

Supply Chain Management on Project Profitability: A Case Study of Teuscher Investment Project in Rwanda

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Abstract

A case study of Teuscher investment project in Rwanda was undertaken to examine the adoption of the Supply Chain Management on the project profitability. The study design included use of pre-tested questionnaires, interviews, focus group discussions, and questionnaires administered to the selected respondents through drop and pick-later technique in a period of six months. A sample size of 50 respondents was drawn from the sample frame using simple random sampling technique. Data were entered in SPSS statistic version 16 and then analyzed using descriptive statistics that included frequencies, tables, charts and histograms. Levels of statistical significance were determined using chi square. Despite all the interventions, in Rwanda today, there is limited information/data available on the effect of supply chain on product profitability, up-to-date information on challenges and if it serves as a driving force for agriculture project to be more profitable in international market. The result indicated that majority (64%) of the respondents were male, 36% were female while 54% of the respondents were degree holders, 24% diploma, 6% postgraduate and 16% certificate and below. This difference may be due to the nature and employment policy of the work which involves dealing with machines, skills, knowledge and carrying heavy loads which females and persons with low levels of education may not prefer doing or being employed in. Most of respondents (46%) were from production department, 52% worked with the company between 1-5years implying that they have worked for a reasonable period to know about supply chain management, coffee production and business profitability. On supply chain management systems 76% of the respondents agreed that was used in Teuscher Investment, 84% agreed its contribution to the profitability of a company with 28% selected ERP system as very efficient 44% it reduces the chances of human error, shorter planning times and faster inventory turnover. There was a strong positive correlation between supply chain management and profitability ($r = 0.914^*$ and significant level = 0.01) meaning that when supply chain management is effective profits will increase. In conclusion SCM system used in Teuscher Investment is ERP system that was an effective realistic and flexible SCM system and had significant benefit for any business when implemented well the main challenges were maintenance, implementation costs and selected training costs. Teuscher Investment should try and improve on supply chain management to meet its set vision, mission and objectives, respond quickly to changes in demand and determine accurate customer delivery dates, partnerships and reduction of long supply chains, putting suggestion boxes for the organization and do more networking and advertising of their products.

Introduction

Coffee is the biggest foreign currency earner in Rwanda, in some years accounting for over 70 % of all exports [1]. Around 470, 000 small holders grow coffee in Rwanda on approximately 37, 000 hectares. Since 1992, production and quality of coffee have been adversely affected as a result of war and the subsequent abandonment of coffee areas [2]; Production is currently approximated at 16,040 tons, down from 97,000 tons in 2002 [3,4]. The history of coffee in Rwanda dates back to 1905 when German missionaries introduced coffee plantations in the highlands [5,6]. Since early 1920s, the country became an exporter of semi-washed bourbon Arabica coffee. The colonial authorities enhanced its production through intensive extension services and by 1927 it became mandatory to farm coffee in Rwanda [7,8]. In order to be competitive in the world market, many exporting companies including the coffee industry in Rwanda have to meet the challenges and demands posed by the current global trading environment. According to Lin CT [9], the question is how these companies can use their competitive advantage in the global supply chain to run their global market operations. Globalization has restructured the business world and introduced the concept of a global supply chain. A global supply chain consists of companies networking and outsourcing all over the world [10,11]. In a global supply chain, outsourcing has brought the promise of better margins and has become big business. There are several reasons for doing outsourcing. Outsourcing is a popular strategy for many industries to reduce production costs and enable the industries to focus on core competition [12] Profitability is the ability of a business to earn a profit [13]; A profit is what is left of the revenue a business generates after it pays off all expenses directly related to the generation of the revenue, such as producing a product, and other expenses related to the conduct of the business activities [14]. Many organizations have begun to recognize that supply chain management is the key to building sustainable competitive edge for their products and services hence enhancing the profitability of Rwandan coffee in effective way in international markets. In

the current global market, industries have to plan and design an effective supply chain, either upstream or downstream so as to satisfy customers in effective way. In current global terms, supply chain management is now better known as global supply chain management and involves the fundamental balancing of supply and demand on a global basis [1]. According to Meyr H [15], global supply chains are a source of competitive advantage. An effective supply chain provides opportunities to create competitive advantage and lead to agricultural projects to be more profitable [16,17]. The effective management of a supply chain is measured by the decline in lead time, decline of raw material, improved product quality and efficiency which affect the company and business profitability [18,19]. Evidence suggests that business enterprises now focus on supply chain management to improve quality business enterprises now focus on supply chain management to improve quality and lead-time [20,21].

Rwandan coffee is not more profitable in a global free trade market. This is because of their low level of competitiveness, high transportation costs. In order to meet the challenges that Rwandan coffee is facing in an accelerated global economy, supply chains have become a key component to Rwandan coffee to be more profitable in international market. Since many coffee exporters come from developing countries, the profits generated by the coffee industry helps to facilitate the distribution of wealth from middle and high-income countries to developing countries. In addition, coffee exports also play a vital role in servicing foreign debt [22]. This area of globalization, the concept and implementation of a supply chain is an integral component of industrial activity.

The supply chain concept and its mechanism has been a part of industrial activity for some time now for agricultural projects [23,24]. Coffee industry in Rwanda, like all industries cannot function effectively and be more profitable without effective supply chain management for coffee, the chain is usually complicated and differs from country to country but in general it includes: growers, intermediaries, processors, government agencies, exporters, dealers/brokers, roasters and retailers [3]. However, as O'brien J [25] states, there are constraints that affect developing countries from achieving global supply chain competitive advantage and these constraints are lack of infrastructure such as transportation, communication, skillful labor and technology utilities and the equipment. By setting up a supply chain, a company will be able to establish itself as a global industry with a worldwide distribution network. It is on the above back ground that this study has been carried out in order to find out whether supply chain in Rwanda using the Teuscher Investment project as case study is well implemented and can affect positively the profitability of agriculture projects hence gaining a competitive advantage in the market place.

Table 1: Education level of the respondents.

Education level	Frequency	Percentage
Certificate and below	8	16
Diploma	12	24
Degree	27	54
Post graduate	3	6
Total	50	100%

Source: primary data.

Methodology

A cross-sectional survey was conducted, based on the 2014 census of Teuscher Investment limited (reference!). A total of 98 workers were cross examined in three months in the period 2016-2017 and using a simplified process of determining the sample size for a finite population, [26] table, the ultimate sample size was determined to be 50 respondents. The 50 workers were randomly selected using systematic random sampling method at Teuscher Investment Company located in Kicukiro-Kigali town. The data were collected, entered into excel spread sheets and analyzed in (SPSS, 16 versions).

Results and Discussion

Descriptive statistics

The descriptive statistics shows the demographic information of the respondent which includes gender of the respondents, education level, age of the respondents, department of the respondents and duration worked in the company.

Gender of respondents

Results in Table 1 indicate that, majority of the respondents (64%) were male and 36% were female. This shows that more males were employed in Teuscher Investment Project than female because of the nature of the work which involves dealing with machines and carrying heavy loads which females may not prefer doing. This result is in agreement with the report by [27,28].

Education level of the respondents

Results in Table 2 indicate that, majority of the respondents (54%) were degree holders, 24% diploma, 6% postgraduate and 16% certificate and below. This shows that employment policy requires that the staff should be at least degree holders who are knowledgeable and have the skills to help management achieve the desired vision, mission and objective of the organization.

Age distribution of the respondents

Results in the Table 3 indicate that, 16% of the respondents fall under the age of 41-50, 30% belonged to the age group 31-40, 36% fall under the age of 26-30years, 8% were above 50years and 5% were under 26 years. Majority of the respondents belong to the age group 26- 30. Implying that the company has energetic and responsible employees who carry out their work effectively and understand supply chain management as supported by the research by [17].

Results in Figure 1 indicate that, 12% of the respondents were

Table 2: Showing the age distribution of the respondents.

Age	Frequency	Percentage
Under 26 years	5	10
26-30 years	18	36
31-40 years	15	30
41-50 years	8	16
Above 50 years	4	8
Total	50	100%

Source: primary data.

Table 3: Showing duration worked in the company.

Duration	Frequency	Percentage
Less than 1 year	10	20
1-5years	26	52
5-10years	14	28
Total	50	100%

Source: primary data.

from finance department, 28% from management department, 46% from production department this may be due to heavy, hard work needed within the company, 6% from purchasing department and 8% from stores department. This agrees with the report by Webber CM [29]. Majority of the respondents were from production department. This shows that more people are employed in production of coffee.

Duration worked with the Company

Results in Table 4 indicate that, 28% of the respondents have worked between 5-10 years, 52% between 1-5years and 20% of the respondents have worked for less than 1 year. Majority of the respondents have worked between 1-5years, implying that they have worked with the company for a reasonable period may be to maintain the experienced, skilled, reduce on employment expenditures, trainings for new workers and to know about supply chain management and the profitability of Teuscher Investment Project. This is agreement with report by [30].

Results in Table 5 indicate that, 76% of the respondents agreed that supply chain management systems were used in Teuscher Investment while 24% disagreed. Majority of the respondents agreed. This shows that supply chain management systems are a competitive strategy for integrating suppliers and customers. Although 28% disagreed it cannot overturn the outcome because the majority have said yes this is also was reported by [24,31].

The results indicated that 28% selected ERP system, 2% selected Vendor Managed Systems. Majority of the respondents selected ERP system. This shows that ERP system is very efficient. It is used to automate and integrate business processes, share data and practices across the organization the population in this study was limited to the employees of Teuscher Investment Project that was all 98 workers.

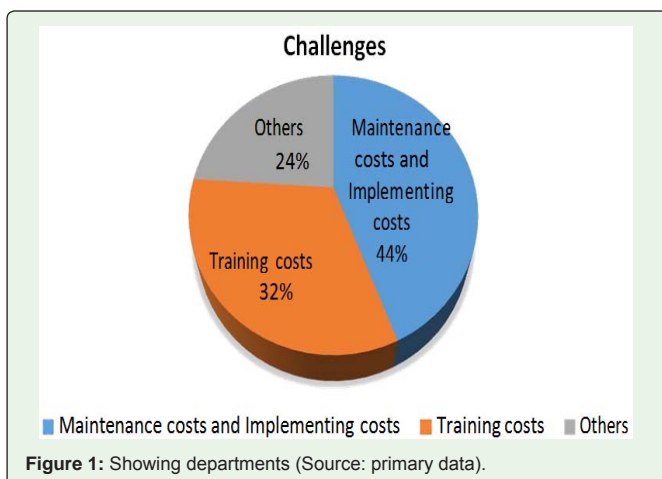


Figure 1: Showing departments (Source: primary data).

Table 4: Showing response on the presence of Supply Chain Management Systems.

Response	Frequency	Percentage
Yes	38	76%
No	12	24%
Total	50	100%

Source: primary data.

And the total number of the population understudy was 50 employees of Teuscher Investment Project as case study. It has resulted into potential benefits such as declines in inventory, reduction in working capital and abundant information on customer needs, produce and access to real time information. This is in agreement with that ERP systems result in potential benefits such as declines in inventory, reduction in working capital and abundant information on customer needs [12,20].

Performance of Supply Chain Management systems

Results in the Figure 2 indicate that, 44% of the respondents agreed that the performance of the SCM system was very good, 30% indicated good, 12% indicated poor and 14% indicated very poor. Majority of the respondents agreed that that the performance of the supply chain management system was very good. This shows that the performance of Supply Chain Management systems is very good it reduces the chances of human error, shorter planning times and faster inventory turnover. This is in agreement with that supplies chain management system leads to first inventory turnover [32].

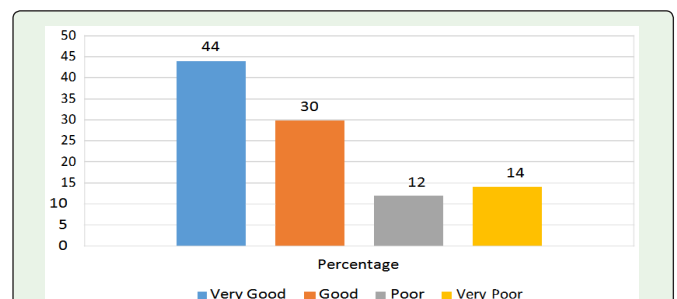


Figure 2: Showing Performance of Supply Chain Management systems.

Table 5: Table Showing the Supply Chain Management systems used Teuscher Investment.

Supply chain management systems	Frequency	Percentage
ERP Systems	14	28
Advanced planning and Scheduling systems	10	20
Ware house management system	6	12
Quality Management system	3	6
Manufacturing Execution System	12	24
MRP system	4	8
Vendor managed system	1	2
Total	50	100%

Source: primary data.

Table 6: Table showing the Responses on Challenges in implementing the Supply Chain Management systems.

Responses	Frequency	Percentage
Yes	25	50%
Not sure	14	28%
No	11	22%
Total	50	100%

Source: Primary data.

Responses on challenges in implementing the Supply Chain Management systems

Results in Table 6 indicate that, 50% of the respondents accepted the company faced challenges in implementing the Supply Chain Management system, 28% were not sure and 22% did not accept. Majority agreed that the company faced challenges in implementing the Supply Chain Management system. This means there are challenges faced in implementing the Supply Chain Management system this result was similar to that of [8,14].

The challenges faced by the Company

Results in Figure 3 indicate that, 44% of the respondents selected maintenance and implementation costs, 32% selected training costs and 24% selected others. Majority of the respondents selected maintenance and implementation costs as a challenge faced when implementing SCM system. This means that maintenance and implementation costs hinder organization to implement SCM systems due to fear of incurring costs and some organizations cannot afford. This is in agreement with [21,33] that Excessive rigidity, high implementation costs and inflexibility are challenges of implementing SCM systems. There are difficulties in maintaining SCM systems like ERP system especially when customization is involved [29] the maintaining costs are high. According to Barrett CB [34] an upgrade cost can amount to 25% to 33% of the initial ERP implementation. ERP has been criticized for being too expensive to implement as such only large organizations are were able to afford ERP systems with cloud computing.

Response on supply chain management system increasing productivity

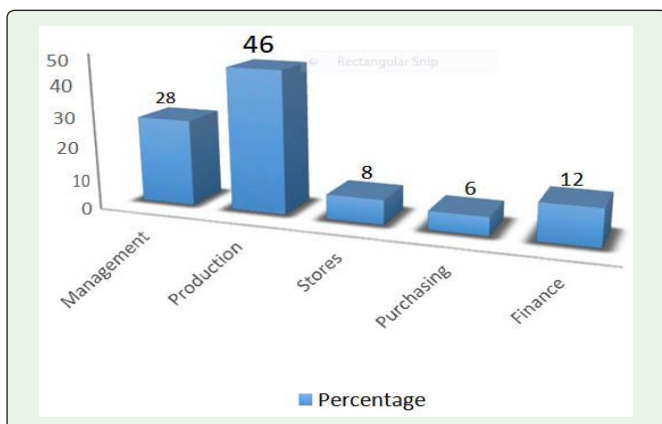


Figure 3: Figure showing the challenges faced by the company.

Table 7: Showing contribution of supply management to the profitability of the company.

Response on the contribution	Frequency	Percent
Yes	42	84
No	8	16
Total	50	100

Source: Primary data.

Results in Figure 4 indicate that, 20% of the respondents agreed that supply chain management system increases productivity, 32% strongly agreed, 24% were not sure, 22% disagreed and 2% strongly disagreed. Majority of the respondent strongly agreed supply chain management system increases productivity. This shows that a fine tuned and flexible SCM system leads to greater productivity and reduces inventory. This is in agreement with

that efficient systems lead to greater productivity, lower cost and reduced inventory shorter planning times and maintaining delivery schedules. Also, started that supply chain management system like ERP system enhances efficiency and productivity of a firm.

Results in Table 7 indicate that, 84% of the respondents agreed supply chain management contributed to the profitability of a company and 16% disagreed. Majority agreed SCM contributed to the profitability of a company. This means that a supply chain that consists of all parties involved in providing goods and services and meets the customers' requests aim to maximize the value generated and a more profitable outcome. Aiello L [35], say that the focus of SCM is upon the management of relationships in order to achieve a more profitable outcome for all parties in the chain.

Results show that there is a strong positive correlation between supply chain management and profitability ($r = 0.914^*$ and significant level = 0.01). This shows that there is a positive relationship between supply chain management and profitability meaning that when supply chain management is effective profits will increase. This was in support by the report by Smith S [20].

Discussion

To identify supply chain management systems used in Teuscher Investment Project

The study found out that supply chain management system contributes on the profitability of the company. An effective realistic

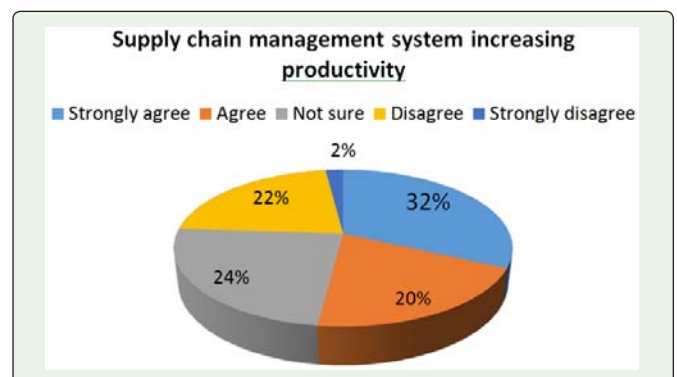


Figure 4: Supply Chain Management System Increasing Productivity.

Table 8: Showing the relationship between supply chain management and profitability.

		Supply chain management	Profitability
Supply chain management	Pearson Correlation Sig. (2-tailed) N	1	0.914
		50	0
Profitability	Pearson Correlation Sig. (2-tailed) N	0.914	50
		0	1
		50	50

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

and flexible SCM system has significant benefit for any business maintains delivery schedules and increases productivity. That is ERP systems is used in Teuscher Investment and ensures that right materials are in the right place at the right time and in the correct amount. Supply chain management system ensures materials are available for production and products are available for delivery to customers and there are challenges faced when implementing supply chain management system. Results in Table 8 indicate that, 44% of the respondents selected maintenance and implementation costs, 32% selected training costs and 24% selected others. Majority of the respondents selected maintenance and implementation costs as a challenge faced when implementing SCM system. This means that maintenance and implementation costs hinder organization to implement SCM systems due to fear of incurring costs and some organizations cannot afford. This is in agreement with that Excessive rigidity, high implementation costs and inflexibility are challenges of implementing SCM systems [2,32]. There are difficulties in maintaining SCM systems like ERP system especially when customization is involved [36]. The maintaining costs are high. According to Tsige L [37] an upgrade cost can amount to 25% to 33% of the initial ERP implementation. ERP has been criticized for being too expensive to implement as such only large organizations with deep pockets are able to afford ERP systems with cloud computing. On the relationship between Supply Chain Management and profitability it was seen that there is a positive relationship established between the variables under study using SPSS/Excel. This implies that the higher the supply chain efficiency and successful the chain the higher the profitability and value of stocks along the chain therefore the performance indicators of supply chain management affect the profitability of any organization.

Conclusion

In view of the findings, the SCM system used in Teuscher Investment is ERP system. It is an effective realistic and flexible SCM system which has significant benefit for any business when implemented well. Supply chain management system ensures materials are available for production; products are available for delivery to customers. Supply chain management system maintains delivery schedule and increases productivity though there are challenges faced on implementing them. On the relationship between profitability and supply chain management these two variables, it is concluded that profitability of Teuscher Investment Project depends on supply chain management. On the way forward, determining factors influencing technical efficiency, supply chain for coffee production and profitability in Rwanda and profitability analysis of coffee cup of excellence competitions for coffee cooperatives in Rwanda.

Recommendations

Supply chain management systems

Teuscher Investment should try and improve on supply chain management in order to meet its set vision, mission and objectives. These can be done by using flexible and effective supply chain systems, respond quickly to changes in demand and determine accurate customer delivery dates, partnerships and reduction of long supply chains improving the quality of their products and putting suggestion boxes for the organization and for the clients which will help in making corrections where necessary and improvements where specified.

On profitability

Teuscher Investment as a manufacturing company should do more networking and advertising of their products, boost their productivity, review their offers and manage their costs the costs will therefore reduce and the company will not charge highly this will attract customers hence increasing the profitability levels. Also, top management should be committed and have the right skills to recognize and implement supply chain management system; supplier development and improved customer service hence increase in profits.

Relationship between Supply Chain Management and profitability

Teuscher Investment should improve on the weaker areas identified to be the major causes of ineffectiveness and poor performance in carrying out their activities in order to strengthen their relationship between supply chain management and profitability.

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