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EFFECT OF SUPPLY CHAIN RESILIENCE STRATEGIES ON THE PERFORMANCE OF FLORICULTURAL FIRMS IN KENYA

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ABSTRACT

The floriculture industry encounters diverse, ever new and high frequency challenges, which if not well managed will cause business closure, great losses and recovery challenges. In Kenya, floricultural firms are exposed to varied disruptions, bottlenecks and delays in their supply chain ecosystem, and this was worsened by the global Covid-19 pandemic. It is therefore crucial for firms to employ the right resilience strategies to prepare for such disruptions in responding and recovering faster to continue operating and improve performance. However whether, how and which resilience strategies affect performance in floricultural firms is a topic that remain under-explored. Using the Complex Adaptive System, Relational, Contingency and Agency theories together with the empirical literature, the study sheds light on the relationship between resilience strategies and firm performance. The specific objectives were to establish: the effects of supply chain collaboration, flexibility, agility and risk management strategies on the performance of floricultural firms in Nakuru County, Kenya. The study adopted descriptive and correlation research design. Target population was 101 flower firms. Primary data was collected using questionnaires. Using SPSS, descriptive and inferential statistics were carried out using ordinal multiple regression and correlation analysis. The study findings will guide the various businesses that are rethinking their business model and finding solutions to survive business disruptions affecting supply chains, by providing information on how to develop the right resilience strategies to deal with unforeseen disruptions and improve their performance.

KEY WORDS: *Supply Chain Collaboration, Supply Chain Flexibility, Supply Chain Agility, Supply Chain Risk Management, Performance Kenya.*

1. INTRODUCTION

In today's vulnerable business environment, firms are disrupted by unexpected events in different parts of a supply chain (World Bank, 2020). The uncertain business environment in the floriculture sector is exposed to varied supply chain disruptions and delays. Kenyan flower farms face challenges of: political unrest, employee strike, natural disasters, system failure, stiff competition in international markets, global economic recession, scarce infrastructure, high freight charges, inadequate marketing, inadequate refrigeration tools, costly production and pests and diseases (Guyo et. al., 2013, Musau 2017, Khan, 2020). Recently Covid-19 pandemic disrupted supply chains globally and seriously affected the floricultural firms in Kenya. Demand for flowers dropped due to lockdown and cancellations of events leading to closure of firms like Chemirei and Tarakwet, moreover flight unavailability affected fresh flowers export forcing flower firms like Equator to destroy millions of flowers (Mwaniga, 2020). To address these disruptions, Guyo et. al (2013) suggest the implementation of thorough plans for business continuity to alleviate risk effects on supply chain disruption and investing in research to develop resilience. Supply chain resilience is represented by a supply chain architecture that is adaptive (Um & Han, 2021). Resilience is the adaptive capacity of the supply chain to get ready for unforeseen events, react to disruption and recover by maintaining continuous operations at the preferred level of connectedness and control over structures and function (Richey, 2022)

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1.2 Research Problem

Supply chain performance is the general set of measures used to approximate the capability and competence of the supply chain (Kurien & Qureshi, 2011). It is a critical indicator of resilience showing fast response and recovery from unforeseen disruptions. Typically, the floriculture sector is differentiated by seasonality and encounters diverse challenges ranging from man-made to natural disasters (Guyo et, al., 2013). Musau, (2017) indicate that flower product deterioration is caused by increased stock contamination during storage, capacity shortages, issues in cold-chain warehousing and poor ventilation. In light of the Covid-19 pandemic, the floriculture industry logistics and supply chain was harshly hit due to transport ban to curb the virus (Mwaniga, 2021). Kenyan flower producers lost $300,000 a day (KFC, 2021). Reduced manpower, minimum spray and fertigation affected flower plants making them fragile and vulnerable to disease (Khan 2020). In facing these diverse, ever new and frequent disruptions the idea of preparedness and resilience pops up. Supply chain executives can only develop right resilience strategies to deal with such disruptions. Little has been done on studying supply chain resilience and performance of floricultural firms**.** It is against this background that this study was undertaken to examine supply chain resilience strategies for surviving disruptions, particularly: collaboration, flexibility, agility and risk management and the performance of floricultural firms in Kenya.

2. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Relational Theory

Dyer and Singh, (1998) came up with relational theory which proposes that the greater the partners' investment is in relation-specific assets and inter-firm knowledge sharing routines, the greater the potential will be for relational rents. A relational rent is a super-normal profit that is mutually produced and cannot be produced by each firm alone and is hard to replicate by competitors (Dyer & Singh, 1998). These relational rents are: effective governance between coalition partners, knowledge-sharing routines, relation-specific assets and complementary resources and capabilities. Relational view was therefore used in studying how superior relational competencies enhance supply chain collaboration in the course of unforeseen floricultural risks. Hence, the study hypothesizes that: **$H_0$1:** Supply chain collaboration strategies have no significant effect on the performance of floricultural firms in Nakuru County, Kenya.

2.1.2 Complex Adaptive System (CAS)

CAS is a network of agents that is acting in parallel, constantly reacting to what other agents are doing, thus influencing behaviour and the network as a whole (Holland, 1992). The agents are guided by order-generating rules (schemas), showing how the CAS reacts quickly during the adaptation process to maintain fit with their rugged and dynamic environment. Adaptation implies that the agents are responsive, reactive, flexible and frequently proactive in dealing with the inputs of other agents (Holland, 1999). A CAS is predisposed to unpredictable relationship (non-linearity) between the cause and effect of events giving unreasonably negative or positive results (Urry, 2005). A supply chain just like a CAS is resilient until it adapts to its environmental threats (Um & Han, 2021; Adobor, & McMullen, 2018). The non-linearity of supply chain resilience can be established by Covid-19 global effects in supply chains. Kenyan floricultural firms operate in unpredictable frequently changing environment due to disruptions and yet they have to survive and adapt. As a result, floricultural firms need to be self-organising, proactive, flexible and re-design their structures. Hence the study hypothesizes that: **$H_0$2**: Supply chain flexibility strategies have no significant effect on the performance of floricultural firms in Nakuru County, Kenya.

2.1.3 Contingency Theory

This theory by Joan Woodward, (1958) proposes that a sequence of best decisions within a firm are contingent (dependent) upon external and internal factors and that the fit between process and organizational structure leads to improved performance. The concept of fit suggests that a proper alignment among internal and external organizational factors positively affect performance (Woodward, 1958). The theory assumes that: (1) depending on the environment or task done there is no best way to organize and (2) management should strive to achieve good fits and alignments. Contingency theory has been used to identify supply chain resilience in relation to natural disasters and managing the crisis (Drozdibob, et. al, 2022; Parast, 2022). The theory assisted the researcher to understand the risky operating environment of floriculture firms and how to develop an agile production system to facilitate resilience hence the study hypothesize:**$H_0$3**: Supply chain agility strategies have no significant effect on the performance of floricultural firms in Nakuru County, Kenya.

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2.1.4 Agency theory

This theory by Jensen and Meckling, (1976) states that the agency relationship is created when a person (the principal) authorizes a perzson (the agent) to act on behalf of him/her which involves assigning some decision-making authority to the agent. There is a risk that the agent will not act in the best interests of the principal but be opportunistic causing problems.

Therefore a contract is made to reduce or eliminate the likelihood that the agent will be opportunistic (Jensen & Meckling, 1976). In complex purchases, it's often hard for the buyer (principal) to authenticate specifications of goods since mostly they rely on the seller (agent) to give the information. The agency theory has been used to understand supply chain disruptions and developing resilience (Aigbogun, 2022; Dekkers et. al., 2020; Matinheikki et. al., 2022). The theory can be used to investigate supply chain risks and how to develop risk management strategies (da Silva, 2022; Um & Han, 2021). Efficient supply chain risk management entails: risk identification; risk reduction; risk allocation and risk monitoring (Kalvet & Lember, 2010). Hence the study hypothesizes that:

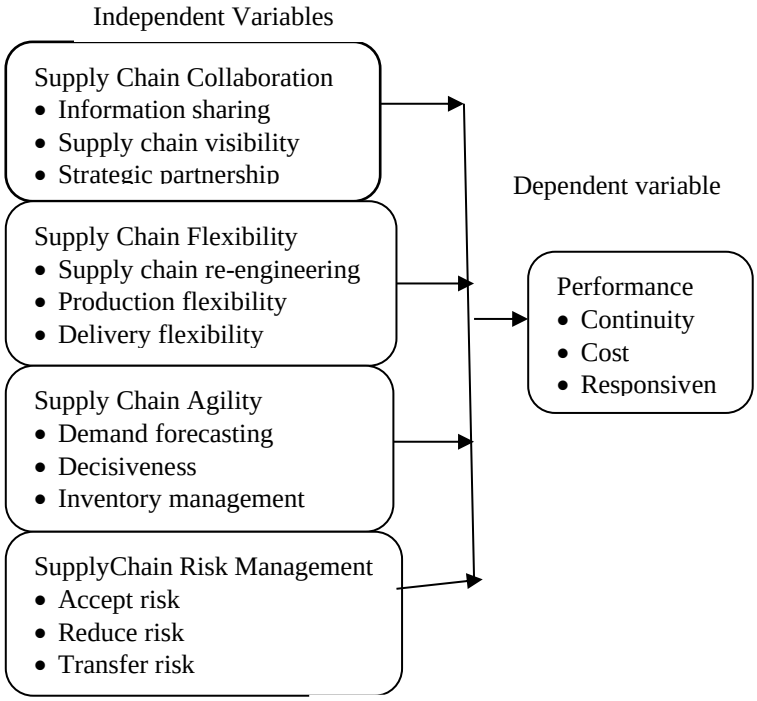
$H_0$4: Supply chain risk management strategies have no significant effect on the performance of floricultural firms in Nakuru County, Kenya.

2.2 Conceptual Review

2.2.1. Supply chain collaboration

Supply chain collaboration is the creation of close and lasting partnerships of supply chain members to achieve shared objectives by sharing information, resources and risk (Cao & Zhang, 2011). Fawcett and Magnan, (2004) aver that collaboration assist managers to alleviate demand and supply uncertainties as resources and knowledge are shared to remain responsive and efficient to customer needs. Key collaboration activities improving supply chain resilience are: collective communication, information exchange, jointly created knowledge and relationship efforts (Scholten & Schilder 2015). Umar and Wilson, (2021) put forward information sharing, informal financial support, effective communication, mutual dependence and trust as collaboration components that improve supply chains resilience in natural disasters. This study adopted information sharing, supply chain visibility and strategic supplier partnership.

Figure 1: Conceptual Framework



Source, Research, 2023

2.2.2. Supply chain Flexibility

Flexibility enhances the ability to lessen risk exposure in occurrence of supply chain disruption (Skipper & Hanna, 2009). It aids firms to re-allocate resources promptly and smoothly in response to change, thus flexible firms are much innovative, dynamic and

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responsive to changes and challenges (Gligor & Holcomb, 2012). Erol, Sauser, and Mansouri (2010), view operational flexibility as the capability of an enterprise to adjust with little effort and time to the changes of its environment and stakeholders. Scholars have established flexibility indicators that are significant predictors for supply chain resilience as production flexibility, sourcing flexibility, order fulfillment and enhanced transport flexibility (Arani,2015; David et al.,2021). This study adopted supply chain re-engineering, production flexibility and delivery flexibility.

2.2.3. Supply chain Agility

Agility is the capability of a supply chain to swiftly react to change by adjusting its early steady configuration (Christopher, Peck & Towill, 2006). Ghatari et al., (2013), define agility as a core factor for surviving environmental threats when the supply chain is at risk, and facilitate firms to deliver exact products just in time. According to Nag, Han and Yao (2014) agility has two main factors: reacting to changes in timely and proper ways; and utilizing and using changes as chances to survive and flourish competitively. Supply chain agility implies the ability to adjust delivery time promptly in case needs change which is required to perform alternative delivery plans that are necessary for ensuring a resilient supply chain (Al-Shboul, 2017). This study adopted three agility metrics: demand forecasting, decisiveness and inventory management.

2.2.4. Supply chain Risk Management

A risk is an exposure to an event which causes disruption, affecting the efficient management of the supply chain network (Christopher & Lee, 2004). The Supply Chain Risk Leadership Council, (2011) describe supply chain risk management as bringing together of activities to manage an enterprise's entire supply chain in consideration of supply chain risks. Chenge, (2014), advocates the importance of supply chain risk mitigation as it eradicates the likelihood of a risk, decrease its impact, shift its effects to a third party and institute contingency plans after an occurrence. Supply chain risk management practices are: identifying, assessing, controlling and monitoring risk causes in organization (Wieland & Durach, 2021). This study adopted: risk acceptance, risk reduction and risk transfer risk management strategies.

2.3 Empirical Review

Umar and Wilson, (2021) put forward effective communication, information sharing, mutual dependence, informal financial support and trust as collaboration components that improve supply chains resilience in natural disasters. Flexibility indicators like production capacity flexibility, sourcing flexibility, order fulfillment flexibility and enhanced transport flexibility are significant predictors for supply chain resilience (Arani,2015; David et al.,2021). The most important step that businesses can take to enhance their resilience is to increase their flexibility as this increases their capacity to reduce exposure to risk incase a supply chain disruption (Skipper & Hanna, 2009; Maxim et al.,2022).

Major disruptions like the Covid-19 show the essence of learning from the crisis to build swift responsiveness by having simplified, agile, and reachable business continuity with possible applicability in future disruptions (Esra et. al., 2022; Schmid, et. al., 2021). Agility is the major component supply chains need to survive environmental uncertainties by responding swiftly in case of risks in supply chain management, and helps firms deliver right products just in time (Muricho & Muli, 2021; Ghatari et. al., 2013). Risk alleviation strategies will decrease the impact of natural or man-made calamities (Gurtu & Johny, 2021).

According to Minhyo and Aaron, (2022) supply chain resilience can build and sustain constant uninterrupted operations amid dynamic supply chains and global disruption. Joanna and Subramanian, 2021 also confirmed the importance of reacting, adapting and setting up mechanisms for crisis management to withstand uncertainty situations. Maxim et. al, (2022) posit that arranging recovery policies for supply chain adaptation prior to a pandemic is much better than during the crisis.

3. RESEARCH METHODOLOGY

3.1 Design and Data Collection

Descriptive research design was used for this study that used quantitative data. The researcher used structured questionnaires to collect primary data..

3.2 Sampling Design

Sample size calculation was by using a formulae adopted from Yamane (1967) at 90% confidence level with a 5% -10% margin of error, where 10% was preferred since previous studies used it and obtained high number of respondent (Muricho & Muli, 2021). Purposive sampling was then used to pick 255 respondents at managerial levels.

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3.3 Data Analysis
Descriptive and ordinal multiple regression analyses were conducted to determine relationships among variables: the dependant variable being performance while supply chain collaboration, flexibility, agility and risk management strategies were the independent variables.

3.4 Location of Study
This study was carried out in the Republic of Kenya, in the County of Nakuru, which is a home and center of Kenya's flower farming.

4. RESULTS
4.1 Performances of Floricultural Firms
The study sought to determine the respondent's level of agreement concerning the performance of Floricultural Firms in Nakuru County. From table 1, majority of the questions yield a mean value between 3.41 – 4.20 with an average mean of 3.73; varied by a standard deviation of 0.840. This implies that majority concurred. It is evident that supply chain resilience enhances the performance of floricultural firms in Nakuru County, Kenya linked to continuity, operational cost savings and responsiveness. These findings are consistent with Ivy *et al.,* (2019) that performance is determined by annual gross margin, sales growth, return on investment and customer satisfaction. Conversely, Shradha et al., (2017) and Amit et al., (2016) aver that organisational performance is a measure of cost savings, improved profits, revenue growth, reduced defects, better asset utilization, stronger competitive position, quality improvements superior customer service.

Table 1: Descriptive Statistics for Performance

	N	Mean	Std. Deviation
1. Continue operation regardless of the disruption	197	3.60	1.028
2. Increased market share, penetration and growth	197	3.18	1.068
3. Improved, efficient and effective operations	197	3.56	1.112
4. Reduce operational costs	197	3.96	0.513
5. Reduced production wastages	197	3.72	0.807
6. Reduced stock-outs	197	3.68	0.855
7. Quick response to demand changes	197	3.85	0.752
8. Quick chande of delivery schedules and time	197	4.02	0.714
9. Improved time of changeovers	197	4.02	0.714
Valid N (listwise)	197		
Average score		3.73	0.840
Valid N (listwise)	197		

4.2 Hypothesis Testing
The hypothesized relationships were tested using F-test by comparing the ρ values, at 0.05 significance level. If the ρ value is $\leq$ 0.05, then reject the null hypothesis.

4.2.1 Effect of Supply Chain Collaboration Strategies on Performance of Floricultural Firms
The regression results in table 2 indicate the predictors that is, supply chain visibility and strategic partnership explained 66.4% of the variance (R^2 =.664, Adj R^2 =.659), F(3,193)=127.140, ρ<0.05; t=10.461. H_{01}: It was found that supply chain visibility, which was positive, significantly predicted performance (B=0.462, ρ<0.05) t=5.744 as did strategic partnership (B=0.158, ρ<0.05) t=4.018. Thus, H_{01} was rejected. Also, it was observed that information sharing (B=0.004, ρ>0.05) t=0.053 is not a significant variable for studying performance of floricultural firms.

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Table 2: Regression Coefficients of Supply Chain Collaboration Strategies and Performance

Variables	B	S.E	β	t	ρ	Tolerance	VIF
(Constant)	1.339	0.128		10.461	0.000		
Information sharing	0.004	0.084	0.006	0.053	0.958	0.149	6.700
Supply chain visibility	0.462	0.080	0.612	5.744	0.000	0.153	6.530
Strategic Partnership	0.158	0.039	0.248	4.018	0.000	0.455	2.197

$R=0.815; R^2=0.664; R^2_{Adj}=0.659; \rho \leq 0.05$

4.2.2 Effect of Supply Chain Flexibility Strategies on Performance of Floricultural Firms

The regression results in table 3 indicate the predictors explained 73.4% of the variance (R^2 =.734, Adj R^2 =.726), F(3,193)=11.120, ρ <0.05; t=16.222. H_{02}: It was found that supply chain re-engineering, positively and significantly predicted performance (B=0.055, ρ <0.05) t=2.798 as did production flexibility (B=0.159, ρ <0.05) t=2.596, and also delivery flexibility (B=0.015, ρ>0.05) t=3.224, thus rejecting H_{02}.

Table 3: Regression Coefficients of Supply Chain Flexibility Strategies and Performance

Variables	B	S.E	β	t	ρ	Tolerance	VIF
(Constant)	2.913	0.180		16.222	0.000		
Supply chain re-engineering	0.055	0.069	0.095	2.798	0.036	0.315	3.176
Production flexibility	0.159	0.061	0.289	2.596	0.010	0.357	2.803
Delivery flexibility	0.015	0.067	0.022	3.224	0.042	0.460	2.176

$R=0.857; R^2=0.734; R^2_{Adj}=0.726; \rho \leq 0.05$

4.2.3 Effect of Supply Chain Agility Strategies on Performance of Floricultural Firms

The regression results in table 4 indicate the predictors explained 72.9% of the variance (R^2 =.729, Adj R^2 =.719), F(3,193)=31.569, ρ <0.05; t=6.265. H_{03}: It was found that demand forecasting, positively and significantly predicted performance (B=0.090, ρ<0.05) t=2.412 as did decisiveness (B=0.450, ρ<0.05) t=4.834, and also inventory management (B=0.179, ρ>0.05) t=2.291, thus rejecting H_{03}.

Table 4: Regression Coefficients of Supply Chain Agility Strategies and Performance

Variable	B	S.E	β	t	ρ	Tolerance	VIF
(Constant)	1.643	0.262		6.265	0.000		
Demand Forecasting	0.090	0.064	0.128	2.412	0.039	0.423	2.362
Decisiveness	0.450	0.093	0.429	4.834	0.000	0.442	2.265
Inventory Management	0.179	0.078	0.264	2.291	0.023	0.262	3.817

$R=0.854^{a;}$ $R^2=0.729$; $R^2_{Adj}=0.719$; $\rho \leq 0.05$

4.2.4 Effect of Supply Chain Risk Management Strategies on Performance of Floricultural Firms

Regression results in table 5 indicated the predictors explained 61.1% of the variance (R^2 =.611, Adj R^2 =.597), F(3,193)=8.018, ρ <0.05; t=17.513. H_{04}: It was found that risk acceptance, positively and significantly predicted performance (B=0.013, ρ <0.05) t=1.981 as did risk reduction (B=0.045, P<0.05) t=1.986, and also risk transfer (B=0.156, ρ >0.05) t=2.176 which were positive and significant, thus rejecting H_{04}.

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Table 5: Regression Coefficients of Supply Chain risk management Strategies and Performance

Variable	B	S.E	β	t	*ρ*	Tolerance	VIF
(Constant)	3.016	0.172		17.513	0.000		
Accept Risk	0.013	0.071	0.020	0.189	0.045	0.425	2.352
Reduce Risk	0.045	0.072	0.076	0.628	0.041	0.315	3.179
Transfer Risk	0.156	0.072	0.254	2.176	0.031	0.337	2.968

$R=0.782^{a;}$ $R^2=0.611$; $R^2_{Adj}=0.597$; $\rho \leq 0.05$

4.3.5 Overall effects of Supply Chain Resilience Strategies on Performance of Floricultural Firms

The overall regression results in table 6 indicate the predictors explained 74% (R2 =.740, Adj R2 =.735), F(4,192)=136.932, ρ<0.05; t=3.266 of the variation on performance of floricultural firms: It was found that Supply chain collaboration strategies (SCCS), positively and significantly predicted performance (B=0.572, ρ<0.05) t=17.609 as did Supply chain flexibility strategies (SCFS) (B=0.073, ρ<0.05) t=1.955, similarly Supply chain agility strategies (SCAS) (B=0.155, ρ<0.05) t=4.397 and also Supply chain risk management strategies (SCRMS) (B=0.223, ρ>0.05) t=5.649.

Table 6: Overall Regression Coefficients of Supply Chain Resilience strategies and Performance

Variable	B	S.E	β	t	*ρ*
(Constant)	0.508	0.155		3.266	0.001
SCCS	0.572	0.032	0.735	17.609	0.000
SCFS	0.073	0.039	0.110	1.975	0.035
SCAS	0.155	0.035	0.178	4.397	0.000
SCRMS	0.223	0.039	0.324	5.649	0.000

$R1=0.860^{a;}$ $R^2=0.740$; $R^2_{Adj}=0.735$; $\rho \leq 0.05$

5. DISCUSSION

It is evident that supply chain collaboration strategies contribute positively to performance of floricultural firms. Supply chain collaboration was measured by information sharing, supply chain visibility and strategic partnership. Evidence indicates that visibility and strategic partnership are significant indicators of floricultural firms' performance linked to continuity, cost saving and responsiveness. The findings concur to other scholars that trust, visibility, mutual dependence, collective communication and joint relationship are collaboration components that improve supply chains resilience in natural disasters (Scholten & Schilder, 2015; Umar & Wilson, 2021).

It is noted that supply chain flexibility strategies, measured by supply chain re-engineering, production flexibility and delivery flexibility positively and significantly affect the performance of floricultural firms linked to continuity, operational cost savings and responsiveness. The findings are similar to those of different scholars linking production flexibility, sourcing flexibility, order fulfillment flexibility and enhanced transport flexibility as significant indicators of supply chain resilience (Arani, 2015; David, et. al., 2021). Increasing flexibility is the major step businesses can take to enhance resilience through increasing their capacity to reduce exposure to risk in case of supply chain disruption (Skipper & Hanna, 2009; Maxim, et al.,2022). Flower firms need to incorporate flexibility to quicken response to production and transportation disruptions present in floricultural industry.

It is established that supply chain agility strategies, measured by demand forecasting, decisiveness and inventory management positively and significantly affect the performance of floricultural firms. These strategies will enhance floricultural firms resilience to withstand disruptions, recover, and continue operations amid the crisis and save costs. This is consistent with the arguments of Esra, et. al., (2022) and Schmid, et. al., (2021) that major disruptions like Covid-19 verified the essence of learning from a crisis to create accessible, simple and agile continuity plan prior to future disruptions. Similarly, other scholars contend that agility is a major supply chain component that swiftly conquers environmental uncertainties, and also helps firms deliver right products just in time (Muricho & Muli, 2021; Ghatari et. al., 2013; Al-Shboul, 2017). Floricultural firms can thus embrace agility to develop agile supply chains capable of managing inventory and adjusting delivery time when needs change to alternative plans to ensuring a resilient supply chain.

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It is eminent that supply chain risk management strategies, measured by risk acceptance, risk reduction and risk transfer positively and significantly affect the performance of floricultural firms linked to continuity, operational cost savings and responsiveness. This is in sync with Gurtu and Johny, (2021) that risk alleviation strategies will decrease the impact of natural or man-made calamities. In addition, the results are consistent with various studies that in order to avoid supply chain risks, a supply chain resilient strategy should be developed with appropriate strategies that averts or decreases the occurrence of disruptive events (Minhyo & Aaron, 2022; Maxim et al., 2022). The floricultural supply chain network is characterized with dynamic and ever new disruptions. Due to the perishable nature of their product, flower firms should create a more robust supply chain by transferring the largest part of risks to third parties because risk reduction decreases its impact and builds resilience

6. CONCLUSION

Supply chain resilience strategies contribute positively and significantly to the performance of floricultural firms in Nakuru County, Kenya. Clearly, supply chain collaboration strategies, supply chain flexibility strategies, supply chain agility strategies and supply chain risk management strategies are used to manage the new, diverse and ever present risks characterized in the floricultural sector. It is clear that floricultural firms employ visibility and strategic partnership to enhance collaboration, which is a key strategy in building resilience amid the risky operating environment. Through visibility, flower firms improve performance by readily availing data to all stakeholders. As a result they are able to manage logistics and operations more effectively and provide quick response to disruptions, changing needs and market information.

Evidently, supply chain flexibility enhances the resilience of floricultural firms by sustained performance regardless of the disruptions present in floriculture industry. This is realized through supply chain re-engineering, production and delivery flexibility. Supply chain reengineering facilitates a competitive edge as flower firm respond quickly to changing requirements ofdelivery time, capacity of distribution services and creating new products for the market. Flower firms can however sustain flexibility by having an adaptive supply chain structure and a well-developed system to integrate information and quickly change the routing and mode of transportation to cope with changes brought about by disruptions Demand forecasting, decisiveness and inventory management improved supply chain agility through enhanced resilience of flower firms amid the numerous disruptions in this sector. Flower firms are able to make decisive plans and adjustments to improve performance, adapt to external environment and quickly introduce alternative plans. Flower firms can sustain an agile supply chain through demand forecasting and increasing storage capacity and also have excess capacity of materials and labour to quickly boost output if needed. This will be a buffer against order changes in market, new customer priorities and changing requirement of pricing. Finally, risk acceptance, risk reduction and risk transfer strategies enhanced risk management which is a key strategy in building resilience of floricultural firms' risky operations. Flower firms are able to learn from past disruptions and prepare for future disruptions by instituting a team which is dedicated to supply chain risk management. Flower firms can however sustain risk management practices by reducing their impacts through sharing and insuring against risks.

Policies should be formulated that would enhance supply chain resilience by instituting collaboration between flower firms and customers and promoting transparent supply chain visibility and strategic partnerships at all levels between the firms and customers. This will in contribute significantly to their improved performance linked to operational cost savings, continuity regardless of to the ever present floricultural disruptions and quick responsiveness.

The adjustable policies should create a flexible supply chain equipped with re-engineering to integrate readiness and allow quick and effective response to disruptions. Production and transportation flexibility will quicken response to changes in flower production due to order variations or uncertain transportation respectively as a result of unforeseen events and seasonality that is characterized in the flower sector.

Policy makers in floricultural sector can create adaptable policies to allow quick decision making by having an agile supply chain that is capable of detecting and offsetting disruptions by adjusting to varying demands to effectively manage inventory and also capable of adjusting the delivery time when needs change to alternative delivery plans thus ensuring a resilient supply chain hence creating a more robust and resilient supply chain in the varied disruptions in floricultural industry. Supply chain resilience is found on the fundamental assumption that not all risks can be barred. Therefore, flower firms should accepting the existence of varied, ever present and new supply chain risks in the floriculture industry and formulate amendable policies that would counteract supply chain risks through transferring the largest part of risks to third parties as it is evident that risk reduction decreases its impact and builds resilience thus improving performance.

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