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### **Food Supply Chain Management System**

### **Enhancing Sustainable Development and Minimising Operating Cost**

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**Abstract:** In this paper, food supply chain management system for enhancing sustainable development and minimising operating cost is presented. In the competitive world, production and distribution in time is the big issue to all the enterprises. There must be an efficient supply chain system to develop for tackling the present challenges in the supply chain and to minimising operating cost incurred in it. There are more crucial elements to look after to frame a considerable system as it is adoptable to the long period. In this attempt, challenges and opportunities, incentive, governance and co-operation, technological innovations and logistics and operations, life cycle assessment, packaging and containment and food quality are focused. The recent development in the food supply chain is also enumerated. The solutions for facing the problems and methods and various analysis are also provided for the efficient and sustainable food supply chain management.

**Key words:**

Supply chain management – Logistics and Distributions – Life cycle assessment – Operating cost- Technological innovation – Inventory management.

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## 1. Introduction

Fierce competition in today's global markets, the introduction of products with shorter life cycles, and the heightened expectations of customers have forced business enterprises to invest in, and focus attention on, their supply chains. This, together with continuing advances in communications and transportation technologies (e.g., mobile communication, Internet, and overnight delivery), has motivated the continuous evolution of the supply chain and of the techniques to manage it effectively. In a typical supply chain, raw materials are procured and items are produced at one or more factories, shipped to warehouses for intermediate storage, and then shipped to retailers or customers. Consequently, to reduce cost and improve service levels, effective supply chain strategies must take into account the interactions at the various levels in the supply chain.

The supply chain, which is also referred to as the *logistics network*, consists of suppliers, manufacturing centers, warehouses, distribution centers, and retail outlets, as well as raw materials, work-in-process inventory, and finished products that flow between the facilities. In a production economics, sustainable production and distribution is an important and timely issue in production economics. This is very critical for the food industry, which is still the largest manufacturing sector in many developed and developing countries. Although food production and distribution system have become very essential in many aspects, the industry consumes takes natural resources for production and requires the continuous demand for the unstopped production function. In India and China people of 175 million and 130 million respectively area feeding with grain by over-pumping of water for their production purpose ( Brown, 2012), In the developing countries, the wastage of food is the big issue to sustainable food supply.

Totally one-third of the global food production is wasted or lost annually ( Gustabasson et al. 2011). The food industries have been struggling to tackle the issues like food security, waste, public health, land quality and so on. Other than these problems, it also have the problems such as climate changes, oil dependency, fair trade and localism. The concept of suitable supply chain management for social and environmental sustainability of the food industry. On the other hand, the regular question towards the consumption of water sources for the development of supply chain. It is mostly in the hands of technology. But the survival of the technology is persisting only for the reasonable time period. Without reducing the cost and advantages, the supply chain management cannot must be set sup to improve sustainable development, minimise the food waste and reduce operating cost together. To design the

management for achieving the sustainable development, it should be needed to look beyond the organisational boundaries.

The main important of the special issue sustainable food supply chain management is to focus the recent progress made in this concept and to analyse the operational challenges and take decision effectively relating to the strategic, operational and technical levels. In this paper, the various concepts and issues and problems regarding sustainable food supply chain management are reviewed in sections 2 while the special issues are discussed in section 3 and in the last sections the concluding remarks are listed.

The UK Sustainable Development Commission (SDC; DEFRA 2002) has combined many different stakeholder views to produce an internationally applicable description of 'sustainable food supply chains' as those that:

- i. Produce safe, healthy products in response to market demands and ensure that all consumers have access to nutritious food and to accurate information about food products.
- ii. Support the viability and diversity of rural and urban economies and communities.
- iii. Enable viable livelihoods to be made from sustainable land management, both through the market and through payments for public benefits.
- iv. Respect and operate within the biological limits of natural resources (especially soil, water and biodiversity).
- v. Achieve consistently high standards of environmental performance by reducing energy consumption, minimizing resource inputs and using renewable energy wherever possible.
- vi. Ensure a safe and hygienic working environment and high social welfare and training for all employees involved in the food chain.
- vii. Achieve consistently high standards of animal health and welfare.
- viii. Sustain the resource available for growing food and supplying other public benefits over time, except where alternative land uses are essential to meet other needs of society.

## **Supply Chain Management Today**

If we take the view that Supply Chain Management is what Supply Chain Management people do, then in 1997 Supply Chain Management has a firm hand on all aspects of physical distribution and materials management. Seventy-five percent or more of respondents included the following activities as part of their company's Supply Chain Management department functions:

- Inventory management
- Transportation service procurement
- Materials handling
- Inbound transportation
- Transportation operations management
- Warehousing management

Moreover, the Supply Chain Management department is expected to increase its range of responsibilities, most often in line with the thinking that sees the order fulfilment process was one co-ordinated set of activities. Thus the functions most often cited as planning to formally include in the Supply Chain Management department are:

- Customer service performance monitoring
- Order processing/customer service
- Supply Chain Management budget forecasting

On the other hand, there are certain functions which some of us might feel logically belong to Supply Chain Management which companies feel are the proper domain of other departments. Most difficult to bring under the umbrella of Supply Chain Management are:

- Third party invoice payment/audit
- Sales forecasting
- Master production planning

Write-in responses reveal the leading edge of what some Supply Chain Management departments are doing. These include engineering change control for packaging; custom

### **Today Supply Chain Management includes services such as:**

- Operational Analysis and Design Materials Handling
- Distribution Strategy
- Operational Improvements, Distribution Management
- Computer Systems

- Warehouse Design Project Management
- Operational Commissioning
- Computer Simulation
- Technical seminars

## **2. Practical problems and Solution for sustainable food supply chain management**

### **2.1 Objectives of sustainable food supply chain management:**

Sustainable food supply chain management has some purpose to achieve the target. It is different from one category of industry and product to another. Some of the objectives of sustainable. All the firms struggle to survive among the competition. The sustainable issues without considering the strategic impacts would be grate problems to the concern. Therefore, the purpose of managing the sustainable food supply is required to take any decision. Ahumada and Villalobos(2009) reviewed on the decision making models on food supply chain. On the basis of this review, the studies have focused on production decision at the tactical level. Van der Vorst(2006) suggested a number of useful performance measures at different levels and readers are referred to this article for more details. Ahumada and Villalobos (2009) also pointed that there is a need for the research regarding coordination and integration of food supply chain, Hobbs and Young (2000). Because of combined activities, all are functioned.

The decision making models are distracted by the uncertainty and it can deviate the determined objectives of such models. Therefore, distracting the impact of uncertainty is another strand of research. The forecasting errors the very familiar source of such uncertainty are inevitable in the business concern. It always affects small and medicum enterprise(IIIbery et al 2004). Van der Vorst et al (1998) described four of them-- the scope of forecasting the order, input data, administrative and decision processes and inherent uncertainties. The author simulated food supply chains and monitored the impact of the aforementioned sources of uncertainty on a number of objectives, including inventory level and freshness of the products at both distribution centre and ordering system and suggested improvement approaches. Van der Vorst and Beulens(2002) arranged a case study with three food supply chain companies to further investigate the generic sources of uncertainty and recommended a list of generic redesign strategies based on the findings. A direct consequence of the aforementioned uncertainly is risk. But really, they do not exist without

the one another( Cavinato,2004). Therefore, risk management is the base and primary objectives in a food supply chain, which will affect the performance of the chain and the related decisions to be made.

The above issues are typical in food supply chain, which focus mainly on the economic performance of the whole chain. As discussed earlier regarding the role of technology, sustainable food supply chain management is a matter of controlling economic social and environmental performance of the supply chain(Hamprecht et al.2005). In this connection, any objectives set out and the associated decision making models should take three famous triple bottom line into consideration, which is still very immature in the literature. Yakovleva(2007) is one of very few studies that have taken the initiative to propose performance indicators from these three aspects for the UK food supply chain. Here, with the above three aspects, cost oriented concepts to reduce the operation are included. This is perhaps the reason why this area is under-studied.

## **2.2. Incentives of sustainable food supply chain management**

The weather condition and the frequent changes are the major causes for the environmental problem from the policy setter's view and the food system makes a considerable contribution to the Green House Gas (GHG) emissions. Between 15 and 30% to overall GHG emission is released from the processing, distribution, retailing, to home food preparation and waste(Garnett, 2011). Agriculture's contribution to the global emissions total has been estimated to account for as much as 30%. Once all direct and indirect impacts are summed(Bellarby et al. 2008).

The vibrant food system may be at problem under climate change since it could be in various ways from direct effects on food production, to changes in markets, food prices, food utilisation, access to food and supply chain infrastructure(Schmidhuber and Tubiello, 2007; Wheeler and Von Braun, 2013). It is difficult for stakeholders to view beyond their organisational boundaries to enhancing the sustainable food supply chain in the food industry .

The effective food system policy should also concentrate on the cost incurred from the stage of implementation to the stage of execution. The cost required for this management plays vital role in determining the type and scope of food supply chain management. The factors relating to estimating the costs and sources of finance to meet the demanded amount

for this management are the crucial tasks to the management. Because these decisions and analysis are uncertain and fully related to the future events. The policy makers must keep in their mind that the operating costs is the burden if it is beyond the capacity of the industry.

The processes and products relating to improving the sustainability of the food chain may be useful to the food industry to reduce risks and respond to the changing consumer demands. Smith(2008) stated that the opportunities of food business within food supply chains to motivate them to invest in more sustainable manufacturing and delivering systems and to link more sustainable business practices to consumer purchases and societal value. The main reason for executing sustainable practices is that organisations can generate more business opportunities than their competitors if they can address environmental and social issues successfully. This is added in the findings of studies of green supply chain management(Zhu and Sarkis, 2004; Rao and Holt, 2005; Azevedo et al, 2011, Wang et al., 2012). From these studies it is revealed that the economics performance and financial analysis are the two key elements to derive the food supply chain management to implement sustainability initiatives and practices and green practices.

### 2.3. Supply-Chain Principles/ Methodology & Solutions

If supply-chain management has become top management's new "religion," then it needs a doctrine. Andersen Consulting has stepped forward to provide the needed guidance, espousing what it calls the "Seven Principles" of supply-chain management. When consistently and comprehensively followed, the consulting firm says, these seven principles bring a host of competitive advantages.

*The seven principles as articulated by Andersen Consulting are as follows:*

**1.Segment customers based on service needs.** Companies traditionally have grouped customers by industry, product, or trade channel and then provided the same level of service to everyone within a segment. Effective supply-chain management, by contrast, groups customers by distinct service needs--regardless of industry--and then tailors services to those particular segments.

**2. Customise the Supply Chain Management network.** In designing their Supply Chain Management network, companies need to focus intensely on the service requirements and profitability of the customer segments identified. The conventional approach of creating a "monolithic" Supply Chain Management network runs counter to successful supply-chain management.

3. **Listen to signals of market demand and plan accordingly.** Sales and operations planning must span the entire chain to detect early warning signals of changing demand in ordering patterns, customer promotions, and so forth. This demand-intensive approach leads to more consistent forecasts and optimal resource allocation.
4. **Differentiate product closer to the customer.** Companies today no longer can afford to stockpile inventory to compensate for possible forecasting errors. Instead, they need to postpone product differentiation in the manufacturing process closer to actual consumer demand.
5. **Strategically manage the sources of supply.** By working closely with their key suppliers to reduce the overall costs of owning materials and services, supply-chain management leaders enhance margins both for themselves and their suppliers. Beating multiple suppliers over the head for the lowest price is out, Andersen advises. "Gain sharing" is in.
6. **Develop a supply-chain-wide technology strategy.** As one of the cornerstones of successful supply-chain management, information technology must support multiple levels of decision making. It also should afford a clear view of the flow of products, services, and information.
7. **Adopt channel-spanning performance measures.** Excellent supply-chain measurement systems do more than just monitor internal functions. They adopt measures that apply to every link in the supply chain. Importantly, these measurement systems embrace both service and financial metrics, such as each account's true profitability. The principles are not easy to implement, the Andersen consultants say, because they run counter to ingrained functionally oriented thinking about how companies organise, operate, and serve customers. The organisations that do persevere and build a successful supply chain have proved convincingly that you can please customers and enjoy growth by doing so.

#### **2.4. Technological Innovation in sustainable food supply chain management**

Technology which empowers the supply chain to operate on a new level of performance and is creating clear competitive advantages for those companies able to harness it Buhr(2003). Applying state of the art technology such as electronic data interchange can facilitate quicker and more efficient response(King and Phumpu, 1996; Hill and Scudder, 2002). The rapid development provides suitable outlet for traceability

applications(Bechini et al; 2008). This is because information can flow across the internet with better visibility and accuracy(Wilson and Clarke, 1998). Companies should address the following points:

- Do our IT platform and core applications software support world-class SCM?
- Where will advanced decision-support capabilities have the greatest impact on business performance?
- What data are required to manage the core business processes outlined above?
- How can we capitalise on advanced communications (e.g., intranets and the Internet) in managing the supply chain?
- How can we leverage enhanced visibility of customer demand and other key operating parameters?

From a different point of view the consulting firm of A.T. Kearney has developed an instructive framework for establishing a strategic supply-chain agenda and then implementing it To spearhead the effort, Kearney recommends creation of a supply-chain assessment team that works under the aegis of a companywide steering committee. The agenda-setting process proceeds along 4 key steps. The team's first task is to assess the supply-chain competitiveness of the organisation. The evaluation begins with a comparison of business objectives against existing capabilities and performance. This exercise typically reveals where the existing supply chain can achieve immediate competitive advantage (Kearney calls these the "early wins") and where inefficiencies may be leaving the company vulnerable to the competition. Step two in the agenda-setting process is to create a vision of the desired supply chain. Through a series of "visioneering" sessions that might also include key customers and suppliers, the team considers how such trends as globalisation, channel shifts, and new technology will affect the desired supply-chain configuration. That exercise addresses such questions as, What supply-chain factors and performance levels drive customer buying decisions? What would make one supply chain a winner over others? Step three in the A.T. Kearney approach defines those actions required to close the gap between tomorrow's supply-chain vision and today's reality. The team identifies possible re-engineering, restructuring, or other actions that could help narrow any gaps. At this stage, the team also works closely with management to assess the organisation's readiness to pursue needed changes. Finally, step four prioritises the action items identified in the preceding step and then commits the appropriate resources. The end

result of this task is a unified commitment to a supply-chain strategy and a clear agenda to achieve that strategy.

Applications for the aforementioned technology have proven useful, however, only from economic or financial point of view (Markley and Davis, 2007). Potential benefits are reducing operating cost, streamlining supply chain operations by better information flow, reducing the complexity of food supply chains and so on.

## **2.5. Logistics and operations for sustainable food supply chain management**

The logistics and operations system plays a vital role in determining the quality and taste of food products. This is the reason logistics is the main for food supply chains from the procurement to the distribution activities (Manzini and Accorsi, 2013). Transportation occupies an important step from farm-to-fork, because of the crucial performance during the shipments and storage in international and intercontinental distribution of products (Valli et al. 2013).

The decisions taken for food supply chain management affect not only costs and logistic efficiency, but also the level of quality of products and processes, the level of sustainability and safety of the supply system with direct and indirect impacts on consumers' safety health and well-being. Therefore, the management and control of warehousing system is an important one for the effective sustainable food supply chain management system. The storage decisions are significantly related with the inventory management and fulfillment problems for perishable and not perishable products (Herbon et al., 2015; Duan and Liao, 2013).

The mathematical models and different supporting decision methods can be adopted in the logistic networks. Hence the literature is decided to contribute to the integrated models and approaches to decision making from procurement to transportation including the management and control of reverse flow of materials. Van Der Vorst et al. (2009), provided an integrated decision making model to this purpose.

## **2.6 Life Cycle Assessment in Sustainable Food Supply Chains**

Product-based evaluation is called, life cycle assessment (LCA). LCA is an approach that evaluates all stages of a product's life. During this evaluation environmental impacts from each stage is considered from raw material products, processing, distribution, use, and disposal. This methodology considers not only the flow of materials, but the outputs and

environmental impacts of these. LCA processes have been standardized (e.g., ISO 14044) and follow the main steps of goal definition and scoping to define the process and boundaries; inventory analysis to identify material and energy flows and environmental releases; impact assessment to assess the environmental effects of the inventory analysis; and interpretation to draw conclusions from the assessment (SAIC, 2006).

Conclusions can include decisions on different materials or processes. The benefit of LCA is that it helps avoid shifting environmental problems from one place to another when considering such decisions (SAIC, 2006). Ultimately, the life cycle approach for a product is adopted to reduce its cumulative environmental impacts (European Commission, 2003). LCA is done in terms of a functional unit (FU) – for food that usually is a finished product like a pound of cheese or kg of meat. LCA has been used for environmental assessment of milk (Thomassen 2008; Weidema et al. 2007; Thomassen and de Boer 2005; Cederberg and Mattsson, 2000; Haas et al. 2000), pork (Weidema et al. 2007; Basset-Mens et al. 2006; Dalgaard et al. 2007; Cederberg and Flysjö, 2004; Eriksson et al. 2005), beef (Ogino et al. 2007; Weidema et al. 2007), grains (Weidema et al. 1996, Dalgaard on soybeans) and other agricultural/horticultural products (Halberg et al. 2006).

When the food supply chain management considers the life cycle for assessment, it should also think properly about the cost structure for its all stages. Golicic et al (2010) pointed out that fewer than 105 of Fortune 500 companies have addressed the environmental impacts of transportation and are actively implementing improvement.

## **2.7 Packaging – the role of packaging system for sustainability:**

Packaging has a vital role to play in containing and protecting food as it moves through the supply chain to the consumer. It already reduces food waste in transport and storage, and innovations in packaging materials, design and labelling provide new opportunities to improve efficiencies. Product protection needs to be the primary goal for packaging sustainability, and sometimes this requires trade-offs between packaging and food waste.

A number of opportunities to reduce food waste through packaging improvements were identified, including:

- 1) Distribution packaging that provides **better protection and shelf life for fresh produce** as it moves from the farm to the processor, wholesaler or retailer. This may require the development of tailored solutions for individual products.

- 2) Distribution packaging that supports **recovery of surplus and unsaleable fresh produce** from farms and redirects it to food rescue organisations.
- 3) Improved design of secondary packaging to ensure that it is **fit-for-purpose**, i.e. that it adequately protects food products as they move through the supply chain.
- 4) A continuing shift to **pre-packed and processed foods** to extend the shelf life of food products and reduce waste in distribution and at the point of consumption (the home or food services provider). The packaging itself also needs to be recoverable to minimise overall environmental impacts.
- 5) Adoption of **new packaging materials and technologies**, such as modified atmosphere packaging and oxygen scavengers, to extend the shelf life of foods.
- 6) Education of manufacturers, retailers and consumers about the meaning of **use-by and best-before date marks** on primary packaging to ensure that these are used appropriately. Confusion about date marking results in food being thrown away when it is still safe to eat.
- 7) Product and packaging development to cater for **changing consumption patterns and smaller households**. Single and smaller serve products will reduce waste by meeting the needs of single and two person households.
- 8) Collaboration between manufacturers and retailers to **improve the industry's understanding of food waste** in the supply chain. Greater attention to be given to where and why this occurs, tracking over time, will reduce the costs and environmental impacts of waste.
- 9) More synchronised supply chains that use **intelligent packaging and data sharing** to reduce excess or out-of-date stock.
- 10) Increased use of **retail ready packaging** to reduce double handling and damage and improve stock turnover, while ensuring that it is designed for effective product protection and recoverability (reuse or recycling) at end of life.

The implementation of these initiatives could be supported Packaging that is designed to effectively contain and protect food across the supply chain will minimise waste of both food and packaging. On average packaging accounts for only 10% of total energy but it plays a critical role in ensuring that the other 90% is not wasted. The packaging system should

consider the protection of product and general rules (Azzi et al 2012). Literature discusses the need to change regulations and standards, which assign new categories of products to a specific container system(Panozzo and Cortella. 2008). Issues and trends in food packaging are recently noted down by Mahalik and Nambiar (2010). The new approaches on packaging should consider technical, economic and environmental points of view.

## **2.8. Food quality and safety**

While many programs and systems have been developed and implemented with varying degrees of success, we believe it is incumbent on all of the food segments within the U.S. to protect their customers and their companies through their own comprehensive programs. Every step along the food supply chain must be held accountable for what they supply or handle. It is essential to understand and have confidence that your immediate source of supply also has conducted a preventative controls assessment as characterized in the FSMA. Members of the supply chain must have a clear understanding of the production and processing controls necessary as well as have them functionally verified and validated to address the hazards that may be associated with the foods they handle both up and down the supply chain.

For this issues, Government agencies, both international and national are responding to these developments by imposing new legislation and regulations to ensure safe and animal-friendly production, restricted pollution and to economize on the use of resources (Trienekens and Zuurbier, 2008). A food traceability system presents manufacturers with opportunities to follow a product and the processes it undergoes(Wang et al., 2009) Wognum et al., 2011). In addition, an efficient and effective traceability system transmitting accurate, timely, complete, and consistent information about products through the supply chain can significantly reduce operations cost and increase productivity(Regattieri et al. 2007). The Time Temperature Indicator Technologies in condition monitoring in the food industry provides effective quality control of the temperature(Wang and Li, 2012 ; Zaroni and Zavanella, 2012). Moreover, Deasy (2002) stated that individual producers must reassess their handling of quality and traceability data for strategic and competitive success.

## **2.9. Implementation of Sustainable food supply chain strategies:**

Garnett(2013) examined the options and solutions for food sustainability from three perspectives; improve efficiency demand restraint, and improve governance. Furthermore, as Smith(2008); argued that interpersonal trust are important for it and the Non Government Organisations, innovators, stakeholders and government are important for raising the baseline for sustainable food supply chains. The new system must consider the new technologies in

supply and production processes (Wang and Chan, 2013). Barriers perceived by many firms include incremental cost and confidentiality of achieving commercial advantage (Min and Galle, 2001; Walker et al., 2008). The implementation of sustainable practices requires various sets of resources and capabilities.

### **3. Recent development in research o sustainable food supply chain management**

To face the threat in the future years which develop according to the increasing trend of the population, research and analysis to frame the root through which the recent development of sustainable food supply chain management. Before designing the area or the subject matter of the sustainable food supply chain management, it is more convenient to keep touch on various research topic such as analytical approaches to decision making for sustainable food supply claims, impacts of governance structure or partner relationships in supply chains on sustainable practices, technology driving innovation for sustainability and development of assessment approaches to sustainability and safety in food supply chains.

#### **3.1 Modelling and design for sustainability**

The decision on green practices should fame within the quality and safety performance of foods supplied through supply chains. Kannan, Jafarian and Khodaverdi (2014) propose a multi-objective model for a two-echelon multiple-vehicle location-routing problem for a solution to sustainable supply of perishable foods. Agustinaa, Lee and Piplani present a solution to the model of cross docking operations. Qin. Qin and Wang (2014) propose a joint pricing approach for solution. In the model, Karush-Kuhn-Tucker optimality conditions are developed for the linear complementarity problem. A case study in Talwanese vegetable markets is presented to demonstrate the impact of location of plant factories, number of firms and market demands on performance of the plant factory supply chain and consequently the best location strategy is proposed.

#### **3.2. Enablers of sustainable practice in food supply chains:**

Conversion of traditional supply chain management into more sustainable practice in the food sector is a great challenge due to different in supply chain partners' interest and costs of adopting green technologies and managerial approaches. Glover, Champion, Daniels and Dainty studied the role of supermarkets in legitimising sustainable practices in a dairy supply chain case. Maglaras, Aktas, Gallear and Fotopoulos, the assessment of comprehensive KPIs for firm size on the performance. Beske, Land and Securing as the food industry faces a highly dynamic market in terms of customer demand on quality, nutrition, price, safety and

environmental impact. Grimm, Hofstetter and sarkis study critical factors in sub-supplier management for sustainable food system.

### **3.3. Food quality and safety assurance**

The key performance criteria for food supply chain management is quality and safety. Setting the quality and safety provision are the challenging practice to both academic is and practitioners. An analytical model and case studies for this system are implemented to investigate a milk quality incident in China by Chen, Zhang, and Delaurentis. The research presents evidence the poor vertical control strategy leads to high risks and in food quality in the cases.

## **4. Concluding remarks**

From this paper, a list of various types of problems have been viewed to minimise the operating cost and maximise the sales. But whatever the solution made in the food supply chain management, it is not fixed due to uncertain. Here, the existing and future challenges in research of sustainable food supply chain management have been discussed . It is believed that the special issue provides a procedural view of current research on sustainability issues in the food sector for readers and a useful reference for future research.

At the same time, while considering the new latest system for managing the sustainable food system, it is also an important one to have concentrate on the costs structure from the stage of production to the stage of consumption. The cost factor should analysed according to the capacity of the firm, market and competitors.

This study can also be extended in several ways. Working capital may be analysed to consider the cost factor and as the techniques and steps are different for perishable and non-perishable foods, there is a requirement to set up an system especially for the perishable and non-perishable foods. In other way, the study may concentrate on the obstacles in framing the governance regarding sustainable food supply chain for minimizing the operating costs.

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