

Modeling Quality Supply Chain to Enhance Company's Cost competitiveness:

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Abstract

Today's dynamic market is characterized by transition in competition from single firm level into supply chain, these create difficulty for developing countries manufacturing companies (which have weak supply chain network) to join global market. Managing quality along supply chain, as current state of the art management strategy, has become a solution for organizational performance and competitiveness. From author's investigation through questionnaire survey, guided interview and direct observation, in 54 manufacturing companies some companies have begun the concept of supply chain management and quality management practices independently, but most of them are doing in traditional manner. the major problems identified in the manufacturing companies include: under capacity production, lagging to fill market demand, lack of quality raw material supplier, absence of long-term relation with supplier and/or customers, occurrence of bottle neck partner along the supply chain, usage of total cost as the only performance measurement system and did not give due consideration for employee satisfaction, product quality, on time delivery and customer satisfaction. This research deals with how to manage quality along the supply chain by taking faffa foods sc. as a case study. In addition this research, formulates a model for quality supply chain management, identifies potential improvement areas and draw possible solutions. Finally the research recommends the company to improve: supply systems, to save cost of raw materials rejected due to low quality and shorten lead times. Distribution system, to minimize customer complain due to delay.

Keywords- supply chain quality management, organizational performance, Ethiopian manufacturing firms.

I. Introduction

Over the last 50 years, a transition from the producers' market to the customers' markets has occurred. This transition began in the 1960s with an increasing role of marketing in the conditions of mass production of similar products to an anonymous market. This period is known as the economy of scale [4]. After filling the markets with products, the quality problems came to the forefront of enterprise management. In the 1970s, total quality management (TQM) was established. The increased quality caused the individualization of customers' requirements in the 1980s. This was the launching point for the establishment of the economy of the customer. This period is characterized by efforts for optimal inventory management and a reduction in production cycles. In the 1980–1990s, handling a high product variety challenged enterprise management. Another trend was the so-called speed effect. The speed of reaction to market changes and cutting time-to-market became even more important. Consequently, the optimization of internal processes simultaneously with external links to suppliers was rooted in the concepts of lean production and just-in-time. Throughout the 1990s, companies concentrated on development approaches to core competencies, outsourcing, innovations and collaboration. These trends were caused by globalization, advancements in IT and integration processes into the world economy [11]. But till 1980s, the products were not very complex and hence companies could manufacture them in their own premises. Hence the TQM philosophies hovered around improving quality within the companies. By the time the world settled to apply TQM within the premises of companies, a new challenge began to surface. According to this challenge, it became necessary to outsource majority of the components of products and services. Hence more than the management, the suppliers began to play major roles in determining the success and failure of the products and services. Particularly in the 1990s, the paradigm of supply chain management was established [4]. Today, it is very difficult to see a company without depending upon its supply chain management department for effective and profitable development of products, processes and service [5]. Since supply chain management field has changed the way of manufacturing the items under one roof to the supplying of the items by numerous suppliers, this change has made the task of achieving higher degree of quality a complex one. In order to face this challenge, during the recent years, researchers have started to work in the direction of integrating principles and concepts of quality management with supply chain management. Competition now is not only found at the firm level. Business competition now exists as supply chains seek to gain advantage over competing supply chains. This level of competition requires a much greater level of coordination among chains or networks of suppliers, distributors, producers, and customers [9, 8, 9]. As a result, this study develops a model for quality supply chain which is defined as a systems-based approach to enhance company's cost competitiveness that leverages opportunities created by upstream and downstream linkages with suppliers and customers. Therefore, understanding quality management in a supply chain environment requires a transition from the product to the process-oriented perspective towards quality [12]. Instead of

focusing at a single firm, quality managers must integrate their firms' practices with those of customers and suppliers. This study strengthens supply chain network by spreading quality management practices, techniques and tools through the whole chain.

II. Objective of the study

General objective of the study was to integrate or extend quality management practices and principles into the supply chain to improve company's cost competitiveness.

Specific Objectives include:

- Identify the critical factors (or variables) for quality supply chain and their causal linkages with companies cost competitiveness.
- Evaluate company's readiness to start the improvement process under the quality perspective at supply chain level.
- Maximize the overall value generated i.e. the difference between the worth of the final product as perceived by the customer and the effort undertaken within the supply chain to produce it.
- Access the current performance of the case company.
- Formulate a model for quality supply chain for Faffa Foods Share Company.

III. Methodologies

The methodologies used by this research to achieve the intended objective are as follow:

- Literature review on the subject matter: - sources reviewed include journals, books and trusted websites.
- Data collection procedures: - primary and secondary data's are collected from case company.
- The survey instrument: - This study measures both observable variables and unobservable constructs. Company size, process type, and ISO certification are observable data that can be measured directly. Time-based efficiency, cost-related efficiency, customer satisfaction, and business performance are latent constructs requiring indirect measurement. Further, the research uses some tools of total quality management as: cause and effect diagram and pareto chart.

IV. Literature Reviews

Supply chain defined as: Life cycle processes comprising physical, information, financial, and knowledge flows whose purpose is to satisfy end-user requirements with products and services from multiple linked suppliers [10]. In other words supply chain can be defined as the "network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product" [6]. According to Chopra and Meindl (2001), supply chain management involves the management of flows between and among stages in a supply chain to maximize total profitability". This definition suggests that SCM involves management of the flows of products, information, and funds upstream and downstream in the supply chain. SCM also entails making decisions about the locations of production facilities, which products to produce, how to produce them, and finally, how to distribute these products. We are now able to define the term Supply Chain Management as the task of integrating organizational units along a supply chain and coordinating material, information and financial flows in order to fulfil (ultimate) customer demands with the aim of improving the competitiveness of a supply chain as a whole.[3, 5]

A. Building Blocks of Supply Chain Management

I. Customer Service

According to a survey conducted by La Londe and Zinszer (Christopher 2005) there are three elements of customer service [5]:

Pre-transactional elements: relate to a company's activities preceding a contract. They concern customer access to information regarding the products and services a firm offers and the existence of an adequate link between organizations involved. Transactional elements: are all those which contribute to order fulfilment in the eyes of a customer. The availability of products (from stock) may be one option. If a product or service has to be made on demand, order cycle times play an important role. During delivery times a customer may be provided with information on the current status and location of an order. Post-transactional elements: mostly concern the service provided once the order is fulfilled. This includes elements like repairing or exchanging defective parts and maintenance, the way customer complaints are dealt with and product warranties.

II. Supply Chain Integration

Integration refers to the special building blocks that cause firms to collaborate in the long term, by focusing on: choice of partners, network organization and inter-organizational collaboration & leadership. [5, 7, 16]

III. Coordination

Coordination of information, material and financial flows are main component of SCM – comprises three building blocks: utilization of information and communication technology, process orientation and advanced planning.

Advances in information technology (IT) made it possible to process information at different locations in the supply chain and thus enable the application of advanced planning.

B. Quality Management and Its Application in Supply Chain

In many literatures quality management is strongly integrated with suppliers/supply chain. The fourth item of Deming's (1986) 14 points suggests in his book 'Out of the crisis': "Move towards a single supplier for any one item on a long-term relationship of loyalty and trust" [15].

Zhihai Zhang (1963) in his research on ‘Implementation of total quality management’ the second quality practice is supplier quality management which says companies must established long-term cooperative relations with suppliers, give due attention for quality in selecting suppliers, always participates in supplier activities related to quality, always gives feedback on the performance of suppliers’ products and regularly conducts supplier quality audit [16].

In Crosby’s (1995) book: “Quality without tears”, he writes about this operation: “Suppliers are educated and supported in order to ensure that they will deliver services and products that are dependable and on time” [14].

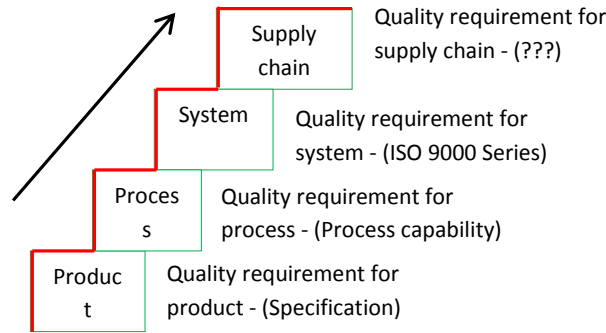


Fig. 1. Quality management objects in development

V. Result Discussion and Analysis

Major problems that hinder quality within and at supply chain for fafa foods Share Company discussed as follow.

A. Problem of integration

Supply, manufacturing and distribution systems are main actors of any supply chain network. In Faffa Food Share Company, the supply system includes raw material suppliers (local and foreign suppliers), packing material suppliers, machinery, equipment and accessory suppliers, input martial warehouses, etc. whereas the manufacturing system focus on production lines at which the raw material has been transformed into finished products. Lastly, the distribution system covers finished product warehouses, regional depots, sales agent, plant sales, whole sellers, retailers and end users (consumers). The problem here is these three systems are not well integrated and bring problems as:

- Frequent delays of orders between functional departments which causes’ productions downtime during peak demand period, then loss of customer trust.
- Due to lack of dependable supplier raw material purchase became very high because of their seasonal production behaviour.
- The company induced high capital tied up to purchase and store large quantity of raw materials.

Table 1. Average capital tied-up

Ser.No.	Raw material	Quantity (quintal)	Unit price (Birr)	Capital tied up (Birr)
1	Maize	50,000	680	34,000,000
2	Wheat	30,000	700	21,000,000
3	Chick pea	5,000	1,100	5,500,000
4	Soya bean	3,000	2,850	8,550,000
5	Oat (aja)	500	3,200	1,600,000
6	Barline	500	1,200	600,000
7	Others	2,000	--	800,000
Total				72,050,000

(Source: Company’s data, 2011)

B. Problems on Technology and Capacity Utilization

Technology: the company have to contend with problems often associated with high maintenance cost of old machinery and equipment. Faffa Foods Sc. incurs around 4,500,000Birr for maintenance due to frequent breakdown of old production machines

including purchase of spare parts. Capacity Utilization: Faffa Foods Sc. is currently producing under its full capacity. This is due to the company does not manage its suppliers properly and the three production lines wait each other for a single mixer.

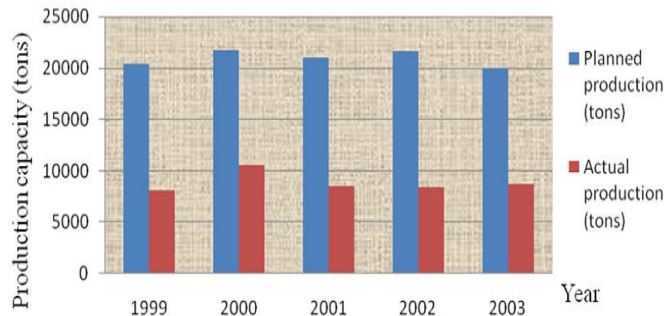


Fig.2. Comparison of actual and planned production of the company

C. Problem of Information Flow

In the company under investigation information sharing, within departments of the company and between suppliers and distributors is weak. The company used report based information flow which causes long communication time, difficult to get right information at right time, unnecessary labour force to move here and there and unsatisfied employee due to routine paper work:

D. Problems of Quality Quality problems at supply side:

Except government farms and private investors, traditional farmers did not properly use fertilizers and pesticides'. These causes low, insect attacked and immature farm output.

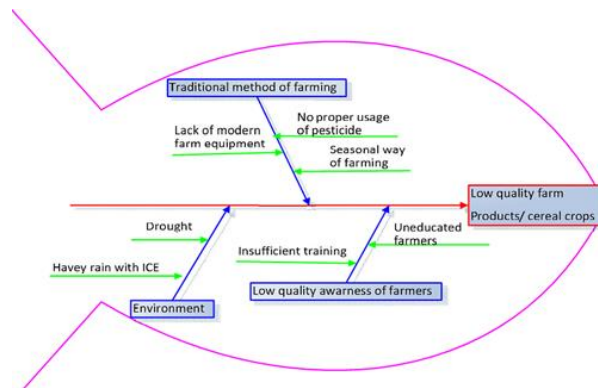


Fig. 3. Cause and effect analysis of low quality raw materials

Material loss: due to poor quality the company rejects many quintals of input raw material. These are determined by physical and chemical laboratory of the firm. The major raw materials with their respective quality parameters and quantities rejected are described below:

Soya Bean: Faffa Foods allowed maximum total impurity of 23% for the entrance of soya bean. This total impurity is summation of six component parameters that are checked independently.

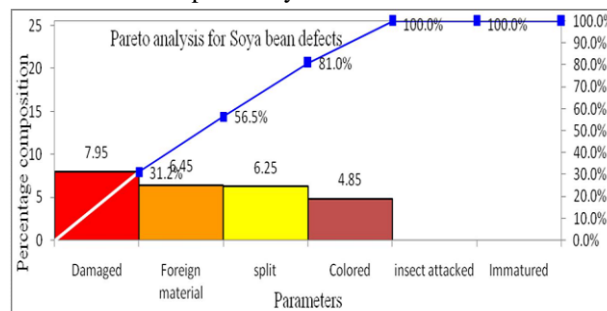


Fig. 4. Pareto analysis for Soya bean defects

This result shows that raw material damage (with mean of 7.95) is the most frequent quality problem that faced the company while foreign material (6.45) and split (with mean 6.25) followed.

The quantity of rejected soya beans due to these quality problems with their respective capital tied up for the suppliers in the last five years is listed below. The price of one quintal soya bean ranges from 2260 to 3200birr. Therefore, Capital tied up = rejected quantity * sales price/quintal.

Table 2. Quantity of rejected soya bean and cost incurred per year

Year	1	20	200	200	20
Rejected	3,	2,	2,0	4,8	3,
ted	524.	889	45.42	18	985.3
Capital tied up	9,	7,	5,5	13,	10
	620,	886,9	83,996.	153,14	,880,

This shows that, raw material soya bean, suppliers of Faffa Foods Sc. has faced averagely 3,452.36 quintals or 10,250,303.80 birr capital tied up and 13,809.44birr cost of transportation which include wages to load/unload truck, driver’s daily payment and fuel cost.

Chick Pea: Similarly the maximum allowed total impurity of chick pea is 10%, which is summation of six parameters as shown below.

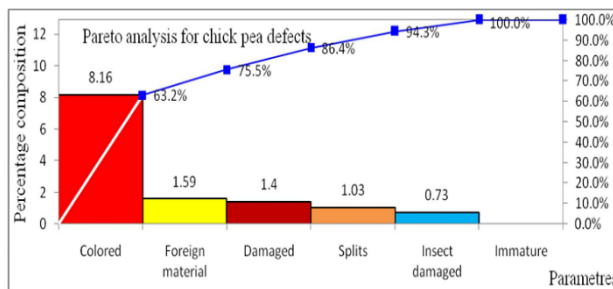


Fig.5 Pareto analysis for Chick pea defects

This result shows 63.2% of chick pea quality problem is due to color while the rest insect attacked, split, damaged and foreign material covers 36.8%. The quantity of rejected chick pea due to these quality problems with their respective capital tied up for suppliers in the last five years is listed below:

Table 3. Quantity of rejected chick pea and cost incurred per year

Year	1999	2000	2001	2002	2003
Rejected (in quintals)	523	654	356	866	1,475.85
Capital tied up	575,300	719,400	391,600	952,600	1,623,435

This shows that, raw material chick pea, suppliers of Faffa Foods Sc. has faced averagely 774.97 quintals or 1,099,368 birr capital tied up and 3,099.88birr cost of transportation which include wages to load/unload truck, driver’s daily payment and fuel cost.

Corn/Maize: The Company allowed 18.5% of total impurity level for corn. For corn there are five major parameters measured to check its quality.

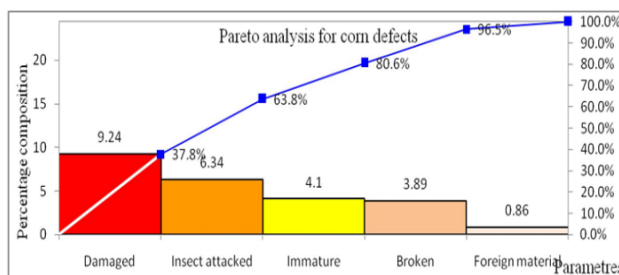


Fig 6. Pareto analysis for Corn/Maize defects

This result shows that insect attacked and damage, which covers 63.78%, are the major factors for raw material rejection while the rest immature, broken and foreign takes 36.22%. The quantity of rejected corn/maize due to these quality problems with their respective cost for the last five years is listed below:

Table 4. Quantity of rejected corn/maize and cost incurred per year

Year	1999	2000	2001	2002	2003
Rejected(in quintals)	5,634	3,998	4,862	4,856	5,004
Capital tied up	3,831,120	2,718,640	3,306,160	3,302,080	3,402,720

This shows that, raw material corn/maize, suppliers of Faffa Foods Sc. has faced averagely 4,871 quintals or 3,616,920 birr capital tied up and 19,484 birr cost of transportation which include wages to load/unload truck, driver’s daily payment and fuel cost.

Wheat: Also the company allows 9.5% total impurity for acceptance of wheat. In addition there are four quality parameters measured at the entrance.

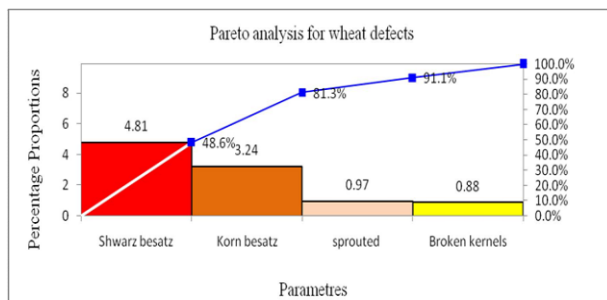


Fig. 7 Pareto analysis for Wheat defects

This result shows that broken kernels and korn besatz which cover 81.33% are major problems for rejection of wheat while sprouted and shwarz besatz followed by covering 18.67%. And the quantity of rejected wheat due to these quality problems with their respective cost for the last five years is listed below:

Table 5. Quantity of rejected wheat and cost incurred per year

Year	1999	2000	2001	2002	2003
Rejected(in quintals)	1,325	520	658	5,977	1,360.15
Capital tied up	927,500	364,000	460,600	4,183,900	952,105

This shows check pea suppliers of Faffa Foods Sc. has faced averagely 1,968 quintals or 939,803 birr capital tied up and 7,872birr cost of transportation which include wages to load/unload truck, driver’s daily payment and fuel cost.

Generally suppliers cost 44,265.32birr for transportation of rejected input materials. In addition, the company Faffa incurs labor cost, equipment cost and time for checking these impurities which didn’t predicted so far.

Quality Problems at Manufacturing Firm:

The company Faffa has awareness about quality management. It has implemented hazard analysis and critical evaluation process (HACCP) system and was ISO 22000 certified company. But the gap identified in the firm is that the company didn’t extend its quality management practice along chain partners. Further some of quality problems observed at the company include:

- The Company uses only one single mixer to all production lines, therefore due to the frequent change of input materials and inadequate cleaning system the final product quality lowers.
- The wheat flour mill was too old and it has got frequent frailer, this results shortage of wheat flour during peak production time.
- The company also has inadequate water well rehabilitation system, this leads to shortage of water during summer season.
- The company uses outdated steam boiler which needs high fuel consumption and faced frequent frailer which takes long time for maintenance, this interrupts production process.
- The company has outdated packing and printing machines, the current machines are working manually, even the company currently uses writing of expiration date manually this leads too long time to write compared to automatic writing machines and causes spoilage of foods due to hand contaminations.
- The laboratory weighting machines lacks accuracy due to long time usage; this causes incorrect proportion of input materials and then lowers quality of final output.

Quality Problems at Distribution Channel:

The final delivery system for relief product was better than that of supply side. The reason for this is those major customers (NGO’s and government organizations) have capabilities to take a product by their own.

VI. Proposed Models Of Quality Supply Chain For Faffa Food Sc.

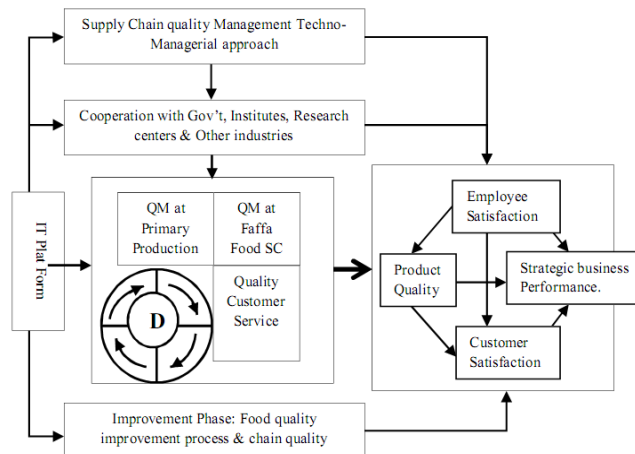


Fig. 8. Proposed model of quality supply chain

A. Supply Chain Quality Management Techno-Managerial Approach

The company must be capable of up to date technologies and information system. As it was shown in the problem statement the company uses old machineries and report based information sharing. But to achieve high quality system there must be state of the arte equipment's and appropriate information sharing mechanism using software's like MRP, MRPII, ERP, EDI etc. This software's enables the company to access on time status of every internal and external partner.

B. Cooperation with Government, Institutes, Research Centres & Other Industries

Government Role: Food safety experts from Asia (India, the Philippines, Thailand), Africa (Morocco, Burkina Faso, Ghana, Mauritania, Senegal), Latin America (Brazil, Costa Rica, Guatemala), and representatives of France, Germany, the United Kingdom, WB, FAO, WHO, and members of the European research community emphasize that food quality control cannot be applied successfully in each country without the support of government and industry (Hanak et al., 2002) [13].

In addition, as stated by Belay. T. may 2007; Ethiopia's industrial development strategic policy is designed primarily to use domestic agricultural products (raw materials) for local industrial production. [1] It appears planned ultimately to link agriculture and industry: agriculture produces industrial inputs, and industry produces agricultural inputs. For example, farms produce wheat for food processing companies, while chemical industries produce fertilizer. The policy-makers (government) thought this would facilitate industrial development which, in turn, would create an adequate market for domestic products in the country under private ownership. In addition to creating favourable conditions for private investors in various sectors of industries.

Role of Institutes and Research Centres: Since Faffa Foods Sc. is a food processing firm institutes and research centres play a great role on product quality and technological advancement. Departments like chemistry, biology and food engineering has direct link to product quality. While IT departments contribute to smooth flow of information and mechanical/electrical engineering contribute for design and installation of production equipment's.

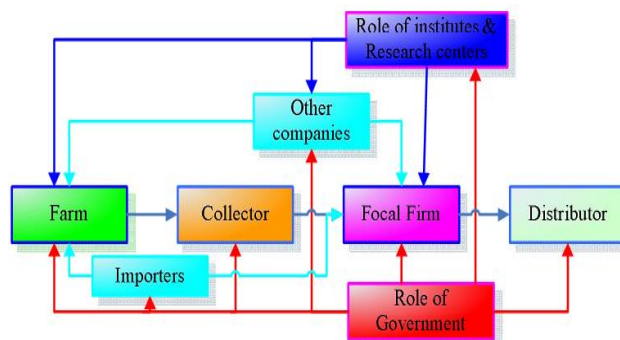


Fig. 10. Role of government, institutes and industries

C. QM at Primary Production/ Supply Side

Faffa Foods Share Company is a food processing firm and it uses most of its major raw materials from local suppliers which are traditional farmers. Therefore, to have a sustainable quality system along the chain the journey for quality must start at the cultivation of cereal crops and animal husbandry which are inputs for the company. By the time the company Faffa did not have a long term relation with its suppliers, and did not manage its supplier beyond the 1st tire currently as mentioned above. But the main

thing to be considered here to achieve high quality suppliers is that the company must work hardly on supplier selection, supplier development and supplier integration.

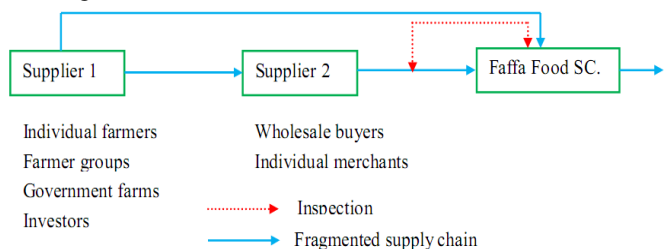


Fig. 9 Exiting supply system of Faffa Food Share Company

As mentioned in the problem statement the company uses only inspection for the incoming raw materials. It has not constant suppliers and select suppliers price wise. Therefore, the following model shows supply system quality management for the company. Supplier 1 represents farmers who cultivate cereal crops, at these stage main issues to be considered is usage of irrigation to prevent frequent occurrence of draught, usage of fertilizers and pesticides on time. These activities prevent occurrence of immaturity and insect attacked input materials. While supplier 2, indicates those wholesale buyer and individual merchants who buy raw materials directly from supplier 1/farmers. Their main responsibility is to transport materials from farmers to the company. Some of the quality aspects considered here are on time delivery with the required place and reasonable price, maintaining quality of materials transported i.e. preserve it from insects, moisture to prevent sprouted ness and damage.

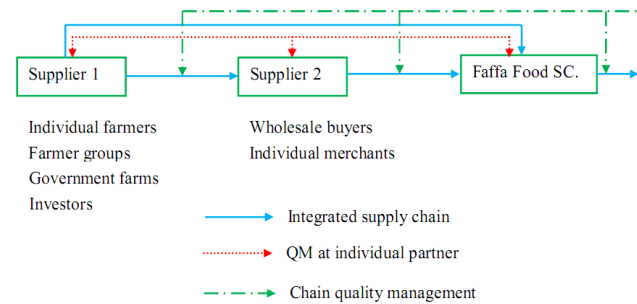


Fig. 11. Proposed supply system quality management

D. Quality management at Ffaffa Food Sc

The two major systems that must be implemented at company level in food processing firms are total quality management and HACCP system. But the company has good quality practice relative to other in the same sector. Faffa Foods Share Company has been implemented HACCP system and it was ISO 22000 certified company. Therefore, here it is necessary to use improvement methods, techniques, tools and formulate models for maintaining strong practice and improving both weak and strong practices because QM is a continuous improvement. Since the focus of this study is supply chain quality, here we will see quality management at the focal company. The quality management system applied at all levels of the company including product design, production process, inventory management and technology used and finally at distribution system.

E. Framework to Implement Quality Management

As stated by Zhihai Zhang, in his research on implementation of total quality management, there are 11 elements of total quality. In this thesis the current level of practice of each element are analyzed. These are management leadership, supplier quality management, vision and plan statement, evaluation, process control and improvement, product design, quality system improvement, employee satisfaction, recognition and reward, education and training, customer focus. The framework to implement the model was shown in the figure 33 and the following table shows current level of practice at Faffa Food Sc.

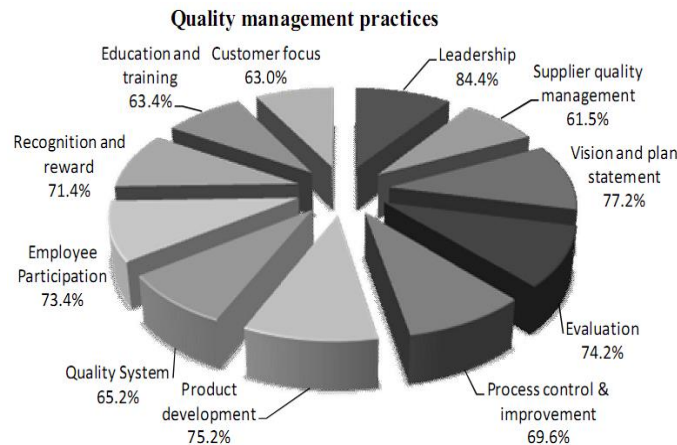


Fig. 12 level of quality practice at Faffa Food SC.

Management Leadership: The Company Faffa has relatively a good position at administration. The general manager actively participates in quality management activities and coordinates department heads and shop floor workers for improvement. From the guided interview it was obtained that 84.4% of elements of leadership practiced at the company.

Supplier Quality Management: As it was seen in the problem statement the company has poor supply system. The company’s past trend show that it doesn’t have a long term relationship with suppliers. They select suppliers that provide with fewer prices and considering quality as a second parameter to be checked later. The above analysis shows that it was the least practiced (61.5%) element from the 11 elements of TQM

Vision and Plan Statement: The Company has long term mission and vision statement which states as follow:

Vision: the vision of the company is to play a leading role in building mentally and physically capable generation by producing high nutritional value products while, becoming internationally competitive business entity.

Mission: the mission of the company is to produce and sell various kinds of pre-cooked baby foods, semi-cooked supplementary foods, protein enriched & fortified flours, emergency foods and related products of high nutritional value in response to the growing demands of consumers. Looking into the future, the company is planning to produce new products.

Process Control and Improvement: Even if the company have a well-organized laboratory, they didn’t use statistical process control techniques (SPC) to determine whether the process is in control or out of control. Therefore, by missing quality control techniques it is difficult to achieve process quality which is one aspect of total quality management.

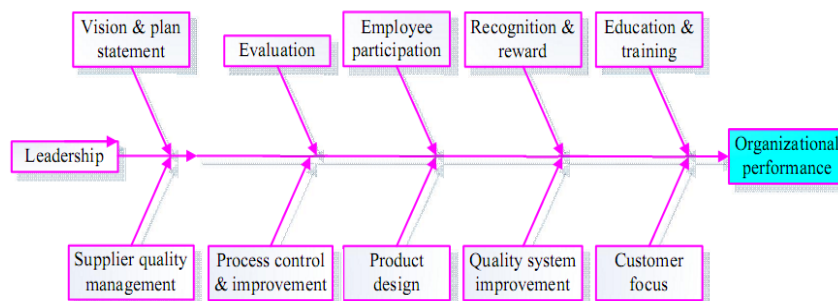


Fig. 13 Frame work for total quality management

Product Development: The Company achieves 75.2% of elements of product development. It is the best quality practices practiced in the company. For instance, Ediget milk was the company’s own product which is not produced by other companies.

Quality Improvement System: Since the company was ISO 22000 certified, it has a well-documented quality system. But the main problem here is that the company didn’t follow the document and it is just put as a paper work only. Theoretically they know about quality, but in the real situation the company doesn’t use quality tools, techniques and methods.

Employee Participation: Every employee has the power to control quality on process and work in collaboration with the supervisors. They have the right to come up with their own working problems because they don’t afraid being fired from the company. But, actually the company didn’t have structured quality circles and there is no job rotation in the company.

Evaluation: The Company regularly evaluates its employee satisfaction level. Employees are evaluated to improve their performance not for criticism. And quality related information are widely displayed at shop floor level.

Recognition and Reward: The Company give bonus for their employees as per the profit gained. Further, every employee has the right to get permission when he/she got personal problems.

Education and Training: As mentioned above most of the employees in the company are under grade 10 and certificate. By this situation the company doesn't have enough material for their employees to upgrade their status. In addition, training provided for employees are very few and on specific task not on quality issues. And those participate the training are departments heads not shop floor workers.

Customer Focus: Still now the firm has enough demand for their product. But they don't conduct any type of market analysis i.e. they didn't conduct market survey to understand what their customers need. Customer expectations, future requirements, and competitors' offerings remained unclear to a certain extent for product developers.

F. Distribution System Quality Management

It is important to note that the quality level delivered to final customer is the result of the quality management practices of each partner of supply chains, and hence each partner plays an important role in the production and distribution process. Therefore, it should be recognized that an essential ingredient of successful supply chain management is high quality logistics throughout supply networks. As stated by Millen and Maggard, 1997, there are about eight components that must be considered to have a quality distribution/ logistics system. [14] These are as follows:

- On-time delivery
- Total support of customer needs
- Consistency of order cycle
- Error-free transactions
- Accurate inventory information
- No goods damaged in handling or delivery
- Defined procedures and work instructions
- Reliable suppliers

A. Organization and Involvement

This shows the organizational structure for distribution system quality management and the peoples involved in it. But the system considered in this thesis is distribution systems quality management of the manufacturing firm/ Faffa Food SC. in collaboration with its suppliers and customers, not for an independent logistics provider organization.

The form of organizational structure used for supporting quality of the logistics system includes:

- Steering committee of senior staffs' management: - which controls and monitor the activities to be done.
- Departmental functional quality circles:- these are personnel's from functional departments of the company. They are responsible for setting quality specifications for the respective activities done i.e. they analysed and set what quality aspect must be seen during raw material entrance, inbound logistics, materials in/out flows in the warehouse, outbound logistics and the like.

There are also four approaches which could be used to administer a logistics quality program. But the two most frequently used approaches were "Specific employees dedicated to quality projects" and "all employees having some quality project responsibilities". While the rest are each manager have his/her own approach organizationally and quality is managed through an external department.

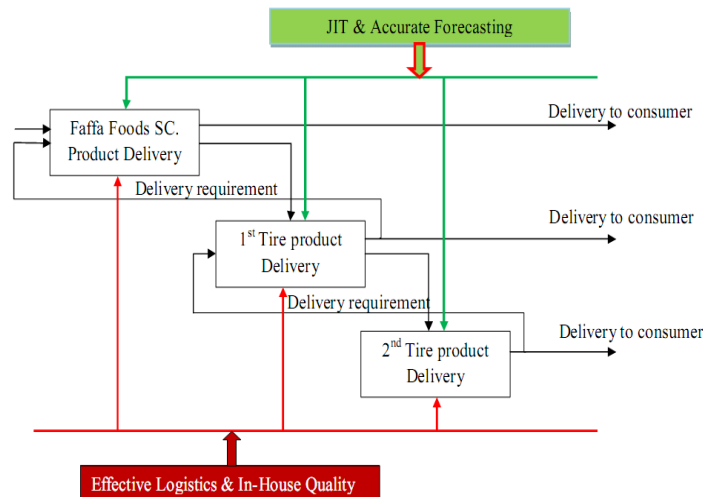


Fig.14. Proposed distribution system quality management adapted from [14]

Where: 1st Tire product deliveries include the six sales outlets at Addis Ababa, regional sales agents, government organizations and NGO's. And 2nd Tire product deliveries include holes and restaurant, whole sellers, retailers and individual users. But in the case where the distribution channel expands beyond 2nd Tire product delivery the model repeats itself in the same manner. Every partner along the distribution channel is a customer of its preceding member and supplier of the succeeding member. And satisfying

the ultimate customer is the final goal of total quality. Therefore, each partner is expected to fulfill the requirements of the succeeding member. As mentioned above these requirements/specifications are set by members of quality circles (expert from different departments).

VI. Conclusion

In the 21st century product or service quality is an industry's only insurance that it can compete successfully, whether in regional, national or world markets. Based on the analysis and interpretation of survey result the following conclusions are forwarded.

- The company didn't have a smooth information flow. That is, the company's main information transfer mechanism was a report based approach and to some extent telephone for personal contact.
- The six sales outlets at Addis Ababa for the company have a very small capacity and can't fulfill the local market demand.
- Among these six sales outlets, Bole Rwanda has small sales output averagely, 98.36 quintal per year. This shows that the company can't compete with supermarkets around there and can't satisfy needs of customer's especially high income consumers.
- The company have to contend with the problems often associated with high maintenance cost of old machinery and equipment. And it costs averagely 4,500,000Birr per year for maintenance.
- The company lacks reliable raw material suppliers especially for local inputs. Due to this poor quality the company rejects 3,452.36 quintals Soya bean, 774.97 quintals chick pea, 4,871 quintals corn/maize and 1,968 quintals wheat yearly.
- Due to rejection of major input raw material (Soya bean, chick pea, corn/maize and wheat) because of quality problems, suppliers cost 44,265.32birr for transportation annually.
- Foreign input materials such as vitamins, minerals and milk powder has relatively good quality.
- In addition, the company didn't use any quality control tools. Inspection was the only method that the company use to check quality from input materials through work in process and finished goods.

Therefore, after investigated the above results, this research formulates supply chain quality management model for Ethiopian manufacturing industries in general and Faffa Food Sc. in particular and analyzed its causal linkage with organizational performance. Further, the model for the case company was decomposed into supply system, manufacturing system and distribution system in order to implement the model easily. In addition, employee satisfaction, product quality and customer satisfaction are also included in this research; to the traditional performance measurement systems (total cost).

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