business universe organizations have always been keen to understand and unfold the factors and determinants of the performance. The quest to discover the determinants of firm performance has long been central to the strategic management field (G. Tomas M. Hult, David J. Ketchen Jr. and Mathias Arrfelt, 2007). Performance of firm is the key to the growth and development of any organization and in case of a business organization it is quite essential that it perform at a minimum rate. But every organization cannot able to perform at a minimum stipulated or expected rate due to the lake of some prominent business strategies vital to the performance. Basically this under-performance of organisations compelled the strategic management field to find out the facts that determine the performance of organisations. Actually, many prominent scholars have contended that building understanding about why some firms outpace others is the foundation of the field (e.g., Hitt, Boyd, and Li, 2004; Rumelt, Schendel, and Teece, 1994; Summer et al.,

1990). Synergies exist between the culture of competitiveness and knowledge development and their interaction has a positive association with performance (G. Tomas M. Hult, David J. Ketchen Jr. and Mathias Arrfelt, 2007).

1990s onwards the completion among the rival firm reached to cut-throat due to the globalization and adaption of liberalization policies by most of the nation of the Globe. Supply Chain Management was determined to be a very pertinent factor responsible for the out-performance of an organizatiosn over others as organistions had to serve the whole world. Corporate organisations started leveraging their respective Supply Chain to reap the benefits and outpace the competitors.

Although the Supply Chain Management was very important for the performance, growth and development of organization but initially, the strategic management field has not dedicated much pragmatic attention to supply chains, while allied disciplines such as marketing and operations management have long accentuated the performance insinuations of functioning activities. The importance of SCM can be observed as how organizations such as Wal-Mart, Zara, Toyota, and Dell have exploited their supply chains as competitive missiles to gain pluses over aristocracies. In the meantime, failure of strategic management of supply chains leads to grave negative outcomes for the organization. For instance, Lee (2004) describes how supply chain hitches led Cisco to write off $2.25 billion in inventory in 2001 and led Motorola to lose many decisive early camera phone sales in 2003. Inferences drawn for profits and sales, it is perchance not astonishing that the proclamation of a major supply chain problem corrodes an organization's market value by an average of 10 percent (Hendricks and Singhal, 2003).

Forbes global magazine said, ‘Mumbai’s Tiffinwalas have achieved a level of service to which western businesses can aspire. Efficient Organisation is not the first thought that comes to mind in India, but when profit motives is given free rein , anything is possible. To appreciate Indian efficiency at its best, watch the Tiffinwala at work.’ The error free operation of Dabbawala, one error or less in 6 million transactions, has made them probably the only six-sigma organization in India.

Unique Supply Chain management and direct business model made able Dell Computer Corporation to take on IBM. Generally most of the students just want to pass their examinations. Michael Dell dreamed to take on IBM. That’s a pretty

ambitious goal for a student selling made-to-order personal computer (PCs) over the phone out of his dormitory room at the University of Texas. In 1984, Dell dropped out the school so that he might pursue this urge fulltime ignoring that he had only $ 1000.as seed money founded Dell Computer Corporation. Only twelve year later, Dell Computer Corporation had market share of the domestic PC maker, more than that of IBM. Dell was the leader, by 2001, with more than 25 per cent market share astonishing Compaq (13 per cent), Hewllet-Packard (10 per cent), Gateway (8 per cent) and leaving targeted IBM for behind with only 6 per cent market share.

Supply Chain Management is the growth engine (Harrison, 2008). It is the Harrison who has been instrumental in having P&G to think regarding supply chain while keeping the customer in soul. Hence everything now initiates at store shelves and works its approach backward to suppliers. The reintroduced focus on supply chain management enables P&G to realize an extra $ 1 billion sale last year (The Economic Times, 9 April, 2008). Harrison adds that if the Supply Chain is not efficient, products do not reach customers and marketing will not exist. He further says that in ensuing time, supply chain efficiencies will be of strategic advantage to companies. He also wagers, 'with commodity prices hitting the roof, supply chain capability will be the differentiator between companies who win and those who don't'.

In the ending of 1996, the documentation company Xerox (formerly known as Modi Xerox) has set up its integrated supply chain. The basic strategy behind it was to make entire process, starting from manufacturing unit to the customer, transparent as order-to-delivery cycle was taking as long as almost twenty-one days. Hence Xerox implemented process reengineering, eliminated unnecessary administrative procedure and invested in an extensive info-tech network. Presently the order-to-delivery cycle reduce to just seven days.

2.2.1 REVIEW OF LITERATURE RELATED TO SUGAR INDUSTRY:

Sugar industries, across the Globe, have been facing the tremendous problems of appropriate and efficient harvesting, logistics and crashing of sugarcane long before. Some of the researchers of the field contended that the problem of excessive delays between the harvesting and crushing of sugarcane and the associated deterioration of cane has been recognized and investigated in the sugar industry for many years (Brokensha et al., 1975). Many research scholars focused to assess the

profitability in monitory terms for the sugar industry by ensuring the supply of the good quality sugarcane. For instance (Barnes et al., 1998) contend that through supply of better quality sugarcane to the sugar mills, particularly with new improved sugarcane payment system has been estimated in the millions of rands per annum. Inversely many researchers had tried to assess the losses incurred by the sugar industries due to the delays in the sugar cane supply to the sugar mills. For example some scholars as (Brokensha et al., 1975) estimated around 31 cents per ton of loss to the sugar industry due to a single day delay in sugarcane supply. Occurrence of this event increased the importance of the Supply Chain Management in the sugar industry.

The performance of sugar industries has been inconsistent across the world. The basic drivers of these inconsistencies are pertaining to social, economic, logistical and physiological associations across the overall supply chain. Most of these issues are intertwined with one another, like the harvesting and transporting of sugarcane, whereas many of the social and physiological factors are very difficult to identify (Higgins and Lerado, 2006). Such inconsistencies involve huge risk and may reduce the profitability of the overall supply chain stake holders. It indicates that the inefficient supply chain management to be responsible for the inconsistent performance of the sugar industries. Some researches contend that decreasing inconsistencies in the sugarcane supply chain has the capability to increase profitability (Le Gal et al., 2008). Managing the inconsistency in the supply chain of sugar industries has been most difficult task. Some of the scholars state that the influences of inconsistent supply chain can be alleviated by adopting flexible strategies (Tachizawa and Thomsen, 2007; Pitty et al., 2008). However, many researchers find that establishing flexible supply chain system is not easy due to various reasons such as the fluctuating participation of stake holders in the supply chain, their conflicting objectives, the geographical span of the system, problem concerned with the cane logistics and increased costs (Chen and Paulraj, 2004; Tachizawa and Thomsen, 2007)

Supply Chain of sugar industries suffer with a limitation of harvesting. Some researchers acknowledge it as a major supply chain hurdle in the sugar industry because harvesting usually occurs only during daylight hours, whereas the milling operations remains continuously fictional (Higgins et al., 2006). Harvesting

limitation normally occurred with the imbalance in the demand and supply of the sugarcane as during day time the supply exceeds the demand and rest of the time demand of the sugarcane suffers with shortages. Some scholar of the field investigated the inconsistency in the time of delivery of sugarcane to the mill over weekends and public holidays (Kadwa et al., 2012; Kadwa and Bezuidenhout, 2013). Another issue regarding the supply chain of sugarcane is the variation in the collection centers as some researchers pointed that the location and number of collection points of harvested sugarcane vary each day (Stutterheim et al., 2008). Apart from these issues some other pertinent hurdles of the supply chain of sugar industries are the time required for loading and unloading of sugarcane, the distance of farm to the sugar mills and the kind of vehicles, equipment and roads utilized may all vary every day. In this regards many scholars find out the some other roots as equipment maintenance, weather conditions, road conditions, accidents and vehicle breakdowns that lead to the inconsistencies in the sugarcane supply chain.(Diaz and Perez, 2000; Higgins et al., 2004; Bezuidenhout, 2010; Boote et al., 2011).

The factors leading to the inconsistent performance in the sugar industries do not end here rather some scholar unfold many other issue pertaining to the logistical and technical delays at the sugar mills that can generate lines, like excess vehicle arrivals, weighing, inspecting and unloading of sugarcane (Rangel et al., 2010; Sanchez-Rodrigues et al., 2010). These queues in vehicles arrival, weighing, inspections and off-loading of sugarcane ultimately create huge hurdles for effective supply chain management of the sugar industries. Some of the researchers contend that waiting lines generate blockages at the sugar mill and generally occurred due to daylight operations, breakdowns of mill, changes in shift of drivers and unscheduled deliveries (Giles et al., 2005; Sanchez-Rodrigues et al., 2008).

Inconsistencies in the various process involved in overall supply chain of the sugarcane leads to the underutilization of the resources increased cost of production. In this regards some researchers pointed out the inconsistencies may result in increased taskforces, lake of full utilization of various tools and equipment, augmented costs, inconsistent output and perhaps occurred with the problem of dual-handling (Hahn and Ribeiro, 1999; Barnes et al., 2000; Kadwa and Bezuidenhout; 2013). Some researcher indicate how the breakdown of the vehicles and long waiting queue affect smooth flow of the supply chain of sugarcane for instant during the

operations trucks break down or long queue will compromise the return time to the field from the mill and vice-versa leading to decrease in the pace of the overall supply chain (Rangel et al., 2010).

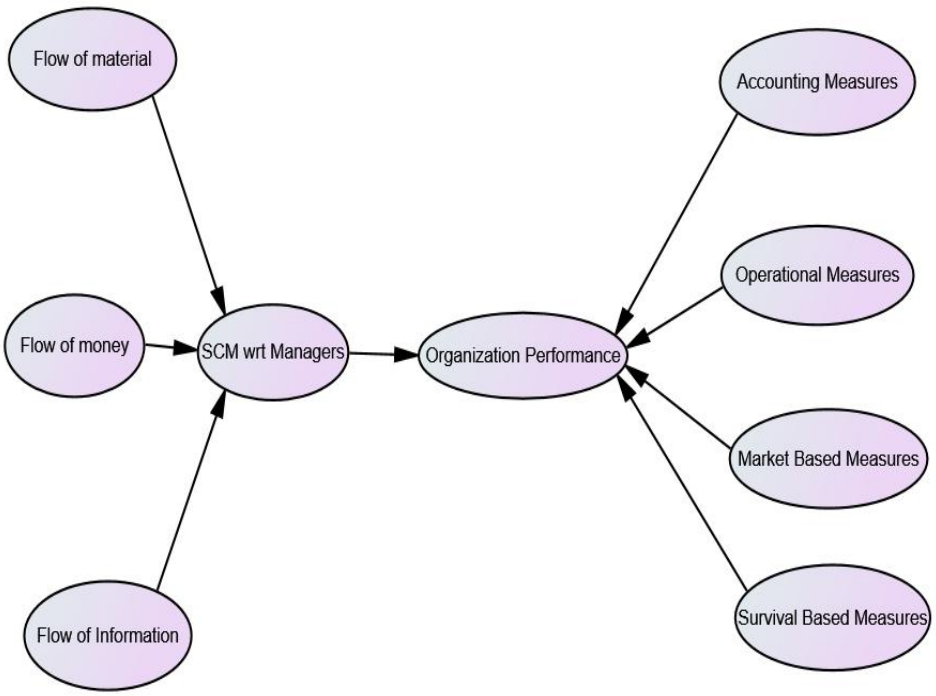
One of the most important factors impeding the supply chain management of sugar industry is increasing costs of production and logistics as some of the researchers estimated logistics as a largest contributor to the cost for example in 2006 it was found in a estimate that the transportation cost leads to around 20% and 25% of the total cost of production of sugarcane industries in South Africa and Australia, respectively (Milan et al., 2006). It is easier to estimate the cost of harvesting and transportation of the sugarcane as it is tangible in nature and most apparent than any other ingredient of the total cost. That is why many scholars paid much emphasis to improve the integration of the harvesting and transport systems (Salassi and Champagne, 1998). Barnes et al. (2000) provide a detailed model of different harvesting and transporting techniques. Other components of the system, including agronomic, social and economic linkages across the chain are difficult to quantify (Higgins and Lerado, 2006).

The comprehensive literature prove that the sugar industry is the complex agro-processing industry involving many intricate process and operations to be performed before getting the sugar ready in which the Supply Chain Management is the most pertinent issue to be addressed to enhance the production, productivity, profitability and overall capability of the organization. The pertinence of Supply Chain Management in agriculture specially in Sugar Industry can be understood by the study of (Marco Fava Neves, Vinicius Gustavo Trombinb and Matheus Alberto Consolic, 2010) They devoted their study for mapping and quantifying the sugarcane chain in Brazil. For the very purpose they used the method Strategic Management of Agro-Systems (GESIS). They claim that after the application of the method, it was found that the sugarcane chain then shown the astonishing figures that indicated its economic importance to the nation. The figures of sugar industry found was very inspiring, with sugarcane chain GDP $28.1 billion out of an annual turnover of over $80 billion and equivalent to 2% of the GDP of Brazil. This GDP of sugarcane they estimated that almost equal to the total annual income generated by the nation as Uruguay.

2.3.0 RESEARCH GAP AND CONCEPTUAL FRAMEWORK

From the reviewing of the various related literature with the help of the numerous research papers , articles , thesis , previous work , digital library , books, magazine, j-Gate, DelNet for the secondary information on the Supply Chain Management of Sugar Industry and its impact on Organizational Performance, Organizational Strategic Competence of Sugar Industry and Socio-economic Condition of the farmers of sugarcane but the secondary data received or collected will not fully severed our purpose for the study which have been projected in this research and most of the previous researches focused only on developing models of SCM and the methodology or process of the working of the Supply Chain Management of Sugar Industry but in this study the basic concern is to find out the relationship of Supply Chain Management with Organizational Performance, Organizational Strategic Competence and Socio-economic Condition of sugarcane farmers. The three conceptual models have been framed and their pictorial presentation has been made below in the figures 1.1, 1.2 and 1.3.

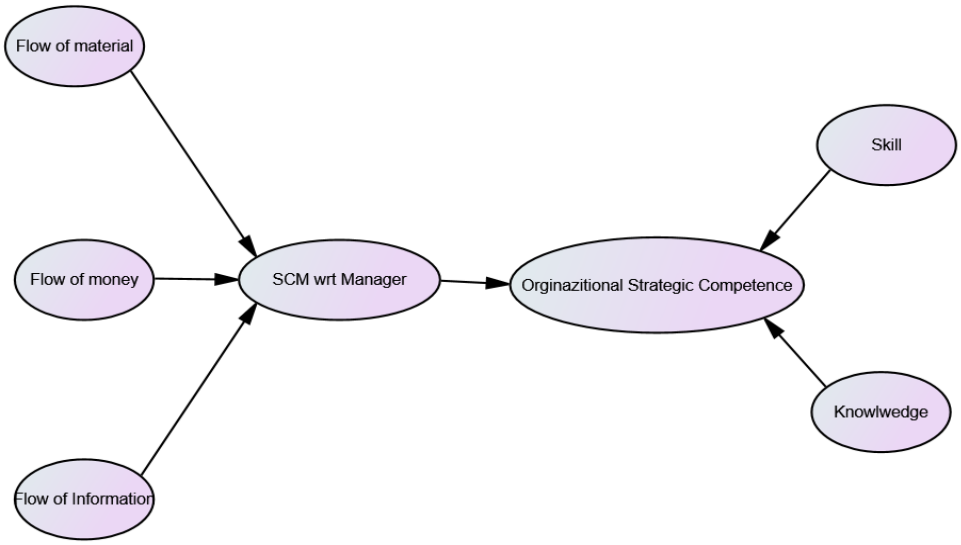
CONCEPTUAL MODEL DEVELOPED FOR SCM FROM MANAGERS' POINT OF VIEW AND ORGANIZATIONAL PERFORMANCE



In the first model the Supply Chain Management is studied with the help of three parameters viz. Flow of Material, Flow of Money and Flow of Information with

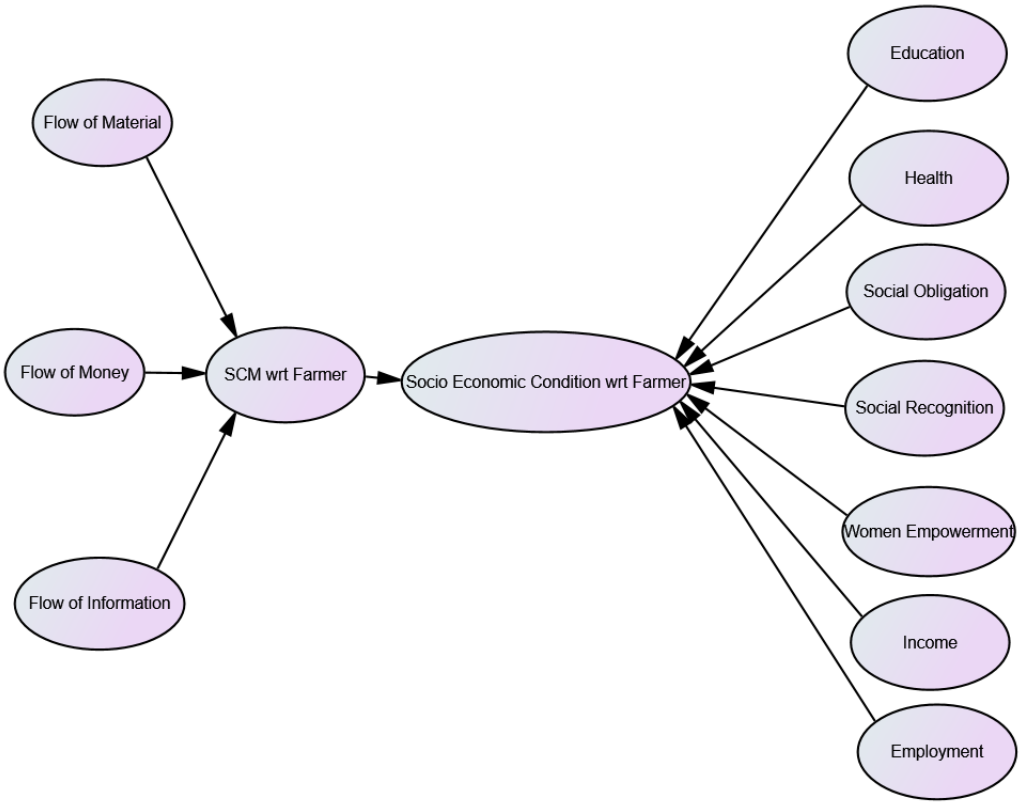
respect to manager's point of view and Organizational Performance is studied with the help of four parameters viz. Accounting Measures, Operational Measures, Market Based Measures and Survival Measures.

FIGURE 2.2 CONCEPTUAL MODEL DEVELOPED FOR SCM FROM MANAGERS' POINT OF VIEW AND ORGANIZATIONAL STRATEGIC COMPETENCE



In the second model the Supply Chain Management is studied with the help of three parameters viz. Flow of Material, Flow of Money and Flow of Information with respect to manager's point of view and Organizational Strategic Competence is studied with the help of two parameters viz. Skills and Knowledge.

FIGURE2.3 CONCEPTUAL MODEL DEVELOPED FOR SCM FROM FARMERS' POINT OF VIEW AND SOCIO-ECONOMIC CONDITION



In the third model Supply Chain Management is studied with the help of three parameters viz. Flow of Material, Flow of Money and Flow of Information with respect to farmers' point of view and Socio-economic Condition of farmers of Eastern Uttar Pradesh with the help of seven parameters viz. Education, Health, Social Obligation, Social Recognition, Women Empowerment, Income and Employment.

2.4.0 OBJECTIVES:

1. To study the impact of the determinants of Supply Chain Management on the Performance of Sugar Industry of Eastern Uttar Pradesh.

2. To study the impact of determinants of Supply Chain Management on Organizational Strategic Competence of Sugar Industry of Eastern Uttar Pradesh.

3. To study the impact of determinants of Supply Chain Management of Sugar Industry on Socio-economic Condition of farmers of Eastern Uttar Pradesh.

2.5.0 HYPOTHESIS:

Objective wise hypotheses have been given below.

2.5.1 HYPOTHESIS RELATED TO FIRST OBJECTIVE

H_0: There is no significant impact of SCM (flow of material/ Flow of money/ Flow of Information) on the Organizational Performance (Accounting measure-Profitability, Growth, Leverage, Liquidity, Cash Flow/ Operational Measures-Crushing Time of sugarcane, Production, Payments ,Cost of Production, Flow of Material, Relationship/ Market based Measure-Return to Shareholders/ Survival Measure- Long-Term Survival) of sugar industry.

$H_0$1: There is no significant impact of Supply Chain Management on the Accounting Measures under Organizational Performance of sugar industry.

$H_0$2: There is no significant impact of the Supply Chain Management on Operational Measures under Organizational Performance of sugar industry.

$H_0$3: There is no significant impact of Supply Chain Management on Survival Measure under Organizational Performance of sugar industry.

H_0: There is no significant impact of Supply Chain Management on Organizational Performance of sugar industry.

2.5.2 HYPOTHESIS RELATED TO SECOND OBJECTIVE

H_0: There is no significant impact of Supply Chain Management (Flow of Material/ Flow of money/ Flow of Information) on the Organizational Strategic Competence (Skills, Knowledge)

$H_0$1: There is no significant impact of Supply Chain Management on Employees' Skills under Organizational Strategic Competence of sugar industry.

$H_0$2: There is no significant impact of Supply Chain Management on Employees' Knowledge under Organizational Strategic Competence of sugar industry.

H_0: There is no significant impact of Supply Chain Management on Organizational Strategic Competence of sugar industry.

2.5.3 HYPOTHESIS RELATED TO THIRD OBJECTIVE:

H_0: H0: There is no significant impact of Supply Chain Management (Flow of Material /Flow of Money/Flow of Information) of sugar industry on Socio-economic Condition (Education/ Health/ Social Obligation/ Social Recognition/ Women Empowerment/ Income/ Employment) of farmers of Eastern Uttar Pradesh.

$H_0$1: There is no significant impact of Supply Chain Management of sugar industry on Education under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$2: There is no significant impact of Supply Chain Management of sugar industry on Health under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$3: There is no significant impact of Supply Chain Management of sugar industry on Social Obligation under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$4: There is no significant impact of Supply Chain Management of sugar industry on the Social Recognition under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$5: There is no significant impact of Supply Chain Management of sugar industry on Women Empowerment under Socio-economic Condition of Eastern Uttar Pradesh.

$H_0$6: There is no significant impact of Supply Chain Management of sugar industry on Income under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$7: There is no significant impact of Supply Chain Management of sugar industry on Employment under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

H_0: There is no significant impact of Supply Chain Management of sugar industry on Socio-economic Condition of farmers of Eastern Uttar Pradesh.

1.6.0 ALTERNATIVE HYPOTHESIS

Objective wise alternative hypotheses have been given below.

2.6.1 ALTERNATE HYPOTHESIS RELATED TO FIRST OBJECTIVE:

H_0: There is a significant impact of SCM (flow of material/ Flow of money/ Flow of Information) on the Organizational Performance (Accounting measure-Profitability, Growth, Leverage, Liquidity, Cash Flow/ Operational Measures-Crushing Time of sugarcane, Production, Payments ,Cost of Production, Flow of Material, Relationship/ Market based Measure-Return to Shareholders/ Survival Measure- Long-Term Survival) of sugar industry.

$H_0$1: There is a significant impact of Supply Chain Management on the Accounting Measures under Organizational Performance of sugar industry.

$H_0$2: There is a significant impact of the Supply Chain Management on Operational Measures under Organizational Performance of sugar industry.

$H_0$3: There is a significant impact of Supply Chain Management on Survival Measure under Organizational Performance of sugar industry.

H_0: There is a significant impact of Supply Chain Management on Organizational Performance of sugar industry.

2.6.2 ALTERNATIVE HYPOTHESIS RELATED TO SEECOND OBJECTIVE

H_0: There is a significant impact of Supply Chain Management (Flow of Material/ Flow of money/ Flow of Information) on the Organizational Strategic Competence (Skills, Knowledge)

$H_0$1: There is a significant impact of Supply Chain Management on Employees' Skills under Organizational Strategic Competence of sugar industry.

$H_0$2: There is a significant impact of Supply Chain Management on Employees' Knowledge under Organizational Strategic Competence of sugar industry.

H_0: There is a significant impact of Supply Chain Management on Organizational Strategic Competence of sugar industry.

2.6.3 HYPOTHESIS RELATED TO THIRD OBJECTIVE:

H_0: H0: There is a significant impact of Supply Chain Management (Flow of Material /Flow of Money/Flow of Information) of sugar industry on Socio-economic Condition (Education/ Health/ Social Obligation/ Social Recognition/ Women Empowerment/ Income/ Employment) of farmers of Eastern Uttar Pradesh.

$H_0$1: There is a significant impact of Supply Chain Management of sugar industry on Education under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$2: There is a significant impact of Supply Chain Management of sugar industry on Health under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$3: There is a significant impact of Supply Chain Management of sugar industry on Social Obligation under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$4: There is a significant impact of Supply Chain Management of sugar industry on the Social Recognition under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$5: There is a significant impact of Supply Chain Management of sugar industry on Women Empowerment under Socio-economic Condition of Eastern Uttar Pradesh.

$H_0$6: There is a significant impact of Supply Chain Management of sugar industry on Income under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

$H_0$7: There is a significant impact of Supply Chain Management of sugar industry on Employment under Socio-economic Condition of farmers of Eastern Uttar Pradesh.

H_0: There is a significant impact of Supply Chain Management of sugar industry on Socio-economic Condition of farmers of Eastern Uttar Pradesh.

CHAPTER III

RESEARCH METHODOLOGY

This study was the survey research and Research Methodology opted in this study included Sample (population, sampling technique, sample size and characteristics of samples), Variables, Tool, Procedure of Data Collection and Data Analysis. Population of the study was divided into two segments in which under first segment managers of sugar mills of Eastern Uttar Pradesh were included and under the second segment sugarcane cultivating farmers of concerned sugar mills were included. Sampling Technique used in this study was Non-probabilistic viz. Purposive Sampling. Sample Size was also divided into two parts in which under the first part 90 samples of managers of sugar mills of Eastern Uttar Pradesh were included for the first and second objectives and under the second part 300 samples of sugarcane cultivating farmers from the area concerned sugar mills were included for the third objectives. The salient characteristic of the Samples was their homogeneousness profession and education i.e. managers were well educated and farmers were either illiterate or very less educated. Variables in this study were Supply Chain Management, Organizational Performance, Organization Strategic Competence and Socio-economic Condition. Supply Chain Management was taken as Independent Variable (IV) and Organizational Performance, Socio-economic Condition and Organization Strategic Competence were taken as Dependent Variables (DV). Tool used in this study for the Data collection was Questionnaire and data were measured at interval scale for that Likert's 5 point scale was utilised. At the scale 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. Further 3 = Neutral was defined as $2.5 < x < 3$ = Moderately Disagree and $3 < x \leq 3.5$ = Moderately Agree where x is the average value of responses of respondents at Liker's 5 point scale. Data were collected from the managers of the sugar mills sending them questionnaire by E-mail and by post to filled it in and approaching them personally to get filled in the questionnaire. In case of sugarcane cultivating farmers data were collected approaching them personally to get questionnaire filled in. Statistical Technique used in this study for data analysis was correlation and regression.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

The previous chapter was concerned with research methodology followed in the study and a detailed discussion over research methodology adapted in the study has been discussed in the chapter. Present chapter is dedicated to the analysis of data which were collected with the help of questionnaire from 90 managers of sugar mills of various districts of Eastern Uttar Pradesh and from 300 sugarcane farmers of various districts of Eastern Uttar Pradesh. The analyses of data have been divided into two stages viz. first stage analysis and second stage analysis in which under the first stage analysis the data related to demography of managers, SCM from managers' point of view, Organizational Performance, Organizational Strategic Competence, demography of farmers, SCM from farmers' point of view and Socio-economic Condition of farmers were analysed with the help of simple Frequency Test, Bar Chart and Pie Chart and under the second stage analysis data related to Supply Chain Management, Organizational Performance and Organizational Strategic Competence were analysed with the help of Frequency Test, Correlation and Regression analysis. For the analysis of data Microsoft Excel and SPSS software has been utilised in the study. The analysis of data has been done under two stages. Under the first stage analysis the data related to demography of managers, Supply Chain Management from managers' point of view, Organizational Performance, Organizational Strategic Competence, demography of farmers, Supply Chain Management from farmers' point of view and Socio-economic Condition of farmers were analysed with the help of simple Frequency Test, Bar Chart and Pie Chart. The detailed analysis of data and its interpretations have been below given under various captions. And under the second stage analysis the data analysis and hypothesis testing have been done objective wise. Data were analysed with the help of Frequency Test, Correlation and Regression analysis using SPSS software. The detailed analyses of data, hypothesis testing and their interpretations have been given below under various captions.

CHAPTER V

FINDINGS AND DISCUSSIONS

5.1.0 INTRODUCTION:

In the previous chapter a detailed analysis and interpretation of data have been given and the present chapter is devoted to findings and discussions of the study which have been explained below under the different captions.

5.2.0 DEMOGRAPHY OF MANAGERS

In the investigation of demography of Managers of sugar industry of Eastern Uttar Pradesh during the study following facts came out which have been concluded under this paragraph. All the levels of managers i.e. lower level, middle level and top level managers were included in the study but half of the managers were from middle level management. The managers were well experienced and mature enough to put reliable and valid opinion related to Supply Chain Management, Organizational Performance and Organizational Strategic Competence of sugar industry. One astonishing fact about the management of sugar industry of Eastern Uttar Pradesh was that all the responding managers were found to be males which reflected that there were either no female managers or their representation was negligible in the industry. All the managers were found to be married and living in the joint family concept which indicated that they were carrying both the family and the professional and responsibilities that helped to get experienced and mature response with respect to Chain Management, Organizational Performance and Organizational Strategic Competence of sugar industry. During the study it was found that most of the responding managers were well qualified which led to reliable and valid responses from them. In the investigation of the study it was also found that half of the managers were getting their salary above Rs. 65000 per month. Another fact that came out in the study was that around 10% sugarcane was found to be wasted during the processing in the sugar mills.

5.3.0 DEMOGRAPHY OF FARMERS

In the investigation of demography of the Farmers during the study following results and facts reflected which have been concluded under this paragraph. Most of the

farmers were mature enough and had the good knowledge of agriculture and sugarcane farming. In the study most of the sugarcane cultivators were found to be males and the involvements of females were only around one fourth of males in the farming of sugarcane. One of the most important facts regarding the female farmers was also come out that they hesitated to interact with the investigators and most of the males did not wanted their female to interact with strangers. Most of the farmers were found to be married and nuclear family concept was growing in villages. The education level of farmers was low and it was found that most of the farmers were either illiterate or educated up to the high school. The economic condition of the most of the farmers was not satisfactory due to low annual income and land holding below one acre for sugarcane farming. Generally 3-4 members of most of the families were found to be engaged in the farming of sugarcane and most of the farmers did not have their own tractors and pumping set which were obstacles for effective and efficient farming of sugarcane. In the investigation of the study it was also found that around 10-20 % sugarcane was found to be wasted till harvesting in the fields of the farmers of Eastern Uttar Pradesh which was a major loss of sugarcane not only for farmers but also for the sugar industry and whole nation.

5.9.1.0 FINDINGS AND DISCUSSIONS RELATED TO FIRST OBJECTIVE

The first objective of the study was 'to study the impact of determinants of Supply Chain Management on the Performance of Sugar Industry of Eastern Uttar Pradesh." In the investigation of the study it was found that the correlation coefficient between Supply Chain Management and Organizational Performance was 0.931. It may, therefore be said that there was a high positive correlation between Supply Chain Management and Organizational Performance for the sugar industry of Eastern Uttar Pradesh. Further the findings of the study also indicated that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Organizational Performance on Supply Chain Management was Y (OP) = 0.912 + (0.831) (SCM). It may, therefore be said that there was a significant impact of supply chain management on Organizational Performance of the sugar industry of Eastern Uttar Pradesh and an unit increase in the parameters of Supply Chain Management would lead to 0.831 units increase in the Organizational Performance provided other variables remained constant.

5.9.2.0 FINDINGS AND DISCUSSIONS RELATED TO SECOND OBJECTIVE

The second objective of the study was "to study the impact of the determinants of supply chain management on the organizational strategic competence of the sugar industry of eastern Uttar Pradesh." During the investigation of the study the correlation coefficient between Supply Chain Management and Organizational Strategic Competence was found to be 0.926. It may, therefore be said that there was a high positive correlation between Supply Chain Management and Organizational Strategic Competence of sugar industry of Eastern Uttar Pradesh. Further the findings of the study also indicated that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Organizational Strategic Competence on Supply Chain Management was Y (OSC) = 2.547 + (0.371) (SCM). It may, therefore, be concluded that there was a significant impact of Supply Chain Management on Organizational Strategic Competence of sugar industry of Eastern Uttar Pradesh and a unit increase in the parameters of Supply Chain Management would lead to 0.371 units increase in the Organizational Strategic Competence provided other variables remained constant.

5.9.3.0 FINDINGS AND DISCUSSIONS RELATED TO THIRD OBJECTIVE

The third objective of the study was "to study the impact of the determinants of Supply Chain Management of Sugar Industry on the Socio-economic Condition of the farmers of Eastern Uttar Pradesh." In the study it was found that the correlation coefficient between Supply Chain Management of sugar industry and Socio-economic Condition of farmers was 0.674. It may, therefore, be concluded that there was a high positive correlation between Supply Chain Management of sugar industry and Socio-economic Condition of farmers of Eastern Uttar Pradesh. Further in the findings of the study it was also revealed that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Socio-economic Condition on Supply Chain Management was Y (SEC) = 1.930 + (0.417) (SCM). It may, therefore be concluded that there was a significant impact of Supply Chain Management of sugar industry on Socio-economic Condition of farmers of Eastern Uttar Pradesh and a unit increase in the parameters of Supply Chain Management would lead to 0.656 units increase in the Socio-economic Condition of farmers provided other variables remained constant.

CHAPTER VI

CONCLUSION AND IMPLICATION OF THE STUDY

6.1.0 CONCLUSION

This study was related to Supply Chain Management in Agriculture. The basic focus of the study was to study the impact of Supply Chain Management on Organizational Performance, Organizational Strategic Competence of agriculture based industrial organizations and Socio-economic Condition of farmers of the area in which the organizations were being operated their business. To serve the purpose sugar industry of Eastern Uttar Pradesh was chosen for the study. For the study 3 objectives were constituted covering Supply Chain Management, Organizational Performance, Organizational Strategic Competence and Socio-economic Condition. Tool and sampling for the data collection were Questionnaire and judgmental sampling respectively. Data were analyzed with the help of Descriptive Statistics, Correlation and Regression using software SPSS. The conclusive findings and discussions have been given in upcoming paragraphs.

First Objective of the study was "to study the impact of determinants of Supply Chain Management on the Organizational Performance of sugar industry of Eastern Uttar Pradesh." Thus the data were analyzed with the help of correlation and regression and the findings have been concluded in this paragraph. In the investigation of the study it was found that the correlation coefficient between Supply Chain Management and Organizational Performance was 0.931. It may, therefore be said that there was a high positive correlation between Supply Chain Management and Organizational Performance for the sugar industry of Eastern Uttar Pradesh. Further in the findings of the study it was also found that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Organizational Performance on Supply Chain Management was Y (OP) =0.912 + (0.831) (SCM). It may, therefore be said that there was a significant impact of determinants of supply chain management on Organizational Performance of the sugar industry of Eastern Uttar Pradesh and a unit increase in the determinants of

Supply Chain Management would lead to 0.677 units increase in the Organizational Performance provided other variables are constant.

The second objective of the study was "to study the impact of determinants of Supply Chain Management on Organizational Strategic Competence of sugarcane industry of Eastern Uttar Pradesh." Thus the data were analyzed with the help of correlation and regression and the findings have been concluded in this paragraph. During the investigation of the study the correlation coefficient between Supply Chain Management and Organizational Strategic Competence was found to be 0.926. It may, therefore be said that there was a high positive correlation between Supply Chain Management and Organizational Strategic Competence of sugar industry of Eastern Uttar Pradesh. Further in the findings of the study it was also revealed that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Organizational Strategic Competence on Supply Chain Management was Y (OSC) = 2.547 + (0.371) (SCM). It may, therefore, be concluded that there was a significant impact of determinants of Supply Chain Management on Organizational Strategic Competence of sugar industry of Eastern Uttar Pradesh and a unit increase in the determinants of Supply Chain Management would lead to 0.371 units increase in the Organizational Strategic Competence provided other variables remained constant.

The third objective of the study was "to study the impact of the determinants of Supply Chain Management on Socio-economic Condition of the farmers of Eastern Uttar Pradesh." Thus the data were analyzed with the help of correlation and regression and the findings have been concluded in this paragraph. In the investigation of the study it was found that the correlation coefficient between Supply Chain Management of sugar industry and Socio-economic Condition of farmers was 0.674. It may, therefore, be concluded that there was a high positive correlation between Supply Chain Management of sugar industry and Socio-economic Condition of farmers of Eastern Uttar Pradesh. Further in the findings of the study it was also found that the Sig. Value (p) was 0.000 which was significant at 0.05 significance level as it was less than 0.05 and the regression equation of Socio-economic Condition on Supply Chain Management was Y (SEC) = 1.930 + (0.417) (SCM). It may, therefore be concluded that there was a significant impact of determinants of Supply Chain Management of sugar industry on Socio-economic Condition of farmers

of Eastern Uttar Pradesh and a unit increase in the determinants of Supply Chain Management would lead to 0.656 units increase in the Socio-economic Condition of farmers provided other variables remained constant.

6.2.0 IMPLICATION OF THE STUDY

The problems and prospects of "Supply Chain Management in Agriculture: A Case Study of Eastern U.P. With Special Reference to Sugar Industry" is basically related to the implementation of Supply Chain Management in the arena of agriculture and agriculture based industry and to study the impact of SCM on Organizational Performance, Organizational Strategic Competence and Socio-economic Condition of farmers. Sugar industry of Eastern Uttar Pradesh was included in this study. The implications of the study are most important for sugar industry, society and Government which have been discussed below under various captions.

6.2.1 IMPLICATION TO SUGAR INDUSTRY: During the investigation of study it was found that sugar industry was facing the issue of well-knit supply chain and ineffective and inefficient Supply Chain Management whose negative impacts were reflected on Organizational Performance, Organizational Strategic Competence and Socio-economic condition of farmers. The study describes that if sugar industries develop a well-knit supply chain then, it will definitely improve the performance and strategic competence of sugar industries

6.2.2 IMPLICATION TO SOCIETY: The investigation of the study reflected that the Supply Chain Management has a significant impact on Socio-economic Condition of farmers. In the study it was also found that around 15-20% sugarcane was wasted till harvesting in the field of farmers and almost 5-10% sugarcane was wasted during the processing in the sugar mills. It means around 30% sugarcane is wasted without giving any economic value and this loss is a huge loss for the farmers, sugar industry and ultimately for the whole society. Application of Supply Chain Management and developing a well-knit supply chain in the field of agriculture and agriculture based industry will definitely help in minimizing this huge loss of sugarcane and maximizing the profits for sugar industry and farmers. In the process it will also help the farmers to get more income and employment opportunities in their own areas and ultimately it will help the whole society in form of assistance to the economy especially rural economy.

6.2.3 IMPLICATION TO THE GOVERNMENT: The implication of the study to the government is very important as from last few decades a number of cases of suicides committed by farmers due to debts have been observed despite of utmost effort Government to help the farmers. Since last few years the Indian National Congress, a leading political party of India, has continuously been raising the issues of farmers declaring in his manifesto to waive off the debts of the farmers. And present ruling part, BJP, has also contended to double the farmers' income to help them. In nut sell the issues of farmers' income and employment is a national issue of India which must have to be addressed. Application of Supply Chain Management and developing a well-knit supply chain in the arena of agriculture and agriculture based industry will definitely help Government to address this national issue.