

## ENVIRONMENTAL TURBULENCE AND ENTREPRENEURIAL SUCCESS OF AGRIBUSINESSES IN RIVERS STATE, NIGERIA

**Haliru Bala Ph.D**

Department of Management, Faculty of Management Sciences, University of Port Harcourt  
Port Harcourt – Nigeria

**E-mail:** [halirusbala@yahoo.com](mailto:halirusbala@yahoo.com)

### **Abstract**

*The study investigates the relationship between environmental turbulence and entrepreneurial success of agribusinesses in Rivers State. The independent variable, environmental turbulence, was operationalised with technological turbulence and market turbulence, while the criterion variable, entrepreneurial success, was measured with revenue growth and customer satisfaction. The study was a cross-sectional survey design. The population comprises 218 owners of agribusinesses in Rivers State. A sample of 140 respondents was determined using the Krejcie and Morgan table. A well-structured questionnaire was used in obtaining the primary data. Random sampling technique was used. The findings revealed a significant relationship between the dimensions of technological turbulence and entrepreneurial success. The study concludes that environmental turbulence correlates with entrepreneurial success of agribusinesses in Rivers State. The study recommends that agribusinesses strategically harness and respond to both technological and market turbulence in order to enhance entrepreneurial success.*

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**Keywords:** Agribusiness, Entrepreneurial, Environmental, Success, Turbulence

### **1.0 Introduction**

The success of entrepreneurs is very essential in enhancing their performance and general fortune in the business domain. Entrepreneurial success refers to transformative and major improvements and positive changes in shaping the growth, expansion, survival, and sustainability of agribusinesses (Ezennia & Mutambara, 2022). As the agric sector continues to undergo pressures from market the capability of entrepreneurs to achieve substantive success becomes an essential driver of agribusiness performance. Successful entrepreneurs adopt modern technologies, introduce innovative enterprise models, and respond proactively to

environmental challenges (Amadu et al., 2021).

Entrepreneurial success enhances innovation and modernisation within agribusiness systems. Successful agribusiness entrepreneurs often bring new and smart ideas into farming, especially ideas that help the environment, improve productivity, and make farming more efficient. They introduce climate-smart technologies, improved production proficiency, and digital tools that promote productivity and resource efficiency (Amadu et al., 2021). The introduction of innovative ideas improves product quality, reduces production risks, and increases profitability. As highlighted by Meuwissen et al. (2021),

entrepreneurial capability strengthens a firm's ability to innovate and adapt, making business operations more resilient to turbulence, climate variability and supply chain disruptions. Successful entrepreneurs can diversify into new markets and improve their products through new processes, such as new packaging or branding, to drive market expansion and value addition and sustain a vital competitive advantage in domestic and international markets. Successful entrepreneurs look for new business opportunities, upgrade their products through investing in processing, packaging, and marketing, and collaborate and build strategic partnerships with other businesses to grow stronger and thus enhance their market presence. Benni and Vigani (2021) suggest that entrepreneurs who leverage digital financial tools to increase value chain efficiency and competitiveness and expand their market linkages promote effectiveness and efficiency that result in business success.

Entrepreneurial success in agribusiness is attached to the capacity of entrepreneurs to develop strategic agility, navigate turbulent environments through innovation, adapt quickly to changing conditions and be strategic in proactive decision-making. The success of agribusiness entrepreneurs often lies in their ability to enhance diverse income streams, improve capabilities, adopt climate-smart technologies, build strong network relationships and utilise flexible resources.

Amadu et al. (2021) suggest that a business organisation that promotes diversity in operations, utilises climate-smart practices, and strengthens networks is better positioned to convert environmental threats into opportunities to enhance their competitive advantage. Nevertheless, the extent of entrepreneurial adaptability varies in agribusiness operators who face higher exposure to climate and market shocks (Nolte & Ostermeier, 2020); hence, environmental turbulence creates unequal risks across different segments of the agribusiness sector. Agribusinesses function within an environment that is dynamic and constantly facing severe environmental instability due to unpredictable structural constraints and climate-induced turbulence. Environmental turbulence—characterised

By continual, rapid, unexpected, and significant changes in key external variables such as droughts, floods, pest outbreaks, and soil degradation—continues to threaten production systems and weaken agribusiness resilience as a result of fluctuating weather patterns (Nhamo et al., 2020; Despoudi et al., 2021), and global market volatility, fluctuating weather patterns, technological disruptions, policy shifts, and resource scarcity continuously reshape the operational business environment. This inconsistency in the business environment often brings both challenges and opportunities.

Despite several studies on environmental turbulence (Nhamo et al.,

2020; Despoudi et al., 2021; enni & Vigani, 2021; /Shabbir et al., 2021) and entrepreneurial success (Amadu et al., 2021; Meuwissen et al., 2021; Ezennia & Mutambara, 2022), respectively, there is a dearth of empirical study on the influence of environmental turbulence on entrepreneurial success in agribusiness firms. This study will bridge the observed gap in knowledge and provide insights on how environmental turbulence knowledge can strengthen the sustainability and competitiveness of agribusinesses in an era of increasing uncertainty.

### **Statement of the Problem**

Agribusinesses in Rivers State are struggling and not achieving the expected levels of growth, innovation, or business performance; many continue to record poor entrepreneurial success, and this is shown through records of low profitability, as they are not making enough profit; they are faced with weak market penetration, and their businesses are not growing, making it difficult to add new products, expand operations, or invest in new opportunities, and hence resulting in limited portfolio expansion and a high rate of underperforming small and medium agribusiness enterprises (SMEs). Ateke and Godday's (2023) survey of agribusiness SMEs in Rivers State revealed that many agribusinesses are not expanding their operations and are making low profits, indicating that their overall business success is poor and growth is limited, which is a sign of uneven and overall poor entrepreneurial

outcomes in the sector, as many entrepreneurial performances are inconsistent and generally low, with some firms doing slightly better than others but most struggling. However, in Poi & Adim (2021), the study suggests that changes in market demand, unpredictable government policies, and climate-related disruptions require businesses to be flexible and proactive, but many SMEs in Rivers State are not adapting well to these changes, which makes their poor performance worse, and because businesses are not responding effectively to these environmental challenges, their ability to succeed as entrepreneurs is further reduced.

Beyond economic effects, persistent long-term poor performance in agribusiness affects not only money and growth but also the availability of food and the ability of farms and markets to withstand shock. Low farm productivity, weak value chains of agricultural networks, and poor investment make the food supply chain system more unstable, fragile, and vulnerable to shocks (Tsakok, 2023). Various interventions have been initiated to enhance agribusiness entrepreneurship, ranging from microcredit, government and donor-backed SME support, and entrepreneurship training (Ateke & Godday, 2023; Benni & Vigani, 2021); nonetheless, many agribusinesses remain unstable, unable to translate available support into sustained entrepreneurial success as interventions fail to address the environmental turbulence (Poi & Adim,

2021; Amadu et al., 2021). Hence, the study intended to address the problem by exploring the influence of environmental turbulence on entrepreneurial success among agribusinesses in Rivers State, to strengthen firm-level resilience, improve uptake of value-adding practices, and ultimately raise agribusinesses' entrepreneurial success.

### **Aim and Objectives of the Study**

The aim of this study is to examine the relationship between environmental turbulence and entrepreneurial success of agribusinesses in Rivers State. The specific objectives are to:

- i. Explore the relationship between technological turbulence and revenue growth of the agribusinesses in Rivers State.
- ii. Determine the link between technological turbulence and customer satisfaction of the agribusinesses in Rivers State.
- iii. Assess the relationship between market turbulence and revenue

### **Research Hypotheses**

The following research hypotheses were stated and tested in this study.

$H_0 1$ : There is no significant relationship between technological turbulence and revenue growth of the agribusinesses in Rivers State.

$H_0 2$ : There is no significant relationship between technological turbulence and

growth of the agribusinesses in Rivers State.

- iv. Investigate the association between market turbulence and customer satisfaction of the agribusinesses in Rivers State.

### **Research Questions**

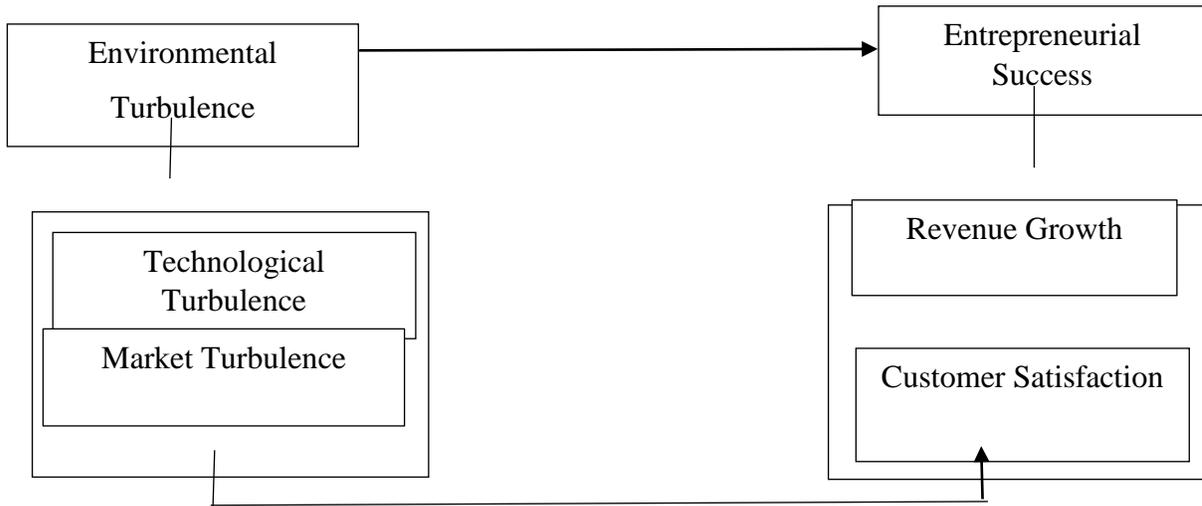
The following research questions were given in the study:

- i. What is the association between technological turbulence and revenue growth of the agribusinesses in Rivers State?
- ii. How does technological turbulence relate to the customer satisfaction of the agribusinesses in Rivers State?
- iii. How does market turbulence relate to the revenue growth of the agribusinesses in Rivers State?
- iv. What is the linkage between market turbulence and customer satisfaction of the agribusinesses in Rivers State?

customer satisfaction of the agribusinesses in Rivers State.

$H_0 3$ : There is no significant relationship between market turbulence and revenue growth of the agribusinesses in Rivers State.

$H_0 4$ : There is no significant relationship between market turbulence and customer satisfaction of the agribusinesses in Rivers State.



**Figure 1:** A conceptual framework of environmental turbulence and entrepreneurial success.  
**Source:** Conceptualized by the researcher

**2.0 Review of Related literature**

This study is based on dynamic capability theory. The dynamic capabilities theory was propounded by Teece (1997). The theory suggests that a firm's capability in building, combining, and changing its internal and external capabilities to adjust speedily to ever-changing environments keeps it ahead of the competition. Agribusinesses often experience turbulent environments noticeable in fast technological improvement, climate variability, market disorder, shifting market demand, evolving regulatory frameworks and policy ambiguity, thus requiring organisations to cultivate dynamic capabilities to detect threats and emerging opportunities and take advantage of the new prospects and reconfigure resources to sustain performance

(Teece, 1997; Teece, Peteraf, & Leih, 2016). The Dynamic Capabilities Theory opines that entrepreneurs who could sense, seize, and change things are better able to cope with turbulent environmental shocks by providing creative ideas for their businesses. This theory is relevant to this study because when the organization is able to adapt based on their dynamic capability such will help enhance the entrepreneurial success.

**Conceptual Review**

**Environmental Turbulence**

Environmental turbulence refers to rapid, unexpected, and unpredictable changes in the business's external environment that the firm cannot fully control, such as market volatility, regulatory shifts, and technological disruptions that can destabilise business operations. Market

volatility is a sudden change in customer demand or prices. 'Regulatory shifts' refers to changes in government policies, laws, or rules that affect business operations, while 'technological disruption' refers to new technologies that change how business is done or make old methods obsolete. Arslan & Yilmaz (2023) suggest that environmental turbulence (technological turbulence, market turbulence, and competitive intensity) reduces product life cycles, changes customer demands, and challenges firms' strategic planning. These external pressures of unpredictable changes outside the business compel organisations to monitor their surroundings and build a strong ability to react quickly and adapt, or risk falling behind their competitors. Arslan and Yilmaz (2023) posit that environmental turbulence influences strategic agility. Business environmental turbulence is unpredictable, making firms often require greater strategic agility and innovativeness.

### **Technological Turbulence**

Technological turbulence refers to the speed at which technological change occurs and disrupts present business processes. Rapid technological advancements in the form of new software, machinery, or digital tools often change how businesses operate and make existing processes outdated. The rapid change in technology compels firms to incorporate new tools and new technologies, update their software, and update their processes to stay efficient and remain competitive. Hanoun et al. (2023) posit that technological

turbulence is moderately associated with entrepreneurial marketing and firm performance. Fast-changing technology can disrupt business processes, offering both new opportunities and challenges, and firms must adapt to stay competitive and successful. Moreover, technological turbulence requires businesses to be flexible within the organisation; they must not only adopt new technology but also build absorptive capacity to understand and apply it productively. Additionally, businesses need to be agile in leveraging this technology quickly and adjusting processes as new technologies emerge (Ramadan et al., 2023).

### **Market turbulence**

Market turbulence refers to a situation where fast, unforeseeable changes in the preferences of the customers, the needs and demand levels, and competitive activities destabilise the business environment, making the business environment unstable and difficult to predict. A firm operating in an environmental condition with high market turbulence must struggle to know the customers' needs and wants and when they are needed. Organisations whose business operations are under high market turbulence constantly undergo ambiguity about what their customers need and want, when they want it, and at what price, making traditional forecasting and long-term strategic planning difficult. Arıcı and Gök (2023) suggest that environmental turbulence relates to environmental success; however,

organisations that embrace market sensing, agility, and rapid decision-making could turn uncertain market threats into opportunities.

### **Entrepreneurial Success**

Entrepreneurial success refers to how well a business organisation meets its strategic goals and financial targets and how they sustain their long-term growth objectives. This business success may emerge from competencies, willingness to take calculated risks, opportunity recognition, risk-taking, and entrepreneurial self-efficacy, and these personal and strategic factors strongly shape whether an entrepreneur is able to build and sustain a successful business opportunity (Gautam & Khadka, 2022). Beyond personal competencies, environmental and contextual factors are also shaped by the external conditions in which a business operates and their influence on entrepreneurial success. Entrepreneurial ecosystems, such as access to finance, supportive institutions, and market conditions, often strengthen or weaken the bond between an entrepreneur's abilities and the performance of the business (Bala et al., 2022). Thus, entrepreneurial success is not only a function of individual drive but also of the broader environment in which the entrepreneur operates, which enables them to use their capabilities in generating powerful outcomes or limits their efforts regardless of competencies. This study shows that entrepreneurial success is not ascertained entirely by individual

effort influenced by the external environment's constraints, opportunities and support systems.

### **Revenue Growth**

Revenue growth refers to the increase in a firm's sales or financial gain over a period and is often used as a key indicator of business performance and success. In SMEs, revenue growth is a symptom that agribusiness is being strategic, innovative, and strategic in decision-making and market-orientated practices. When business organisations consider investing in innovative products, creative new market opportunities and processes, take advantage of entrepreneurial marketing and achieve higher sales growth (Mutuku, 2022). These increased revenue and growth trajectories reflect not just survival but progression, advancement, enlarging the business's capableness, and aligning it for long-term sustainability through continuous reinvestment and growth. Entrepreneurs who grow their revenues are better positioned to reinvest, scale, and sustain operations. Hence, organisations that incorporate innovation with strategic agility can turn uncertainty into a new opportunity to enhance revenue expansion even under turbulent conditions.

### **Customer Satisfaction**

Customer satisfaction represents the extent to which customers perceive their expectations have been met or exceeded by a firm's products or services. It is an essential non-financial performance measure

for SMEs, since high satisfaction brings about loyalty, repeat purchases, and positive word-of-mouth to promote stability and long-term competitiveness. Zakari & Ibrahim (2021) suggest that enterprises with higher customer satisfaction exhibit stability and higher business performance results; hence, they engage in customer-focused strategies for business success. In turbulent environments, customer satisfaction provides stability, and when external markets fluctuate or conditions become unclear and unpredictable, loyal and satisfied customers protect an organisation from sudden drops in demand.

### 2.3 Empirical Studies

Kisilu (2022) investigates the influence of competitive strategies on environmental instability in horticultural enterprises in Kenya during the COVID-19 epidemic. The study is anchored on Dynamic Capabilities Theory and Industrial Organisations Theory. The study was a cross-sectional survey design. The population comprises the department heads, senior management, and middle management of 38 horticulture exporters based in Kenya. Frequencies and percentages were used for the analysis. The findings revealed that organisational leadership impacts the competitiveness of horticulture firms amid environmental disruptions.

Dias (2021) explores the association between economic and financial

performance (FP) and environmental sustainability commitment (ESC). A sample of 160 employees of fresh fruit farms was used. Partial least squares structural equation modelling (PLS-SEM) was used for the analysis. The results reveal that entrepreneurial training initiatives could empower farmers to perceive food security as a market opportunity rather than as a set of regulations to adhere to. This study differs from previous empirical works because it examines the relationship between environmental turbulence and entrepreneurial success of agrobusiness in Rivers State.

### 3.0 Methodology

The cross-sectional survey was used in this study. The population of this study is 218 owners of agribusinesses in Rivers State. A sample of 140 respondents was determined using the Krejcie and Morgan table (1970). A well-structured questionnaire was used in obtaining the primary data. Random sampling technique was used. The independent variable, environmental turbulence, was operationalised using two dimensions: technological turbulence and market turbulence. Each construct was measured with a set of five items. Technological turbulence was examined with items such as “Technological changes in our industry are frequent and unpredictable.” Similarly, market turbulence was measured with items such as “Customer preferences in our market change rapidly.” The criterion variable, entrepreneurial success, was measured using

two dimensions: revenue growth and customer satisfaction. Revenue growth was assessed with items such as “Our business revenue has increased steadily over the past three years.” Customer satisfaction was measured with items such as “Most of our customers are satisfied with the products or services we offer.” Face and content validity were used to determine the validity of the instrument used in this investigation. The reliability was determined using Cronbach's alpha. Cronbach’s Alpha reliability level of 0.7 was used in the investigation. Values above 7.0 are considered reliable. The reliability of 0.792, 0.833, 0.822 and 0.796 was observed for technological turbulence,

market turbulence, revenue growth and customer satisfaction respectively. Spearman’s Rank Order Correlation Coefficient was used for the analysis.

**4.0 Results and Discussion**

A total number of one hundred and forty (140) questionnaires were distributed, but only 133 (95%) copies were returned, and this constitutes the valid questionnaire. The hypothesis test is undertaken at a 95.5% confidence interval, and the decision rule states that where  $P < 0.05$ , reject the null hypothesis, and where  $P > 0.05$ , accept the null hypothesis.

**Table 1: Correlations between Technological Turbulence and the Dimensions of Entrepreneurial Success**

			Technological Turbulence	Revenue Growth	Customer Satisfaction
Statistical Results	Technological Turbulence	Correlation Coefficient	1.000	.595**	.605**
		Sig. (2-tailed)	.	.000	.000
		N	133	133	133
	Revenue Growth	Correlation Coefficient	.595**	1.000	.535**
		Sig. (2-tailed)	.000	.	.000
		N	133	133	133
Customer Satisfaction	Correlation Coefficient	.605**	.535**	1.000	
	Sig. (2-tailed)	.000	.000	.	
	N	133	133	133	

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

**Technological Turbulence and Revenue Growth:** In table 1, the Spearman’s rho value is 0.595 ( $p = 0.000$ ), which is lower than the 0.05 significance threshold. The coefficient of determination ( $r^2$ ) is 0.354. This means 35.4% revenue growth differences are attributed to variations in technological turbulence. This finding led to the rejection of the null hypothesis ( $H_{01}$ ) and the acceptance of the alternative hypothesis ( $H_{a1}$ ). The study revealed a positive relationship between technological turbulence and revenue growth.

**Technological Turbulence and Customer Satisfaction:** Table 1 also reveals a Spearman’s rho value of 0.605 ( $p = 0.000$ ), which is less than the 0.05 threshold level. The  $r^2$  value of 0.366 suggests that 36.6% of the variance in customer satisfaction is attributable to technological turbulence. Consequently, the null hypothesis ( $H_{02}$ ) is rejected in favour of the alternative hypothesis. This shows the existence of a positive relationship between technological turbulence and customer satisfaction.

**Table 2: Correlations between Market Turbulence and the Dimension of Entrepreneurial Success.**

		Market Turbulence	Revenue Growth	Customer Satisfaction
Market Turbulence	Correlation Coefficient	1.000	.610**	.615**
	Sig. (2-tailed)	.	.000	.000
	N	133	133	133
Revenue Growth	Correlation Coefficient	.610**	1.000	.575**
	Sig. (2-tailed)	.000	.	.000
	N	133	133	133
Customer Satisfaction	Correlation Coefficient	.615**	.575**	1.000
	Sig. (2-tailed)	.000	.000	.
	N	133	133	133

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

**Market Turbulence and Revenue Growth.** In Table 2, column 5, the Spearman's rho value is 0.610 ( $p = 0.000$ ), which is below the significance level of 0.05. The coefficient of determination ( $r^2$ ) is 0.372, indicating that 37.2% of the variation in revenue growth is explained by market turbulence. With this result, the null hypothesis ( $H_{03}$ ) is rejected, and the alternative hypothesis ( $H_{a3}$ ) is accepted. This observation demonstrates a strong and significant positive relationship between market turbulence and revenue growth.

**Market Turbulence and Customer Satisfaction:** Table 2 also shows a Spearman's rho value of 0.615 ( $p = 0.000$ ), which is less than the 0.05 significance level. The  $r^2$  value is 0.378, indicating that market turbulence accounts for 37.8% of the variance in customer satisfaction. Based on this evidence, the null hypothesis ( $H_{04}$ ) is rejected in favour of the alternative hypothesis. This suggests that there is a strong, significantly positive relationship between market turbulence and customer satisfaction.

#### 4.1 Discussion of Findings

The study investigate the association between environmental turbulence (operationalised with technological turbulence) and market turbulence, and entrepreneurial success, measured through revenue growth and customer satisfaction, within the agribusinesses in Rivers State. The analysis was conducted using Spearman's correlation coefficient. The

findings shows that both dimensions of environmental turbulence influence entrepreneurial success positively and significantly

**Technological Turbulence and Entrepreneurial Success:** The research finding in table 1 indicated that technical turbulence has a significant positive correlation with revenue growth and customer satisfaction. This means that companies that have engage in in unexpected changes in technology require more use of adaptive strategy in adopting new technologies, improving procedures, and spending money on new idea for better provision of excellent goods and services, which increases sales and enhances customer satisfaction. This result is aligns with Kisilu (2022) that competitive strategies correlates with environmental instability in horticultural enterprises in Kenya. It also conform with Zhou (2005) whose study reveals that technologies enhances better products that give customers satisfaction.

**Market Turbulence and Entrepreneurial Success:** The findings also revealed that market turbulence shows a positive and significant correlation with revenue growth and customer happiness. This implies a better performance from organisations that swiftly notice and adjust to changes in client preferences and competitive dynamics. These results agrees with Dias (2021) explores that between economic and financial performance correlates with

environmental sustainability commitment. Market instability encourages entrepreneurial firms to stay alert, focused and be flexible in changing plans speedily. The overall results review a correlation within environmental turbulence and entrepreneurial success.

### 5.0 Conclusion

This study examines the association between environmental turbulence and entrepreneurial success, as assessed among agribusinesses in Rivers State. Environmental turbulence, the predictor variable, was conceptualised and measured through technological turbulence and market turbulence, while entrepreneurial success, the criterion variable, was measured through revenue growth and customer satisfaction. The findings revealed that both dimensions of environmental turbulence have moderate and significant positive relationships with entrepreneurial success. Specifically, technological turbulence brings measure of improving revenue growth and customer satisfaction by anticipating changes, initiating new ideas, and acting early. Similarly, a strong relationship exists between market turbulence and all the two measures of entrepreneurial success (revenue growth and customer satisfaction). Hence the

agribusinesses that keep an eye on their surroundings, quickly adapt to changing market needs, and use new technologies are more likely to do better, keep their customers, and stay ahead of the competition in tough business situations.

### 6.0 Recommendations

1. Agribusinesses should invest in new technology and digital tools that make production more efficient, improve market access, and enhances better decisions on operational activities
2. Agribusinesses should improve production operation, cut expenses, and improve revenue growth by adopting new technologies for products to keep up with current technology trends and enhances training on use of technology, use new ideas that improve quality, and make their packing and delivery systems better for client satisfaction.
3. Agribusinesses should continually engage in sensing the market and gathering information about their competitors to increase their income growth.
4. Agribusinesses should focus on their customers and make sure that their products and services stay in line with changing trends.

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**Appendix****Questionnaire on Environmental Turbulence and Entrepreneurial Success**

Please carefully tick (√) the option as it relates to your perception of the questions.

1 = Strongly disagree

2 = Disagree

3 = Agree

4 = Strongly agree

S/N	Environmental Turbulence	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
	<b>Technological turbulence</b>				
1.	My organization is experiencing high technological turbulence				
2.	The rate of technological proliferation has drastically increased over the years.				
3.	There is continuous technological disruption in the industry.				
4.	My organization faces high level of novelty in terms of technological advancement				
5.	In my organization, there is high-tech invention that has altered how things was done in the past.				
	<b>Market Turbulence</b>				
6.	My organization is exposed to high market turbulence.				
7.	In changes in prices in the industry is becoming uncontrollable.				
8.	My organization is faced with high volatility index				
9.	My organization id faced with high rate of uncertainty in the market				
10.	There is constant shift in customers preferences in the market domain.				

	<b>Entrepreneurial Success</b>				
	<b>Revenue Growth</b>				
11.	Our organization has experience profitability.				
12.	There is high rate of turnover in my organization over the years.				
13.	In my organization is growing geometrically				
14	The revenue growth in my organization is constantly on the increase.				
	<b>Customer Satisfaction</b>				
16	The customer of our organization always rates us high.				
17	In my organization, the customers always express a sense of satisfaction.				
18	My organization enjoy increase patronage from our customers.				
19	My organization have been able to effectively satisfy the expectations of our stakeholders.				
20	The customers of my organization display affective satisfaction.				

$N$	$S$	$N$	$S$	$N$	$S$
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note —  $N$  is population size.  $S$  is sample size.