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**Total quality and competitive
advantage of firms in the horticultural
industry in Kenya**

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Full Length Research

Total quality and competitive advantage of firms in the horticultural industry in Kenya

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The study focused on Kenya's horticultural industry and the aspects of total quality and competitive advantage. The available literature shows that total quality is associated with competitive advantage. However, most of that literature has come from developed countries. Researches carried out in developing countries have shown contradictory results. This study aimed at understanding these contradictions, and determination of the exact effect of total quality on an organization's competitive advantage. The materials concerning the horticultural industry in Kenya highlight the context under which the study is undertaken. The industry is a vibrant and important sector of the economy. However, the sector is beset with numerous challenges, the biggest being one of quality. The sector, therefore, provided very fertile grounds for this study. All scientific practices including data validation and effective analysis were undertaken. This was to ensure replicability and validity of the research. Further, factors that were found to have very strong correlation, or scoring low corrected-item total correlation, were dropped before analysis was undertaken. The study is able to confirm that total quality has a strong and positive impact on competitive advantage. In the Kenyan context, it is discovered that the level of implementation of total quality is low. However, those implementing total quality are getting benefits similar to those in developed countries. This finding explains the contradiction seen in studies conducted in developing countries where organizations claiming to be quality oriented have posted different results. This study shows that it is not total quality that has been posting different results, but lack of effective implementation of total quality. A crucial finding is the poor evidence of the leadership concept and the tendency of taking quality certification as an end by itself. It is demonstrated that most of the certified companies do not understand the philosophy behind quality management and, therefore, cannot implement it effectively. Further, the surprise emergence of performance measurement as a powerful principle in the total quality paradigm for enhancing competitive advantage validates the government of Kenya's preoccupation with performance contracts to government institutions. However, the value that ISO 9001 certification is bringing to the institutions against the enormous costs incurred is not validated. The research, therefore, recommends among other things, the appreciation and understanding of the total quality philosophy or any quality management system before embarking on implementation. Future research could take the form of a study of government institutions or firms cutting across industries that are ISO 9001 certified their level of implementing the quality management system, and the value the system has brought to the firms.

Key words: Total quality, competitive advantage, horticultural industry, Kenya

INTRODUCTION

Though challenging, quality management has become almost a norm in international business. Further, the need for firms to be viewed as quality organizations has made International Organization for Standardization's ISO 9001 certification to virtually become a mandatory requirement for exports to Europe, forcing companies in Japan to be certified, not because of quality issues, but as a way of increasing market share (Tang and Kam, 1999).

There has been debate on the value of total quality management to an organization (Beer, 2003) and the impact it has. The aim of the study was therefore to contribute to this debate concerning total quality management as a strategic tool for competitive advantage. The literature in this study explores the intellectual underpinnings and concepts behind Total Quality Management (TQM), Operations Effectiveness (OE)

and Competitive Advantage (CA). In this study, we will designate the name Total Quality (TQ) to mean Total Quality Management (TQM). The reviewed literature will enable us define TQ as a set of principles, approaches, methods and techniques of management that ensures continuous improvement in the quality of all aspects of an organization's process, product and/or service, in order to satisfy customers. Further, we are able to see that the conceptual approach to TQ brings forth competitive advantage. This is validated by the empirical studies carried out in the developed countries such as UK, USA, Japan, Australia and emerging economies like Malaysia.

However, when these studies are contrasted with those carried out in developing countries such as Iran, Nigeria, Turkey and Kenya, the results are mixed, with some showing some positive impacts, while others registering no or negative impacts. It is also noted that some hindrances have affected the extent of implementing TQ. Therefore, there seems to be a clear disconnect between the developed and developing countries as far as TQ is concerned. One common factor of these studies is the focus on benefits to organizations implementing TQ, without discovering whether they are effectively implementing it, and if they are, what benefits have accrued. This study aimed at finding out why there should be such distinct difference in the studies done in developed countries, and those done in Kenya and the other developing countries mentioned above. From this perspective, the researcher developed a conceptual model that enabled the carrying out of a comprehensive study focusing on one of the most vibrant economic sectors in Kenya, the horticulture sector. The need for this sector to have a collective international competitive advantage in view of the big challenge from other African, Caribbean and Pacific (ACP) producers in the international horticulture market, bearing in mind the huge contribution to the Kenyan economy cannot be over emphasized. The research, therefore, studied the extent the firms in this sector were implementing TQ, and whether they were able to utilize quality management systems for and as a strategic tool for competitive advantage.

Literature review

This section discusses quality dimension and competitive advantage to highlight the linkages involved. The concept of total quality can be traced to Japanese companies who managed to gain exceptional competitive advantage against American and European companies especially in the motor vehicle industry with Toyota leading the onslaught (Hino, 2005, Martinez-Lorente et al., 1998). The quality movement in Japan began in 1946 with the U.S. Occupation Force's mission to revive and restructure Japan's communications equipment industry. It is here that Williams Edwards Deming was invited to provide a seminar in Japan on statistical quality control (SQC). The seminars provided the criteria for Japan's famed Deming

Prize for quality. Within a decade, Union of Japanese Scientists and Engineers (JUSE) had trained nearly 20,000 engineers in SQC methods. Today, Japan gives high rating to companies that win the Deming prize (Deming Institute, 2008). Another notable contributor is Joseph M. Juran who came to Japan in 1954 and raised the level of quality management from the factory to the total organization. He stressed the importance of systems-thinking that begins with product designs, prototype testing, proper equipment operations, and accurate process feedback. Juran's seminar also became a part of JUSE's educational programs. Juran provided the move from SQC to total quality control (TQC) (Juran, 1998) in Japan. This included company-wide activities and education in quality control, quality circles and audits, and promotion of quality management principles. By 1968, Kaoru Ishikawa, one of the fathers of companywide quality control (CWQC) in Japan, had outlined the elements of CWQC management as: Quality comes first, not short-term profits; the customer comes first, not the producer; Customers are the next process with no organizational barriers; Decisions are based on facts and data; Management is participatory and respectful of all employees; Management is driven by cross-functional committees covering product planning, product design, production planning, purchasing, manufacturing, sales, and distribution (Ishikawa, 1985).

Ishikawa's diagram has led Japanese firms to focus quality control attention on the improvement of materials, equipment, and processes (Evans and Lindsay, 2011; Ishikawa 1982). The Japanese believe that the greatest benefit occurs when defect detection is achieved within the manufacturing sequence, thus minimizing the time required for final inspection, maximizing return on investment, and indirectly improving product reliability (Deming, 1986; Evans and Lindsay, 2011).

The major objective of TQ is the search for customer satisfaction. It is a call for an organizational commitment to meeting or exceeding customer expectations (Besterfield et al., 2003). This is borne from the knowledge that the customer is the organization's "raison d'être", its purpose for existence. Without the customer, an organization cannot survive (Ohmae 1991, 2000, 2005). Strategies therefore should be designed all aimed at ensuring customers are satisfied. Indeed, the aim should be total customer satisfaction. The customer should be given maximum focus, maximum care, and maximum respect. All organization activities should be geared towards the goal of pleasing customers. Emphasizing customer satisfaction will result in many benefits for the organization, including repeat sales, word-of-mouth advertising, reputation and goodwill building, and pointers for improvements through customer complaints and suggestions (Juran and Godfrey, 1998; Deming, 1986, 1993; Ohmae 1991, 2005). This knowledge has been synthesized into the TQ philosophy.

The TQ concept is presented in form of principles,

methods, approaches and tools. While JUSE has been able to define TQM, it also presents the principles for purposes of judgment of organizations for the Deming Application Prize, as Policies; The organization and its operations; Education and dissemination; Information gathering and communication; Analysis; Standardization; Control/management; Quality assurance; Effects; and Future plans; (JUSE, 2007). These judgment criteria form the basis under which the assessors are able to determine whether an organization is implementing TQ and the score for the year in consideration. While other countries have established national quality awards, the most internationally known quality awards after Deming Prize include Malcolm Baldrige National Quality Award (MBNQA) started in 1987 for American companies, and the European Foundation for Quality Management (EFQM) Excellence Award started in 1991 for European companies (Evans and Lindsay, 2011).

Competitive advantage denotes a firm's ability to achieve market superiority (Evans and Lindsay, 2011). This concept is the core for strategic management as every organization searches for a vantage point that could deliver competitive edge against the rivals. Porter provided a framework that models an industry as being influenced by five forces, (Porter, 1985). His advice was that the strategic business manager seeking to develop a competitive advantage over rival firms can use this model to better understand the context in which the firm operates. While one way of gaining competitive advantage over rivals has been identified as achieving a better cost advantage as seen in the operations effectiveness section, another way to competitive advantage is product differentiation (Porter, 1985). Product differentiation by itself will be of little value unless the difference so achieved attracts and captures the imagination of customers. The needs and wants of the customer must be entrenched in the business process from customer surveys, to design, to production, to delivery, and use, if the customer is to be truly satisfied (Evans and Lindsay, 2011). This can be achieved through implementation of TQ. The 1970s and early 80s were tumultuous years for the powerhouses of the world's motor vehicle industry, with Ford, GM, Chrysler on the verge of closing down and they had to turn to total quality to survive and recapture their markets (Evans and Lindsay 2011).

When Porter (1986) published his second book on competitive strategy focusing on value chain, he moved away from his focus on the five forces, namely bargaining power of suppliers, threat of substitutes, bargaining power of buyers, threat of new entrants and rivalry among competitors, which all focused on external environment. He had realized that internal value creation is a crucial component to competitive advantage. Value creation depends on organizational competencies. Organization competencies are made up of strategic assets such as pool of experience, knowledge, systems, skills and

technologies (Hamel and Prahalad, 1994; Markides and Williamson, 1994). Later, Porter was able to postulate that Total Quality Management provides the thrust under which organization effectiveness can be achieved (Porter, 1990).

According to Ohmae (1991), an organization with effective strategic thinking will gain competitive advantage with the resultant outcome of better satisfied customers. Better satisfied customers lead to bigger market share leading to increased revenue (Evans and Lindsay, 2011) while the effectively developed and executed strategy should be one that has marshaled the organization's resources to a unique posture that can take advantage of internal resources (Ohmae, 1991, 2005). This taking advantage leads to better productivity, while the productivity will only come about when there is reduced waste, coupled with satisfied customers, employee satisfaction increases (Evans and Lindsay, 2011).

METHODOLOGY

The research was a cross-sectional survey targeted at firms in the horticultural industry. The focus of this research was on TQ, implementation and competitive advantage. The industry has both large and small scale firms, hence the research design was one that was capable of capturing as much information from the organizations as possible to reduce possibilities of making wrong conclusions.

The design of the study ensured all possible data sources were captured. Further, the questionnaire was designed with objectivity in mind to enable data analysis and reporting that brings forth replicable scientific report. This formed the quantitative part of this study. On the other hand, how the human beings behave in their natural settings in the target organizations formed part of the study. The research assistants were trained to observe such phenomena as to how target organizations answer calls, the attitude of security officers, front office administrators and senior managers. Triangulation method was, therefore, used whereby both quantitative and qualitative methods were employed. However, the research relied more on the quantitative method for an objective and scientific analysis to enable development of models for prediction.

The population consisted of all companies registered with the Horticulture Development Authority (HCDA) as of 30th June 2010 as exporters of horticulture and designated as "active companies". Of the 1390 companies registered with HCDA, some with licences long expired between 2003 and 2007, 146 companies were listed as active, 108 of which had traceable address. This list did not indicate the sizes of companies. However, it was assumed that the companies vary in sizes in terms of turnover as well as number of employees. A census approach to the research was employed. A census is the method of obtaining

Table 1: Institutions certifying the companies

Certifying Body	Frequency	Percent
Global Gap	4	7.8
Euro Gap	26	51.0
ISO 9001 – 2000	1	2.0
Others	6	11.8
Total	37	72.5
Missing	14	27.5
Total	51	100.0

information about every member of a population. This can be compared to sampling in which information is only obtained from a subset of a population (Cooper and Schindler, 2006). While it was assumed the “active” companies were available, the census approach was used to ensure that as many companies participated, as it was possible.

A self-administered questionnaire whose design incorporated aspects of control/collaboration/confirmation was used. The questionnaire was either self-administered and returned by post or email to the researcher or completed in the presence of the researcher or in his research assistants. The target informant was the Chief Executive Officer or the person in charge of quality systems. The questionnaire incorporated both quantitative and qualitative data. The main reason for this approach was to achieve a more in-depth understanding of the various factors affecting the organizations, and hence be in a position to make informed conclusions.

Further, the questionnaire was framed in such a way as to incorporate closed-ended questions, some requiring response on a five-point scale, and providing two levels of agreement, no opinion and two levels of disagreement for wide choice of fitting descriptions. Others were open-ended questions. The open-ended questions were set in such a way as to ensure there is no direct answer on the complex nature and factors informing on quality management. This was designed to remove, as much as possible, any bias that could develop. A pilot test was administered on some respondents. A coding system was used to capture the various components and attributes of the target informants was built into the questionnaire, based on variables and indicators obtained from the conceptual framework.

RESULTS

This section provides detailed results of analysis. The presentation starts descriptive statistics, followed by testing of research hypotheses starting with level of total quality implementation in Kenya’s horticultural sector, correlation of variables to show relationships, and then regression results which provide insight on the relationships between independent variable total quality, and dependent variable competitive advantage.

Quality certification was taken as an important milestone for companies aiming to be total quality organizations. The number of companies that have a quality certificate were analyzed against those with no quality certificate. The largest portion of companies under the study, 73 percent, indicated they are quality certified by one organization or the other. Only 27 percent in the study were not certified. At 73 percent quality certified companies, it is then expected that the sector is one of quality. However, results on quality implementation make the certification seem more forced than voluntary. The organizations that have certified the companies include global gap and euro gap as indicated in the table 1.

Euro Gap has the largest share at 70 percent followed by others. Global Gap is catching up. ISO 9000 has only one company while other certifications take the balance. Euro Gap case is understandable in the horticulture sector as most players are shipping to Europe where most customers demand the certification. Global Gap is new and is to replace Euro Gap so it is expected to have more companies as time progresses.

On the relationship between certification and competitive advantage, the mean score was registered in figure 1. The average competitiveness of the companies was very similar at 3.95 for those not certified and 4.11 for those certified, a difference of only 4 percent. However, the error bar, reflective of variance, for companies with certification is narrow indicating that the mean competitive advantage for these companies is nearer to the group mean competitive advantage. This means that the companies that are certified are more likely to post a better level of competitive advantage than those not certified. However, error bars cross each other indicating that the advantage cannot be said to be absolute.

Total quality implementation

This research focused on the effect of total quality on organization’s capability to acquire competitive advantage. The section below highlights some of the captured attributes associated with total quality implementation against competitive advantage. We start with total quality implementation level in the sector and then look at the individual variables such as leadership, customer focus and the sector scores. Finally, the total quality implementation level in the sector is analyzed and the hypothesis H_1 : *Level of total quality implementation in Kenyan horticultural companies is high*, is tested.

Total quality implementation index

Total quality implementation index (TQII) was calculated from the adaptation of the Malcolm Baldrige National Quality Award Criteria for Performance Excellence (MBNQA-Criteria). The resultant equation worked out as follows:

$TQII = \frac{\sum X_i}{N} \times \{MBNQA-Criteria\}$ = take the sum of all scores from X_1 to X_N against highest total score for each

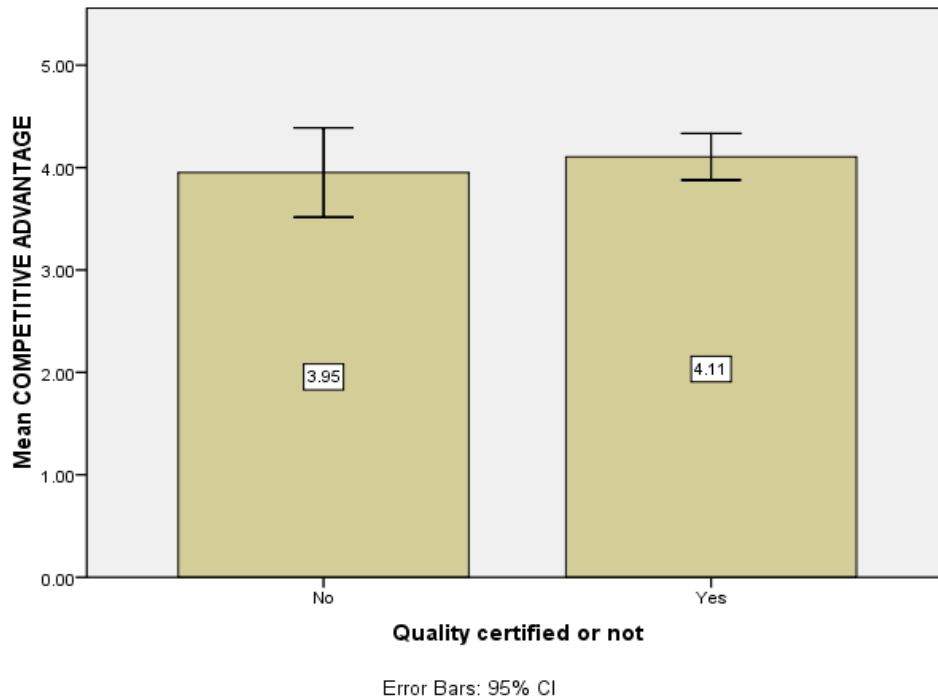


Figure 1: Quality certification versus competitive advantage

Table 2: Total quality implementation level

Level of tq implementation	Frequency	Percent	Statistics
Not Implementing	12	23.5	N=51
Learning to Implement	11	21.6	Mean=2.51
Partially Implementing	18	35.3	Median=3.00
Mostly Implementing	10	19.6	Mode=3
Total	51	100.0	Std. Devi.=1.065

TQ principle for all respondents, Multiply by MBNQA-Criteria score, divide the sum by 550 (total possible score) and multiply by 100 that is $X_1*1 + X_2*2 + X_3*3 + X_4*4 + X_5*5$ multiply MBNQA weighting

$$= \left\{ \frac{N \sum X_i}{N*5} \right\} * \{ \text{MBNQA-Criteria score} \}$$

Where:

- X_1 =Not at all
- X_2 =Little extent
- X_3 =Moderate extent
- X_4 =Great extent
- X_5 =Very great extent

And MBNQA-Criteria_i has:

MBNQA-Criteria₁: Leadership including formal strategic

plan @ 120 marks

MBNQA-Criteria₂: Customer focus including formal QMS @ 85 marks

MBNQA-Criteria₃: Supplier partnership @ 85 marks

MBNQA-Criteria₄: Performance measurement including CSI @ 90 marks

MBNQA-Criteria₅: Continuous improvement @ 85 marks

MBNQA-Criteria₆: Employee empowerment @ 85 marks

It was expected that a company fully implementing total quality would register a score of 100 percent in all the main variables. This would indicate the level of commitment and understanding of the philosophy of total quality and the importance the company places in the need to implement effective quality management.

The level of total quality implementation by companies working in the horticultural sector in Kenya is presented in table 2. The scores were graded according to the following criteria:- 70 and below- not implementing; 71 to 80-learning to implement; 81 to 90-partially implementing

Table 3: TQ principles implementation index

Factor	Score of 100
Leadership	76
Customer Focus	79
Supplier Partnership	80
Performance Measurement	78
Continuous Improvement	80
Empowerment	79

and 91 and above-mostly implementing. The mean score was 2.51 out of the four groups meaning a level of above learning to implement with median and mode at 3, which is partially implementing total quality.

Out of the 51 companies studied, 12 were found not to be implementing at all total quality as a concept of management, 11 were found to be in the learning stages of implementing total quality, while 18 were found to be partially implementing total quality. Only 10 (ten) out of the 51 respondents were found to be said to be mostly implementing total quality. These are companies that registered an average score of 90 and above in the total quality implementation index (TQII). None of the companies scored 100, which would have placed it as totally or fully implementing total quality as a concept of management. 80 percent of the companies were found to be partially implementing (35 percent), learning to implement (22 percent) or not implementing total quality at all (23 percent). Of those not implementing total quality at all, 42 percent claim to have a quality certification from a reputable institution. On the various fundamental principles of total quality, the sector registered mixed scores as shown in table 3.

All the parameters registered poor scores with the best being supplier partnership and continuous improvement at 80, which in our grading is learning to implement. The poorest score was registered by the most important component of total quality, leadership. This was at 76, while another important aspect of total quality, performance measurement, registered a score of 78. The sector mean score TQII is at 78.7 with a standard deviation of 1.5 while mode and median are at 79. This is the level of learning to implement total quality. We therefore reject the hypothesis, H_{1a} : *Level of implementing TQ in Kenya's horticultural industry is high* and accept the alternative hypothesis that level of implementing TQ in Kenya's horticultural companies is not high.

Correlation analysis

Correlation analysis was carried out on the main variables depicted in the study. The aim to find out the type and strength of relationships if any, existed between the various factors making up the main variables, the strength of those relationships and the type, whether negative or positive. This section presents the results of the correlation analysis.

Total quality factors

Table 4 shows the results of Pearson correlation on factors making up the predictor variable total quality (TQ). The factors are the main principles of total quality as documented in this research, namely: - leadership, customer focus, supplier partnership, performance measurement, continuous improvement and employee empowerment.

Under total quality, performance measurement was found to correlate significantly and consistently to all other five factors with .523r at $p < .001$ against supplier partnership being the highest, followed by customer focus at .490 and $p < .001$ with all the other factors correlating significantly at the .001 level. The other factors showing strong correlation with other factors is leadership and employee empowerment, showing significant correlation with all factors but at lower levels than performance measurement. The factors showing lowest correlation are supplier partnership and continuous improvement, with significant correlation at $p < .001$ with performance measurement only.

Competitive advantage factors

The dependent variable, competitive advantage (CA), was also subjected to Pearson correlation analysis. Factors making up this variable, namely employee satisfaction, customer satisfaction, waste reduction, and increase in revenue showed the below correlation values as depicted on table 5.

All factors correlated significantly at $p < .001$ with each other with customer satisfaction showing highest correlation with increase in revenue at .757 and waste reduction at .68, followed by increase in revenue correlating with employee satisfaction at .667. The lowest correlation was posted by increase in revenue against waste reduction at .483. However, this was still significant at $p < .001$.

Factors making up total quality against competitive advantage

Comparing total quality and competitive advantage, the following correlation coefficients were registered as shown in table 6. The factors compared strongly to each other. Some were significant at level $p < .001$.

Factors making up competitive advantage correlated strongly with factors making up total quality. The factor with the strongest correlation was employee satisfaction which related with other factors at $p < .05$, $p < .01$, and $p < .001$, except with continuous improvement factor with an r of .201. The factor that followed employee satisfaction was reduction in waste then increase in revenue. The TQ factor that registered highest correlation was leadership at .597 followed by performance measurement at .52 then customer focus at .51 all against employee satisfaction indicating that there is a strong relationship between employee satisfaction and major factors making total quality.

Table 4: Correlation coefficient for total quality factors

Correlations							
Variable	R + Sig	1	2	3	4	5	6
Leadership 1	Pearson Correlation	1					
	Sig.						
Customer focus 2	Pearson Correlation	.430**	1				
	Sig.	.002					
Supplier partnership 3	Pearson Correlation	.440**	.461**	1			
	Sig.	.001	.001				
Performance measurement 4	Pearson Correlation	.416**	.490**	.523**	1		
	Sig.	.002	.000	.000			
Continuous improvement 5	Pearson Correlation	.331	.260	.399**	.610**	1	
	Sig.	.018	.066	.004	.000		
Employee empowerment 6	Pearson Correlation	.296*	.309*	.428**	.444**	.531**	1
	Sig.	.035	.027	.002	.001	.000	

* . Correlation is significant at the 0.05 level (2-tailed).

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

Table 5: Correlation of competitive advantage factors

Correlations					
Variable	R + Sig	Employee satisfaction	Customer satisfaction	Waste reduction	Increase in revenue
Employee satisfaction	Pearson Correlation	1			
	Sig. (2-tailed)				
Customer satisfaction	Pearson Correlation	.595**	1		
	Sig. (2-tailed)	.000			
Waste reduction	Pearson Correlation	.500**	.680**	1	
	Sig. (2-tailed)	.000	.000		
Increase in revenue	Pearson Correlation	.667**	.757**	.483**	1
	Sig. (2-tailed)	.000	.000	.000	

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

Table 6: Correlation between total quality and competitive advantage

Correlations											
Variable	R + Sig	1	2	3	4	5	6	7	8	9	10
Leadership 1	<i>r</i>	1									
	Sig.										
Customer focus 2	<i>r</i>	.430**	1								
	Sig.	.002									
Supplier partnership 3	<i>r</i>	.440**	.461**	1							
	Sig.	.001	.001								
Performance measurement 4	<i>r</i>	.416**	.490**	.523**	1						
	Sig.	.002	.000	.000							
Continuous improvement 5	<i>r</i>	.331	.260	.399**	.610**	1					
	Sig.	.018	.066	.004	.000						
6 employee empowerment	<i>r</i>	.296*	.309*	.428**	.444**	.531**	1				
	Sig.	.035	.027	.002	.001	.000					
Employee satisfaction 7	<i>r</i>	.597**	.510**	.337*	.520**	.201	.348*	1			
	Sig.	.000	.000	.015	.000	.158	.012				
Customer satisfaction 8	<i>r</i>	.299	.348	.130	.500**	.138	.280	.595**	1		
	Sig.	.033	.012	.362	.000	.333	.047	.000			
Waste reduction 9	<i>r</i>	.283	.338	.264	.487**	.375**	.336*	.500**	.680**	1	
	Sig.	.045	.015	.061	.000	.007	.016	.000	.000		
Increase in revenue 10	<i>r</i>	.300*	.341	.267	.469**	.168	.263	.667**	.757**	.483**	1
	Sig.	.033	.014	.058	.001	.238	.062	.000	.000	.000	

* . Correlation is significant at the 0.05 level (2-tailed).

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

Test of hypotheses

Multiple regressions were used to test the various

hypotheses in the study. The analyses gave insight on how well the equation line developed fits the observed

Table 7: Benefits of implementing quality management system (QMS)

Benefit	Score
Higher market share	7.47
Higher revenues	7.39
Satisfied customers	8.54
Better relations with our suppliers	8.27
More motivated employees	7.96
Fewer rejects and interceptions	8.40
Better relations with stakeholders	8.27
Higher employee productivity	8.21
Better relations among employees	8.11

Table 8: Challenges of QMS implementation

Challenges	Score
High financial costs	7.81
Lack of qualified personnel	5.36
Treating certification as an end	5.83
Lack of management commitment	4.35
Long time needed to see results	4.71
Resistance from middle managers	4.04
Resistance from shop floor workers	4.26
Low availability of consultants	4.67
Too much time needed	5.96
Lots of data gathering and analysis	5.94

data that is goodness of fit. The tables and results and their interpretations are presented in this section. Each hypothesis is given enough interpretation to allow us to make conclusions that will feed to the research recommendations.

Presented in this section are the many statistics necessary to inform a rigorous hypothesis test. These include the sum of squares, the residual sum of squares, residual errors, and the F -ratio, or how much the model has improved the prediction of the outcome compared to the level of inaccuracy in the model. Also included are t -statistics, which test the hypothesis that the value of b is 0 and, therefore, if it is significant, we gain confidence in the hypothesis that the b -value is significantly different from 0, and that the predictor variable contributes significantly to our ability to estimate values of the outcome (Field, 2009). Other associated statistics including Durbin-Watson scores, which tests for serial correlation between errors in regression models, are also presented.

Level of total quality and competitive advantage

This Hypothesis focused on the relationship existing between total quality implementation level and competitive advantage. It specifically states that, "*there is a positive relationship between the level of TQ implementation and competitive advantage*". For this hypothesis, correlation analysis was used to test the validity of the statement and the correlation coefficient was found to be positive 0.645. Further, an analysis of

levels of implementing total quality against competitive advantage brought out the results shown on figure 2.

The progression from not implementing to mostly implementing shows consistency and significance. The error bar, indicative of variance, of partially implementing, is small and not overlapping with mostly implementing total quality. There is, therefore, clear and sustained positive relationship between level of total quality implementation and competitive advantage. Read together with the correlation coefficients for individual factors and combined factors making up total quality and competitive advantage respectively, we cannot reject the hypothesis H_{1b} that *there is a positive relationship between the level of TQ implementation and competitive advantage*.

Benefits and challenges to implementing QMS

The respondents were asked to list out on importance basis the benefits they have seen when they implemented quality management systems. They were also asked to state the main challenges, again on an importance level basis that they think are the main causes of not effectively implementing quality management system. This section presents the findings of the received data.

Benefits to implementing total quality

The benefits of implementing total quality or a quality management system were varied (Table 7). The respondents indicated the best benefit to be satisfied customers at 8.54 out of 10, followed by fewer rejects and interceptions at 8.4. The third scoring benefit was better relations with stakeholders at 8.27, with better relations with suppliers registering 8.265. The parameter that scored poorly was higher revenues at 7.39, followed by higher market share at 7.47. The mean score was 8.07 with a standard deviation of .4 and a median of 8.2

Challenges of QMS implementation

Implementation of the quality management system in the horticultural industry in Kenya faced many challenges. These are shown on table 8. The biggest challenge to quality management implementation is high financial costs at a score of 7.81 out of 10. This is almost two points higher than the second scoring challenge of too much time needed at 5.96, with number three being lots of data gathering and analysis at 5.94. Lack of qualified personnel is cited as an important challenge at 5.36. Resistance from both middle managers and the workers score the least at 4.04 and 4.26 respectively. The mean score for the challenges was 5.3 with a standard deviation of 1.1 and a median of five.

DISCUSSION AND CONCLUSION

The purpose of the research was to establish whether there were significant relationships between implementation of total quality and competitive advantage in the various firms in the horticultural industry in Kenya.

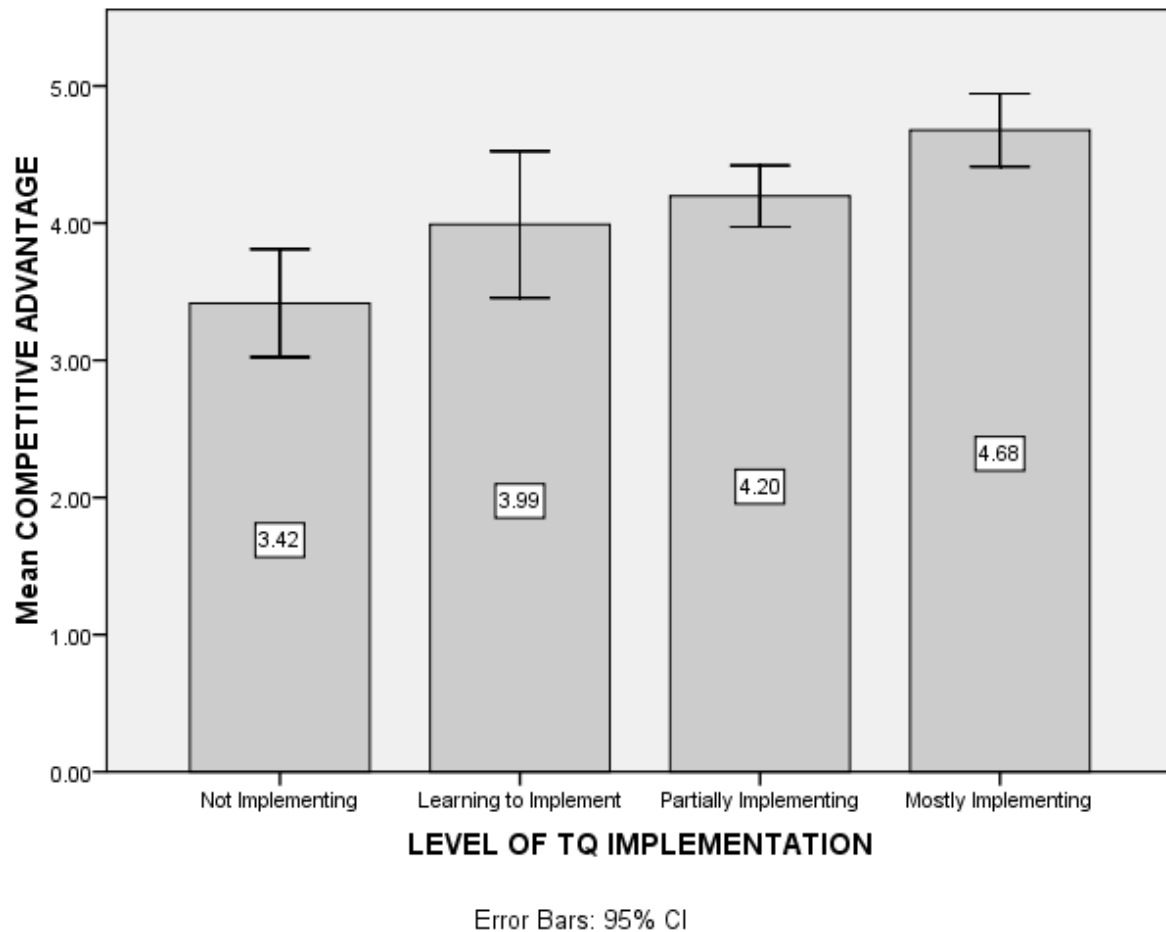


Figure 2: TQ implementation level versus CA

Further, the research aimed at establishing the level of TQ implementation in the sector.

The study developed a total quality implementation index (TQII), which was an adaptation of the Malcolm Baldrige National Quality Award criteria for performance excellence to find out the level of total quality implementation in Kenya's horticultural industry. In this case quality was defined as the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs (ASQ, 2008) while total quality was defined as a set of principles, approaches, methods and techniques of management that ensures continuous improvement in the quality of all aspects of an organization's process, product and or service, in order to satisfy customers. We, therefore, looked at total quality as a set of activities that can be summarized in six principles namely leadership; customer focus and satisfaction; employee empowerment; performance measurement; supplier partnership; and continuous improvement, which are all geared towards satisfying customers.

At a benchmark score of 100 plus as fully implementing total quality in an organization, the implementation level

of total quality in the horticultural industry in Kenya was found to be low at an average of 78. This was categorized as learning to implement total quality. The level of quality implementation was found to be in agreement with what Lee and Kelce (2004) found in their study of China's SMEs, where implementation of TQ was found to be low. The leadership principle was found to be the poorest performer contradicting Jooste (2004) on aspects of inspiring and influencing people to do extraordinary things while agreeing with Ngware et al (2006) that failure to implement TQ in Kenya's secondary schools is due to lack of leadership, showing that the same problem is affecting the horticultural sector in Kenya.

On customer focus, the sector was found to be doing slightly better than leadership, but still not to the standard envisaged of a total quality organization. The view that the customer is the reason for an organization's existence (Ohmae, 2005) seems not to be internalized by the horticultural sector players. Further, the understanding that customer satisfaction is achieved through customer surveys and process coordination (Evans and Lindsay, 2011) is not a widely held position by the players as only

21.6 percent of the companies carried out annual customer satisfaction surveys.

The other important aspect of total quality, namely performance measurement, scored poorly among the sector players. According to Baldrige Criteria for Performance Excellence, an organization implementing quality management must use measurement to drive company's strategy formulation and analysis of performance. This seems to be lost to the companies operating in the horticultural sector in Kenya as performance measurement scored a poor 78 or learning to implement total quality. None of the total quality factors registered an average score of above 80, showing that the sector cannot be said to be implementing total quality. The two factors with a score of an 80, supplier partnership and continuous improvement, showed the sector demand on working with farmers rather than the understanding of the philosophical underpinning of supplier partnership and the need to change, that characterize the horticultural sector due to its volatile nature. The two factors did not register significant positive correlation to competitive advantage with continuous improvement posting a negative relationship. The hypothesis H_1 that total quality implementation in the horticultural industry in Kenya is high was, therefore, rejected and the null hypothesis, that total quality implementation in the horticultural industry in Kenya is not high, accepted.

The challenges facing the sector in implementing total quality gives more insight in the above state of affairs. The major challenge that the respondents cited was high financial costs. This agrees with Al-Dabal (2001), who stated that TQ is considerably wider and far more expensive than other quality management systems such as ISO 9001 in USA companies. This means that trying to implement TQ in organizations that are having problems with relatively lower quality management systems such as Global Gap, then it is expected the level of implementation, will be low. Further, the second most important challenge facing the horticulture sector is treating certification as an end. This was validated by the level of TQ implementation in the sector, and shows a lack of understanding of the philosophy behind total quality or any quality management system, for that matter.

Discussions with respondents also brought out some of the feelings bottled up in the system. One respondent bitterly complained of "bad customers who always complain and never compliment". This is a lack of understanding of the customer, and the score confirmed that the sector does not employ the scientific practice of understanding customers through capturing customer satisfaction index. Other members were bitter with industry sector regulator, HCDA. Their comments were that HCDA was keener on revenue collection than providing information and support to industry players especially on customer management. Bearing in mind

target customers are in Europe and other developed countries, then HCDA would be playing a more crucial role of market data depository and dissemination for knowledge management and enhanced customer service to and by the sector. The other industry players were not left out for censure. There was a sense of frustration with the lobby institutions FPEAK and Kenya Flower Council by players and even by some officials of these organizations. The argument was that the institutions have become more of employers where workers go to enjoy the benefits of employment, than provider of services to the members. On the kind of relationship existing between total quality and competitive advantage, the study results showed that progressing from not implementing to mostly implementing there was a clear and sustained positive relationship between level of total quality implementation and competitive advantage. Further, the standard errors came close to the average mean competitive advantage the higher one went on the level of total quality implementation. We therefore could not reject the hypothesis H_{1b} that there is a positive relationship between the level of TQ implementation and competitive advantage showing that total quality implementation would assist the firms in acquiring competitive advantage.

Most Total Quality criteria have significant relationship with competitive advantage outcomes. The objective of this hypothesis was to find out the impact the variables making up the TQ paradigm have on specific outcomes making up competitive advantage. Correlation techniques were used to detect the kind of relationship existing between the variables, and multiple regressions to establish the nature and extent of the relationship. The variables making up TQ were analyzed individually against the specific outcomes making up competitive advantage namely increase in revenue; customer satisfaction; reduction in waste; increased employee satisfaction. From the results, it was established that the correlations between total quality factors and individual competitive advantage outcomes of customer satisfaction; increase in revenue; employee satisfaction; reduction in waste; was .661, .654, .682, .630 respectively at $p < .001$, implying that there was a moderately strong, positive and very significant relationship between the variables.

All combined factors, therefore, registered R levels of over 0.6. Using the beta coefficients as base of analysis, customer focus showed a significant impact on all parameters except in waste reduction. Customer focus had significant impact on customer satisfaction, increase in revenue, and employee satisfaction. Performance measurement had significant impact on both customer satisfaction and waste reduction, while leadership had significant impact on employee satisfaction. Supplier partnership had significant impact on waste reduction. Of the six total quality criteria in the study, four had significant impacts on the four competitive advantage

outcomes of increase in revenue; customer satisfaction; reduction in waste; and employee satisfaction.

This agreed with Rahman (2001) whose study of SMEs in Australia found that most quality criteria had significant relationships with business outcomes measured in terms of revenue, profitability and number of customers. It also related well with Agus and Sagir (2001) research on Malaysian companies, which found that TQ acted as an intervening variable between competitive advantage and financial performance. Further, the research by NIST (2008), Mucai (2008), BSI (2005), and Kagura (2004) which indicated that TQ brings forth customer satisfaction, increased revenue, reduction in waste, and better employee satisfaction was validated. As a result, the null hypothesis was rejected, and the alternate hypothesis H_5 , that most quality criteria have significant relationships with competitive advantage outcomes measured in terms of increase in revenue; customer satisfaction; reduction in waste; and employee satisfaction, was accepted, confirming that competitive advantage depends on total quality.

Implications of the study

Implications for theory

Total quality management seems assured a place on the table of powerful management theories. However, the convergence of the various theories of management is seen to continue occurring. On its part, total quality is a very strong system for sustained competitive advantage. To that end, total quality should be incorporated in any strategic planning approach to management. However, during the SWOT analysis, the level of total quality implementation in the organization will determine the focus the organization should take. If the SWOT indicates that the level of total quality implementation is low, then the organization should embrace the search for operations effectiveness first focusing on process management and effectiveness. If the level of total quality implementation is high, then the focus should be on fine tuning the various parameters of TQ that are not well implemented to enhance the level of competitive advantage. These alternative theoretical approaches will depend on the guidance from the leadership of the organization.

Implications for policy

It is clear that total quality has powerful implications on competitive advantage. Companies implementing partially to fully the concepts of total quality have shown a consistent and sustained growth in competitive advantage over rivals. The results of this study have policy implications at the macro and micro levels categories of the Kenyan economy and horticulture sector respectively. At the macro level, these results give impetus to the Kenya government's policy of encouraging companies and government institutions to embrace the concept of quality management by way of getting ISO

9001 certified. However, certification in quality management system, does not, in itself, bring forth competitive advantage. Further, those certified did not exhibit significant difference in levels of total quality implementation. This contradiction needs to be managed to ensure the very heavy investment in certification adds value to organizations. The area of value in the research is the competitive score registered by companies that were one year certified. Certification at this point does add value and brings forth a distinct competitive advantage. Thereafter, there is a systematic decline in competitive advantage as years of certification increase. The approach to policy makers is to come up with requirements that put organizations in a newly certified mode all the time. This will ensure sustained quality management implementation all the time.

Implications for practice

The practices that have come out clearly include the need to fully implement the total quality principles and especially the concept of performance measurement, customer focus and effective leadership. These three variables have strong drive to competitive advantage. Having a quality assurance department and focusing on operations management have clear positive impact on organization's competitive advantage. The organizations that implement these principles are assured of sustained competitive advantage. At low levels of total quality implementation, companies are encouraged to embrace the concept of operations effectiveness ensuring that processes are driven to higher levels of efficiency and effectiveness. This approach will entail some levels of precision and flexibility. As the companies improve, then the holistic view of total quality should be brought into the picture and sustained implementation of the same driven into the firm.

REFERENCES

- Agus A, Sagir RM (2001). The structural relationships between total quality management, competitive advantage and bottom line financial performance: an empirical study of Malaysian manufacturing companies. *Quality Magazine*, 7, 1018-1024, Carfax Publishing Company.
- Al-Dabal JK (2001). *Is total quality enough for competitive advantage? - realities in organizations implementing change initiatives with examples from the United States and developing countries*. Retrieved from <http://www.dissertation.com>
- Ambundo PA (2000). *Total quality management: The case of Barclays bank of Kenya*, (Unpublished Master's Thesis). United States International University, Nairobi.
- ASQ (2008). *Quality systems terminology -ANSI / ASQC A3-1978*. Milwaukee: American Society for Quality Control. Retrieved from <http://www.asq.org>
- Beer M (2003). Why total quality management programs

- do not persist: the role of management quality and implication of leading a TQM transformation. *Decision Sciences*, 34(4): 623-642.
- Besterfield DH, Besterfield-Michna C, Besterfield, GH, Besterfield-Sarce M (2003). *Total quality management*. Upper Saddle River, New Jersey: Prentice-Hall Inc.
- BSI (2008) Case studies. Retrieved from <http://www.bsi.org>
- Cooper RD, Schindler SP (2006). *Business research methods*. Singapore: McGraw-Hill Edition.
- Deming Institute (2008). *The Deming Prize*. Retrieved from <http://www.deming.org>
- Deming WE (1986). *Out of crisis*. New York: MIT Press.
- Deming WE (1993). *The new economics for industry, government, education*. Cambridge, MA: MIT Center for Advanced Engineering Study.
- Evans JR, Lindsay WM (2011). *The management and control of quality*, 8th Edition. South-Western, Cengage Learning.
- Field A (2009). *Discovering statistics using SPSS*, London: Sage Publications Ltd,
- Hamel G, Prahalad CK (1994). *Competing for the future*. Harvard Business School Press
- Hino S (2005). *Inside the mind of Toyota: management principles for enduring growth*. Productivity Press
- Jooste, K (2004). *Leadership: A new perspective*. *Journal of Nursing Management*, 12, 217-223.
- Juran I (2008). *Institute statement on Joseph M. Juran*, February 29th 2008. Retrieved from <http://www.juran.com>
- Juran JM, Godfrey AB (1998). *Juran's quality handbook*. McGraw-Hill Professional, 5th Edition.
- JUSE (2007). *Guide for the Deming application prize*, The Deming Prize Committee. Retrieved from <http://www.juse.or.jp/e/deming>
- Kagura Jo (2004). *The impact of ISO 9000 implementation among the business organizations in Nairobi*. (Unpublished Master's Thesis), United States International University, Nairobi.
- Karauri, R (2010). *The impact of ISO 9000 certification on financial performance of Kenyan companies*. (Unpublished Master's Thesis), United States International University, Nairobi
- Martínez-Lorente AR, Dewhurst F, Dale B (1998). *Total quality management: origins and evolution of the term*, *The TQM Magazine*, 10 (5), 378-386. Emerald Group Publishing Limited
- Markides CC, Williamson PJ (1994). *Related diversification, core competencies and corporate performance*. *Strategic Management Journal*. (Special Issue), 149-167.
- Mucaí JM (2008). *The application of TQM principles by ISO 9000 certified firms in Nairobi*. (Unpublished Master's Thesis), United States International University, Nairobi.
- Myers R (1990). *Classical and modern regression with applications*, 2nd edition. Boston MA: Duxbury.
- Ngware MW, Wamukuru DK, Odebero SO (2006). *Total quality management in secondary schools in Kenya: extent of practice*. *Quality Assurance in Education* 14 (4), 339-362. Emerald Group Publishing Limited.
- NIST (2008) Baldrige Awards and case studies. Retrieved from <http://www.baldrige.nist.gov>
- Ohmae K (1991). *Mind of strategist: the art of Japanese business*. McGraw-Hill.
- Ohmae K (2000). *The invisible continent: four strategic imperatives of the new economy*. Harper-Collins Publishing Inc.
- Ohmae K (2005). *Next global stage: the challenges and opportunities in our borderless world*. Wharton School Publishing.
- Porter ME (1985). *Competitive advantage: creating and sustaining superior performance*, New York: Free Press.
- Porter ME (1986). *Competitive strategy: techniques for analyzing industries and competitors*, New York: Free Press.
- Porter ME (1987). *From competitive advantage to corporate strategy*. *Harvard Business Review*, May-June 1987, 44-59.
- Porter ME (1990). *On competition*. Harvard Business Review Publishing.
- Rahman S (2001). *Total quality management practices and business outcome: evidence from small and medium enterprises in Western Australia*. *Total Quality Management Magazine*, 12 (2), 210-210. Routledge.
- Tang SL, Kam CW (1999). *A survey of ISO 9001 implementation in engineering consultancies in Hong Kong*. *International Journal of Quality and Reliability Management*, 16 (6), 562-74. Emerald Group Publishing Limited.