INTERNATIONAL JOURNAL OF SOCIAL Sciences and Information Technology
ISSN 2412-0294 www.ijssit.com
http://www.ijssit.com

EFFECT OF INVENTORY CONTROL MANAGEMENT ON THE OPERATIONAL PERFORMANCE OF SUGAR MANUFACTURING INDUSTRIES IN KENYA: A CASE OF NZOIA SUGAR COMPANY

[1*] **Ron Muhande**
muhanderon@gmail.com

[2**] **Dr. Amuhaya Iravo**
miravo@jkuat.ac.ke

[1*] *Scholar, Jomo Kenyatta University of Agriculture and Technology*

[2**] *Senior Lecturer, Jomo Kenyatta University of Agriculture and Technology*

Abstract

Inventory management and determining of optimal inventory level have a vital role in the point of the productivity of firms' operations especially for the firms which operate on manufacturing industry. This study has a vital importance because of several reasons. There are limited numbers of studies relevant to discrete components of inventory performance and financial performance of many processing companies Inventory control management is the activity that organizes the availability of the items to the customer. It coordinates the purchasing, manufacturing and distribution functions to meet the market needs. The outcome of the study is a set of recommendations and a framework that would help in improving the performance of Nzoia Sugar Company and the entire sugar manufacturing sector in Kenya. The findings revealed that the variables had a significant effect on operational performance. In particular to determine the effect of Inventory management technique, Inventory cost and Computerized Inventory management on operational performance in sugar manufacturing companies in Kenya.

Keywords: Control Management, Continuous Replenishment System (CRP) , Operational Performance

INTRODUCTION

On a global point of view, Vikram *et al.,* (2012) directed a study on inventory management systems and supply chain collaboration that assumes table supply side. The researcher's discoveries inferred that inventory management offices were all the more eager to have seller overseen inventory system to keep up predictable supply and joint effort amongst partners. A related study by Adeyemi *et al.,* (2010) concentrated on inventory management advancement instrument in Coca-Cola Bottling industry in Nigeria. The analyst reasoned that right amount, quality and timing of inventory is accomplished by use proper inventory management systems. In an Indian context, Ramachandran and Jankriaman, (2009) study reinforced the favourable bond between inventory and firm's performance. An affirmative and significant link between inventory days-reduction and profitability using a sample of UK firms which was reported by researchers Pong and Mitchell, (2012). Recently, Elsayed (2015) observed a

positive relationship between inventory efficiency and financial performance using a sample of Egyptian firms.

A local study conducted by Ng'ang'a (2013) on inventory management systems concept, focusing on the effectiveness of inventory management in Ministry of State for Provincial Administration and internal security in Nairobi. The study concluded that delay in procurement and frequent stock outs affected the organization performance. Githendu *et al.* (2008) asserts that firms that have centralized stock holding have an advantage because they are able to control the stocks and avoid stock duplication in their subsidiaries.

There are different ways in which Inventory control can be done within the company so as to prevent the company from incurring unnecessary inventory losses made by different departments. Measures which can be put in place for example stock-taking which is the accounting of stock at every end of the month, so as to record the lost and available stock. Making proper supervisions during the on the production line so to avoid spoilage and wastage materials by the production line attenders. The company should set up strict rules to procurement officers and store managers which they should follow during purchasing and storing of material so as to avoid loss of inventory within the sugar company.

In view of Nzoia sugar company

Nzoia Sugar Company Limited (NSC) is one of the key players in Kenya's sugar Industry. Nzoia Sugar Company is located in Bungoma County, Bungoma South sub-County, 5 Kilometers from Bukembe, off the Webuye-Bungomahighway. The Company serves over 67,000 farmers in the larger Bungoma, Kakamega, Lugari and Malava. It is situated at a latitude of 0° 35'N and a longitude of 34° 40'E, and an altitude of between 1420-1490 meters above sea level.

The Company was established in 1975, under the Companies Act Cap. 486 of the Laws of Kenya with Memorandum and Articles of Association and issued a certificate of incorporation No.C13734 dated 1st August, 1975. The Government is the majority shareholder owning 98% shares while Fives Cail Babcock (FCB) and Industrial Development Bank owning the remaining 2%.NSC produces sugar and supports cane production through the provision of extension services to farmers with an extensive Company nucleus cane estate covering 3,600 ha and an out grower zone spanning more than 23,500 ha under cane.

The company had an initial milling capacity of 2000 tons of cane per day (TCD). In 1989, this capacity was expanded to 3000 TCD. While this growth was phenomenal, optimum utilization was not realized due to plant operational limitations. The company however has to attain optimum utilization of the factory capacity at 3000 TCD and 315 tons of sugar per day by undertaking factory rehabilitation and product diversification to enable the company remain competitive and also attractive for privatization. The company further intends to enhance the factory capacity to 7000 TCD and 735 Tons of Sugar per day during the current Strategic Plan period. Nzoia Sugar Company initially started packaging sugar in denominations of 100 kg bag. New denominations of 50Kg, 25kg, 10kg and 5Kg bags were introduced by the year 2000. Thereafter, the company introduced the 1st of its branded Sugar in the year 2003. The sizes of the branded sugar then were in 2kgs, 1kg and 1/2kg packets. This brand was dominant for several years until the year 2010.

Statement of the Problem

In recent past, sugar processing companies in Kenya have experienced a lot of challenges in while trying to carry out its inventory management and material control processes, this has in return impacted more negatively on the performance of

this very companies in the country. Sugar Companies incur loses through poor inventory management ranging from Raw material, work-in-process, finished goods and total inventory along the product processing line. Sugar companies face special challenge in keeping inventory at reasonable levels due to the difficulty of forecasting demand and expectations of customers about product availability (Coyle, Bardi, & Langley, 2003).

According to the parliamentary committee, Kenya sugar manufacturing companies have been performing poorly something that has been attributed to more highly by poor inventory management practices among other reasons. A report by IBM outlines that 79% of supply chain officers report that lack of visibility significantly impact on supply chains. To start, companies should take a holistic view into knowing both core vs. non-core items and when they should be ordered. Core items are those that you sell year round and need continuous replenishing of stock. By separating these out from non-core (or seasonal) items inventory levels can be much more aligned with an established schedule and product lifecycle.

A report by parliament on Parastatal factories like Nzoia sugar company are notorious for not collecting cane from farms on schedule due to poor inventory and capacity constraints on their part. The amount of sucrose they extract per tonne from late harvests is low, meaning that they have to crush a larger amount of cane than an efficient factory to extract the same amount of refined sugar - adding to their already monumental inefficiency problems.

According to Lining, & Ying (2008), the inventory investment for companies takes up a big percentage of the total budget yet inventory control and management is one of the most neglected areas in many sugar manufacturing companies. Many of the sugar companies find themselves with either less inventory in relation to the demand or more inventory. The researcher therefore wants to investigate the relationship between inventory management and operational performance of sugar companies in Kenya, while focusing on Nzoia Sugar Company.

Objectives of the study

The study's specific objectives were to;

i. Determine examine whether various inventory management techniques affect the operational performance of Nzoia sugar company.

ii. Determine the effect of inventory costs on the operational performance of Nzoia sugar company

iii. Examine whether computerized inventory management influences the operational performance of Nzoia Sugar Company.

iv. Examine the relationship between inventory management on operational performance of Nzoia sugar company.

Conceptual Framework

Jabareen (2009) defines "Conceptual framework as a network, or "a plane," of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena" The conceptual framework is a set of broad ideas used to explain the relationship between the independent variables (factors) and the dependent variables (outcome).

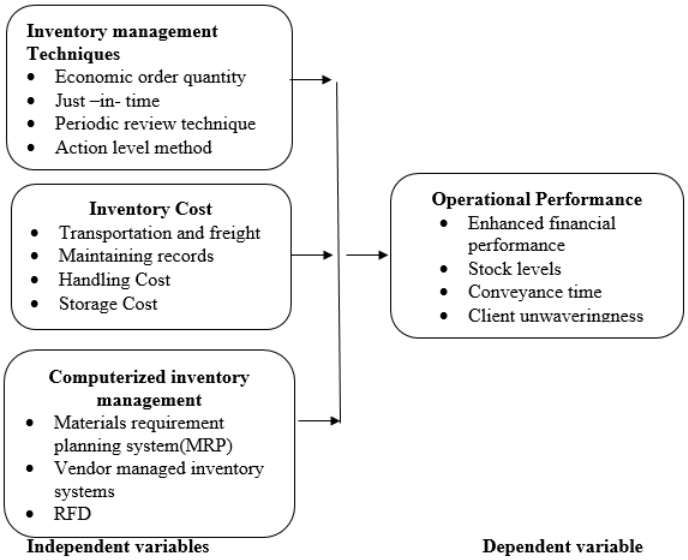

Figure 1: conceptual framework

RESEARCH METHODOLOGY

The study adopted both descriptive analytical research designs. Descriptive design was used in establishing the company performance and the analytical research design was used to establish relationship between inventory control and performance. The survey used the employee's population of 1200 of Nzoia sugar company from which a sample size was determined by formulae of Krejcie Morgan (1970). Both primary and secondary data was used in the survey. Primary data was collected by the use of questionnaires while. Frequency tables, and graphs was worked out basing on the data entered into excel. In these frequency tables, and graphs analysis was done with a corresponding percentage. However statistical packages for social sciences (SPSS) used to determine the relationship between the variables. Findings were represented using statistical methods and results presented in form of tables, percentages; data collected was analyzed concurrently while the results were interpreted based on the theme of the study.

RESULTS AND DISCUSSION

Pilot Test

Table 1 Reliability Test

Variables	Cronbach's Alpha
Inventory management technique	0.745
Inventory cost	0.732
Computerized inventory management	0.715
Operational Performance	0.752

Table 1 Presents the results from the pilot study where 10 % of the target population was involved. The respondents in the pilot study were excluded from the actual study. It can be observed that the reliability and internal consistency of the items constituting; Inventory management technique, Inventory cost, Computerized inventory management and Operational Performance construct was established. The overall Cronbach's Alphas for these variables was 0.745, 0.732, 0.715 and 0.752 respectively which were above the required cut off value of 0.7, therefore all the item in the questionnaire were reliable.

Descriptive statistics

Inventory management techniques

Table 2 Inventory management techniques

Opinion Statement	Statistic	Std. Error
The company full effected economic order quantity As an inventory management strategy	4.37	.114
There are orders done on JIT method	4.41	.117
Inventory in the company are review regularly	4.42	.122
The firms has adopted action level method	4.37	.113
The firms apply various techniques depending or customers preferences	4.39	.119
Orders are delivered on time due to adoption of inventory management techniques	4.43	.130

The study sought to examine the respondent's level of agreement or disagreement on the various measures of employee performance. Table 4.6,

presents the relevant results which show that on a scale of 1 to 5 (where 1= strongly and strongly disagree=5). The responses had means of; The company full effected economic order quantity As an inventory management strategy 4.37, There are orders done on JIT method 4.41, Inventory in the company are review regularly 4.42, The firms has adopted action level method 4.37, The firms apply various techniques depending or customers preferences 4.39 and Orders are delivered on time due to adoption of inventory management techniques 4.43

Inventory Cost

Table 3 Inventory Cost

Opinion Statement	Mean	Std. Error
Transport and freight cost are manageable	4.29	.130
The cost of maintaining inventory record is economical	4.39	.134
The inventory cost has been a major unit of low profitably	4.33	.132
The firm incur high storage cost	4.40	.132

The study sought to examine the respondent's level of agreement or disagreement on the various measures of employee performance. Table 3, presents the relevant results which show that on a scale of 1 to 5 (where 1= strongly and strongly disagree=5). The responses had means of; Transport and freight cost are manageable 4.29, The cost of maintaining inventory record is economical 4.39, The inventory cost has been a major unit of low profitably 4.33 and The firm incur high storage cost 4.40.

Computerized inventory management

Table 4 Computerized inventory management

Opinion Statement	Mean	Std. Error
The firms has installed computerized inventory management system	4.21	.136
Orders are managed electronically	4.24	.129
There is a system linking the customers inventory movement	4.26	.142
The firm has a vendor managed inventory system	4.20	.134

The study sought to examine the respondent's level of agreement or disagreement on the various measures of employee performance. Table 4, presents the relevant results which show that on a scale of 1 to 5 (where 1= strongly and strongly disagree=5). The responses had means of; The firms has installed computerized inventory management system 4.21, Orders are managed electronically 4.24, There is a system linking the customers inventory movement 4.24 and The firm has a vendor managed inventory system 4.20.

Operational performance

Table 5 Operational performance

Opinion Statement	Mean	Std. Error
Due to inventory management the firm financial performance has improved	4.60	.127
Timely delivery of orders	4.55	.114
There is reduced customers complaint	4.71	.114
There is Reduced stock variances	4.63	.110

The study sought to examine the respondent's level of agreement or disagreement on the various measures of employee performance. Table 5, presents the relevant results which show that on a scale of 1 to 5 (where 1= strongly and strongly disagree=5). The responses had means of; Due to inventory management the firm financial performance has improved 4.60, Timely delivery of orders 4.55, There is reduced customers complaint 4.71 and There is Reduced stock variances 4.63.

Correlation Test

Table 6 Correlation Test

		Operational Performance	Inventory management Technique	Inventory Cost	Computerized inventor Management
Operational performance	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	82			
Inventory management technique	Pearson Correlation	0.849**	1		
	Sig. (2-tailed)	0.000			
	N	82	82		
Inventory cost	Pearson Correlation	0.774**	0.625**	1	
	Sig. (2-tailed)	0.000	0.000		
	N	82	82	82	
Computerized inventory management	Pearson Correlation	0.739**	0.614**	0.534**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	82	82	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

From table 6 it can be observed that the correlation between the independent variables and the dependent variable was high and positive at 0.849, 0.774, and 0.739 for Inventory management technique, Inventory cost and Computerized inventory management respectively. The interpretation was that the level of multicollinearity between the independent variable was not very high.

Regression Results

Model Summary

Table 7 Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.927[a]	0.860	0.854	.34423341

a. Predictors: (Constant), Management, Inventory cost, Inventory management technique

From table 7 the values of the adjusted R square were 0.854. This value clearly suggests that there is a strong relationship between, Inventory management technique, Inventory cost and computerized inventory management operational performance. This indicates that Inventory management technique, Inventory cost and computerized inventory management causes a variation of 85.4 % on operational performance. The conclusion is that the three variables used only explains 85.4 % of the variation on the dependent variable.

Analysis of variance

Table 8 ANOVA- Analysis of Variance

Model		Sum of Squares	df	Mean Square	F-statistics	Sig.
1	Regression	56.663	3	18.888	159.394	0.000[b]
	Residual	9.243	78	.118		
	Total	65.906	81			

The results in Table 8 indicates that the overall models was a good fit since the value of F-statistic was found to be 159.394 and their p-values were found to be 0.000 which is less than the critical value of 0.05. This suggest that all the three variables considered were relevant in explaining the operational performance.

Regression Coefficient

Table 10 Regression Coefficient

Variable	Unstandardized Coefficients		t-Statistic	P-Value
		Std. Error		
(Constant)	1.314	0.380	3.458	0.000
Inventory management Technique	0.471	0.059	7.928	0.000
Inventory Cost	0.319	0.054	5.943	0.000
Computerized Inventory Management	0.257	0.053	4.849	0.000

The fitted regression model is

$$Y = 1.314 + 0.471 X_1 + 0.319 X_2 + 0.257X_3 + \varepsilon$$

Standard Error	0.380	0.059	0.054	0.053
t-Statistics	3.458	7.928	5.943	4.849
p-value	0.000	0.000	0.000	0.000

Where; Y = Operational performance, X1 = Inventory management Technique, X2 = Inventory Cost, X3 = Computerized Inventory Management, ε = Error Term,

Inventory Management Technique

From table 10 the regression coefficient of Inventory Management Technique was found to be 0.471. This value shows that holding other variables in the model constant, an increase in Inventory Management Technique by one unit causes the operational performance to increase by 0.471 units. The value of the coefficient is also positive. The positive effect shows that there is a positive relationship between Inventory Management Technique and operational performance in the sugar processing industries.

The coefficient was positive and also statistically significant with a t-statistic value of 7.928. The p-value was found to be 0.000. These findings are in line with those of Robert (2004) and Van (2004) who found that Inventory Management Technique had effect on operational performance. Robert (2004) in particular note that the reasons for physical stock taking are to verify the accuracy of stock records that support the value shown in the balance sheet by physical verification of the item. This may even disclose frauds, theft or loss and any weakness in the system of custody and control of stock. Van (2004) asserted that the size and number of surpluses and deficiencies revealed by stock taking is a good criteria to assess the efficiency of store keeping methods and material control procedures. The interpretation was that Inventory Management Technique causes the performance to increase. The stakeholders in the sugar manufacturing industries in Kenya sector should consider the effect of Inventory Management Technique to their performance.

Inventory Cost

From table 10 the regression coefficient of Inventory Cost was found to be 0.319. This value shows that holding other variables in the model constant, an increase in Inventory Cost by one unit causes the operational performance to increase by 0.319 units. The value of the coefficient is also positive. The positive effect shows that there is a positive relationship between Inventory Cost and operational performance in the sugar processing industries.

The coefficient was positive and also statistically significant with a t-statistic value of 5.943. The p-value was found to be 0.000. These findings are in line with those of Laugero (2002); Tersine (2002); Cordell (2006) and Peurifoy (2000), who found that Inventory Cost had effect on operational performance. The interpretation was that Inventory Cost causes the performance to increase. The stakeholders in the sugar manufacturing industries in Kenya sector should consider the effect of Inventory Cost to their performance.

Computerized Inventory Management

From table 10 the regression coefficient of Computerized Inventory Management was found to be 0.257. This value shows that holding other variables in the model constant, an increase in Computerized Inventory Management by one unit causes the operational performance to increase by 0.257 units. The value of the coefficient is also positive. The positive effect shows that there is a positive relationship between Technique Computerized Inventory Management and

operational performance in the sugar processing industries.

The coefficient was positive and also statistically significant with a t-statistic value of 4.849. The p-value was found to be 0.000. These findings are in line with those of Carter and Price (1995) who found that Computerized Inventory Management had effect on operational performance. Carter and Price (1995) assert that information is the life blood of all organizations. Inventory manager needs information technology in order to succeed in his work. Computers can assist stock control in calculating the optimum amount of stocks to hold and dispatch in order to satisfy the users requirements. The computer can do this by comparing inventory variables (stock levels, demand and delivery dates). The Electronic Data interchange, EDI is a system which enables direct communication between organizations without there being any human intervention. This technology has revolutionized inventory management. The interpretation was that Computerized Inventory Management causes the performance to increase. The stakeholders in the sugar manufacturing industries in Kenya sector should consider the effect of Computerized Inventory Management to their performance.

Coefficient Correlations

Table 11 Coefficient correlations

	Inventory management technique	Inventory cost	Computerized Inventory management
Inventory management technique	1.000		
Inventory cost	0.445	1.000	
Computerized Inventory management	0.425	0.244	1.000

Table 11 shows the coefficients correlation matrix. The results shows the correlation is fairly low implying that the model is a good-fit. The low values are also an indication of low multicolinearity among the variables.

Residual Scatter plot

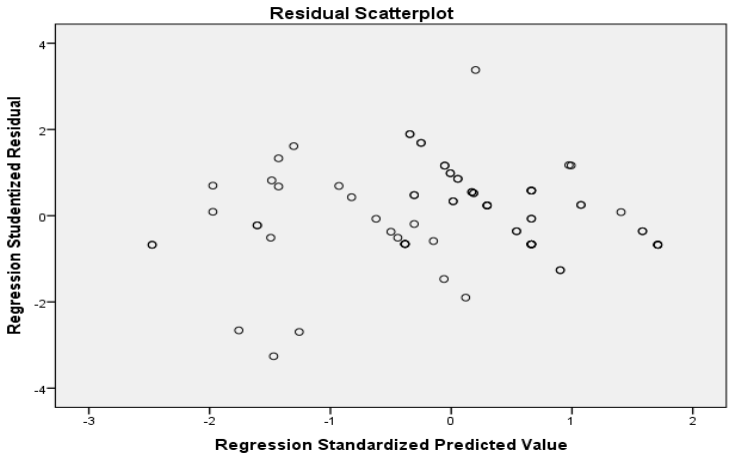

Figure 2 Residual Normality Test

Figure 2 shows the plot of the residuals in the model. The result shows that the residuals are very close to the value of zero. This means that the model is well identified. Since the residuals are closely packed around the value of zero line it shows that there is homoscedasticity in the residuals. The conclusion is that the estimates from the model were identified optimally.

Summary of the Findings

This study was set to investigate the effect of inventory control management on the operational performance of sugar manufacturing industries in Kenya. In particular the study sought to assess the effect of Inventory management Technique, Inventory Cost and Computerized Inventory Management on operational performance. The study used questionnaire as the data collection instruments. The research employed use of graph and tables to present the descriptive results and multiple regression for the inferential analysis. Prior to actual data collection and analysis the questionnaires were pretested on a 10% section of the target population to assess the reliability of the included items. From a total of 120 questionnaires

that were administered only 82 of them was recovered from the respondents.

The findings noted that 70 % of the respondents were male and 30% were females. The interpretation was that more males work for the sugar manufacturing industries in Kenya compared to the females in Kenya. It was also noted that majority of the workers had worked for a duration of between 5 to 9 years. On the level of education more respondents were holders of a university degree than any other qualification. The study also employed multiple regression as an analytical tool to reveal the effect of inventory control management factors on the operational performance of sugar manufacturing industries in Kenya. Each of the variables used was found to have a statistically significant effect on the bank's ability to retain customers.

Conclusion

Inventory management Technique

The Inventory management Technique variable was measured using three constructs; The company full effected economic order quantity; As an inventory management strategy; There are orders done on JIT method; Inventory in the company are review regularly; The firms has adopted action level method; The firms apply various techniques depending or customers preferences and Orders are delivered on time due to adoption of inventory management techniques. All these measures were directed to measure the effect of inventory management technique on operational performance. The qualitative results presented showed that indeed these measures were taken to be important measures. This was revealed by the high number of the respondents who agreed. The regression analysis also revealed that inventory management technique has a positive effect on operational performance.

Inventory Cost

Inventory cost was measured using three construct; transport and freight cost are manageable, the cost of maintaining inventory record is economical, The inventory cost has been a major unit of low profitably. All these measures were directed to measure the effect of Inventory Cost on operational performance. The qualitative results presented showed that indeed these measures were taken to be important measures. This was revealed by the high number of the respondents who agreed. The regression analysis also revealed that inventory cost has a positive effect on operational performance.

Computerized Inventory Management

Computerized Inventory Management was measured using three construct; The firms has installed computerized inventory management system, Orders are managed electronically, There is a system linking the customers inventory movement and The firm has a vendor managed inventory system. All these measures were directed to measure the effect of Computerized Inventory Management on operational performance. The qualitative results presented showed that indeed these measures were taken to be important measures. This was revealed by the high number of the respondents who agreed. The regression analysis also revealed that Computerized Inventory Management has a positive effect on operational performance.

Recommendation

Inventory management Technique

This study, argue that sugar manufacturing industries in Kenya should be keen on inventory management technique. Since this variable was found to have a positive significant effect on operational performance, the managements of these sugar companies should make sure that they identify techniques that affect inventory management and subsequently operational performance. In particular the manufacturing

industries should invest money in ensuring that the staff has the necessary training on the inventory management.

Inventory Cost

This study, argue that sugar manufacturing industries in Kenya should be keen on Inventory Cost. Since this variable was found to have a positive significant effect on operational performance, the managements of these sugar companies should make sure that they identify techniques that affect Inventory Cost. In particular the manufacturing industries should invest money in ensuring that the staff has the necessary training on the Inventory Cost.

Computerized Inventory Management

This study, argue that sugar manufacturing industries in Kenya should be keen on computerized inventory management. Since this variable was found to have a positive significant effect on operational performance, the managements of these sugar companies should make sure that they identify techniques that affect computerized inventory management in particular the manufacturing industries should invest money in ensuring that the staff has the necessary training on the computerized inventory management.

Recommendation for further research

Future research should be directed towards identifying more management factors that affect operational performance. From the regression model it was noted that the variables included were only able to explained 85.4 % of the variation in operational performance. This study therefore recommends the improvement of this model by including more variables that are relevant in explaining the variation some of which have been mentioned above.

REFERENCES

Alm. N. (2000). Bank Management (4th Ed), Fort Worth, Dryden Press.

Laugero. J. (2002). Financial Management and Policy, Eleventh Edition. Prentice Hall Lin A Simon and Schuster Company, U.S.A.

Olubodum. C. (1995), The Law of Business Organisation in East and Central Africa. East African Literature Bureau, Nairobi.

Van. H. (2004). Financial Management and Policy (4th edition) Prentice Hall, London

Robert. L. (2004). Management of information technology. Bankers work book series chartered institute of Bankers.

Coyle. J. J., Bardi, E. J., & Langley, C. J. Jr. (2003). The Management of Business Logistic: A Supply Chain Perspective (7th ed.). Mason:

Institute of Social Accountability (2010). Geographical locations. Nairobi.

Jonson, G. (2000). Packaging Technology for the Logistician (2nd ed.). Lund: Lund University.

Kenya, E. P. (2005). Kenya sugar industry report. Nairobi: PKF Consulting Ltd.

Kenya National Bureau of Statistics, (2009). Kenya Population and Housing Census. Nairobi: KNBS

Lining, B. & Ying Z. (2008). Improving Inventory Management in Small Business, jonkoping international business school. journal. Jonkoping International Business School Journal.

Mugenda. O.M. &Mugenda, G.A. (1999). Research method: Quantitative and Qualitative Approaches. Nairobi: Acts Press

Onwubolu. G.C., & Dube B. C. (2006). Implementing an Improved Inventory

Control System in a Small Company: A Case Study. Production Planning & Control. Journal of Business Study , 17(1), 67-76.

Pienaar. W. (2009). Introduction to Business Logistics. . Southern Africa: Oxford University.

Reinaldo F. dosSantos, F. A. Silva J. Murta & Artur H. Moellmann. (2010). A Real Application of the Theory of Constraints to Supply Chain Management in Brazil. Brazilian Journal of Operations & Production Management, 7 (2).

Riordan. M. & Williamson, O. (1985). Asset specificity and economic organization. International Journal of Industrial Organization , 3, 365-78.

Rosenblatt, S. (1977). Modern Business- A Systems Approach (2nd ed.). Boston: Houghton Mifflin Co. Publishers

Ryzin. G. J. (2001). Analyzing Inventory Cost and Service in Supply Chains. Columbia: Columbia Business School.

Saghir. M. & Jonson, G. (2001). Packaging Handling Evaluation Methods in the Grocery Retail Industry, Packaging Technology and Science. Lund: Lund University.

Salmon, K. (2011). Maximizing Inventory Efficiency. Retrieved from www.kurtsalmon.com

Schroeder. R.G. (2000). Operations Management-Contemporary Concepts and Cases. USA: International Edition.

SimchiLevi. D., Kaminsky, P., & SimchiLevi, E. (2004). Managing The Supply Chain: The Definitive Guide For The Business Professional. New York: McGraw-Hill.