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Mitigating the High Cost of ISO 14001 EMS Standard Certification: Lessons from Agribusiness Case Research

Emmanuel K. Yiridoe ^a and Geb E. Maret ^b

^a *Associate Professor, Department of Business and Social Sciences, Nova Scotia Agricultural College, Truro, Nova Scotia.*

^b *Research Associate, Tellus Institute, Cambridge, Massachusetts.*

Abstract

Small and Medium Enterprises (SMEs) account for an estimated 90% of the world's economic activity, implying that environmental management strategies customized specifically for such organizations are important in a global environmental management initiative such as ISO 14001. The cost of third party ISO 14001 standard registration can be extremely high, and generally beyond the means of SMEs. Three dimensions to ISO 14001 EMS standard registration, which can substantially affect the cost associated with developing, implementing and obtaining ISO 14001 accreditation, were examined: i) whether the EMS implementation and registration process is direct or indirect; ii) how an organization can demonstrate compliance with ISO 14001 requirements; and iii) scale of the ISO 14001 certification process. In addition, case studies are used to highlight important ISO 14001 certification considerations, and assess how the organizations studied mitigated the high cost of ISO 14001 registration.

Keywords: international, ISO 14001, small/medium enterprises, environmental entrepreneurship.

① Corresponding author: Tel: + 902-893-6699

Email: eyiridoe@nsac.ns.ca

Other contact information: G. Maret: gmaret@tellus.org

Introduction

The WTO (formerly Uruguay Round of the GATT) negotiations in 1986 (which addressed the need to minimize nontariff barriers to trade), and the 1992 “Earth Summit” on the environment (which highlighted the importance of a global commitment to environmental quality improvement) are precursors to development of the ISO 14000 series of standards (Van der Verdt, 1997). ISO 14001 EMS is a relatively new environmental entrepreneurship approach to managing environmental risks in organizations, thereby helping to incorporate environmental management issues into corporate strategic decision making. This process also helps to address some concerns with traditional command and control regulatory measures (such as passive compliance behaviour, and cost-effectiveness).

Governments in both industrialised and developing economies are encouraging voluntary private industry initiatives on environmental management. A proactive approach through the ISO 14001 EMS standard can be used to meet such needs. Organizations, on the other hand, see the relatively new ISO 14001 standard as a tool with potential to help not only in achieving society’s environmental stewardship objectives of meeting a growing ‘green market’ demand, but also for minimizing unwarranted compliance costs and helping to meet government environmental regulations (Ervin and Casey, 2001). Managers also have new and increased incentives to pursue private environmental management initiatives as the costs of participating in public programs grow, and as the market for green products and investments expand.

Small and medium enterprises (SMEs) account for an estimated 90% of the world’s economic activity (Van der Veldt, 1997). In the European Union, for example, SMEs dominate the industrial and commercial sectors, with more than 70% of the labour force in firms with less than 500 employees (Greenan, Humphreys and McIvor, 1997), while in Canada, 78% of business firms employ fewer than five people (Dulipovici, 2001). In the Asia Pacific Economic Cooperation (APEC) economies (consisting of about 18 countries), SMEs account for more than 90% of all (APEC) enterprises (Johansson, 1997). The relative importance of SMEs to national economic development takes on a higher dimension especially in economically depressed regions (of developed countries), where they are considered to be the main source of employment opportunities (Greenan Humphreys and McIvor, 1997). This overview suggests that environmentally-friendly business management strategies for such SMEs is critical in any global environmental management initiative. However, although the International Organization for Standardization developed the ISO 14001 EMS standard for organizations of any size, in reality, many of the benefits from certification appeal mainly to “large multinational and global organizations” (Van der Veldt, 1997). Building an understanding of the unique constraints to implementing and certifying to ISO 14001, especially for

SMEs, is an important step to helping them achieve public environmental policy objectives.

Although firms generally acknowledge the importance of good environmental management practices, there is limited awareness of the best way to achieve good environmental stewardship, especially among SMEs (Greenan, Humphreys and McIvor, 1997). Dulipovici, (2001) described the issue more succinctly when the author noted that there is limited information on environmental management systems customized specifically for SMEs. Yet a study commissioned by the Canadian Federation of Independent Business (CFIB) reported that what motivates SMEs in improving environmental quality is not (government) regulation, for example, but the business operator's knowledge and understanding of environmental issues (Dulipovici, 2001). According to the CFIB report, information on practical environmental management strategies (such as ISO 14000 standards), customized specifically to suit SME needs, are critical for promoting environmental stewardship.

Among SMEs, a major constraint to obtaining ISO 14001 certification is the direct costs associated with implementing and registering to the ISO 14001 EMS standard (Greenan, Humphreys and McIvor, 1997; Johansson, 1997; Wall, Weersink and Swanton, 1998; Grolleau, 1999; Yiridoe *et al.*, 2003; Van der Veldt, 1997). In an empirical study for Canada, Yiridoe *et al.* (2003) reported that the cost of third party ISO 14001 registration can be prohibitive, while Johansson (1997) noted that certification costs are generally outside the budgets of SMEs. Johansson (1997) estimated that the level of investment needed for ISO 14001 certification would preclude at least 74% of Canadian SMEs. Furthermore, when other factors were considered jointly with registration costs, the chances of ISO 14001 certification was "low" or "unlikely" for up to 97% of Canadian businesses. These challenges are likely to be greater, especially for organizations in developing countries, where environmental problems are increasingly becoming important government and public concerns.

The main purpose of this study is to assess how SMEs can mitigate the high costs of ISO 14001 certification. Consequently, a first objective was to assess and consolidate the literature on three dimensions to ISO 14001 certification, which can substantially affect the costs associated with developing, implementing, and obtaining ISO 14001 accreditation, namely: i) alternative approaches to obtaining ISO 14001 registration; ii) demonstrating compliance to ISO 14001 EMS code; and iii) scale of the EMS standard certification process. Second, a case study method is used to assess how selected organizations, illustrating different business types, have achieved ISO 14001 certification at relatively low cost.

ISO 14001 Certification Costs: How Big or How Small?

Although still in its early stages, analysis of the costs of ISO 14001 EMS is important, for example, for understanding business incentives, since widespread adoption of ISO 14001 will depend on whether the overall benefits exceed the costs for each organization (Wall and Weersink, 2001). In addition, adoption should not impose a higher burden (in relative terms) on a particular category of organizations (such as SMEs) than others (Dulipovici, 2001). In general, limited public information on smaller firms leads to more acute asymmetric information problems (i.e., more severe adverse selection and moral hazard problems in the credit market) (Chow and Fung, 2000). Furthermore, market-induced (e.g., obtaining business financing) and government-induced (e.g., bureaucratic discretion) business obstacles tend to be more severe for smaller firms than larger businesses because they represent fixed costs that larger firms tend to more easily absorb (Schiffer and Weder, 2001).

Applied economists have found that, as in other situations, determining reliable EMS cost estimates is analytically challenging. Some analysts argue that such costs need to consider the universality principle; i.e., by including all relevant certification costs. The total cost associated with developing and implementing an EMS, and registering to the ISO 14001 standard may be classified using several criteria. Yiridoe *et al.* (2003) identified these costs as either internal or external to the organization, while Wall and Weersink (2001) separates them into certification costs and marketing costs. The one time costs associated with developing and implementing the ISO 14001 EMS include:

- Cost of acquiring information: necessary for completing the certification requirements;
- Costs associated with record keeping and documentation, and changes in practices necessary for meeting the requirements of the ISO 14001 EMS;
- Employee training, and the opportunity cost of down time due to non-conformance;
- Auditing costs: include both internal and third party auditing costs to verify that the policies and practices established by the organization and required by the standard are being followed; and
- Registration cost: paid to an accredited registrar (i.e., national agency that oversees ISO standardization).

Expenses are also incurred for periodic audits, continuous management and improvement of the EMS, and for marketing and promoting awareness of the environmental implications of and trust in certification. In addition, full re-certification (and the associated cost) is required every three years, under the current accreditation scheme.

How much is incurred in seeking ISO 14001 certification? In general, the cost will

depend on factors such as type and size of the organization (i.e., the service or product produced) (Yiridoe *et al.*, 2003), stringency of the EMS and stakeholder awareness (Wall, Weersink and Swanton, 2001), and the approach used to implement and certify to the standard (Bansal and Bogner, 2002). Wilson (1997) reported that internal (sunk) costs constitute about 67% of the total cost, with the remaining 33% incurred in training and consulting (about 25%), and registration costs.

Although several studies provide insight on the financial implications of ISO 14001 certification (e.g., Bakari *et al.*, 2003; Bansal and Bogner, 2002; Raines 2002), there is limited published information on the actual ISO 14001 certification costs. Bansal and Bogner (2002) reported that single-site US firms were certified for estimated costs ranging from US\$10,000 (for small firms) to US\$200,000 (for large firms). After the initial certification, other branches or locations of the same firm tend to certify at lower costs due to reduced learning costs and significant economies of scale. In a survey of Canadian organizations, Yiridoe *et al.* (2003) reported that internal costs associated with certification were greater than external costs for medium (i.e., more than 100 employees) to large organizations (Table 1). In contrast, external costs were higher for small-size organizations with less than 100 employees. The study further reported that internal costs increased with size of the organization, as expected, while external costs (for such activities as third party auditing, consulting fees, registrars fees, etc.) tended to depend on the type of business (i.e., products or services offered). Actual costs reported ranged from CND\$5,000 to over CND\$60,000. Johannson (1997) noted that small businesses generally pay a substantial amount against a base income and, in some cases, the total cost can exceed the small firm's annual profit margin.

Table 1: Estimated Costs of ISO 14001 Registration by Canadian Organizations

Organization Size (Number of Employees)	External Cost (CND\$) ^a			Internal Costs (CND\$)		
	Minimum	Maximum	Average ^b	Minimum	Maximum	Average ^b
Small (<100) (N = 6)	5,000	40,000	22,000 ^B	5,000	60,000	17,000 ^C
Medium (101-500) (N = 6)	5,000	40,000	16,000 ^C	15,000	60,000	30,000 ^B
Large (> 500) (N= 6)	15,000	60,000	33,000 ^A	25,000	60,000	42,000 ^A

^a In 2000, one Canadian dollar was equivalent to Euro 0.730, and US\$0.673.

^b Means were compared separately for external cost and for internal cost. Values within this column followed by the same letter are not significantly different according to Wilcoxon rank sum test, for $\alpha = 0.05$.

Source: Yiridoe *et al.* (2003)

Approaches to Obtaining ISO 14001 EMS Certification

In general, the approach for developing and implementing an EMS, and certifying to ISO 14001 depends on factors such as the goals of the organization and reasons for implementing the standard, availability of resources and technical expertise, and environmental risk tolerance. Three dimensions to these approaches are addressed in this section: i) whether the EMS implementation and registration process is direct or indirect; ii) how an organization can demonstrate compliance with ISO 14001 requirements; and iii) scale of the ISO 14001 registration process. These dimensions can affect the costs associated with developing, implementing and obtaining ISO 14001 registration.

Direct and Indirect Routes

The routes to developing, implementing and registering to ISO 14001 have been characterized as either direct or indirect (Hilary, 1997; Wall, Weesink and Swanton, 1998), depending on whether the organization has prior experience with implementing and registering another management scheme(s). A direct route involves developing and implementing an EMS from scratch, and certifying to ISO 14001 without having first implemented and registered to a related management system standard (such as the ISO 9000 quality assurance schemes, EMAS or HACCP (a food safety and quality assurance scheme) or quasi-EMS (Figure 1). A formal gap analysis can be undertaken to compare existing environmental management programs and practices with the requirements of ISO 14001, and help determine what would be needed to obtain certification.

The various indirect methods, on the other hand, generally involve adapting an existing EMS or quasi-EMS, or other management system (such as a sector-specific environmental guide) as a springboard to ISO 14001 EMS standard certification (Figure 1). Where an organization registers to multiple standards, fixed costs associated with registering to one standard can be carried over to others, thereby lowering overall transactions costs of certifying to a new standard (Yiridoe *et al.*, 2003). In addition, various steps involved in implementing several of the ISO standards, for example, involve issues about running an effective management system and, therefore, are common strategies that can be transferred to implement a new standard (Von Zharen, 1996). Indirect routes may also appeal to firms that prefer a graduated approach to obtaining ISO 14001 certification, or when there is uncertainty about direct registration to ISO 14001 (Ammenberg, Börjesson and Hjelm, 2000).

One of the possible indirect routes involves firms that have already certified to one or more of the ISO 9000:1994 series of quality assurance schemes (which together are, arguably, the most widely known and successful ISO standards) (see, for

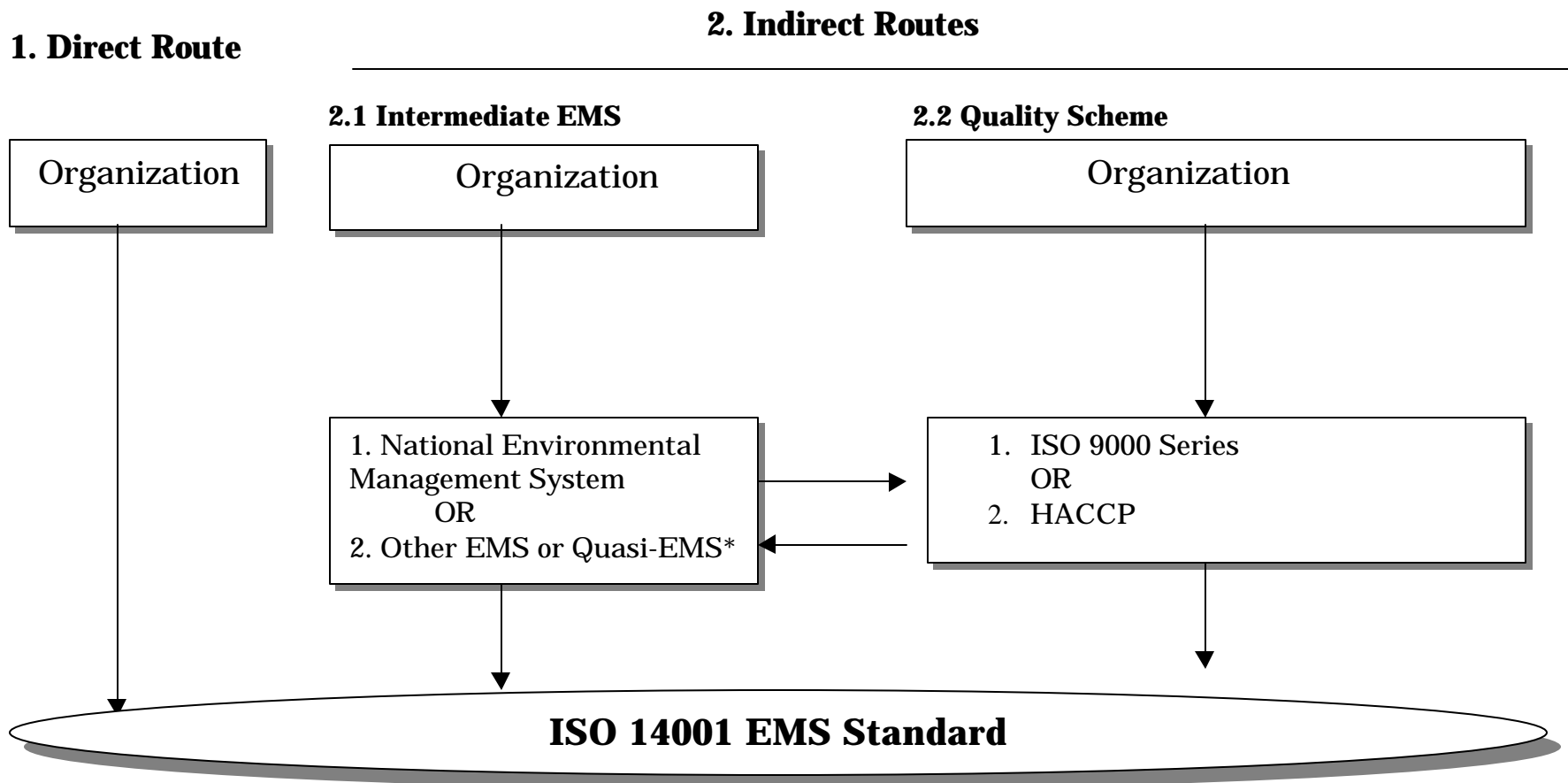


Figure 1: Alternative Routes to ISO 14001 Registration

* Examples of quasi-EMS include environmental management templates developed under the Environmental Farm Plan Program (in North America), and the “ENVIROP-AG” Farm Environmental Certification Scheme (in New Zealand).

Source: Adapted from Hillary (1997)

example, Wall et al., 2001). Experience from managing the quality standard facilitates certification to ISO 14001. A variant of this approach involves seeking simultaneous implementation of a quality or safety scheme, and ISO 14001.

Another indirect route involves using a regional or national standard or quasi-EMS, such as a generic tool for streamlining environmental management in a particular economic sector (e.g., agriculture or forestry), as a springboard to obtaining ISO 14001 registration (Wall, Weersink, and Swanton, 1998; Alexandra, 1999). For example, in the forest sector, an ISO technical committee has developed a bridging document (*Information to Assist Forestry Organizations in the Use of Environmental Management System Standards ISO 14001 and ISO 14004*, ISO/TR 14061) to guide forestry organizations in the application of generally accepted criteria for sustainable forest management, and establish performance objectives and targets for forest management certification (Hortensius, 1999). Hortensius (1999) noted that this bridging document uniquely links ISO 14001 with sustainable forest management performance benchmarks.

Demonstrating Compliance with ISO 14001 Standard

An organization that has developed and implemented an ISO 14001 EMS may choose to self-declare, or seek further verification. Self-declaration is a claim that an organization's EMS conforms to all ISO 14001 requirements. Under self-declaration, the burden of proof of conformance to the standard rests with the organization itself. Self-declaration alone may be appropriate for an organization that cannot justify the cost of third-party audits and registration, or where the relationship between the entities or stakeholders involved does not require certification. Another situation where self-declaration makes sense is when the demand for registration is not justified by associated market or economic incentives.

A major drawback to self-declaration relates to demonstrating credibility of the EMS, and of conformance to the ISO 14001 standard. This concern stems, in part, from the fact that unlike the ISO 9000:1994 series of quality management standards where interested parties (of an organization's products and services) are easy to identify, the outside interested parties of ISO 14001 are not so narrowly defined, and include employees, regulatory agencies, customers and clients (such as insurance agencies, bankers, potential investors, and other clients), and society as whole (Wilson, 1997). Wilson (1997) noted that interest in environmental quality extends beyond concerns about the quality of a product or service, and translates to a personal level for society as a whole. Consequently, the credibility demanded by stakeholders is of a higher degree, and more stringent for environmental stewardship. Furthermore, conventional wisdom, and experience with (other) ISO standards suggest that an objective third party evaluation of an organization's EMS, identifying non-conformance, and corrective action approval can help improve the EMS. This concern with credibility takes on a higher level when one considers

that in reality, prior to an audit, there are few organizations that do not believe they fully comply with the requirements of a standard (Wilson, 1999).

To help gain additional credibility with clients without incurring the full costs of third party audits and ISO 14001 registration fees, an organization may self-declare with an EMS report (i.e., a statement) on specified auditing procedures (EMS ROSAP). With this option, the organization specifies the existence of an EMS based on the firm's self-declaration, and evidence of having met the requirements of ISO 14001. Typically, a professional accountant with special training uses accepted auditing procedures to determine the existence of the EMS. However, the EMS ROSAP does not include a registration audit of the EMS nor does it indicate the quality, effectiveness or performance outcomes of the EMS.

Although the credibility of a self-declaration may be strengthened through an internal audit or, better yet, through a non-ISO 14001-certified outside audit (such as an EMS ROSAP), the full benefits of ISO 14001 standard implementation can only be realized after receiving a certificate of compliance from an accredited (third party) registrar. ISO 14001 certification is a process whereby observable and unobservable environmental management systems and characteristics are "guaranteed" to clients and other stakeholders. To minimize conflicts of interest, the guarantee is usually issued by a third (independent) party whose ability to verify the environmental management claims is greater than that of the firm's clients and other stakeholders. The rest of this study therefore focuses on how to mitigate the costs associated with developing and implementing the ISO 14001 EMS standard, and receiving certification.

Scale of the ISO 14001 Registration Process

Although indirect methods can help reduce some costs compared to a direct approach, the cost reduction may not be enough to make ISO 14001 registration worthwhile. Another aspect of ISO 14001 EMS implementation and registration relates to the scale or level at which registration can take place. An organization may choose to certify only a sub-unit of its operation to ISO 14001. An example of an organization that illustrates this is the Regional Municipality of Waterloo in Ontario, Canada which obtained ISO 14001 certification for its Waste Management Centre, within the Waste Management Division of the Transportation and Environmental Services Department. Transportation and Environmental Services, which is one of ten separate departments within the Regional Municipality, in turn, is partitioned into five Divisions including, of course, Waste Management.

An organization with several branches in various locations may also choose to obtain ISO 14001 registration for only selected branches. In general, obtaining ISO 14001 EMS accreditation for only a subunit of an organization or selected franchises is more relevant for medium- to large-size organizations.

Several organizations involved in the production of a similar product or service, or which have a common environmental policy goal can also obtain group or joint ISO 14001 standard registration for all member organizations. A variant of this approach is illustrated by the Living Wine Group (discussed later), and involves joint registration by all member agencies. Under this approach, all member organizations go through all the certification requirements and processes, including internal and external auditing.

Another variant of this group management approach is illustrated by the North Otago Sustainable Land Management Group (discussed below), where an intermediate structure is established to facilitate internal auditing and other activities (Figure 2). With this approach, cost savings are generated through random third party auditing of selected, as opposed to all, member EMSs. However, internal auditing of all individual EMSs ensures compliance and readiness of all participating firms for external audits. Administration of the scheme is provided by the central or coordinating entity, including internal auditing to ensure that all participants comply with the group's codes of practice.

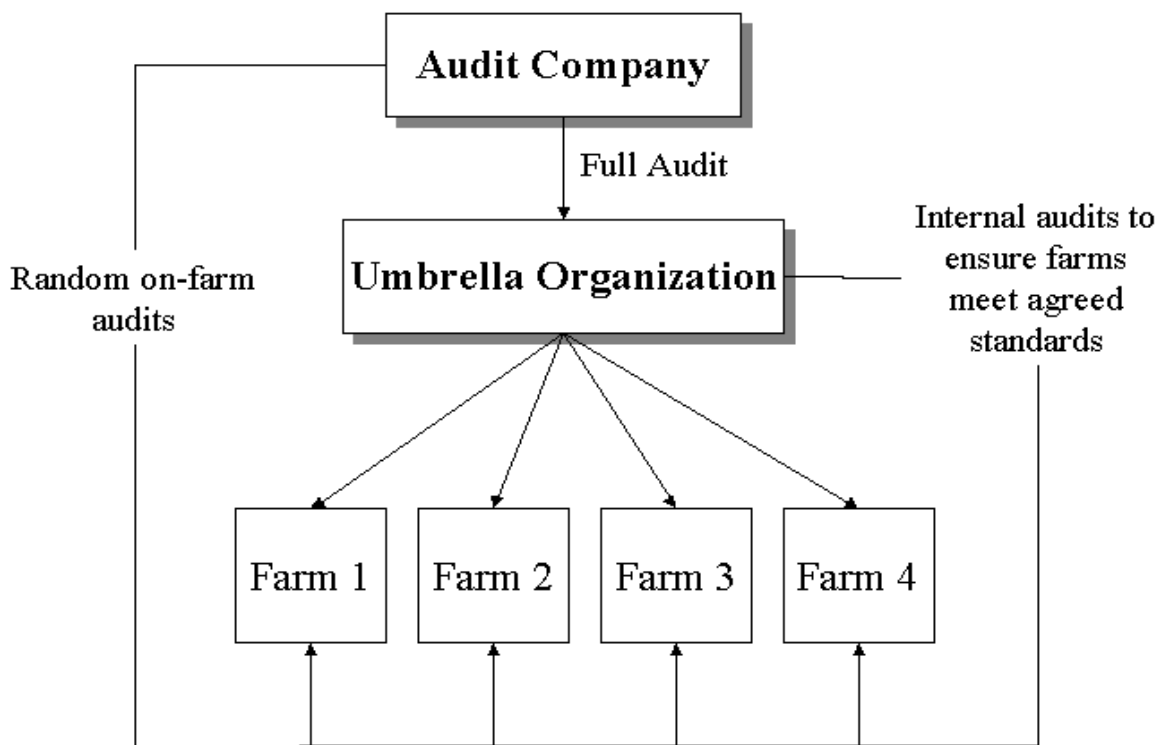


Figure 2: A Group Management ISO 14001 EMS Scheme

Source: Adapted from North Otago Sustainable Land Management Group (1999)

Joint EMS or group certification to ISO 14001 can lead to significant cost savings, compared to individual certification. In a Swedish study of a diversified range of SMEs (including firms involved in transportation, manufacturing, waste management, and construction), Ammenberg, Börhesson, and Hjelm (2000) reported that group certification resulted in a 50% reduction in certification cost compared to individual certification. Cost savings may be generated from having a single internal auditor, rather than one for each participating firm. Other savings may arise from unique advantages associated with SMEs compared to larger organizations. For example, lines of communication are generally shorter, while organizational structures are generally less complex in smaller than in larger organizations. Such characteristics can enhance effective environmental management (Stapleton, Glover and Davis, 2001).

There are several other advantages to using a group management approach with an intermediate or central coordinating entity. First, average fixed costs are lowered as total costs are distributed among a larger number of participating firms. Second, management and control of the scheme rests primarily with the intermediate or umbrella entity, thereby reducing workloads while increasing efficiency for individual member organizations. Third, skills and expertise from individual enterprises can be pooled and shared within the group, as well as the potential to train internal auditors who may then offer reduced-fee services. Fourth, there is a potential for more effective and cost-efficient marketing and promotion for a larger cooperative of enterprises than for smaller individual operations which may not have the contacts, resources, or reach to influence the successful marketing and promotion of the environmental management practices (Riddiford, 1999; North Otago Sustainable Land Management Group (NOSLaM), 2000).

Case Study Design and Method

Case research is the “preferred method of social science research when ‘how’ and ‘why’ questions are being posed, when the investigator has little control over events and when the focus is on a contemporary phenomenon within some real-life context” (Yin, 1994, pp.6) such as the one that interests us. In addition, research methods for conducting rigorous analysis of studies that involve processes have been proposed by Langley (1999). These methods were adapted for this study.

The case study approach allows for determining the reasons why particular decisions about ISO 14001 certification were made, how the EMS implementation and certification process was undertaken, and outcomes from certification. Three cases were studied to allow for in-depth analysis, while also facilitating the identification of subtle similarities and differences within group cases, as well as inter-group similarities and differences. This approach can improve understanding of key issues while generating prescriptions for prospective SMEs.

The unit of analysis emphasized the entity that registered to ISO 14001. However, the constituent organizations in the entity were also investigated to provide background information on how the management and organization of the ISO 14001 standard certification process was accomplished. Thus, questions asked had to be pertinent to the unit of analysis, thereby improving relevance of the evidence collected.

Multiple sources of case evidence were collected and analysed, consistent with the case research method. For the three cases studied, information was obtained from several sources including various formal documents and newsletter publications, electronic-mail and telephone correspondence with key personnel, and websites of member organizations and ISO 14001-registered entities¹.

The protocol for selecting organizations for the case research was based on a purposeful targeting of businesses in the agri-food sector. Specifically the objective was to: i) study firms in the agri-food industry that have demonstrated EMS compliance through third-party certification to the ISO 14001 standard; and ii) screen organizations within this set based on size, among other criteria. The organizations needed to fit a definition of SME, either in terms of number of employees, or based on gross annual income of the organization². Second, each SME organization included in this case research should have obtained ISO 14001 certification, and more specifically used a process that, among other considerations, helped to considerably reduce the overall cost involved in developing and implementing an EMS and obtaining ISO 14001 certification, which would otherwise be a prohibitive expense for a single organization.

Agribusinesses have been slower in adopting ISO 14001 than other sectors - it is only in the past few years that farm and other agricultural organizations have begun registering to ISO 14001 (Wall and Weersink, 2001). The group initiatives studied illustrate ISO 14001 standard certification in the agri-food industry. Thus, businesses in the agricultural sector (which constitute over 60% of economic activity in developing countries and a significant employer in developed countries) can benefit from the experiences of the cases studied. However, the key issues highlighted can be applied to SMEs in other sectors, both in industrialized and less

¹ Official websites of the organizations studied include:

Living Wine Group: <http://www.livingwine.org.nz/index.html>

Norfolk Fruit Growers Association: <http://www.norfolkfruitgrowers.com>

North Otago Sustainable Land Management Group: <http://www.noslam.co.nz/agvantage>

² In the scholarly literature, there is no consensus on a definition of a SME. For example, US statistics refer to companies with fewer than 200 employees as SMEs. By comparison, in Canada, companies with fewer than 100 employees are defined as SMEs (Johannson, 1997). On the other hand, the Commission of the European Communities (CEC) (1996) defined SMEs as independent companies employing fewer than 250 employees, with a turnover of less than €40 million or an annual balance sheet total not exceeding €27 million (cited in Ammenberg *et al.*, 2000).

favoured economies. The focus of the case study is on group-management approaches because the majority of SMEs may not have the financial and other resources and/or the desire to pursue registration independently.

Profile of Case Studies

The Living Wine Group

The global wine industry is initiating efforts to understand voluntary corporate environmental management, not only because there are environmental issues linked with both viticulture and winemaking (Knowles and Hill, 2001), but also because wineries are facing increasing market-related environmental pressure (Sterns and Peterson, 2001). The Living Wine Group (LWG) is a consortium of seven wineries (including Ata Rangi Vineyard, CJ Pask Winery Ltd, Martinborough Vineyard Ltd, Mission Estate Ltd, Palliser Estate Wines, Sileni Estates, and Vidal of Hakes Bay) in New Zealand that obtained ISO 14001 registration by using an indirect approach for the whole group. The LWG is the first winery in the world to obtain ISO 14001 certification, and the first to do so as a group (Riddiford, 1999).

The seven wineries have several common characteristics. For example, C.J. Pask Winery was founded in 1985, initially as a father and daughter venture, but completed a major expansion in 1991. Annual production currently stands at about 48,000 cases of largely four premium wine varieties, managed from over 100 ha of vineyard. To ensure a product of the highest quality, all wine is produced and processed on site, including bottling and labelling. C.J. Pask Winery has distributors in several countries in Europe (e.g., Germany, France, Sweden, Switzerland and England), Asia (e.g., Hong Kong, and Thailand), North America (e.g., Canada), and of course in New Zealand and Australia.

New Zealand as a whole prides itself as a leader in environmental management because its international reputation relies, in part, on its pristine environment over a small land area. Consequently there is a general keen interest in environmental stewardship in the country, and especially environmental management systems/standards, by various private industry groups. Although many industry organizations may seek to achieve government regulatory compliance only, a management system standard that has global recognition is important for internationally traded products such as wines (Orth and Krška, 2002). In addition, the wine industry as a whole is characterized by highly differentiated products, targeting particular consumer tastes and preferences (Knowles and Hill, 2001). Thus, demonstrating credible environmental management systems is important in the wine industry, where competitiveness within industry niches is growing in importance.

Given that about 55% of the wine produced is exported to environmentally-

conscious consumers (in markets such as western Europe), the Living Wine Group made a conscious effort to protect and/or improve the surrounding environment of their operations, thereby helping to continuously produce wines that are both excellent and unique. In the process, the LWG continuously aims at meeting the increasing demand for environmental accountability, while maintaining their niche market share (Goldsworthy, 2000).

The LWG, as a consortium, also exploited the first mover advantage associated with environmental innovation. In the process, the group emerged as the first winery in the world to register to ISO 14001, and subsequently exploited this in advertising and promoting their products to consumers. The behaviour of the LWG is therefore consistent with the opportunity-seeking firm in the environmental entrepreneurship literature (see, for example, Hart, 1995; Vastag *et al.*, 1996) that focuses on the benefits of certification to realize competitive advantages and first mover advantages (Rondinelli, et al, 1997), and other strategic tools aimed at differentiating the consortium from other competitors (Goldsworthy, 2000).

Motivation and Management Experience

The ISO 14001 registration process for the Living Wine Group initially involved using a HACCP-based approach to assess the sites and activities of members, followed by a review of relevant local and national legislations (Riddiford, 1999). A set of key issues and activities were identified following the site analyses, and environmental objectives and targets were set and timelines established. Finally, operational controls and improvement programs, and monitoring and corrective action were implemented. A graduated approach was used to address environmental issues identified, and a network approach was used to meet ISO 14001 requirements jointly. The entire process required 18 months to complete (Goldsworthy, 2000). One of the member wineries had ISO 9002:1994 certification, which the group used as the springboard to develop the basic components of the EMS.

The registration process was voluntary and motivated primarily by internal, as opposed to external, considerations. Internal factors that motivated the registration decision included management culture with a willingness to adopt strategic corporate environmental policies, and integrate environmental management into all aspects of the activities and products of the LWG.

Cost was a key factor that motivated the joint approach to ISO 14001 accreditation. According to Riddiford (1999), there was significant cost savings in several aspects, such as consultancy fees, auditing costs, and certification costs. Apart from the cost savings, joint registration also allowed for the sharing of information from the various vineyard and winery management practices, thereby allowing for efficient and speedy accreditation. The competitive nature of the individual wine business

ventures, (see, for example, Knowles and Hill, 2001; and Orth and Krška, 2002), initially led to hesitation in information sharing, but peer support and motivation prodded the process to succeed (Marett, 2000).

Members of the consortium cited other benefits associated with taking such a group approach to achieving ISO 14001 registration. Internal staff time and the opportunity cost of time spent during the EMS development and registration process were minimized considerably. One member winery estimated its costs of implementation and initial audit at about CDN\$32,000 (Goldsworthy, 2000). Costs of external expertise were minimized by providing consulting and training jointly, sometimes in a group workshop format. In addition, having members of the consortium present “best practices” seminars, provided additional savings. Furthermore, during a three-year period, periodic auditing and registration costs (as part of the continuous improvement cycle of ISO 14001) for a 250-500 tonne winery was reduced from approximately CDN\$29,000 to between CDN\$6,500 and CND\$9,700 (Riddiford, 1999).

Many enterprises find internal staff time to be a costly component of ISO 14001 certification. The Living Wine Group reported that its last winery required about 20-person days to move from initial EMS development to registration, a considerable savings over what has been reported for other organizations (see, for example, Knowles and Hill, 2001). The savings were achieved partly through effective use of time, by having pre-set documentation and spreadsheet templates for recording, monitoring and testing. This saved considerable time in setting up and implementing the EMS, and allowed more time for achieving high environmental standards and outcomes.

A second category of benefits reported, and which is key to the overall cost efficiencies in the group approach, was the shared information and knowledge that resulted from collaborating among similar enterprises. The group approach allowed for participating companies to develop a knowledge and information base and experience, and a library of practical solutions to complex environmental issues (Riddiford, 1999). The resulting peer support and encouragement that prodded the entire group process was described as a huge bonus. Members of the LWG reported that the rapid accumulation of experience and knowledge would likely not have been possible if they sought ISO 14001 registration individually.

Summary

Complexity of the environmental issues facing the individual wineries, and the fact that members of the Living Wine Group were the first winery in the world to seek ISO 14001 certification were reported as challenges. However, these challenges were managed by pooling knowledge and resources, from which evolved a large data and information base, covering a broad array of issues and solutions. The HAACP-

based indirect approach provided flexibility, but also allowed the wineries to integrate various practices and programs simultaneously, as well as help address other relevant issues such as food safety and health, and food quality. Furthermore, limited consumer knowledge about environmental management was addressed to some extent through the group approach, as it allowed for greater market awareness of the environmental management practices. This approach to marketing and promotion has potential application to other SMEs both in agri-food and non-agricultural businesses, because it is generally more difficult for firms with smaller market shares to create or maintain new and/or existing international markets. The joint approach also made it possible for the consortium to develop a cooperative marketing strategy, with market synergies in, for example, the packaging of products to customers.

The Living Wine Group benefited from formalized procedures, changed attitudes, and improved general outlook and the ability to think about a 'broader picture'. Overall, the LWG is optimistic that the long-term benefits of ISO 14001 registration will outweigh the costs because the group has long-term environmental stewardship goals.

Norfolk Fruit Growers' Association

The Norfolk Fruit Growers' Association (NFGA) is a farmer co-operative, located in Simcoe, Ontario, Canada. NFGA is an apple marketing organization, with storage and packing facilities for its member-growers. NFGA was chartered in 1906, and has undergone various changes over the years. For example, membership has changed, from 525 in 1911, to 43 in 1980, and currently consists of 32 active member-growers. NFGA is a limited liability company in which policy decisions are made by the general membership, while the co-operative's daily operational activities are overseen by five member-elected directors.

NFGA has, since its establishment in 1906, focused on organizing small-scale farmers into a successful organization, and strives to generate benefits from marketing its products in North America (i.e., Canada, and the US), South and Central America (including the Caribbean region), the U.K., Indonesia, and Sri Lanka. These benefits (including those from ISO 14001 certification) would otherwise be difficult to achieve for any one member alone. The primary functions of the NFGA are to continuously improve: i) the quality and quantity of the fruits marketed, and ii) uniformity in the system of packaging, storing and marketing its products. The main fruits shipped from the co-operative are apples (especially varieties such as Empire, McIntosh, Red Delicious, Idared, and Golden Delicious) and, to a lesser extent, pears. Members of the association jointly produce about 20% of Ontario's apples, grown on 3300 acres, and has the potential to produce an estimated 2.25 billion bushels a year (Dean, 1999).

Motivation and Management Experience

NFGA agreed to obtain ISO 14001 certification as part of a pilot project for the Ontario Federation of Agriculture (OFA), in which the federation wanted to assess the gaps and upgrades needed to transform the Ontario Environmental Farm Plan program to meet ISO 14001 requirements (see also, Figure 1). The primary objective and clientele groups of the pilot project were to assess the needs for producers, and agricultural produce packing facilities. NFGA agreed to undergo the packhouse experiment. A further motivation to seek ISO 14001 certification arose from pressure from UK clients to demonstrate credible quality and environmental management standards (O'Neil, 1999). Consumer demand for crisp and juicy apples led to changes in the growing, handling, packing and marketing of the organization's apples, sold under the 'Norfolk Brand' and 'Golden Garden Brand' labels. Thus, packaging is used as a strategic tool for product differentiation and developing the Norfolk brand, consistent with Vazquez *et al.* (2003), who further argued that packaging also serves to communicate product benefits to consumers. In addition, the ability to better market their products and gain potential market advantages helped to push the ISO 14001 certification process into completion.

ISO 14001 certification by the NFGA is consistent with the earlier discussion on scale of the certification process, and illustrates a case where only a component of the entire fruit production and marketing process is registered. Members grow the apples on their farms, while the NFGA staff manage the facility. No employees of the NFGA are members of the cooperative. To ensure product quality and consistency in the production process before each individual member-grower's fruits are received in the NFGA facility, members are provided with technical services including crop protection services and products, field containers, and other orchard supplies. The co-operative also engages quality control staff, who visit member orchards to monitor crop development and conduct studies aimed at continuous product improvement.

It took about 16 months to complete the ISO 14001 EMS implementation and registration requirements. Writing the cooperative's EMS implementation procedure manual took considerable time, and was completed in November 1999. ISO 14001 certification was obtained in 2001. To help demonstrate product safety and quality, the co-operative also employs HACCP principles in the packing and storage processes. HACCP certification, which is a food safety and quality assurance scheme, was obtained in 2001, concurrently with ISO 14001, and generated synergies and benefits for both schemes. Simultaneous certification of ISO 14001 and HACCP illustrates a variant of the indirect routes to ISO 14001 certification, highlighted earlier. Consistent with the earlier discussion on the possibility of carry-over fixed costs associated with registering multiple schemes, staff of the NFGA reported "substantial" benefits from the simultaneous certification to ISO 14001 and HACCP, and transaction cost reductions. Another

demonstration of NFGA's innovativeness is highlighted through an Integrated Pest Management Program (IPM) that was implemented on member-farms in the late 1970s. The IPM program helps to ensure fruit tree protection, while considering and integrating horticultural, environmental and economic aspects of their activities.

New innovations in the NFGA facility include a state-of-the-art packing line, with optical (i.e., video camera) graders which help to sort fruit by size and colour, along with computerized and automated bagging units (Dean 1999). The association also actively collaborates with public research institutions and universities, thereby helping to stay abreast with new production and management techniques. Besides satisfying the environmental concerns of clients, implementation of ISO 14001 EMS enabled the member-growers to become more aware of the environmental impacts on their activities and services.

Summary

Members of NFGA are involved in the production and marketing of a common product – fresh apples – and have common environmental policy goals of demonstrating a reputation as 'good stewards of the land'. Consistent with the earlier discussion on scale of the certification process, these common goals and production characteristics provide a basis for joint certification by the cooperative. ISO 14001 certification by the NFGA illustrates several agribusiness and ISO 14001 EMS-related characteristics, not reflected in the other two case studies. First, NFGA is a chartered co-operative, registered as a limited liability company. Furthermore, the NFGA illustrates a case where ISO 14001 certification is achieved by registering only the packing and marketing component of the production and marketing of an agricultural product, thereby illustrating the issues discussed earlier regarding scale of the ISO 14001 registration process. In addition, ISO 14001 registration was obtained simultaneously with the HACCP scheme, and helped to generate synergies for the two schemes.

North Otago Sustainable Land Management Group

The North Otago Sustainable Land Management Group (NOSLaM) has been in operation since 1994, and is an outgrowth of an initiative to develop soil management guidelines for the North Otago region of New Zealand (North Otago Sustainable Land Management Group, 2000). North Otago is situated on the east coast of the South Island of New Zealand, and is one of the oldest farming regions in the country. A key motivation for the NOSLaM initiative stemmed from several years of drought and overgrazing which, in turn, resulted in soil erosion and soil degradation problems. In 1996, NOSLaM expanded its focus to include broad environmental issues. A primary goal of NOSLaM was to have the North Otago region recognized in the marketplace, both nationally and internationally, as a sustainable farming community with a strong commitment to meeting changing

market demands and environmental stewardship in food and fibre production. The group promotes adoption of environmentally friendly farming methods through information exchange via newsletters, field days, seminars and on-farm demonstrations.

Motivation and Management Experience

A centrepiece of the NOSLaM efforts was probably the development of the "ENVIRO-AG" Farm Environmental Certification Scheme, which is modelled on, and is an intermediate scheme to obtaining, ISO 14001 EMS. ENVIRO-AG can help farmers objectively assess the environmental impact of their farm activities, develop suitable management practices and monitoring methods, and can help ensure conformance to ISO 14001 codes. Each farmer controls this process by using a proforma work manual and customizing it to suit individual needs and operating conditions, thereby saving time and other (including financial) resources (Carruthers, 1999).

The group felt that ISO 14001 registration could enable participants to demonstrate credible claims of environmental management because, unlike other environmental farm planning initiatives, ISO 14001 certification requires third-party audits in order to meet the stringent ISO codes. ENVIRO-AG certification takes the farm planning initiatives to another level, with auditing of both farm plan documents and on-farm practices to ensure that farmers comply with their environmental management claims. Farmers also conduct self-audits every year to ensure that key objectives are met. In addition, farms are audited by NOSLaM every three years, and are subject to random audits by a certification organization, Societe Generale de Surveillance New Zealand Ltd.

The whole process involves three stages, details of which are outlined elsewhere (North Otago Sustainable Land Management Group, 2000), and are not repeated here. Throughout these stages, farmers are actively involved and provide input on key information pertaining to their operations and, with the aid of computer software and staff, determine important activities, objectives, best management practices, monitoring methods and corrective actions. The farm plans also incorporate elements of the Hazard Analysis and Critical Control Point (HACCP) system.

If farmers do not wish to pursue full ISO 14001 certification, they are not required to do so, but can still have effective environmental farm risk management plans. However, if farmers wish to further demonstrate their environmental stewardship claims, then ISO 14001 standard registration provides a means to document environmental management activities, and provide operational control and assurance to clients. More than 80 properties across the North Otago region have ENVIRO-AG plans, with some in various stages of ISO 14001 certification under a

group scheme. Six of those who had ENVIRO-AG certification also completed ISO 14001 certification by 1999. The certification is conducted as a partnership between the NOSLaM group and Societe Generale de Surveillance New Zealand Ltd. Obtaining ISO 14001 certification through the ENVIRO-AG environmental program illustrates an indirect route to certification, discussed earlier (see, also Figure 1). However, unlike other similar farm programs (e.g., current Environmental Farm Plan programs in Canada and the US), because the ENVIRO-AG process is an auditable system, it is also used to verify farmers' claims about their environmental management.

As part of its education and communication efforts, NOSLaM develops information leaflets on topics of importance to farmers, and helps focus on issues affecting environmental sustainability. These brochures also provide summaries of the latest research and practical recommendations on farming. NOSLaM uses the information sheets at field days and interest-group meetings.

Summary

Success of the ENVIRO-AG program and group certification to ISO 14001 have been attributed to several factors (North Otago Sustainable Land Management Group, 2000), including:

- The group had a clear vision of where it wanted to be in the future, aiming to become a market leader in sustainable land management. This evolved a sense of purpose and a need to develop sustainable, practical and effective solutions to real farm issues.
- The group developed a 'paddock to plate' philosophy that required developing links with processors, producer boards and other industry groups, and community. A group co-ordinator played an important role in organizing and coordinating all the initiatives and activities among members (see Figure 2), while establishing and maintaining vital links and networking with other organisations.
- Innovation was a key feature to success of the NOSLaM program. The group took risks in developing and implementing systems that had previously not been attempted at the farm level.
- Strong partnerships were developed and maintained throughout this continuous process, between various stakeholders (such as communities, Otago Regional Council, and Waitaki District Council). These relationships were extremely mutually beneficial to all parties involved.

Lessons Learned from Case Studies

In all the cases studies investigated, the initial impetus for establishing, implementing, and continuously monitoring and evaluating the EMS was a

voluntary one, based on a felt need and not imposed by external regulators. The NOSLaM program was motivated by a need to conserve soil resources after years of degradation. In contrast, the Living Wine Group sought to exploit the first-mover advantage associated with environmental innovation, and used this strategic tool to differentiate wines produced by the consortium from competing products. On the other hand, NFGA agreed to participate in a pilot project, primarily because the cooperative wanted to meet the needs of clients, especially in the UK.

In general, most organizations have some kind of EMS, although this may be very rudimentary and informal, and not well documented and/or communicated. A formal system can be developed, regardless of the initial framework used to create the EMS, and can result in cost savings. In addition, the organizations studied used as much existing management practices and resources as possible, including existing quality and management schemes, to meet the ISO 14001 EMS requirements. Thus, the organizations did not completely 're-invent the wheel' or redesign the process during the EMS development and implementation. Where appropriate, the organizations made use of the experience and expertise of internal personnel to achieve their objectives.

The Living Wine Group produces products where emphasis on the production process and practices can enable retailers and consumers distinguish the product from competing goods. The LWG is also involved in markets (such as the EU) that demand verifiable environmental quality management, or where image on environmental quality management is critical to business success. Thus, SMEs which produce commodities that cannot be differentiated from similar products may not be in a position to obtain such market benefits through ISO 14001 registration, because other competing firms will free ride and capture some of the accrued benefits.

Implications for Managers of SMEs

Environmental stewardship is a concern for a diverse range of business organizations, in both industrialised and developing economic systems. It is important to note that the certification costs considered in this study focus on the costs associated with adopting and implementing the ISO 14001 EMS, but tend not to link such costs with specific outcomes, such as reduction in environmental quality levels. This is partly because ISO 14001 is a conformance and guidance standard, as opposed to a performance standard. For businesses involved in international markets, the NFGA and LWG case studies suggest that consideration be given to exploiting the competitive advantages and other benefits associated with implementing an international standard such as ISO 14001.

Apart from the one time costs for developing and implementing the ISO 14001 EMS standard, additional expenses are needed for marketing and promoting awareness

of the standard, and for periodic re-certification. SMEs may be reluctant to adopt ISO 14001 due, in large part, to the high economic (including opportunity) costs associated with EMS development and implementation. The ingenious approaches used in the case studies investigated demonstrate that there are ways to effectively mitigate the high costs and other resource problems of SMEs, if there is the will and commitment to do so. For example, sectoral adoption and implementation ISO 14001 can assist SMEs in adopting the EMS. However, SMEs will require the will and commitment to undertake such initiatives.

Apart from cost considerations, other issues for SMEs (especially in less favoured economies) may constrain ISO 14001 certification. These include availability and accessibility to environmental auditors, and other technical considerations such as lack of standards-setting national agencies and their representation on ISO. In addition, human resource needs is one of the key challenges to EMS implementation for SMEs. Furthermore, SMEs tend to be more threatened by (larger) competitors because SMEs tend to be in niche markets that are typically more competitive because niches tend to change frequently.

On the other hand, from a management and an organizational point of view, several unique characteristics of smaller enterprises may make them better suited for implementing environmental management initiatives than larger firms. Smaller firms are generally able to manage change better than larger firms. Employee relationships also tend to be closer and less rigid because SMEs have fewer employees and a less hierarchical organizational structure than large organizations. Larger organizations will have to break down and implement environmental management initiatives at divisional and department levels, making it less easy to have the whole organization committed to and certify to the standard.

Summary and Conclusions

The primary objective of the ISO 14001 EMS standard is to enhance and continuously improve compliance with environmental laws and regulations, and the environmental stewardship policies of organizations. However, environmental stewardship programs are not costless initiatives. The case studies investigated linked these elements with production by integrating environmental and business objectives, with environmental stewardship as a core part of the corporate decision making process. Individually, the SMEs studied do not wield great power in the traditional business sense. However, the organizations studied saw competition of the present/future as shifting from competition for market share towards competition for opportunity share, and therefore exploited the first-mover advantage in environmental innovation. The joint or group approaches adopted resulted in “beyond compliance” activities that considerably reduced certification costs and enhanced resource use and overall business performance. In addition,

existing environmental management systems or quasi-EMSs that can be adapted and used can help reduce ISO 14001 EMS standard registration costs.

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