

Research Article

Assessment of Total Quality Management Practices on Sustainable Food Security Project in Nigeria

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Abstract

Most developing nations encountered various challenges due to unsustainable food security projects, despite huge financial commitment and time invested on food sustainability, the impact is not really sufficient. This raises a concern to conduct a study on how total quality management practices affects sustainable food security project in Nigeria, This study adopted a survey research design, using a structured questionnaire. A formular developed by Cochran was used to determine the sample size of 246 farmers from the North-Western state of Nigeria. The data collected were analyzed using percentage distribution statistics and multiple Regression analysis. The findings revealed that, there was a significant relationship ($R^2 = 0.401$; $p < 0.05$) between leadership commitment and measurement index on food accessibility. From the findings of the study, it was discovered that effective leadership commitment and measurement could enhance food accessibility in Nigeria Therefore, it could be concluded that government developing policies based on farmers input could promotes food security in Nigeria.

Keywords

Total Quality Management, Leadership Commitment, Measurement, Food Accessibility and Sustainable Food Security

1. Introduction

Survival of individuals and organizations in this present competitive environment are mostly function of continuous improvement and customer satisfactions. The era of modernization is currently impacting all aspect of human life, this also include the agricultural sector which prompted, competition between different agricultural firms that operates at all levels such as local, regional, national and international level. Based on that, a firm is demanded to be able to continue to grow is quality management techniques, so that it can face

existing competition [8].

ISO 9000 (2010) defines Quality as “the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs”. Project requirements from the donor and the beneficiaries are defined based on stated and implied quality needs for the project. Quality was also described as “Conformance to requirements or fitness for use”, this implies that the expected goal of the sponsor and end-users of the project are met, and the intending value of the product or

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service are not compromised as it was originally plan. Exceeding or meeting stakeholder's expectations and conforming to the project design and specifications are the major focus of quality management.

Nigeria as one of the developing economies with agricultural activities is a critical economy activity. However, there has been dwindling in agricultural productivity over the years in the country, despite numerous efforts of the government to grow and increase the area of feed for the ever-increasing population. [9]

Managerially self-sufficiency, adequate finance and technical success are major consideration of creating a community of sustainable food security. Financial self-reliance implies that the community has ability to draw their own budgets for food security projects, they are able to sufficiently assemble their financial capitals, account for incomes received from food projects activities within their communities and can prepare financial reports for food projects [4].

Statement of Problem

Sustainability of food projects has been a great challenge in various developing countries, where huge money and time are invested during implementation but expected impact is not really sufficient. Funding and support structures of food projects are sometimes not adequately impacted the needs of the beneficiaries. Sometimes surplus food is produced from some part of a country but could not be move where inadequate food supply is experienced in the country due to logistic proble. However, most of previous studies on project sustainability consider only economic factors for project sustainability such as existence of the projects several years after implementation, increased food supplies and availability of food produce [7, 11, 13].

Despite the contribution of these authors most of these challenges still persist, this raises a concern to conduct a study on how total quality management practices affects sustainable food security project in Nigeria, using leadership commitment and measurement index to measure total quality management practices, while food accessibility was used to measure sustainable food security.

2. Literature Review

Total Quality Management (TQM) is considered as a method of improving efficiency. The principle of TQM is a way to organize and mobilize an entire organization, every department, every activity, and every individual at every level to achieve quality [8]. In the study of [12] Total Quality Management was referred to as a journey, not a destination. In their research it was discussed that effective implementation of TQM enhances client's satisfaction, superior products value, and better market share as a resultants effect proper adoption of TQM. According to [12], total quality management includes: leadership commitment, continuous improvement, training and education, communication, measurement, customer focus and employee empowerment and

involvement. Total Quality management was view as a broader concept with many definitions. It was described as a means of ensuring customer satisfaction, through improvement in competitive position that are determined by end users imputes. Total quality management focus on continuous improvement and long-term achievement of organization. [10]

2.1. Leadership Commitment

Bonding of all colleagues together in a common element are requirements for leadership foundation for any transformational approach that shares responsibilities Therefore, worker/manager approach should be eliminated and focus more on team management approach to promotes more of consumer value. It is highly recommended that the leaders should possess and gather all possible knowledge about total quality management skills, the required leadership style for the implementation and the path approach [3]. Effective communication channel among the employees, should be a responsibility of a leader, while planning strategy and policy for grow and develop staff and team members In order to enhance continuous improvement effort, total quality management practice must be imbibe as a culture of an organization. Leadership is the crucial factor that is needed to boost the employee. [2]

2.2. Sustainable Food Security

Globally, security of food plays a crucial role among the vulnerable and poor communities in eradicating hunger Therefore, transiting to sustainable food system, using a sustainable food project is to global sustainable food challenges [9].

Sustainability of food security projects means producing enough food to maintain the human population while at the same time ensuring social welfare and reducing impact to the environment [1]. Community also has the responsibility to maintain and manage the project, after its completion. However, it has been noted that some projects become noticeably unsuccessful, even without any technical failure while others have achieved their targets without much difficulties, which is based on community planning approach on responsibilities. [6]

Success of food security projects sometimes depends on effective leadership accountability to the beneficiaries. In sustainable food security system, food security projects could also be affected by forces of socio-political environment and external stakeholders' pressure, emanating from different pressure groups. This might require level of analytical skills for effective planning, implementation, and monitoring and evaluation for the project [9].

2.3. Food Accessibility

Having access to food economically, physically, or social culturally, indicates food accessibility. When food is not

physically accessible, its sometimes implies that surplus food are produced from some part of the regions but could not be move to other parts of region experiencing inadequate food supply due to logistic problem. Food accessibility could also be a measure of consumer price index or percentage of people having a nourished food. Food accessibility is generally declining unsustainability of food project in the country. [7]

2.4. Total Quality Management and Sustainable Food Security

Timoteus examined the relationship between element of total quality management, operational and organizational performance in food production [12]. Survey research design was use to collect data from 136 respondents in food production at east java region of the republic of Indonesia. The data were analysed using partial least square method. The findings of the study show that operation performance of food production is highly influenced by quality-oriented organisational culture.

Nurliah, M & Munizu, M conducted a study on analysis of total quality management on Vegetable and fruits products at parmanert Makassar. Structured interview was adopted for data gathering, while purposive sampling techniques was used to select 11 respondents [8]. The data collected were analysed using descriptive analysis. The findings of the study shows that application of total quality management enhance customer satisfaction.

Humaira, F, Arvid et al. [5] conducted a study on application of total quality to ensure quality food quality in food industry, using qualitative approach. Hazard analysis critical control point was adopted for the study. The findings of the study shows that integrated approach of ISO standard and HACCP concept are vital for management of quality and safety of food production.

Nyaga, J. and James, R. [7] examined capacity building strategies and sustainability of food security. Descriptive and explanatory research design was adopted for the study. The respondents were 243, this comprise of project group leaders, UN agencies and county government representatives. The data collected were analysed using both Pearson correlation coefficients and multiple regression. The findings of the study show that capacity building has significant effect on food security.

3. Methodology

The study adopted a survey research design. The survey
Descriptive Analysis

was done through the use of questionnaire to collect primary data from commercial farmers from the North- Western States of Nigeria that are mostly into mechanized farming. The formular developed by Cochran was used to determine the sample size of farmers.

$$Ss = [z^2 \times p \times q] / c^2$$

Where Ss= Expected sample size of the clients of the selected construction firms.

Z = Standard error of the mean at 95% confidence level or 5% level of significance = 1.96

P = Probability of success i.e. percentage of population picking a choice expressed in decimal is 0.8

q = Probability of failure is 0.2; where q = [1 - p]

C = Confidence interval level [level of significance 0.05].

Where z = 1.96

p = 0.8

q = [1 - 0.8] = 0.2

c = 0.05

$Ss = [1.96]^2 \times 0.8 \times [1 - 0.8] / [0.05]^2$

$Ss = [1.96]^2 \times 0.8 \times [0.2] / [0.05]^2$

$Ss = [3.8416 \times 0.16] / 0.0025$

$Ss = 0.614656 / 0.0025$

$Ss = 245.8624$

Convenient and purposeful sampling techniques were used to determine the selected farmers that have knowledge of the identified variables of this research and which can respond appropriately to the survey questions. Content validity was used to test for validity of the research instrument. The reliability of the instrument was determine using Cronbach alpha, which was achieved at $\alpha = 0.82$ Data collected for this research will be analyzed and presented using inferential statistics with the aids of Statistical Package for Social Sciences (SPSS).

4. Analysis and Interpretation of Findings

Based on the research methodology discussed above, two hundred and thirty (230) copies usable questionnaires were received from the commercial farmers in the north western part of Nigeria. This represents 91% response rate. Descriptive statistics and multiple regression analysis was used to analyses the data collected from the participating farmers.

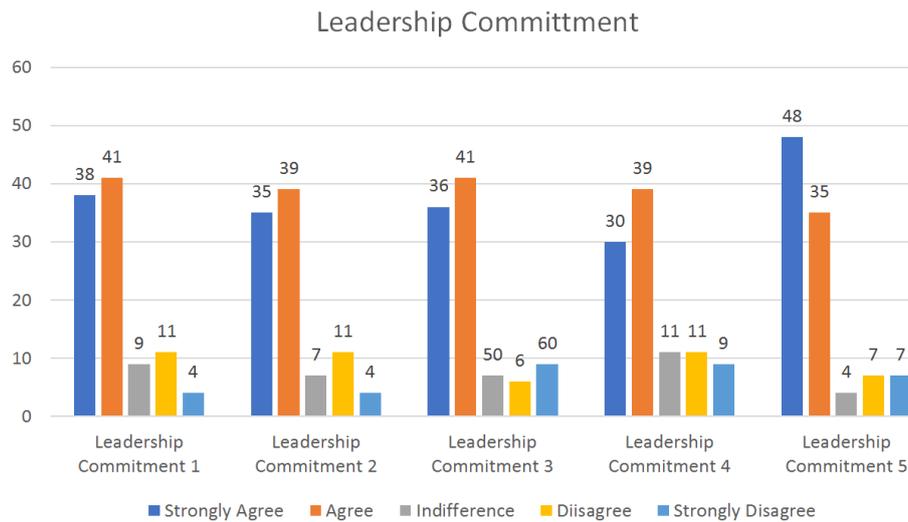


Figure 1. Analysis of Respondents perspective on Leadership Commitment.

Figure 1 above shows the respondents' perspective on leadership commitment and sustainable food security in Nigeria. Based on the items in the questionnaire, the chart above indicated that 38% of the respondents strongly agreed that Government setting clear goals of overall quality perspective on food security could promote sustainable food security, while 41% agreed, 9% of the respondents were indifferent, 11% disagreed and the remaining 4% of the respondents strongly disagree. This implies that the majority of the respondents strongly agreed that Government setting clear goals of overall quality perspective on food security will promote sustainable food security in Nigeria. The chart also showed that 35% of respondents strongly agreed that Government transfers all quality objectives on food security to farmers, 39% agreed, 7% of the respondents were indifferent, 11% of the respondents disagreed while the remaining 4% strongly disagreed. This implies that the respondents strongly disagreed that Government transfers all quality objectives on food security to farmers. Furthermore, 36% of the respondents strongly agreed that Government develops policies based on farmer's input,

41% of respondents agreed, 50% of the respondents 'responses were indifferent, while 6% respondents disagreed, and the remaining 60% respondents strongly disagreed. This implies that the majority of the respondents disagreed that Government develops policies based on farmer's input. The chart further showed that 30% of respondents strongly agreed that Government allocates the necessary resources to promote food security, 39% of respondents agreed, 11% respondent responses were indifferent, 11% respondents disagreed, while the remaining 9% of respondents strongly disagreed. This implies that the respondents agreed that Government allocates the necessary resources to promote food security. Furthermore, 48% of respondents strongly agreed that they always have access to government subsidies for crop cultivation, s 35% of respondents' responses agreed, 4% of respondents were indifferent, 7% disagreed, while the remaining 7% of respondents strongly disagreed. This implies that the majority of the respondents agreed that they always have access to government subsidies for crop cultivation.

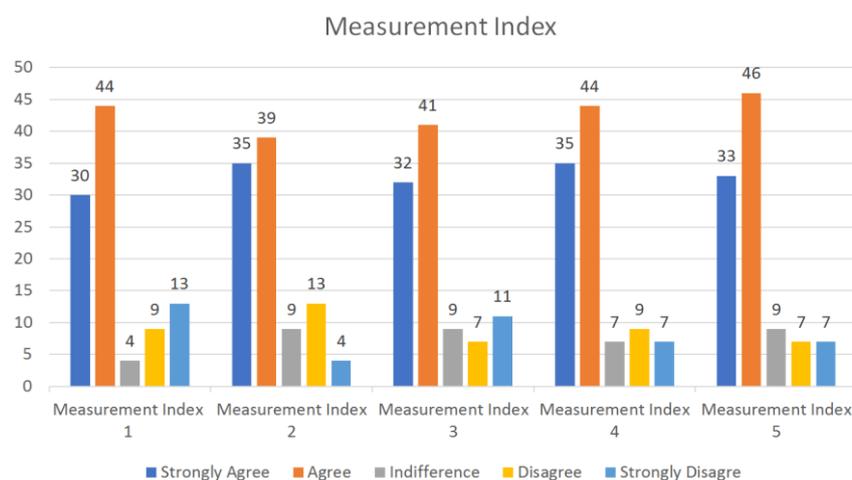


Figure 2. Analysis of Respondent Perspective on Measurement Index.

The figure 2 above shows the respondents' perspective on measurement index and sustainable food security in Nigeria; based on the items of the questionnaire, the chart above indicated that 30% of respondents strongly agreed that Farmer establish performance index to control standards, 44% respondents agreed to this statement, 4% responses were indifferent, 9% respondents disagreed, while the remaining 13% of respondents strongly disagreed. This implies that the majority of the respondents agreed that Farmer establish performance index to control standards. The figure above further showed that 35% of respondents strongly agreed that Farmer's strategic mission is measurable, 39% of respondents agree, 9% of the respondents were indifferent, while 13% of the respondents disagreed and the remaining 4% strongly disagreed. This implies that the majority of the respondents strongly agreed that Farmer's strategic mission is measurable. Furthermore, 32% of the respondents strongly agree that farmers robust planning align with government goals on food security, 41% agree, 9% were indifferent, 7% disagree, and 11% respondents strongly disagree. This implies that the majority of the respondents disagree that farmers robust planning aligns with government goals on food security. The chart also shows that 35% of the respondents strongly agree that training and education on food security promotes performance index of farmer, 44% of the respondents agree, 7% were indifferent, 9% disagree, and the remaining 7% respondents strongly disagree. This implies that majority of the respondents strongly agree that training and education on food security promotes per-

formance index of farmer. Furthermore, the figure shows that 33% of the respondents strongly agree that use of multipurpose packaging is always used to monitor farming progress, 46% agree, 9% are indifferent, 7% disagree, and 7% of the respondent disagree. This implies that the majority of the respondents strongly agree that Use of multipurpose packaging is always used to monitor farming progress.

Figure 3 Perspective of respondents on food accessibility. Based on the items in the questionnaire, 30% of the respondents strongly agree that there is increased food supply from the food security project, 41% agree, 7% are indifferent, while 9% disagree with the statement, and the remaining 13% strongly disagree. This implies that the majority of the respondents strongly agree that there is increased food supply from the food security project. Furthermore, 35% of the respondents strongly agree that more community population can get access to sufficient food, due to effective total quality management practices 44% of respondents agree, 9% are indifferent, while 7% disagree, and the remaining 7% strongly disagree. This implies that the respondents agree that more community population can get access to sufficient food. The chart above also shows that 33% of the respondents strongly agree that there is increased availability of food to the locals, 47% agree, 7% are indifferent, while 9% of the respondents disagree and the remaining 7% respondents disagree. This implies that the majority of the respondents agree that there will be increase in food supply due to effective total quality management practices.

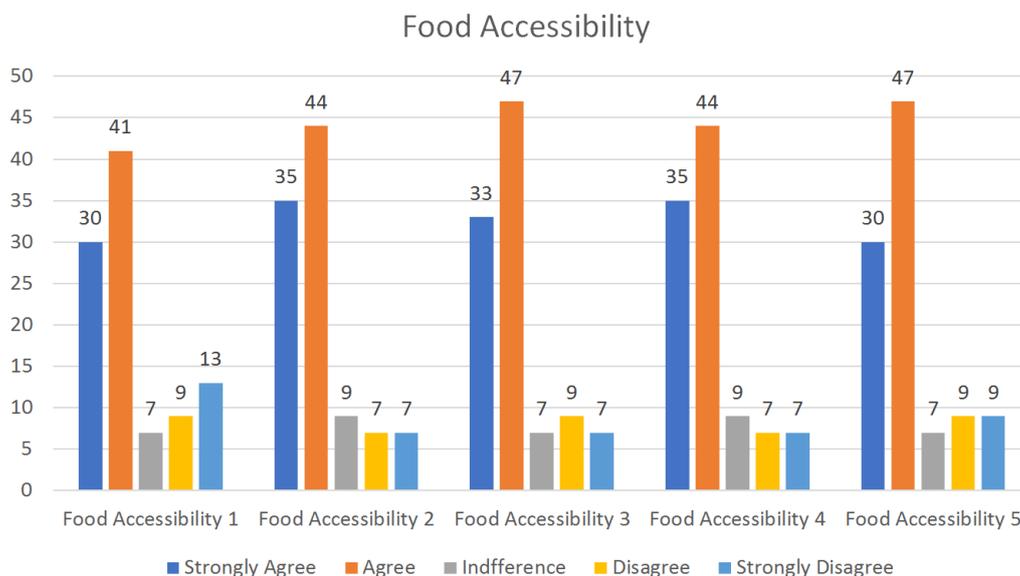


Figure 3. Analysis of Respondents on food accessibility.

The chart also shows that 35% of the respondents strongly agree that there could be increased nutritional food safety among the community members due to effective total quality management, 44% of the respondents agree, 9% were indif-

ferent, 7% disagree, and the remaining 7% respondents strongly disagree. This implies that majority of the respondents agree that there could be increased nutritional food safety among the community members due to effective total quality

management Furthermore, the figure shows that 30% of the respondents strongly agree that food produce will be affordable throughout the year, if there is effective total quality management practices 47% agree, 7% are indifferent, 9% disagree, and 9% of the respondent disagree. This implies that the majority of the respondents strongly agree that food produce will be affordable throughout the year, if there is effective

total quality management practice.

4.1. Analysis of Hypothesis

Leadership commitment and measurement does not have any significant contribution to food accessibility in Nigeria.

Table 1. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637 ^a	.406	.401	.41609

a. Predictors: (Constant), Measurement Index, Leadership Commitment

Table 2. Anova.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.685	2	12.843	74.179	.000 ^b
	Residual	37.569	217	.173		
	Total	63.254	219			

a. Dependent Variable: Food Accessibility

b. Predictors: (Constant), Measurement Index, Leadership Commitment

Table 3. Coefficientsa.

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	1.475	.228			6.468	.024
	Leadership Commitment	.314	.057	.327		5.505	.000
	Measurement Index	.336	.048	.414		6.964	.000

a. Dependent Variable: Food Accessibility

Tables 1, 2 and 3 present the model summary, analysis of variance, and coefficient of determination of the findings, respectively. The model summary table (Table 1) shows that leadership commitment and measurement index have strong positive relationship with food accessibility ($R = 0.637$ ^a). This implies that a holistic approach to leadership commitment and measurement index more likely to lead to food accessibility. The model further shows the extent to which leadership commitment and measurement index account for variation in food accessibility. The coefficient of multiple determination ($R^2 = 0.401$) shows that 40.1% of the change in

food accessibility is accounted for by leadership commitment and measurement index.

Table 2 indicates the degree to which the regression model predicts the dependent variable, as indicated by the statistical significance of the regression model. The p-value (0.024) shows that the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data). An evaluation of the unstandardized coefficients of leadership commitment and measurement index in the coefficient table (Table 3) and their associated p-values show that leadership commitment, ($\beta_{TC} = 1.475$, $p < 0.05$) and measurement index

($\beta_{CC} = 1.475$, $p < 0.05$). are statistically significant and can be used in enhancing food accessibility.

Regression Model: Food accessibility = $1.475 + 0.314LC + 0.336MI$.

4.2. Discussion of Findings

The findings of this study revealed that, there was a significant relationship ($R^2 = 0.401$; $p < 0.05$) between leadership commitment and adequate measurement for performance index would contribute significantly in enhancing the food accessibility in Nigeria, based on the results of multiple regression analysis. Where the null hypothesis will be rejected and the alternative was b accepted. This implies that effective leadership commitment and measurement could enhance food accessibility in Nigeria. This is line with study of [12], assert that operational performance of food production is highly influenced by quality-oriented organizational culture. The study of [7] further corroborated the expected findings of this study, study affirmed that capacity building has significant effect on food security project. Therefore, it is expected from the findings of this study, to show how leadership commitment and establishing measurement performance index could promote positive influence on food security project in Nigeria.

5. Conclusion

The study concludes that leadership commitment and measurement index could improve the adoption of mechanization of farming, government developing policies based on farmers input, Government allocating the necessary resources to promote food security and farmer establishing performance index will consequently increase food supply in the country. However, the study also concludes that government setting clear goals of overall quality perspective on food securities could also be adequately embraced to promote food accessibility. Based on the findings of the study, it was revealed that leadership commitment and measurement index play a vital role in sustainable food security and promote both affordability and nutritional food for the country.

This study was able to show how indicators for measuring total quality management practices could be developed. Finally, this study was able to highlight how sustainable food security could be realized through total quality management practices.

Abbreviations

FAO Food and Agriculture Organisation

Conflicts of Interest

The authors declare no conflicts of interest.

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