ENHANCING THE COMPETITIVENESS OF SOUTH AFRICAN AGRIBUSINESS FIRMS: THE ROLE OF THE ISO 9000 QUALITY ASSURANCE STANDARDS

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ABSTRACT

Worldwide, the ISO 9000 quality assurance standards have received considerable support from firms seeking to improve their economic competitiveness. This paper focusses on South African agribusiness firms' experiences with the ISO 9000 standards. A postal survey was conducted amongst 92 agribusiness firms to determine the extent of adoption of ISO 9000, reasons for certification and to identify the costs and benefits of adopting these standards. About 36 percent of respondent firms were certified. The desire to improve customer service, a basis for quality improvement and the need to improve operational efficiency (reduce wastage) were the most important factors influencing certification. Respondents reported financial, managerial and production benefits following certification. Discriminant analysis revealed that ISO 9000 certified firms tended to be larger, established firms with parent company affiliation, manufacturing products derived from agricultural output and exporting to developed countries. Most non-certified firms had adopted an alternative quality assurance system.

INTRODUCTION

Over the past decade, changes in both the local and international policy environments have influenced the South African agricultural and agribusiness sectors. Locally, deregulation of marketing institutions, elimination of production controls and a new political dispensation have liberated South African agricultural trade. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT), now administered by the World Trade Organisation (WTO), initiated the

process of freeing-up international trade in agricultural and food products. As South Africa is a signatory to GATT and now forms part of the global market place, agribusiness firms are faced with increasing competition in both domestic and international markets. To be competitive, firms need to respond to customer demands and at the same time become more cost effective relative to competitors. Thus, to succeed in a highly competitive environment firms have to improve product and service quality, whilst at the same time reduce production and transaction costs. To meet these challenges, managers of South African agribusiness firms will have to adopt innovative business strategies, including the ISO 9000 quality assurance standards, to enhance firm competitiveness.

The purpose of this paper is to present some important results of a postal survey conducted amongst 92 South African agribusiness firms. The primary objective of the postal survey was to determine the extent of adoption of the ISO 9000 quality assurance standards, the reasons for certification and to identify the costs and benefits of adopting these standards. In addition, Discriminant analyses were conducted to identify and rank factors that distinguish between firms which have adopted the ISO 9000 standards, those which have adopted alternative quality assurance systems, and those operating without any formal quality assurance standards.

ISO 9000 QUALITY ASSURANCE STANDARDS

In 1987, the Geneva-based International Organisation for Standardisation published a series of quality assurance standards which were collectively known as ISO 9000. The ISO 9000 series consists of five standards, ISO 9000-9004, of which ISO 9001-9003 list the certification requirements for quality systems of different comprehensiveness, decreasing from ISO 9001 to 9003 (Schiefer, 1994). The ISO 9000 standards are voluntary principles of good practice and have been adopted by the European Union and much of the industrialised world (Schiefer, 1994; Schuler et al., 1996). At the end of 1997, over 226000 certificates had been awarded in 129 countries worldwide. Of these certificates, South Africa holds 1915 (International Organisation for Standardisation, 1999). Europe (excluding

United Kingdom), the United Kingdom, Far East Countries and North America held 39, 25, 14 and 11 percent of these certificates respectively.

The standards represent a quality assurance system not a product certification scheme (Schuler et al., 1996). According to Hendry (1991), the system aims primarily at preventing nonconformity at all production stages from design through to servicing. The objective of the ISO 9000 series is to promote worldwide standards which will improve quality, operating productivity and efficiency, and to reduce costs (Schuler et al., 1996). To achieve ISO certification, a company must obtain the guidelines, adapt them to its own particular needs, prepare documentation, train employees, follow the documentation procedures and submit to an audit by an external registration organisation which is accredited by the International Organisation for Standardisation. Continuous monitoring and verification of the quality management system ensures that the system does not deteriorate. Surveillance audits are conducted by third-party auditors usually every six months with a full reassessment every three years.

STUDY METHODOLOGY

Agribusiness firms in the context of this study include agricultural input suppliers (seed, feed, fertiliser, agrochemical, equipment and machinery manufacturers), agricultural output processors (wineries, tanneries, canneries, dairies, textiles, sugar and grain millers, sawmills, abattoirs and other farm product processors), as well as agricultural service providers (fruit exporters, pack-houses, agricultural retail suppliers).

A questionnaire was compiled, based on the work by Bredahl and Holleran (1997) and SABS (1995), and piloted during March 1998 amongst four agribusiness firms, two of which were ISO 9000 certified. From constructive feedback, possible problems and misunderstandings were identified and rectified. A postal survey was conducted during July and August 1998. Of the 280 questionnaires sent out, 92 (32,9 percent) responses were received from companies willing to participate in the study. The usable response rate of 32,9 percent for this postal

survey compares favourably to similar studies. Van der Wiele and Brown (1997), Manchester Business School (1996), Scicchitano (1996) and a South African study (SABS, 1995) reported response rates of 32, 28, 26 and 36 percent for their respective postal surveys.

Almost 36 percent (33) of respondent firms were ISO 9000 certified. Of these 33 firms, 31 were certified in the ISO 9002 model with the remaining two firms being ISO 9001 certified. The ISO 9001 model is the most comprehensive in the series (covers 20 elements: quality assurance in design/development, production, installation and servicing) whilst ISO 9002 contains 18 elements (excludes design/development considerations) (Schuler et al., 1996). Of the remaining respondent firms (n = 59), 15 percent (9) were 'intermediate' whilst 85 percent (50) were not certified. Intermediate firms had initiated ISO 9000 implementation but were not certified at the time of the survey.

ISO 9000 CERTIFICATION

Certified firms were also asked whether they considered ISO 9000 certification to be a standard business practice for a firm in their line of business in terms of time (presently and in the future) and scope (locally and internationally). About 64 percent felt ISO 9000 certification to be a standard business practice locally at present, while 90 percent felt it would be a standard business practice locally in the future. On the other hand, 78 percent of respondents felt certification was a standard business practice internationally at present, but all respondents indicated it would be a standard business practice internationally in the future.

Factors which motivated ISO 9000 certification

When asked to give the single most important reason for adopting the ISO 9000 quality assurance standards, 42 percent of certified firms cited internal firm-driven reasons, 42 percent reported external customer-driven reasons whilst 16 percent indicated a combination of the two. Internal factors include procedural efficiency, staff motivation, and reductions in error rates, wastage and costs, whilst external

reasons include customer requirements and the desire to gain market access and market share. Of the certified respondents in this study, 61 percent indicated that their principal customers did not require certification at present, but 78 percent thought that certification would be a future customer requirement.

To investigate the motivating factors in more detail, certified respondents were asked to indicate the importance of these factors on a three-category scale ranging from 'not important' to 'important' and 'very important'. The proportion of firms which indicated 'important' or 'very important' for each influencing factor is presented in Table 1. The factors were ranked according to these proportions.

Table 1. Factors which motivated ISO 9000 certification among a sample of South African (SA) agribusiness firms, 1998 (n = 32)

Factor	Mode*	Percentage of firms indicating 'important' or 'very important'	Rank
Improve customer service	3	100	1
A basis for quality improvement	3	96,9	2
Improve operational efficiency (reduce wastage)	3	90,7	3
Access to foreign markets	3	87,5	4
Reduction in operating costs	2	87,5	4
Gain market share	3	84,4	6
Customer requirement	2	84,4	6
Unite various quality systems	2	81,3	8
Certification will be a future requirement	3	80,7	9
Industry requirement (stay in business)	2	75,0	10
Corporate mandate	2	67,7	11
Reduction in transaction costs	2	56,3	12

* where 1 = not important, 2 = important and 3 = very important

The desire to improve customer service was the most influential factor, followed by a basis for quality improvement and a desire to improve operational efficiency (reduce wastage). Although the importance of certification in reducing transaction costs was only ranked twelfth, it is evident from other factors (e.g. improve customer service, improve operational efficiency, access to foreign markets, unite various quality systems, certification will be a future requirement) that it is an important motivating factor. The factors which motivated ISO 9000 certification among respondents in this study coincide with those reported by SABS (1995), Van der Wiele and Brown (1997), Zaibet and Bredahl (1997), and Guerin and Rice (1996).

Costs of ISO 9000 certification

ISO 9000 certified firms were asked to estimate the costs of ISO 9000 implementation, pre-certification auditing fees and ISO certification (Table 2). All costs shown in Table 2 are expressed on a 1997/98 basis and have been grouped according to firm turnover to account for firm size. ISO 9000 implementation costs include items such as staff training, documenting procedures, hiring of consultants, redeployment of internal resources and the acquisition of equipment for calibration. Certification costs depend upon firm size, complexity (nature of processes) and the ISO 9000 series chosen.

To account for firm size, total costs of certification are expressed as a percentage of annual turnover and total certification costs per employee. Zaibet and Bredahl (1997) reported that the total cost of achieving ISO 9000 certification did not exceed 1,5 percent (range = 0,07 - 1,5 percent) of turnover of firms in their United Kingdom meat sector study. Their study was conducted amongst four small and medium sized firms. They concluded that these costs should not represent a constraint toward achieving certification.

Table 2. Costs of ISO 9000 certification among a sample of SA agribusiness firms, 1997/98 = 100

Costs of ISO 9000	Group *	n	Mean (R)	Median (R)	Range (R)
Implementation	A	7	56256	50943	11880 - 154957
	B	6	144228	100101	14200 - 300000
	C	6	302949	146711	50943 - 1045440
Pre-certification auditing fees	A	5	8046	7642	5043 - 11880
	B	3	8070	4632	1500 - 18078
	C	7	24901	10189	6113 - 70296
Certification	A	4	8235	7301	6457 - 11880
	B	3	27704	21300	15496 - 46316
	C	6	39883	24453	7030 - 99792
Total cost	A	6	67541	50934	12000 - 167871
	B	6	162115	136975	14200 - 322826
	C	7	318758	163019	19911 - 1188000
Total cost per employee	A	6	664,04	522,00	198,00 - 1554,36
	B	6	453,77	137,30	14,35 - 2137,92
	C	6	583,27	399,24	20,17 - 1321,35
			percent	**percent**	**percent**
Total cost as a percentage of turnover	A	6	0,301	0,157	0,027 - 1,024
	B	6	0,041	0,048	0,003 - 0,065
	C	6	0,045	0,019	0,011 - 0,140

* Group A = company turnover < R100 million
Group B = company turnover ≥ R100 million but < R650 million
Group C = company turnover ≥ R650 million

The results of this study (Table 2) suggest that the costs of certification may be prohibitive for very small firms as smaller firms show the highest cost per Rand of turnover and per employee. There is also some evidence of diseconomies for very large firms. However, the means computed for the largest firms were skewed by one firm that reported certification costs in excess of R1 million (this firm achieved ISO 9001 certification). The median values presented in Table 2 indicate size economies across the full range of turnover, but higher certification costs per employee for very small and very large firms.

Impact of ISO 9000 certification

Respondents were asked to score on a five-point scale, ranging from 1 (highly negative) to 5 (highly positive), the impact of certification on each performance indicator. The ranking of performance indicators was based on the proportion of respondents indicating a 'positive' or 'highly positive' impact (Table 3).

Table 3. Ratings of performance indicators, sample of SA agribusiness firms, 1998

PERFORMANCE INDICATOR	Mode*	Percentage of firms indicating 'positive' or 'highly positive'	Rank
Documented process (e.g. record-keeping) (n = 32)	5	96,9	1
Overall firm performance (n = 32)	4	93,8	2
Quality of output (n = 32)	4	93,7	3
Error rates (decrease) (n = 32)	4	90,6	4
Customer service (n = 31)	4	90,4	5
Quality of purchased inputs (n = 32)	4	81,3	6
Competitiveness (n = 32)	4	75,0	7
Sales (n = 31)	4	74,2	8
Inter-firm communication (n = 32)	4	71,9	9
Productivity (n = 32)	4	71,9	9
Worker satisfaction / employee morale (n = 32)	4	68,8	11
Market access (n = 32)	4	68,8	11
Wastage (i.e. scrap costs) (decrease) (n = 32)	4	68,8	11
Profits (n = 32)	4	68,7	14
Overall operating costs (decrease) (n = 32)	4	65,6	15
Market share (n = 32)	4	56,3	16

* where 1 = highly negative impact, 3 = no impact and 5 = highly positive impact

Certification had a positive impact on most performance indicators, in particular on documented processes (e.g. record-keeping), overall firm performance and quality of output. In addition, certification had a positive impact on decreasing error rates, customer service and quality of purchased inputs. Factors ranked 1, 5, 6, 9 and 11 show the positive impact of certification on reducing transaction costs. Similar findings have been reported by Market and Opinion Research International (1996), Manchester Business School (1996), Hendry (1991), SABS (1995) and Zaibet and Bredahl (1997).

Certified firms were asked to provide information (before and after certification) of any improvements in performance measures resulting from certification. A summary of the certified companies' experiences is presented in Table 4.

Table 4. Actual improvements in performance measures as reported by ISO 9000 certified firms, sample of SA agribusiness firms, 1998 (n = 19)

Improvement	n	Before certification	After certification
Conformance to specifications*	10	Mean improvement = 15,9 percent (n = 8), range = 5 - 25 percent	
Less customer complaints*	4	Mean improvement = 394 percent (n = 2), range = 188 - 600 percent	
Reduced product returns/rejects*	4	Mean improvement = 314 percent, range = 91 - 666 percent	
Suppliers' input conformance*	2	85 percent (n = 1)	95 percent (n = 1)
Documentation efficiency*	1	Overall improvement	
Calibration*	2	Mean improvement = 48 percent range = 47 - 49 percent	
Scrap material*	1	2,0 percent of final product	1,3 percent of final product
Product losses	1	±R700000 per annum	±R400000 per annum 1,5 years later
Penalties due to non-conformance*	1	R45514	0

* improvements which reduce transaction costs

Clearly, benefits have been achieved from certification. Substantial cost savings can be achieved through improvements in conformance to specifications, less reject products/returns and scrap material, and less customer complaints will ensure continued customer satisfaction and support.

Disadvantages of ISO 9000 certification

When asked to list any disadvantages of ISO 9000 certification, some 85 percent of certified firms expressed their experiences. Nearly 40 percent of respondents (n = 28) indicated there were no disadvantages/drawbacks of certification, while cost considerations were mentioned by 11 percent of respondents. Excessive documentation load/paperwork was mentioned in 25 percent of cases. Other drawbacks mentioned also reflect the following disadvantages of ISO 9000 reported by researchers elsewhere (Sadgrove, 1995; van der Wiele and Brown, 1997): a) it is bureaucratic, b) excessive on-going paperwork, c) it is internally focused (internal processes), d) staff feel that standards are imposed on them, and e) ISO 9000 does not encourage continuous process improvement.

Of the ISO 9000 certified firms (n = 33), 88 percent indicated that the benefits of ISO 9000 certification outweigh the costs incurred; 79 percent said benefits significantly outweighed the costs whilst 21 percent reported small net benefits. Of the certified firms, 97 percent believed that adopting the ISO 9000 quality assurance standards could benefit South African agribusiness firms. Being an importer and distributor of agricultural equipment, the remaining firm felt that as long as overseas suppliers were certified, local certification was not necessary.

Agribusiness-farmer relationship

Of all survey respondents, 63 percent had farmers as suppliers. Of these firms 93, percent indicated that they required minimum quality standards from farmers. More ISO 9000 certified companies (95 percent) required minimum standards from farmers than non-certified companies (90 percent). All intermediate firms required minimum quality assurance standards from their farmers. Considering the

vertical supply chain concept (i.e. raw material supplier (farmer) → processor → retailer), respondent firms were asked if they thought the incorporation of quality control measures at farm level could make the supply chain more productive and cost efficient. Almost all ISO 9000 certified companies (95 percent) answered yes whilst 87,5 percent of intermediate and 79 percent of non-certified companies agreed. Firms were asked if they thought the ISO 9000 quality assurance standards could facilitate such control measures. The majority (67 percent) of ISO 9000 certified companies said yes, with equal proportions of the remaining respondents (33 percent) answering no and uncertain. Of the non-certified firms, 28 percent, 31 percent and 41 percent responded with yes, no and uncertain respectively.

Although this study focused on ISO 9000 certification by agribusiness firms, farm businesses may also adopt the ISO 9000 quality assurance standards. Farm businesses with processing plants (e.g. dairies, abattoirs, wineries) could consider ISO 9000 certification. In addition, farmers as customers may favour input suppliers (e.g. feed, seed and agrochemical companies) and service companies (e.g. pack-houses and marketing agents) that satisfy minimum quality standards, such as that provided by the ISO 9000 quality assurance standards.

DISCRIMINANT ANALYSIS

Discriminant analysis was used to identify variables that differentiate between adopters and non-adopters of ISO 9000. Results revealed that adopters of ISO 9000 tended to be larger, established firms with parent company affiliation, manufacturing products derived from agricultural output and exporting to developed countries. The presence of an alternative quality assurance system, and operating as a cooperative, were inversely related to ISO 9000 adoption (Turner, 1999).

The most important variable distinguishing between firms that had adopted ISO 9000 and those that had adopted an alternative quality assurance system was firm turnover. This finding suggests that the fixed costs of implementing ISO 9000

limit its adoption amongst very small firms in South Africa. Apparently this is not the case in United Kingdom and the United States of America where ISO 9000 has been readily adopted by small and medium sized firms as well as firms in the service industry.

At present firms with alternative quality assurance systems do not perceive any additional net benefits arising from ISO 9000 certification. However, client preferences, especially in North America, Europe and Australasia, could well shift in favour of an internationally recognised and accredited quality assurance system such as ISO 9000. Barriers to trade, which have steadily declined following international trade agreements (through the GATT/WTO), could be replaced by non-tariff barriers such as ISO 9000 certification and Hazard Analysis Critical Control Point (HACCP) (Caswell and Hooker, 1996).

CONCLUSIONS

The liberalisation of world markets presents both challenges and opportunities for South African agribusiness firms. Global free trade forces firms to become more competitive, allowing firms to expand existing markets or enter new ones. The ISO 9000 quality assurance standards are increasingly being adopted by firms throughout the world to enhance their competitiveness.

A postal survey conducted amongst 92 South African agribusiness firms revealed that 33 respondents (36 percent) were ISO 9000 certified. The desire to improve customer service, a basis for quality improvement and the need to improve operational efficiency (reduce wastage) were the most important factors influencing certification. Certification had a positive impact on most performance indicators, in particular on documented processes (e.g. record-keeping), overall firm performance and quality of output. Results show that certification can yield real benefits (financial, managerial, production) to enhance firm competitiveness. Agribusiness firms may require their farm business suppliers to meet minimum quality standards, such as the ISO 9000 quality assurance standards.

Discriminant analyses revealed that certified firms were characterised as being large, established firms with parent company affiliation, manufacturing products derived from agricultural output and exporting to developed countries. Most non-certified firms had adopted an alternative quality assurance system. Following the results of the Discriminant analyses two points need to be raised. Firstly, managers of firms with alternative quality assurance systems will need to monitor client and country quality assurance requirements to secure future export markets. Secondly, it was evident that the fixed costs of implementing ISO 9000 could limit certification amongst very small firms in South Africa.

This has policy implications in South Africa where government is actively promoting small and medium-sized enterprises (SME's). Government might consider subsidising the costs of ISO 9000 certification amongst SME's wanting to export to developed countries. In addition, government and business associations could increase awareness of ISO 9000 and its associated costs and benefits amongst South African firms by disseminating relevant information.

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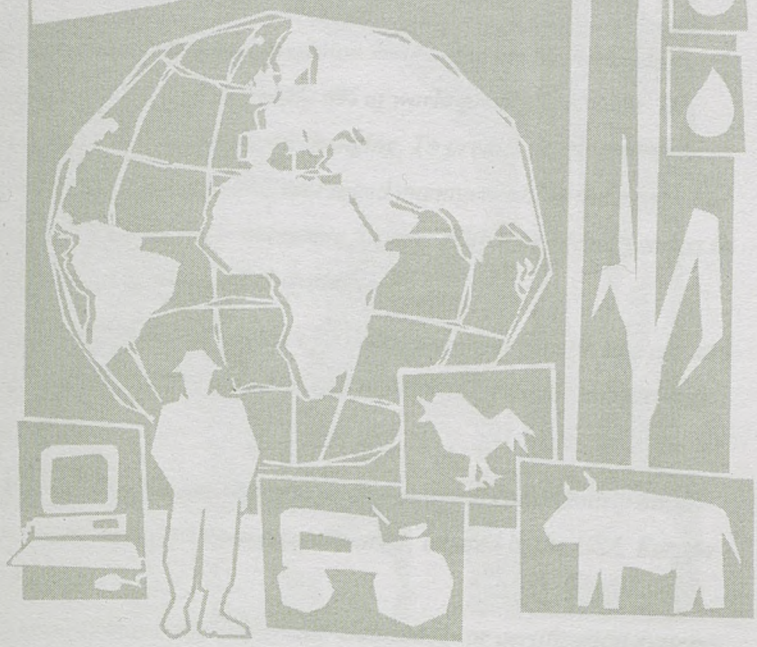

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