

Supply chain management practices and performance at Faffa Food Sh. Co.

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Abstract

The general objective of the study is to investigate the supply chain management practices and performances of Faffa Food Share Company. Descriptive and quantitative methods of research were used and data were collected by interview questions, document review and questionnaires. Open and close ended questions were used to describe the supply chain practices and supply chain performances using data obtained from secondary data sources. It was found that sourcing strategy and relationship management with majority of suppliers are reactive supplier selection and supplier dominant arm's length respectively. Low capacity utilization and efficiency for majority of production lines is not favorable for product focus production strategy. Reliability and responsiveness of the supply chain is good. Customer satisfaction on pre-transaction and transaction supply chain services is strong. But, it is weak with post-transaction supply chain services. It is concluded that, the supply chain practices and performance is not bad despite many internal and systemwide challenges. Specific recommendations revolving around sourcing, relationship management, and make or buy decisions are given. In addition, it is recommended to invest and work more in streamlining the supply chain system integration with supply chain partners through objective alignment, collaboration, data visibility, streamlining processes through removing unnecessary steps, and increasing responsiveness and resilience.

Key words: Supply chain practices, supply chain performance, Faffa Foods.

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1. Introduction

1.1. Background of the study

Organizations are facing different kinds of challenges in their effort of competing in today's dynamic global markets. The new paradigm in modern business management is that competition is no longer among individual business organizations, but rather among inter-networks in the supply chain (Drucker, 1998). The Global Supply Chain Forum describes Supply Chain Management as the integration of key business processes and resources from end user through original suppliers that provide products, services, and information that add value for customer and other stakeholders (Lambert, Cooper, & Pagh, 1998). The main goals of having Supply Chain Management are to offer good service to the final customer, while keeping costs and lead times low (Trkman, Stemberger, Faklic, & Groznic, 2006). Performance and efficiency improvement initiatives through Supply Chain Management are now becoming important factor in maintaining competitive advantage over competitors (Dannese & Romano, 2011). The general objective of the paper is, therefore, to investigate the supply chain management practices and performances of Faffa Food Share Company. The finding from this study will help a lot in designing and implementing an effective and efficient SC system to offer good service to final customer while keeping costs and lead times low.

1.2. Company background

Faffa Food Share Company, the pioneer food processing industry in Ethiopia, was established in 1962 as an Ethio-Swedish joint venture with the objective of reducing the risk of malnutrition among children in Ethiopia by providing low cost and high protein weaning food. It was privatized since

August 2009 to Petram Private Limited Company (Faffa Foods SC - Business Plan, 2013-15 GC).

1.3.Problem statement

Following privatization, Faffa Food Share Company has consistently worked to reform the business structure, expand the revenue base, and increase earning through business expansion. As a result, it was believed that, significant achievements were made in solving inherited operational problems, technical challenges, and dependency on relief aid products. Specifically, the company has worked a lot in improving the sourcing, production expansion, production efficiency, production line expansion, and product line expansion. It has also improved and optimized the distribution system by establishing distribution centers through sole agents and efficient door to door delivery and transportation. Eventhough the supply chain is well considered in the business strategy, the performance is not quantified and described (Faffa Foods SC - Business Plan, 2013-15 GC). According to anecdotal information from customers at different levels, the system lacks consistency in delivering right product of right quality, in the right quantity and time. Specifically, reliability as described by order fill rate, by type and quantity is believed to lack consistency. Asset Management Efficiency as described by months of stock on hand and inventory turnover is the other important supply chain indicator believed to have problem and affecting profitability a lot; and last but not least, idle capacity due to low capacity utilization and efficiency of all lines is also affecting the company's supply chain performance and profitability a lot.

1.4. Research questions

The research attempts to answer the following basic questions:

1. What are the supply chain strategies and practices of Faffa Food Share Company?
2. How is the supply chain performance of Faffa as described by reliability?
3. How is the supply chain performance of Faffa as described by responsiveness?
4. How is the supply chain performance of Faffa as described by asset management efficiency?
5. What is the level of satisfaction of Faffa's sole agents on the company's supply chain performance?

1.5. Objectives of the study

General objective

The general objective of the study is to investigate the supply chain management practices and performances of Faffa Food Share Company.

Specific objectives

Specifically, the objectives of the study are:

- to investigate the supply chain strategies and practices of Faffa Food Share Company;
- to evaluate supply chain reliability of Faffa;
- to evaluate responsiveness of Faffa's supply chain;
- to evaluate asset management efficiency of Faffa; and

- to assess the level of satisfaction Faffa's sole agents on the supply chain performance and product of the organization.

1.6. Significance of the study

Findings and recommendations from this study will have significance for Faffa, other food manufacturing industries, and relevant government policy makers working at different levels in the industry sector.

Significance of the study to Faffa:

- It will provide baseline information on the current supply chain practices, strategies, challenges, and bottlenecks.
- It will help in identifying weak links in the supply chain to prioritize interventions accordingly.
- It will help in diagnosing and evaluating customer focused and internally focused performance attributes of the supply chain for benchmarking and further improvement.
- It will also be used as an input in designing and implementing effective and efficient supply chain strategy that will significantly improve company's performance in terms of profitability and customer satisfaction.

Significance of the study to other food manufacturing industries and relevant bodies:

- The study will provide structural framework and guidance needed to investigate and evaluate the supply chain practices of food manufacturing industries in Ethiopia. It will also be used as an input in designing and implementing effective and efficient supply chain strategy that will

significantly improve companies' performance in terms of profitability and customer satisfaction.

- The study will highlight pertinent bureaucratic and system challenges and bottlenecks that will significantly impact the supply chain performances of the sector; since majority of food processing industries operate in relatively same environment.
- The study will contribute on the limited knowledge in the area of supply chain management of food manufacturing companies of Ethiopia.
- The study will provide insight for anyone who has interest on doing research on supply chain management of food industry.

1.7. Scope of the study

The scope of the study is investigation and evaluation of the supply chain practices of Faffa Food Share Company from suppliers to customers. The study does not include the supplier's supplier and the ultimate customer of the product due to time and budgetary constraints. Information regarding suppliers supply chain practices and performance is obtained from Faffa due to limitation of contact with suppliers. Only three among the five SCOR performance attributes were selected to evaluate the supply chain performance of Faffa Food Share Company due to limitations in documentation and knowledge of the subject matter.

2. Review of related literature

2.1. Supply chain management practices

Supply chain management (SCM) practices are defined as a set of activities undertaken in an organization to promote effective management of its supply

chain. The SCM practices of an organization could be described in terms their supply strategy to source raw materials and as a set of interlinked activities under production planning, inventory control, distribution, and logistics. The detail activities under these processes include: raw material scheduling and acquisition, manufacturing process design and scheduling (Process focus, repetitive focus, and product focus), material handling design and control, design and management of storage policies and procedures for raw materials/work in process/final product inventories, management of inventory retrieval, transportation, and final product delivery (Beamon, 1998).

Cox (2004), has described four sourcing options for buyers which guide the focus of relationship with suppliers and the level of work scope with suppliers and supply chain. Supplier selection and supply chain sourcing are reactive sourcing strategies whereby, suppliers from one or many tiers are chosen among many competing ones. Supplier development and supply chain management are proactive sourcing strategies whereby, buyers and suppliers at the first or many tiers collaborate more on long term basis.

Information sharing practice among companies, customers, and suppliers is an important component required to improve visibility of information to achieve seamless integration within the supply chain. The practice could be described in terms of type (quantity), quality, and level of participation (Zailani & Rajagopal, 2005; Huang, Sheoran, & Wang, 2004).

Information and communication technology (ICT) being process and product communication enabler is very important strategic factor for SC integration. It will help a company a lot in streamlining communication and developing

efficient responsive system (Tummala *et al*, 2006). ICT implementation should go along with the required process changes and re-design activities executed through incremental processes (Power, 2005).

In addition, (Cooper *et al*, 1997), have developed framework encompassing three interrelated elements to describe SCM and the level of integration of a system. Supply chain network structure includes members of supply chain (primary and supporting), structural dimension of the network (horizontal structure, vertical structure, and horizontal position), and the links between members of the supply chain.

In summary, supply chain (SC) practices of an organization could be described in terms of sourcing options and relationship management with suppliers, internal operations and logistics, information sharing practices, ICT implementation, and network structure.

2.2. Supply chain performance measures

Qualitative supply chain (SC) performance measures include customer satisfaction (pre transaction, transaction, and post-transaction), flexibility, information and material flow integration, risk management, and suppliers' performance in terms of delivering the right good in the right time. There are also quantitative measures based on cost and on customer responsiveness. Measures based on cost include cost minimization, sales maximization, profit maximization, inventory investment minimization, and return on investment maximization. Measures based on customer responsiveness include: fill rate maximization, product lateness minimization, customer response time minimization, and lead time minimization (Beamon, 1998).

The supply chain operations reference (SCOR®) has five core supply chain performance attributes broadly grouped under customer focused and internal focused (SCC, 2010). Reliability is customer focused attribute describing system's ability to deliver the right quantity and quality on the right time and supply chain operations reference (SCOR®). Key performance indicator (KPI) is perfect order fulfillment; responsiveness is customer focused attribute describing the speed at which tasks are performed and mostly expressed by cycle-time metrics and SCOR KPI is order fulfillment cycle time; agility is customer focused attribute describing the ability to respond and change according to external influences and SCOR KPIs include Flexibility and Adaptability; cost is internally focused attribute describing the cost of operating the process (labor, material, and transportation costs) and SCOR KPIs include cost of goods sold (COGS) and supply chain management cost; and asset management efficiency is an internally-focused attribute describing the ability to efficiently utilize assets. Asset management strategies in a supply chain include: inventory reduction and in-sourcing vs. outsourcing. Metrics include: inventory days of supply and capacity utilization. The SCOR KPIs include: cash-to-cash cycle time and return on fixed assets.

The table below describes theoretical framework used in describing the SC practices of an organization.

Table 2.1: Theoretical framework for SCM practices used in this study

SCM Operations	SCM Practices	Major References
Sourcing options	<ul style="list-style-type: none"> • Supplier selection, Supply Chain Sourcing, Supplier Development, and Supply Chain Management 	Cox, 2004
Internal Operations	<ul style="list-style-type: none"> • Raw material acquisition and scheduling • Manufacturing process strategies and design • Production scheduling and plant-product assignment 	Beamon, 1998 and Heizer, 2011
Inventory control	<ul style="list-style-type: none"> • Setting up optimal and minimum raw, WIP, and finished product inventory. • Design and management of storage policies and procedures for raw materials, WIP, and final product inventories. • Inventory management practices in place (ABC, record keeping system/accuracy, and cyclic counting) • FEFO and FIFO employment • No. of product types held in inventory • Models for determining reorder frequency and quantity and policy on inventory levels to be held 	Heizer, 2011, Ruteri and Xu, 2009
Distribution	<ul style="list-style-type: none"> • Retrieval and transportation from warehouse to whole sellers and retailers. • Distribution scheduling • Number of echelons (stages) • Distribution center (DC) - customer assignment 	Beamon, 1998 and Wong, 2005
Information sharing practices	<ul style="list-style-type: none"> • Type (strategic, operational, market, consumer, and logistics) • Coordination with distributors on demand forecasting and annual sales target development • Quality (accuracy and validity) 	Huang <i>et al</i> , 2004
ICT implementation	<ul style="list-style-type: none"> • Type (Fax/internet, bar-coding/scanning, Intranet...) • Extent of coordination among SC partners • System compatibility 	Tummala <i>et al</i> , 2006
SC network structure	<ul style="list-style-type: none"> • SC members (Primary Vs Secondary members) • Structural dimension of the network (horizontal structure, vertical structure, and horizontal position) 	Cox, 2004
Relationship management	<ul style="list-style-type: none"> • Arm's Length and Collaborative 	Cox, 2004

The figure below conceptually summarizes the relationship among major supply chain operations.

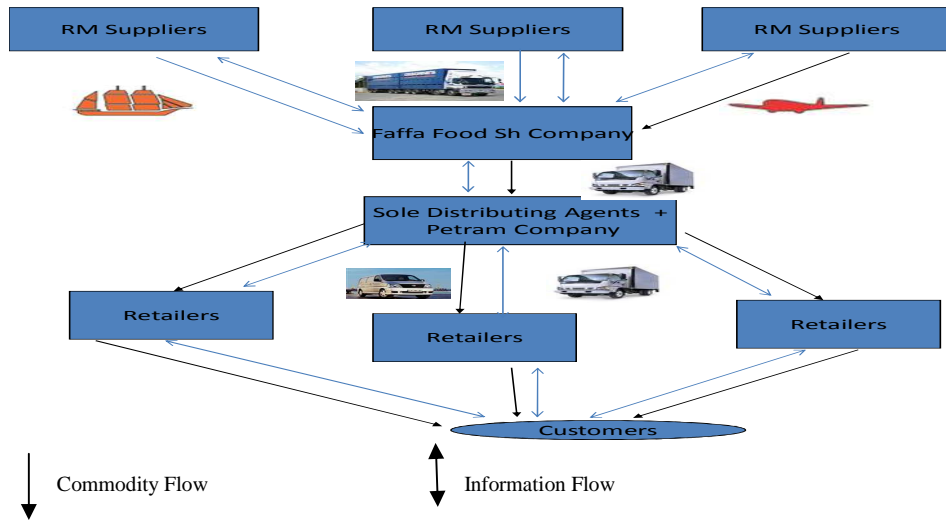


Figure 2.1: Conceptual framework for supply chain management practices of Faffa Food Share Company

The table below could be described as framework for assessing the supply chain performance of SCM.

Table 2.2: Theoretical framework for SC performance measures

Supply chain performance attributes	Measures and KPIs	References
I. Qualitative performance measures		
Customer satisfaction	<ul style="list-style-type: none"> • Pre-transaction satisfaction (service elements prior to product purchase) • Transaction satisfaction (service elements during physical distribution of products) • Post transaction satisfaction (support provided for products while in use) 	Beamon, 1998
Suppliers performance	<ul style="list-style-type: none"> • Consistency of suppliers in delivering raw materials on time and in good condition. 	Beamon, 1998
II. Quantitative performance measures		
Reliability	<ul style="list-style-type: none"> • Order fill rate by item and quantity 	SCC, 2010 and Beamon, 1998
Responsiveness	<ul style="list-style-type: none"> • Delivery lead time 	SCC, 2010 and Beamon, 1998
Asset management efficiency	<ul style="list-style-type: none"> • Inventory days of supply • Machine capacity utilization and efficiency • Inventory turnover • Percentage invested in inventory • Weeks of supply 	SCC, 2010 and Beamon, 1998

In summary, supply chain (SC) practices of an organization could be described in terms of sourcing options and relationship management with suppliers, internal operations and logistics, information sharing practices, ICT implementation, and network structure. And, supply chain (SC) performance could be measured using level of customer satisfaction on supply chain, suppliers' performance, reliability, responsiveness, and asset management efficiency.

3. Research design and methodology

3.1. Research design

The study has adopted explanatory design to describe and explain the supply chain practices of Faffa Food Share Company. Descriptive study design was used to describe and evaluate performance of Faffa's supply chain using selected key performance indicators from SCOR model. Qualitative approach was used to describe the supply chain practices and quantitative approach was used to evaluate Faffa's supply chain performance. The study was mostly cross sectional carried out in snap shot. But, longitudinal data was used to calculate and analyze trends for some of supply chain performance indicators.

The variables used to describe the supply chain practices of the organization are manufacturing process strategies, production scheduling, inventory control and distribution system, information sharing practices, ICT implementation, SC network structure, and relationship management.

The variables used to describe and evaluate the supply chain performance of the organization are customer satisfaction on the SC service, order fill rate, delivery lead time, weeks of supply, month of stock, percentage invested on inventory, inventory turnover, machine capacity utilization and efficiency, and production performance.

3.2. Population and sampling techniques

The basic unit of analysis for the study is Faffa Food Share Company supply chain; which involves suppliers, Faffa Food Share Company, and sole whole sale distributors.

Supply chain management (SCM) practices of Faffa Food Share Company (see Table 2.1) and supply chain performance (see Table 2.2) were discovered by the study.

Study samples were selected purposively in Faffa to include relevant professionals and subject matter experts for key informant interview. They were Manufacturing Director, Acting Sales and Marketing Director, Procurement and Material Management Director, Central Planning, RM Store Manager, and Finished Product Store Managers.

The whole population in the sampling frame of nine sole distributing agents was included in this study. But, eight out of nine responded; or response rate was 88.9 %.

3.3. Types of data and tools/instruments of data collection

Primary data sources were used to describe the supply chain practices and to further elaborate the reason for good or poor supply chain performance of Faffa Food Share Company. Data were collected through key informant interview.

- First, preliminary interview was conducted with the General Manager and the Manufacturing Director to get preliminary understanding on the general company background, supply chain management practices, and sole distributing agents. In addition, pre transaction, transaction, and post-transaction services provided in relation to the supply chain management practices were identified during this session. This has assisted the development of key informant interview questions and questionnaires.

- Open ended interview questions with tailored questions for core processes (Procurement, Manufacturing, Sales, and Store) in the organization were designed to qualitatively describe the supply chain practices of Faffa. Key informants in this interview were General Manager, Manufacturing Director, Acting Sales and Marketing Director, Procurement and Material Management Director, Central Planning, and Product Store Managers. Key informant interview was chosen as it was very difficult to get all relevant officials at once for focused group discussion.
- Structured questionnaire with grouped scale was designed to quantitatively measure suppliers' performance as perceived by Faffa's Procurement and Material Management Director. In addition, structured questionnaires with grouped scale were designed to quantitatively measure reliability and responsiveness of Faffa's supply chain as perceived by sole distributing agents. General Managers and/or sales supervisors in the territory have participated in the assessment.

Data obtained from secondary data sources like balance sheet, income statement, annual sales performance report, production performance report, and business plan were used to evaluate the supply chain performance of the company in terms of reliability, responsiveness and asset management efficiency. The specific methods, procedures, and techniques used in describing the supply chain performance were clearly described in section 3.5., Method of data analysis and table 3.1. Formulas to calculate SC KPIs along with secondary data sources. Specific key performance indicators include: order fill rate, delivery lead time, inventory turnover, months of stock, weeks of supply, and machine capacity utilization and efficiency.

3.4. Procedures of data collection

Relevant officials to be interviewed from Faffa were communicated ahead of time for them to get prepared in advance. The interviewer had asked and probed interviewees one by one using open and closed ended specific questions. Information regarding suppliers supply chain practices and performance is obtained from Faffa due to limitation of contact with suppliers using closed and open ended questions. Supply chain practices and performances of Faffa in relation to company's business operation is also obtained from Faffa.

For questionnaires, Faffa's sole distribution agents were communicated ahead of time for their consent. Then, the researcher filled the questionnaires by asking participants orally.

3.5. Methods of data analysis

The supply chain practices of Faffa were described and analyzed qualitatively as per the discussion outputs from key informant interview. These include, sourcing option, internal operation, logistics and distribution, information sharing practices, ICT implementation, supply chain network structure, and relationship management.

Suppliers' reliability by product group was analyzed based on the average perceived order fill rate for individual product groups. Individual, overall, and cumulative percentage of grouped order fill rates of local and foreign suppliers were calculated and compared. Supplier's responsiveness by product group was analyzed based on the average perceived delivery lead time for individual product groups. Individual, overall, and cumulative

percentage of grouped order fill rates of local and foreign suppliers were calculated and compared.

Descriptive statistics like mean, standard deviation and percentage were used to describe, analyze, and compare reliability (order fill rate) and asset management efficiency (inventory days of supply, inventory turnover,...) of Faffa. The variables used in calculating these figures were obtained from the company's annual expense and performance report, business plan, and balance sheet. That is, the table below shows formulas to calculate variables along with source document to obtain figures.

Table 3.1: Formulas to calculate SC KPIs along with secondary data sources.

Variables	Formula	Source Document
Order Fill Rate	Actual sales in ton in a year / Annual Sales Plan in ton in a year *100	Sales performance report
Machine Capacity Utilization within	Actual line output in ton in a year / Line DC in ton in a year * 100	Production performance report and business plan
Machine efficiency	Actual line output in ton in a year / Line EC in ton in a year * 100	Production performance report and business plan
Production Performance	Actual line output in ton in a year / Planned line output in ton in a year * 100	Production performance report and business plan
Inventory turnover	Annual COGS in birr / total inventory investment in birr	Income statement and balance sheet
Percentage invested in inventory	Total inventory investment in birr / total asset in birr * 100	Balance sheet
Months of Stock	Total inventory investment in birr / (Annual COGS / 12 month) * 100	Income statement and balance sheet
Weeks of Supply	Total inventory investment in birr / (Annual COGS / 52 weeks) * 100	Income statement and balance sheet

The pre-transaction, transaction, post-transaction, and overall satisfaction of Faffa's sole agents on the supply chain performance were analyzed using

descriptive statistics like mean, standard deviation, and percentage. Mean scale was calculated to come up with satisfaction figures for pre-transaction, transaction, and post transaction supply chain (SC) services. Based on this average figure, between 1 and 2 shows very strong satisfaction, between 2 and 3 shows strong satisfaction, between 3 and 4 shows weak satisfaction, and between 4 and 5 shows very weak satisfaction.

The pre-transaction, transaction, post-transaction, and overall customer satisfaction levels between Addis and Region based distributing agents were compared using Mann Whitney U test (Non-parametric analogue for independent t-test) based on exact P-value. This is because the sample size of Addis based and region based sole distributing agents are 5 and 3 respectively; which are less than 10 (Rosner, 2010). The analysis was based on the following hypotheses:

H₀1: There is no statistically significant difference in pre transaction customer satisfaction between Addis based and region based distributing agents.

H_a1: Pre-transaction customer satisfaction of Addis based sole distributing agents is better than region based ones.

H₀2: There is no statistically significant difference in transaction customer satisfaction between Addis based and region based distributing agents.

H_a2: Transaction customer satisfaction of Addis based sole distributing agents is better than region based ones.

H₀3: There is no statistically significant difference in post transaction customer satisfaction between Addis based and region based distributing agents.

H_a3: Post-transaction customer satisfaction of Addis based sole distributing agents is better than region based ones.

H₀4: There is no statistically significant difference in overall customer satisfaction on SCM performance between Addis based and region based distributing agents.

H_a4: overall customer satisfaction on SCM performance of Addis based sole distributing agents is better than region based ones.

Faffa's supply chain performances as described by order fill rate and delivery lead time as perceived by sole distributing agents are analyzed using descriptive statistics like mean, standard deviation, and percentages.

4. Results and discussions

4.1 Results

The interview result with General Manager, Manufacturing Director, Acting Sales and Marketing Director, Procurement and Material Management Director, Central Planning, and Product Store Managers was used to describe the supply chain management practices of Faffa as follows:

The vertical network structure of Faffa includes around 20 firms on the first tier supplier side and more than 10,000 firms (sole distributing agents and retailers) on the customer side. The horizontal network structure includes firms like Ethiopian Cork providing wrap and cut service. Sourcing strategy with all foreign suppliers with exception of Le Safre and Hexagon is supplier selection. Sourcing strategy with Le Safre and Hexagon is more of collaborative or supplier development strategy. Supply chain management is also practiced as sourcing strategy with farmers producing quality enhanced yellow maize. The relationship management style with all foreign suppliers with exception of Le Safre and Hexagon is supplier's dominant arm's length relationship or buyer's non-adversarial arm's length. Whereas, the

relationship management with some suppliers like Le Safre and Hexagon is supplier dominant collaborative relationship and buyer dominant collaborative relationship is the relationship management style with yellow maize suppliers around Bako.

There is no inventory control system and model in place that helps in deciding quantity and time of order. Stock prioritization and classification techniques like ABC are also not practiced and implemented. The distribution system is designed for products to go solely through only six sole distributors in Addis Ababa and three in regional capital cities.

Type and extent of information sharing practices of Faffa with raw material suppliers, customers, and within the organization is limited to basic operations and logistics with majority of suppliers. But, more strategic and operational level information like demand plan, operation, and quality control are shared with limited suppliers like Le Safre and Hexagon. The internal information management system is not well integrated and harmonized to get optimal output. The practice with sole distributors, even-though not uniform, is mostly on operational level information like short-term demands like sales target.

ICT implementation initiatives including the basic ones (fax, internet...) and the oracle based software is satisfactory. The implementation didn't necessarily go along with the required process changes and re-design activities. The usual outstanding challenges in relation to change management and culture are also pertinent in Faffa's context.

The SC performance of Faffa as per the analysis of company secondary data and result from structured questionnaires are as follows:

Capacity utilization and efficiency for all lines except for extrusion line is away below 50%, which is not favorable for product focus production process strategy.

The overall sales performance in 2005 was 87 % with high variation among product groups (Magi mix 205 % and Corn flakes 29 %). Dramatic increase in sales performance was observed comparing the figures in 2003, 2004, and 2005. The order fill rate as perceived by majority sole distributing agents for all product groups with exception of Cornflakes is more than 50%.

Delivery lead time for available products according to Faffa and sole distributing agents is between 1 to 2 weeks.

Average values for asset management efficiency taking calculated figures from 2003, 2004, and 2005 has shown assets committed to inventory to be 27%, inventory turnover to be 2.4, and MOS to be 5.3.

Customer satisfaction on pre-transaction and transaction supply chain services is strong or more. But, it is weak on post-transaction supply chain services and pre-transaction training services. And, the 1-tailed exact significance value on Mann Whitney U test has shown that there is no statistically significant difference between Addis and Region-based sole distributing agents in pre-transaction, transaction, and overall customer satisfaction level; and the post-transaction customer satisfaction for Addis-based sole distributing agents is better than Region-based sole distributing agents.

4.1. Discussion

4.1.1. SCM practices

Faffa has made major strategic supply chain decisions that have tremendously affected the horizontal and vertical supply chain network structure. These include: the company's decisions to make cutting and wrapping of flat tins in house (make or buy decision), since Ethiopian Cork is not reliable and responsive enough in fulfilling Faffa's requirement in terms of quality, delivery lead time, and fill rate. And also, Faffa had intentionally narrowed down the number of tier one customers to free up resources and capability to manage the whole supply chain even beyond tier one customers. But still, Faffa is oriented closer to the customer side of the supply chain network.

The production process strategy is product focus for all lines, which is designed to achieve competitive advantage in terms of low cost business strategy with moderate level of responsiveness and differentiation. The firm has the required level of standardization and quality control system in place. The product focused facilities and lines can produce differentiated products in terms of packaging and size to address multiple segments of customers. According to Heizer (2011), to gain most out of this strategy, the company's volume of production and utilization should be high or the process will be too expensive for low volume and utilization. Production scheduling depends on the forecasted sales target, which in turn is based on market demand and company's capacity to meet the demand. So, scheduling activity is concerned with establishing a rate of output to meet sales forecast.

Good and effective inventory control system is crucial for big manufacturing firms like Faffa to strike a balance between inventory investment and

customer service. And also, inventory is one of the big impact areas to consider for cost reduction. All in all, companies can never achieve low cost strategy without good inventory management system (Heizer, 2011). Standard warehousing and inventory management practices like labeling, categorization, record keeping, and FEFO policy are well implemented in both raw material and finished product warehouses.

The forward vertical integration gave Faffa control over how products are marketed (advertising, product positioning, and marketing channel), ability to maintain/control product quality, and ability to maintain company's reputation in such imperfect and fragile market. Distribution center (DC) customer assignment is based on sales volume, client load, and distributor's performance.

Information sharing practice among companies, customers, and suppliers is an important component required to improve visibility of information to achieve seamless integration within the supply chain (Zailani & Rajagopal, 2005). The level of collaboration and trust with most suppliers with the exception of Si Lesafre doesn't allow sharing information beyond basic logistics-related information needed for short term transaction. Vertical integration through contracting has also created appreciable level of coordination and collaboration with sole distributors.

4.1.2. Supply chain performance

The low performance level of local suppliers in horizontal and vertical network structure is related to efficiency and capacity to timely deliver the right quantity in the right quality. Low capacity utilization and efficiency of production lines clearly means availability of huge idle capacity which is attributable to limitations of finance (specially LC and foreign currency),

infrastructure like electricity and water, raw and packing material availability, horizontal and vertical SC network partner efficiency, and internal operation efficiency (production, inventory control, and sales/marketing). High utilization and line efficiency are needed for product focus or continuous production lines to compensate for high fixed cost (Heizer, 2011).

Fill rate maximization is the SCOR KPI for SC reliability, customer focused attribute describing system's ability to deliver the right quantity and quality in the right time (SCC, 2010). The overall sales performance in 2005 was 87% with variations among product groups (205 for Magi mix Vs 29 for Cornflakes), showing gap in planning and optimizing the sales and production targets. In addition, several internal and external factors like consistent availability of raw and packing materials, delivery lead time, operation efficiency, capacity, and/or demand-supply situations affect the overall figure. Order fill rate by product group as perceived by sole distributing agents is somehow different, the highest being Cerifam product groups and the lowest being Corn flakes and Snack food groups. This shows imbalance in demand and supply.

Asset management efficiency is an internally-focused SC performance attribute describing the ability to efficiently utilize assets (SCC, 2010). Increased level of investment on raw material and finished product inventory in 2005 has made assets committed to inventory in percentage the highest. Relatively, 2004 is a good year for inventory turnover, mostly due to high sales performance on relief product line. According to the projection plan, inventory turnover will be expected to remain constant (2.5) since the company is planning to increase both COGS and inventory level to utilize idle capacity (market and sales) and meet unmet demand. Months of stock

levels on average are relatively good (5-6 months) as the average raw material delivery and production lead time for a product is 5-6 months.

Enhancing customer satisfaction is one among important objectives of SCM according to many authors (Tummala *et al.*, 2006; Trkman *et al.*; Habib, 2011). The high level pre-transaction customer satisfaction is due to good and satisfactory contract management, credit facility, and flexible payment scheme in place. Low level of supply chain integration as described by non-collaborative relationship, poor communication, and information sharing practices with suppliers and customers are few among many reasons to be cited for low performance in terms of delivering the right quantity in the right time. The quality complaints and low performance in delivering the right quality are mostly in relation to tin packaging materials wrapped and made in Ethiopian Cork. Eventhough standard recall and logistics support system for distributors is well in place in paper, the company is not committed enough to implement the system to avoid short term costs. This will have long term implication in terms of profitability.

5. Conclusions and recommendations

5.1. Conclusions

The supply chain is characterized by narrow and long network structure on the supplier side combined with short and wide structure on the customer side.

Reactive sourcing strategy for majority of core raw material suppliers along with arm's length relationship management puts Faffa's supply chain performance and profitability at risk. Because, the ability to deliver the right products in the right quantity, and timely depends highly on limited suppliers.

The company is losing a lot of fortune due to poor inventory control practices as it was practically seen with Fontera. In addition, inventory is major cost saving area as it takes significant portion of the asset (27%).

The numbers of distribution centers are not sufficient to access Ethiopia's vast market.

The level collaboration in terms of technical bonding and seamless information sharing is not satisfactory. This is because, the existing level of vision alignment and relationship doesn't allow this level of integration.

ICT projects are not going along with the required process changes and re-design activities. Rather, they are implemented to improve processes individually without considering the big picture.

Supply chain related challenges of Faffa could be summarized under supply, internal, demand, and external factors.

- Supply side challenges include capacity and competency (for local suppliers), flexibility, reliability, and power/leverage circumstances.
- Challenges in relation to internal operation include capacity, competency, and motivation. Imperfect market system, demand uncertainties, and reliability are few among demand related challenges.
- Country system inefficiency, regulatory and bureaucratic procedures and requirements, infrastructure (light and electricity), and shortage of foreign currency are external factors outside the Faffa's circle of influence but still inside circle of concern.

Low capacity utilization and efficiency for all lines is not favorable for product focus production strategy involving continuous lines.

The mismatch between production plan and sales plan shows the gap in planning, optimizing, and matching sales and production targets. Introduction of new products like Abay and Magi Mix along with the collaborative relationship with Le Safre have contributed to the marginal increase in sales performance in 2004 and 2005.

The aggressive plan to increase sales performance in the coming years is mostly through increasing inventory.

Reliability – order fill rate as perceived by majority of distributing agents for all product groups with the exception of Cornflakes and Famix commercial is good. The variation with sales performance figures from secondary data is related to supply and demand imbalances.

Low level of customer satisfaction on post-transaction supply chain services and pre-transaction training support service have the potential to affect company's long term profitability and existence. Level of dissatisfaction of region-based sole distributing agents is higher than Addis based sole distributing agents.

5.2.Recommendations

Faffa needs to make strategic supply chain decision revolving around sourcing, relationship management and make or buy decisions. Power and leverage circumstance and importance and uniqueness of the raw materials are among the main factors to be considered. Specifically, Faffa needs to work on:

- backward integration to source unique and important raw materials like quality enhanced yellow maize. This will help a lot to internalize system related inefficiencies and mitigate supply side problems. But, more

collaborative relationship based on mutual trust and benefit with limited reliable local suppliers should be the way to go for majority of less important raw materials.

- the relationship management with foreign suppliers that should be segmented and based on mutual benefits and trust with win-win mentality.
- the decision to internalize the wrapping and sealing operation for packing materials should also be given high priority; and
- should also look for licensing agreement with known foreign cornflakes producer to produce the right quality for the market. This will help a lot in facilitating the knowledge and skill transfer in a short period of time.

The company should work hard and invest more to bring the required level of integration both at the suppliers and customers side to improve customer satisfaction, sales performance, and reduce cost. This involves objective alignment, collaboration, data visibility, streamlining processes through removing unnecessary steps, and increasing responsiveness and resilience.

- Core internal processes should be integrated to optimize and utilize limited resources efficiently. This includes developing simple linear model relating sales, demand, and production. It is believed that, it will help a lot in mitigating efficiency problems arising due to poor planning and coordination as it was observed in variation in sales performance figures (Magi mix Vs Saba).
- Integration with first line customers through collaboration and relationship should be improved to bring mutual benefit and trust (win-win).
- Standard inventory control system, that helps decision makers when and how much to order and maintain an appropriate stock level should be

implemented. This will in turn improve profitability through minimizing shortage and oversupply.

The company should work hard and invest on improving visibility of information to achieve seamless integration with limited reliable suppliers and customers within the supply chain. In addition, improving the information management system for the operation to focus only in the collection and analysis of important data used in decision-making should be priority. In addition, the importance of data in supply chain decision should be promoted in parallel.

Process automation should follow process mapping and improvement to avoid optimization of sub-optimal process. That is, ICT implementation should go along with the required process changes and re-design activities executed through incremental processes. Change management activities should also be part of the overall automation initiatives to minimize risk associated with human factors mostly due to resistance to change.

Aggressive marketing and sales strategy should be designed for newly introduced but less demanded products like Soya and Cerifam without forgetting to optimize production and sales performance according to the demand level.

It is also advisable to adopt supply chain monitoring systems taking KPIs from SCOR model. This should be considered in the company's business strategy.

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