Supply Chain Optimization And Performance Of Agro-Processing Firms In Kiambu County, Kenya

Patrick Nyamweya and Dr. Anthony Osoro

DOI: 10.29322/IJSRP.14.05.2024.p14929
10.29322/IJSRP.14.05.2023.p14929

Paper Received Date: 11th April 2024
Paper Acceptance Date: 13th May 2024
Paper Publication Date: 22nd May 2024

Tenacity **-** The persistence of the study was to inaugurate the relationship among supply chain optimization and performance of agro-processing firms in Kiambu County, Kenya. The specific objective were: inventory optimization, demand forecasting, sustainability optimization and reduced cost optimization correspondingly. This scholarship was anchored to diverse theories relevant: The scholarship used descriptive research design, where equally qualitative and quantitative exploration was applied.

Index Terms- inventory optimization, demand forecasting, sustainability optimization and reduced cost optimization and performance of agro-processing firms

I. INTRODUCTION

Supply chain management is one of the most essential aspects of conducting business. Many people outside of the direct community (in research and industry) do not realize this because an ordinary consumer often experiences only its effects. Recall the times when the item that you wanted was not available in your favorite garments or grocery store, recall how many times you got a great 'deal' at the end of the season, recall the sudden increases in gas prices due to shortages, recall the times when your e-commerce site promised availability but later could not send the required product or sent you the wrong product, or recall the times when your customized product (like a personal computer or kitchen cabinet) was delayed to a great extent (Vincent, 2019). All the above and several other experiences that consumers have on a routine basis are direct consequences of supply chain practices followed by firms. As opposed to business-to-consumer transactions, supply chain practices have immediate impact on business-to-business transactions. In the late 2000s, due to glitches of its extensively outsourced supply chain for Dreamliner 787, Boeing experienced substantial delay in launching the new aircraft and incurred more than $2 billion in charges to support and expedite component supplies. Less than two years after the first delivery of Dreamliner 787 in 2011, Boeing was ordered to shut down production of the aircraft due to quality issues with batteries (Sarkar, Tayyab, Kim & Habib, 2019).

1.1 Inventory Theory

In instruction for this type of account policy to be efficacious, Zappone and his personnel communicate often. He checks the equal of his inventory and the value of copper daily, and discusses incomplete sales with his sales aircrew. All in all, the mathematical mockups in this study cannot help Zappone's company. Because the value of copper swings so much from day to day, it is tough to say when exactly to order (Bratton, 2003). Perhaps, with more learning and a more complex model, we could articulate an optimal policy for Zappone. This would necessitate more complex statistical analysis in order to deal with the fluctuating price of copper. Another reason we would need a more in-depth model is that while Zappone orders the copper today, at today's values, he will be charged the values of copper on the day it ships, roughly 5 weeks later. Even nevertheless he does not use a model, Zappone has done well for himself. He vends copper all over the world: Japan, South America, Europe, and all 50 states. In addition, he is ecologically friendly since about 80% of the copper he usages comes from secondhand copper and only 20% comes from new copper being excavated from the ground. However, the values of copper, whether it is reusable or new, does not differ, so this does not change his inventory policies. This displays that an inventory model is supportive but not essential for all firms (Carver, 1996).

In this exploration, we began the scholarship of inventory theory. We scrutinized two types' models: deterministic incessant review models and stochastic models. In addition, inventory theory we erudite about quantity rebates and how these pretentious our models. We also looked at a little examples of how these models are rummage-sale (Bratton, 2003). However, this study only traces the surface of what inventory theory is all about. After knowledge the basics, we now can ask and education more complex questions. For instance, what happens when clienteles place orders in advance for a forthcoming delivery? An enterprise could select to allow for four dissimilar levels of response time to clienteles: standard, value, premium, and precision. How does this hypothetical enterprise handle its inventory policy? If concerned in the previous question. Additional problematicatic we can consider deals with a company that deliver goods to two diverse types of consumers: clienteles who have long-term supply

contracts, and clienteles who request goods occasionally. The orders of the customers who have supply contracts are known in advance and must be entirely met without postponement every period. However, the unanticipated requests from infrequent clienteles are unknown and the enterprise can either accept the order or discard it. How does a business deal with their inventory policy when it mixes deterministic and stochastic demand? If concerned in this issue contiguous inventory theory (Becker, 1962).

1.1.1 R**esource Based View Theory**

The resource based theory was propounded by Becker (1962). According to RBV,an organization is considered as a "collection of physical resources, human resources and organizational resources". The theory assumes that all industry firms may have heterogeneous recourse available to them and that firms have resources that may persistently be heterogeneous for some time based on the fact some resources that can be employed to develop a competitive advantage are not transferable. Resource Based View theory seeks to analyze; interprets resources in an organization to understand how these resources can be organized in an organization to create a sustainable competitive advantage. For a resource to be considered as a source of competitiveness, it must fit into the set criteria of being valuable, rare, cannot be imitated, and cannot be substituted. A valuable resource must "enable a firm to do things and behave in ways that lead to high sales, low costs, and high margins or in other ways add financial value to the firm. The opponents argue that TBV is anchored on impressionual and empirical methodology. Becker (1962) argues that the theory ignores the process issues. Aspects of influence of dynamic process oriented issues that relate to RBV have been given little attention despite their importance. Further, RBV uses aggregated findings within the industry when a firm level analysis can present a better reality Ray et al. (2004). Procurement function and technology are two capabilities that can drive performance of agro-processing firms; inventory optimization, demand forecasting, sustainability optimization, reduced cost optimization offer such a competitive and performance advantage (Bandura, 1989).

1.1.2 Agency Theory

The agency theory was discussed in this issue by Morgan et al., additionally offers a natural fit with supply chain management research. This theory focuses on occasions whereby one entity (the principal) delegates authority to a second (the agent) to act on its behalf (Bandura, 1989). In agency relationships, one party (the principal) delegates work to a different party (the agent) to compensate for the dearth of expertise or to target core competencies. Once the agent is acting for the principal, it resembles behaviors such as performing for the benefit of the principal or acting as the principal's representative or employee mentioned, whereas the profit maximization approach and self-interest persists, "...the focus of agency theory on determining the foremost efficient contract governing the principal–agent relationship". The notion of the contract is used here as a metaphor to explain the agency relationship and is designed based on the end result (such as commissions) or behavior (such as salaries) of the agent (Becker, 1962). Agency theory has been applied to numerous activities associated supply chain management together with, outsourcing and supply chain collaboration (Bandura, 1989). AT provides a helpful framework to analyze relationships and behaviors in supply chains as a result of these chains are replete with the principal–agent dyads. Issues arise in these relationships as a result of agents usually behave in ways in which benefit them, not principals. For instance, stockholders delegate authority to top managers to run companies. Participants must choose between courses of action that benefits their firm versus one that benefits the chain as a whole (Becker, 1962).

1.1.3 Network Theory

Networks perspective, also cited as networks theory within the literature basically focused with the value generation through inter-organizational relations. Strong and weak ties are key ideas within network theory (Bandura, 1977). As the names suggest, strong ties involve companies that are tightly coupled and loose ties involve companies with a lot of tenuous links. Each kind presents some advantages to supply chains. It describes, explains, and predicts relations among connected entities. Supply chains are, in essence, a type of network, thus, network theory has the potential to reveal interesting truths regarding chains. However, as the supply chain networks are expanded to a lot of diverse professional and geographic domains, the organizational supply chains are exposed to numerous kinds of risks. The networks perspective has been utilized for both global supply chain studies as well as supply chain in specific industries or countries (Bandura, 1989).

The Network theory is based in the social construct of reality impression. It was brought into view in the late 1970s by John Meyer and Brian Rowan to "help understand how organizations fit with, are related to and are shaped by their societal, state, national and global environments" (Bandura, 1989). The institutional theory has increasingly been used by scholars to explain the complex relationship between the institutions and their dynamic environment. Proponents of this theory argue that the environment within the institution can profusely influence the improvement of the organization's formal structures and operations. Organizational fields and populations are the units of analysis for the institutional theory. Bandura (1977) argued that institutions are made up of regulative, normative and cultural cognitive elements which alongside related activities and resources define life. The regulatory elements apply laws, rules and sanctions to enforce compliance. The normative element uses the norms and values, social responsibilities to ensure compliance. The cultural-cognitive element is based on common beliefs, symbols and shared understanding (Zhang, 2013).

2.1 Inventory Optimization

Inventory optimization practices can help you: Enhancement of Profitability: Gain real-time insight into inventory heights, order status, and proprietorship to enhance client satisfaction, expand quality creativities, and progress performance during the sales process; Lower Costs: Realize the potential for a significant increase in labor productivity, lower operating costs, near-faultless order contentment, and reduced inventory heights in the warehouse which can help make your commercial more competitive; Increase Quality: Receiving things

right the first time drives quality excellence and decreases your inventory investment by circumventing unnecessary reorders caused by imprecise knowledge of what's already on hand (Dhunny et al., 2019). Increase performance concluded the use of data, information, and knowledge to comprehend variability and to increase strategic and functioning decision making; Focus on Incessant Performance Enhancement: Better performance using benchmarking and best performs, as you measure the right metrics to accomplish your corporate objectives; Offer Competitive Guarantees: With a better empathetic of your inventory, you can offer bottommost values or wildest shipping guarantees. Comprehend what markets and clienteles value, now and into the future, and use this to drive structural design, strategy, products, and services (Okumu & Bett, 2019).

Inventory is the largest solitary asset that most corporations need to manage. Inappropriately, it ingests space, gets damaged, and sometimes becomes outdated or expires, and resounding excess inventory unnecessarily costs the institute. Inventory needs to be acquired, stored, and maintained and ties up cash (Dhunny et al., 2019). This operational capital can be a noteworthy burden for many corporations and if freed up can provide noteworthy cash resources that can be rummage-sale to pursue revenue-engendering opportunities and strategic savings. The well-documented profits of running an industrialized, distribution, service, or retail operation with leaner inventory reverberated from a permanent reduction in operational capital to higher productivity to better client service heights. As Forrester Research pointed out in a recent report, the ability to increase inventory turns is a key differentiator among highly fruitful and more poorly performing corporations (Okumu & Bett, 2019).

2.1.1Demand Forecasting

Demand formation and forecasting are a set of commercial procedures that involve envisaging forthcoming demand and bring into line procurement, production, and distribution competences to meet that forecast. Comprising a number of different trade functions, this necessitates the sharing of timely data, the precise processing of that data, and arrangement on joint trade plans, as defined in the S&OP (Dhunny et al., 2019). Accurate and appropriate demand and forecast plans are one of the most significant components of an actual supply chain and inventory optimization. Best practices in bringing real-time demand-led supply chains necessitate collaboration, flexibility in receptiveness, and full-bodied cross-functional commercial planning. Enterprises must take a more systematic tactic to demand planning and forecasting and endeavor for deeper collaborative supply chain practices both within organizations and with trading associates. Developing collaborative supply chain performs will get-up-and-go demand planning accurateness, which in turn augments service levels, while plummeting inventory. Depending upon the size of your inventory, this can be accomplished through inventory management practices and reporting or with dedicated tools that inspire supply chain visibility (Ongeri & Osoro, 2021).

Demand Forecasting; when dealing with independent demand, forecasting is an essential step for the best estimation and prediction of possible changes in the future replenishment (Dhunny et al., 2019). Forecasting also aims to minimize the inaccuracy based on the previous forecasts. Demand forecasting can be either easy or hard, depending on the type of products, stability of demand and the length of the time period. Time Series Methods: These methods involve looking at the pattern of the past demand and extending this into the future, in other words, predicting the future based on the past data. Accuracy of forecast: refers to the actual demand versus demand forecasted in a period (Ongeri & Osoro, 2021).

Demand forecasts for diminutive periods are made on the postulation that the enterprise has a assumed production capacity and the period is too short to change the prevailing production volume. Generally it would be one year period; Production planning: (Dhunny et al., 2019). It assistances in shaping the level of output at numerous periods and circumventing under or over production; Assistances to formulate right purchase policy: It helps in better material management, of procurement inputs and mechanism its inventory level which cuts downcast cost of operation; Assistances to frame accurate assessing policy: A rational assessing policy can be articulated to suit short run and periodic variations in demand. Auctions forecasting: It helps the company to set realistic sales targets for each individual salesman and for the company as a whole; helps in approximating short run financial necessities: It helps the enterprise to plan the finances obligatory for achieving the production and sales targets. The enterprise will be able to raise the obligatory finance well in advance at realistic rates of interest; Shrink the dependence on chances (Ongeri & Osoro, 2021).

2.1.2 Sustainability Optimization

The meaning of the United Nations Brundtland Commission on sustainability has become more self-motivated than others. We call sustainability the skill that meets today's requirements deprived of jeopardizing the future peers' ability to meet their own requirements. Therefore, sustainability is a multidisciplinary impression, based on this empathetic that covers different phases of life. Clearly, sustainability is an impression in the core of the planet that emphases on the circumstance and depletion of the biophysical situation of Earth. In 2015, the General Assemblage adopted the 2030 Agenda for sustainable improvement (Dhunny et al., 2019). They adopted the Agenda for its action to combat poverty, protect the planet, and enhance everybody's lives and chances. This study focuses on studying trends and recent research study in sustainability and energy efficiency (Goals 7 and 12) and sustainable building design problematics out of 17 sustainable improvement goals. Optimization is one of the most essential tools for achieving sustainability. Optimization is a search procedure for a specific problematicatic according to special conditions of that problematicatic. In fact, optimization refers to finding procedures of optimal values for a given network parameter, using all feasible values for the minimization or maximization of network output. The goal of optimization is to discover the best feasible response with the deliberation of the problematicatic constraints (Ongeri & Osoro, 2021).

The presence of multifaceted scientific and engineering complications calls for using optimization approaches to solve the desired problematic. Due to the time consuming and complexity of exact methods, applying intelligent optimization algorithms has crucial significance (Dhunny et al., 2019). Optimization of many multifaceted scientific problematics which necessitate solutions with precise computations and suitable time cannot use classical

procedures. In this regard, nature can be painstaking as a rich source which, like a powerful instrument, provides principles and impersonations cutting-edge order to design artificial computational methods for solving multifaceted optimization problematics. Metaheuristic optimization algorithms, which are also called smart and modern optimization algorithms, are categorized as stochastic optimization algorithms employed for finding optimal solutions. The word "metaheuristic" was first instigated by Glover when introducing TS as a novel heuristic method. Heuristic optimization methods are a set of algorithms for optimization of problematics which search explanation space to find optimal reply randomly but purposeful and simple (Ongeri & Osoro, 2021). A decision-making subject with the quality-based product reclamation was reconnoitered in with multiple optimization goals, including economic, environmental, and societal performance of sustainability (Dincer & Zamfirescu, 2018).

2.1.3 Reduced Cost Optimization

The benefits of cost control are mostly as follows: Cost control helps to attain anticipated return on the capital invested in a corporation, by resolving unconventionalities among actual and anticipated standards (Dincer & Zamfirescu, 2018). Cost control clues to value-added standards of production with the imperfect resources of the company. Cost control diminishes the values or attempts to maintain it by plummeting the cost. Cost control clues to economic use of resources. It upsurges profitability and competitive situation of a business. It augments credit worthiness of the company. It prospers and increases economic stability of the industry. It upsurges the sales of the company and upholds the level of employment. Shortcomings of Cost Control (Ongeri & Osoro, 2021).

The shortcomings of cost control are mainly as follows: It moderates the flexibility and procedure improvement in a business. It restricts innovation by highlighting to reaching the preset standards. It necessitates skilled personnel to set standards. It lacks inspiration as it is worried with following the existing standards (Dincer & Zamfirescu, 2018). It does not top to improvement in standards; Techniques of Cost Control Budgetary control: The budgetary control is procedure of incessant comparison. It works with creating budgets and incessant comparison of these budgets with the real. It is finding the reasons for unconventionalities and revising the budgets with needs. It helps in preparation coordination and controlling. Standard costing: Standard costing is location a standard cost and by means of this standard cost with authentic and scrutinize the variances. It assistances in classifying the causes of adjustments and cost approximation. Inventory control: Inventory control is adaptable acquisition, and usage of material to uphold the production deprived of blocking the additional funds into it. It attempts to decrease the wastage of the material and leads to real application of it (Ongeri & Osoro, 2021).

Ratio examination: Ratio examination identifies the association among different variables. It assistances to classify the trends in an association. Ratio analysis is also used for contrast of different governments on different features (Dincer & Zamfirescu, 2018). It is mostly used for likening the performance with other officialdoms and external standards. Variance analysis: Variance examination is a method of cost control. It encompasses the documentation of the amount of variance and to examine the explanations of these variances. A variance is which varies from the standards set. It can be auspicious or uncomplimentary. Features of a Good Cost Control System According to Backer and Jacobson, real cost control should have the following physiognomies: Description of center's accountability, deciding accountability centers; The allocation of prescribed authority; Various cost standards; The significance of controllable cost; Cost reportage; and Cost reduction (Ongeri & Osoro, 2021).

2.1.4 Performance of Agro-Processing Firms

The agro-processing business is regulated by: the Ministry of agriculture, which sets the rules and strategies for improvement of the agriculture sector and sets the policies and strategies for the livestock and fishery industries; Kenya dairy board which regulates the dairy industry and licenses dairy products processors; (Dincer & Zamfirescu, 2018). Department of veterinary Services, a veterinary regulatory management and quality control of inputs, livestock, livestock products and by-products; and the Kenya sugar board, which licenses sugar importation and coordinates the sugar growing industry. The contribution of the agro-processing industry to GDP in millions of Kenya shillings and contribution to wage employment in terms of the total number of people employed by the industry for the period 2011-2013 (Ongeri & Osoro, 2021).

The agricultural sector theatres critical part in the overall economic growth of the Ghanaian economy (Dincer & Zamfirescu, 2018). Indeed, agriculture is predictable to lead to a significant alteration of the economy through improvements in the sector's productivity. The sector is alienated into a number of subsectors: crops, cocoa, livestock, forestry, and fisheries. The crop subsector pays about 66.2 per cent to the sector, with a large percentage of its products undergoing some form of processing. The major products include cocoa, cashew, sunflower, oil palm, groundnut, fruits, and vegetables, amongst others. The furthermost common item that is deal with is maize, followed by other merchandises such as nuts and oils, fish, and grains such as millet, sorghum, and guinea corn respectively (Ongeri & Osoro, 2021).

Agro-processing is the procedure or action taken by manufacturers of converting primary (raw) agricultural products into consumable commodities suitable for consumption. The agro -processing process begins with the main activity of agriculture. Activities such as farming, livestock, horticulture and forestry take place. Thereafter, these raw materials are supplied to manufacturers, who then begin the activity of processing the raw materials through actions such as milling, fermenting, slaughtering, blending, cutting and moldings. The manufactured products are then packaged and supplied to the wholesale and retail markets to be sold to consumers. Agro- processing is a widely diverse subsector and is vital to the production of food, beverages and non-food products like tobacco, sisal as well as the treatment of wood for furniture and study products (Ominde et al., 2022).

3.1 Methodology

The design allowed researchers to sharpen the research methods suitable for the subject matter and set up their studies for success. The research adopted descriptive research design for the purpose of this study. The descriptive research survey design was

concerned with determining the frequency with which something happens or the relationship between the variables.

3.1.1 INVENTORY OPTIMIZATION

Respondents were invited to give their opinion on the variable Inventory optimization. From table 1.1, the respondents solidly agreement that Inventory optimization safeguarded performance of agro-processing firms and periodic review in Kiambu County in Kenya viable with agreement of a mean was 3.742, and Standard Deviation of 1.0602; Through right inventory management in Kiambu County the respondents gave neutral response with a mean of 3.533 and Standard Deviation of.9202; meeting demand assessment has contribution to the quality and innovation of the inventory optimization with strongly agree a Mean of 3.903, and Standard Deviation of .9007; keeping logistics cost low in Inventory optimization it is essential to put in place and maintain procurement the respondents gave a strongly agree with a Mean of 4.061, and Standard Deviation of .18951; The management of Kiambu County in Kenya implements performance of agro-processing firms award the respondents disagreed with a Mean of 3.541 and SD=1.3020); and Inventory optimization enhances performance of agro-processing firms at Kiambu County in Kenya, they agreed with a Mean of 3.566, Standard Deviation of .7017. This discovery agrees with the finding of Nyile *et al.* (2022) who observed that clear description of Inventory optimization, enhance effective performance of agro-processing firms in Kiambu County,Kenya.

Table 1.1: Inventory optimization

Statement	Mean	Std. Dev.
Our firms ensures right inventory Sharing through Real time basis	3.3742	1.0602
Through our firms in Kiambu county Kenya has been able to make decisions on timeliness	3.533	.9202
Responsiveness of keeping optimization low to performance of Kiambu County, Kenya	3.903	.9007
Through sustainability optimization on Inventory optimization	4.061	.18951
The management of supply chain optimization Supply chain optimization in inventory optimization	3.541	1.3020
Inventory optimization enhances performance of Kiambu County,Kenya.	3.566	.8017

3.1.2 SUSTAINABILITY OPTIMIZATION

From table 1.2, respondents agreed that: The Kiambu County in Kenya contemplates supply chain on Sustainability optimization with a mean of 3.550 and Standard Deviation of.8310; A environmental sustainability is likely to circulated based on supply chain period on performance of agro-processing firms in Kiambu County in Kenya agreed with a Mean of 4.032 and Standard Deviation of.1890; social sustainability application participation on performance of agro-processing firms in Kiambu County in Kenya the respondents were neutral with a Mean of 4.040 and Standard Deviation of.7302); Through economic sustainability towards performance of agro-processing firms in Kiambu County in Kenya; the respondents strongly disagreed with a Mean of 4.110 and Standard Deviation of .7115; proper sustainability optimization and agro-processing firms admission to bids assessment in the earliest possible has improved performance of agro-processing firms in Kiambu County in Kenya, the agreed with a Mean of 4.092 and Standard Deviation of .7005; Online sustainability has enhances performance of agro-processing firms in Kiambu County in Kenya, the respondents gave a strongly agree with a Mean of 4.250 and Standard Deviation of .8165 . This finding is in agreement with the finding of Ongeri and Osoro (2021) that the goal of Supply chain optimization towards pre-emptive planning is to ensure performance of agro-processing firms in Kiambu County in Kenya. Effective Sustainability optimization minimizes or eliminates problematics and potential claims and disputes. This result agrees with the finding of Ominde et al. (2022). It is essential for Sustainability optimization to comprehend the provisions of the firm evaluation, have the ability to perform to all practices complicated, and uphold control over the performance of agro-processing firms in Kiambu County .

Table 1.2: SUSTAINABILITY OPTIMIZATION

Statement	Mean	Std. Dev.
Our firm considers predictive analysis on performance of agro-processing firms in Kiambu	3.550	.8310
Sustainability optimization enables performance of Kiambu County	4.032	.1890
The future of customer sustainability enhances Performance of agro-processing firms in Kiambu	4.040	.7302
Sustainability enhances performance of Kiambu County in Kenya	4.110	.7115
Sound supply chain optimization on performance		

of Kiambu County in Kenya	4.092	.7005
Stability of supplier can boast procurement performance of agro-processing firms Kiambu County in Kenya	4.250	.9165

3.1.3 Model of Goodness Fit

With an R-squared of 0.795, the model displays that Inventory optimization, Sustainability optimization ,Demand forecasting and Reduced cost optimization can subsidize up to 79.5% on performance of agro-processing firms in Kiambu County in whereas 20.5% this variation is elucidated by other indicators which are not inclusive in this research. A degree of goodness of fit abridgments the divergence amongst observed values and the values predicted under the research in question.

R	R2	Adjusted R	Std. Error of the Estimate
0.765	0.795	0.731	0.064

3.1.4 Analysis of Variance (ANOVA)

From the outcomes in table 1.4, analysis of variance statistics was led to control the metamorphoses in the means of the dependent and independent variables to display whether a relationship exists amongst the two. The P-value of 0.005 infers that performance of agro-processing firms in Kiambu County have a noteworthy relationship with Inventory optimization, Sustainability optimization ,Demand forecasting and reduced cost optimization which is important at 95 % level of significance.

Table 1.4 ANOVA TEST

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.155	1	1.059	.341	.001
Residual	6.466	188	.530		
Total	**10.611**	**189**			

Conclusion

Consequently, from the foregoing, this research accomplishes that Inventory optimization, Sustainability optimization, Demand forecasting's, reduced cost optimization have broadly impacted on performance of agro-processing firms in Kiambu County, Kenya. The findings conclude that any in Kenya would ascertain to hold the best performance of agro-processing firms in Kiambu County after improving supply chain optimization in Kenya. When public-secluded enterprises is comprised through Sustainability optimization, Demand forecasting, and Reduced cost optimization then the implementation of performance of agro-processing firms in Kiambu County, Kenya.

REFERENCES

[1] Ascione, F.; Bianco, N.; De Masi, R.F.; Mauro, G.M.; Vanoli, G.P. Resilience of robust costoptimal energyretrofit of buildings to global warming: A multi-stage, multi-objective approach. Energy Build.2017,153,150–167

[2] Ascione, F.; Bianco, N.; Mauro, G.M.; Vanoli, G.P. A new comprehensive framework for the multi-objective optimization of building energy design: Harlequin. Appl. Energy 2019,241, 331–361.

[3] Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. Psychological Review,84(2), 191–215.

[4] Bandura, A. (1989). Human agency in social cognitive theory. American Psychologist,44(9), 1175–1184

[5] Becker, G. S. (1962). Investment in human capital: A theoretical analysis. Journal of Political Economy, 70 (5).

[6] Bratton J. (Eds.). (2003). Strategic human resource management, Theory and Practice (Second edition ed.) .USA, North America .

[7] Carver, R. (1996). Theory for practice: A framework for thinking about experiential education. Journal of Experiential Education, 19 (1), 8-13

[8] Dhunny, A.Z.; Allam, Z.; Lobine, D.; Lollchund, M.R. Sustainable renewable energy planning and windfarming optimization from a biodiversity perspective. Energy 2019,185, 1282–1297.

[9] Dincer, I.; Zamfirescu, C. Sustainability Dimensions of Energy. Compr. Energy Syst. 2018,1, 101–152

[10] Duren, J. V., Dorée, A., &Voordijk, H. (2015). Perceptions of success in performance-based

[11] Mugenda, O., & Mugenda, A. (2008). Research methods: Quantitative and qualitative approaches. (2nd Rev. Ed.). Nairobi: Acts Press.

[12] Ongeri, N.V. and Osoro, A. (2021) Effect of Warehouse Consolidation on Performance of Registered Distribution Firms in Kiambu City County, Kenya. The international journal of business & management Publications, Volume 9, Issue 10, October 2021 ISSN 2321–8916.

[13] Okumu, E. A., & Bett, S. (2019). Inventory management practices and organization performance of steel industries in Kiambu County, Kenya. International Journal of Current Aspects, 3(III), 71-82.

[14] Ominde,S.O, Osoro,A. & Monari, D,G (2022).Contractual Supply Chain Governance, Relational Supply Chain Governance and Performance Of Agro Processing Firms In Kenya. International Journal of Scientific and Research Publications, Volume 12, Issue 4, April 2022 363 ISSN 2250-3153.

[15] Sarkar, B., Tayyab, M., Kim, N. and Habib, M. S. (2019). "Optimal Production Delivery Policies for Supplier and Manufacturer in a Constrained Closed-Loop Supply Chain for Returnable Transport Packaging Through Metaheuristic Approach." Comput. Ind. Eng. (135) 987-1003.

[16] Vincent, J.L.; Gan, H.K.; Wong, K.T.; Tse, J.C.P.; Cheng, I.M.C.; Lo, C.M.C. Simulation-based evolutionary optimization for energy-efficient layout plan design of high-rise residential buildings. J. Clean. Prod.2019,231, 1375–1388.81.

[17] Zhang, A.; Bokel, R.; van den Dobbelsteen, A.; Sun, Y.; Huang, Q.; Zhang, Q. Optimization of thermal anddaylight performance of school buildings based on a multi-objective genetic algorithm in the cold climate ofChina. Energy Build. 2017,139, 371–384.

[18] Zhang, B. (2013) Supply Chain Management Theory and Its Application. Enterprise Reform and Management, No. 3, 27-28.

AUTHORS

First Author – Patrick Nyamweya, MCS In Procurement and Contract Management of the Jomo Kenyatta University of Agriculture And Technology

Second Author – Dr. Anthony Osoro, MCS In Procurement and Contract Management of the Jomo Kenyatta University of Agriculture And Technology