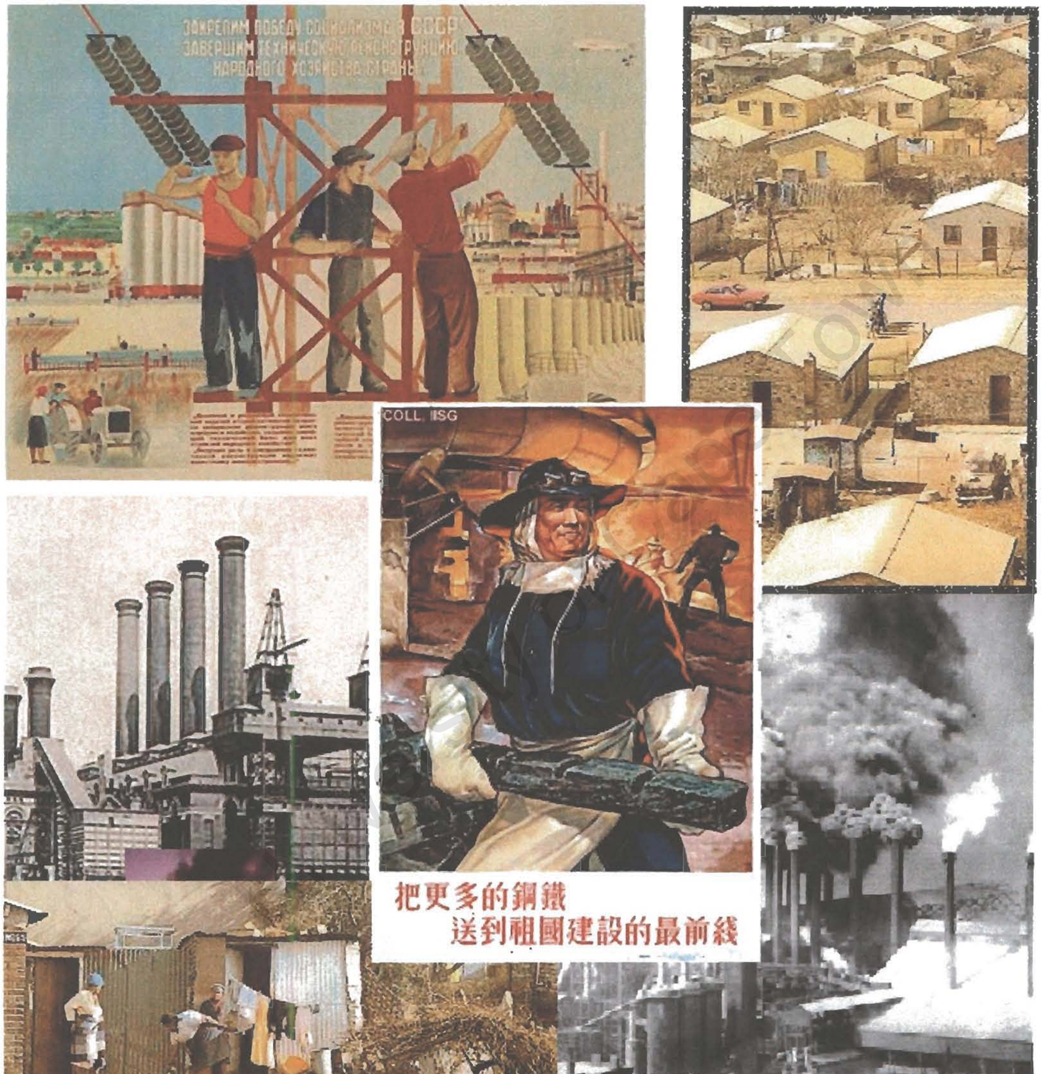
The Promise and Pitfalls of ISO 14001:

A South African Perspective



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Author's note:

One limitation faced in writing this revision is the journal article style in which it is written. I plan to submit an amended version to two American environmental journals. As a result, some of the data which would normally be included in the text of a thesis is relegated to appendices here, without which the paper must assume some background knowledge of ISO 14001 by the reader. Further, although I personally prefer South African spelling and used it for the questionnaire, because I am an American student submitting to American journals, I have chosen to use American spelling for this article.

Miles Keogh
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Glossary of Terms

APEC	The Forum for Asia / Pacific Economic Cooperation
BACT	Best available control technology
CIA	The United States Central Intelligence Agency
ELDC	Economically less-developed country
EMDC	Economically more-developed country
EMS	Environmental management system
EU	The European Union
GDP	Gross Domestic Product
GNP	Gross National Product
ISO 14000	Series of voluntary standards to help guide companies towards improved environmental management
ISO 14001	One standard in the ISO series, dealing with guidelines and specifications for use with Environmental Management Systems
ISO	The International Organization for Standardization
LAER	Lowest achievable emissions rate
NAFTA	The North American Free Trade Area
NGO	Nongovernmental Organization
NIPI	National ISO 14001 Performance Indicator
OECD	The Organization for Economic Cooperation and Development
SABS	The South African Bureau of Standards
SME	Small- or Medium-sized Enterprise
TBT	The Technical Barriers to Trade agreement of the World Trade Organization
TC 207	The ISO technical committee charged with development of ISO series of standards
TNC	Transnational corporation
UNIDO	The United Nations Industrial Development Organization
UNDP	The United Nations Development Programme
WTO	The World Trade Organization
WWF	The Worldwide Fund for Nature

Abstract
ISO 14001's increasing importance in trade considerations and growing status within regulatory policies means that eventually, few organizations of any size and in any country will be able to ignore it. But does the standard discriminate against the Developing World? Is it accurate to measure the success a country has had in implementing ISO 14001 without taking its size and wealth into account? Are critics of the standard missing the point? This paper examines these questions from the South African perspective and proposes a new method to measure the extent of ISO 14001 acceptance between countries of differing population and economic output.

INTRODUCTION

The growth of ISO 14001 since its introduction in 1996 has contributed to its burgeoning importance in trade considerations, its increased standing in national policies, and its emergent position with regard to multilateral trade and environmental agreements. To date, however, there has been very little research into how much effort is being made to achieve widespread adoption of ISO 14001 on a country-by-country basis. These comparisons are especially difficult to make because of the nature of ISO 14001, since it creates regulatory and market-based incentives and pressures on organizations. This necessitates both state and non-state involvement in motivating widespread adoption.

The reasons for implementing an ISO 14001-certified Environmental Management Systems (EMS) arise from business conditions, public pressure, and government regulation. Coupled with the number and variety of actors involved in each country, this wide range of motivations contributes to the difficulty of measuring a country's success at achieving widespread acceptance of ISO 14001. This paper examines the hybrid public / private nature of the new standards, as well as the arguments about the importance of ISO 14001 as a prerequisite for international trade competitiveness and, increasingly, as the basis for national policy. In addition, it investigates the advantages and disadvantages of the standard for both Economically More Developed Countries (EMDCs) and Economically Less Developed Countries (ELDCs). Using South Africa as a case study, this paper examines the characteristics of ELDCs which may cause them to face difficulties when implementing the standards. It also examines perceived weaknesses of the standard for industry and other organizations in ELDCs.

Against this background, the paper describes some methods for making country-by-country comparisons of the extent to which a country is investing in ISO 14001. Existing research has focused on comparing the raw number of certified sites. This method overlooks the notion that it is easier for a large or wealthy country to certify a large number of sites as being ISO 14001 compliant than it is for a smaller or less-wealthy country. Instead, this paper proposes a model that contrasts the number of ISO certified sites per Gross Domestic Product per capita between countries. Using this National ISO 14001 Performance Indicator, it is hoped that a comparison can be made of how ISO 14001 is thriving in both developed and developing countries, even across uneven levels of economic output.

South Africa's position in this ranking is examined in detail, with attention to the criticisms of the standard. In particular, it focuses on the arguments that ELDCs were not involved in the development of the standards, that the costs are too high for ELDCs, that transnational companies (TNCs) will leverage ISO 14001 for competitive advantage over domestic counterparts, and that certification in and of itself will not improve performance. Also of importance for ELDCs is the extent of implementation among small and medium sized enterprises (SMEs), which includes all those organizations with under 500 employees (Hesketh 1996). This paper briefly examines how each of these issues affects South Africa, using the results of a survey performed by the author and a colleague, and makes recommendations for further research in this area.

EXAMINING THE MANAGEMENT SYSTEMS STANDARD

Background of ISO 14001

Until recently, the focus of environmental management has been a "command and control" regulatory approach. In the last decade, environmental regulations have begun to move away from this type of penalty-driven regulation and towards incentive-driven voluntary self-regulation (Soutter & Mohr, 1993, Bell, 1997). This process has been accelerated by the introduction of international environmental guidelines and standards. Guidelines for managing an organization's environmental performance come in a variety of forms, ranging from declarations and mission statements to well-developed standards for management systems (A D Little, 1998). Several voluntary standards have appeared in recent years. A brief listing of some of the more prominent guidelines is shown in Table 1.

Table 1: Comparison of voluntary environmental guidelines

Standard	Introduced	Description	Type
ICC Business Charter for Sustainable Development	April 1991	*16 principles to guide the environmental activities of business, published by the International Chamber of Commerce*	*Private sector development and implementation*
Responsible Care	1988	*10 principles developed by the US chemical industry to improve Environment, Health, and Safety systems.*	*Private sector development and implementation*
CERES Principles	1989	*10 principles of environmentally responsible economic behavior developed by a coalition of 15 US environmental groups and others.*	*Private sector development and implementation*
BS7750	1990	*British Standards Institutions' standard for Environmental Management Systems. Similar in structure to ISO 14001.*	*Public sector development, private sector implementation*
EMAS	March 1992	*EC Regulation that applies to all industries in the member states, allows for voluntary participation by companies.*	*Public sector development, private sector implementation*
ISO 14000 series.	1996	*International Organization for Standardization's guidelines for environmental management. Includes ISO 14001 (Environmental Management Systems), and standards for Eco-Labeling, Life Cycle Assessment, and Environmental Auditing.*	*Public & private sector development, public sector & private sector implementation*

Compiled with assistance from KPMG Environmental Services, also A D Little 1998, Soutter & Mohr, 1993.

The most popular among the new voluntary standards in South Africa is the ISO 14001 Environmental Management Systems (EMS) standard developed by the International Organization for Standardization and introduced in South Africa in 1997 as SABS – ISO 14001 (A D Little, 1998). A listing of the ISO 14000 series of standards and a graphic explaining the required structures and components of an ISO 14001-based EMS is included in Appendix A. The ISO 14001 EMS standard is a set of guidelines for the voluntary formation and maintenance of an EMS that is applicable across industrial and organizational sectors.

The primary assumption of ISO 14001 is that improved environmental performance is best achieved by building environmental concerns into everyday operations. This assumption draws from the experience that managing other organizational functions at the operations level, such as inventory, finance, production, and quality, has typically improved their performance. There is no theoretical difference to suspect that meeting environmental obligations is radically different than meeting other obligations. Therefore, improvement can be expected in this area if well accepted and long-practiced management concepts are applied (Bell, 1997). Because the standards are systems-based rather than performance-based, however, immediate improvement of environmental performance is not always guaranteed to improve in every case with certification (Clapp, 1998; Tibor & Feldman, 1997). Certification does, in fact, demonstrate that systems for managing an organization's adverse environmental impacts are in place, thus increasing the likelihood that environmental performance will improve (A D Little, 1998).

It is beyond the scope of this paper to discuss the development and structure of ISO 14001 in detail. Other publications are available which provide comprehensive explanation of this standard, notably Sheldon, Whitelaw, and Kuhre, in addition to the internet websites of the International Organization for Standardization and the R.F. Weston Company, referenced at the end of this paper.

A new approach to environmental management and regulation

Although the standard's creators did not invent the concept of ~~and~~ EMS, ISO 14001 represents a new approach to managing environmental impacts. Regulatory authorities and environmental managers around the world are looking for more effective and inexpensive tools for controlling the environmental impacts of organizations operating inside and across their borders (Cascio & Shielder, 1998). Some state regulators are turning to ISO 14001 as a systems-based, market-driven alternative to augment the performance-based, penalty-driven compliance structures now in place (Tibor & Feldman, 1996). Recent literature has hailed this new emphasis on voluntary standards and self-enforcement as the beginning of a post-regulatory era of environmental management. Some enthusiastic proponents of the standard assert "that if ISO is used by a company, the day may come when there will be no need for the government to inspect its manufacturing facilities, or that ISO heralds the end of command and control" (Shoener, 1997). Other observers note that the best role ISO 14001 can play is in supporting, rather than replacing, existing regulations (Stephens, 1997; Bell, 1997).

In addition to changing the way states enforce environmental obligations, ISO 14001 also represents a shift away from state authorities' dominance in the creation and maintenance of regulatory regimes. Until recently, the formation process and authority of most regulatory regimes originated at the state level. ISO 14001 represents a regime initiated and enforced by non-state actors and later endorsed by states as being consistent with their goals. A common explanation for the declining role of state influence and the growing prevalence of non-state actors in regime formation is that globalization, technological change, and the emerging power of market forces have eroded the state's control and authority over certain functions. According to this argument, environmental protection is one of the areas which private non-state actors have entered into in order to fill the void (Stranger, 1996).

Another interpretation is that as the responsibilities assigned to state regulatory agencies have grown, these agencies have been unable to fulfill the increased expectations, and voluntarily delegated authority to private actors. Although states have historically borne the duties of environmental protection, new requirements demanding a high level of detail outstrip the state's capacity to respond effectively. ISO 14001 is a response from the private sector, which seeks to augment the state's role in regulating environmental performance. As such, ISO 14001 represents a "mixed" regime; a hybrid system in which both states and the private sector are heavily involved in the creation and maintenance of environmental principles, norms, rules, and decision-making procedures. In such regimes, the boundary between public and private authority is blurred (Clapp, 1998). This pioneering hybrid structure has contributed to the importance of ISO 14001 by allowing it to cross-jurisdictional boundaries into areas traditionally under the aegis of either purely market-driven behavior or penalty-based national and multilateral regulation.

The growing importance of ISO 14001 in national policy

Since its inception ISO 14001 has been cautiously viewed by some state regulatory agencies as an opportunity to expand on their abilities to improve environmental performance. As a result, it is becoming an increasingly important influence on national policy. ISO 14001 could strengthen the capabilities of developing countries in enforcing local laws by shifting the financial burdens of enforcement onto the private sector (Ko, 1997; Pargal et al., 1997). The environmental regulatory systems of many of ELDCs are relatively new and ISO 14001 presents an alternative to penalty-driven systems which offers comparable results at a lower cost for agencies charged with enforcement (Thurston, 1998).

In particular, developing nations that have economies dependent on international trade are incorporating ISO 14001 into their national environmental policies. In Mexico and China, for example, ISO 14001 is on the verge of becoming national policy to reduce pressures placed upon the limited resources of state environmental managers (Wilson 1998). China's increased emphasis upon export-led growth during the last decade and Mexico's involvement with the North American Free Trade Area (NAFTA), have highlighted the linkage between environmental performance and competitiveness in export markets (IISD, 1996). Thailand, Trinidad and Tobago, and India are creating national programs to support environmental professionals interested in implementing ISO 14001(Financial Daily Post, 1997; Wilson, 1998). Commonly perceived as being environmentally lax, countries like these have been forced by outside pressures to strengthen environmental standards and regulations in order to compete overseas (Wilson, 1998).

For some nations ISO 14001 is appealing despite a mature regulatory system. State environmental managers in these countries do not have resources to properly monitor and enforce regulations. ISO 14001 allows organizations to monitor and enforce their own environmental performance, shifting the burden of proof of to the companies themselves as a requirement for certification (Sorge, 1997). Standards-setting bodies in many states and multistate organizations are adopting the ISO 14001 standard, either in whole or in part, as national EMS standards. The Asia-Pacific Economic Cooperation forum (APEC), and the European Union (EU), have adopted the standards as organizational norms, requiring conflicting national standards to be withdrawn. For example, as a result of the EU's decision, UK withdrew BS7750 from its own national regulatory books in 1996 (Clapp, 1999).

Although states are incorporating ISO 14001 into national policies, they are not reducing existing regulations. ISO 14001 is seen as a tool to augment, rather than replace, existing national laws and policies (Wilson, 1998). Nonetheless, there are concerns that the standard may not remain voluntary where it is adopted by governments, and will not be effective unless it is voluntary (Tibor & Feldman, 1996).

Impact of ISO 14001 on trade considerations and competitiveness

Perhaps much more vital from the perspective of organizations considering certification is the rising significance of the standard in trade considerations and in questions of competitiveness in international markets. In practice, becoming ISO 14001 certified is rapidly becoming a de facto requirement for some companies wishing to trade with and within the European Union and NAFTA (Johnston, 1995; Nash & Ehrenfeld, 1996, Hatch 1999). There is also an emerging trend for governments to require ISO 14001 compliance as part of their procurement policies (Clapp, 1999).

Supporters of the standard argue that international standards like ISO 14001 reduce the trade barriers created by the wide range of national standards for environmental performance (Hotter, 1997; Sissel, 1996). However, standards-related barriers have been estimated to impede the sale of an additional $20 billion to $40 billion worth of US goods and services in the European Union, despite the fact that international standards now account for about 45 percent of the standards used by US industry, up from about ten percent in 1970 (Mallett, 1999). ISO 14001 is intended to create a "level playing field", a single standard that meets the specifications of many countries (Johnston, 1996).

Businesses and other organizations in EMDCs are increasingly using ISO 14001 to "green" their supply chains. Some organizations in ELDCs whose businesses depend on relationships with these producers have no choice but to certify. As a result, concerns about ISO 14001 being used as a trade barrier are rising as TNCs like IBM and Volvo require suppliers to be ISO 14001 compliant (Zuckerman, 1999). Companies who are not ISO 14001 certified will run the risk of losing customers abroad, causing ELDCs such as South Africa to lose valuable foreign exchange earnings (SAEP, 1999). The International Institute for Sustainable Development notes that "if ISO 14000 does become important to world commerce, and a factor in defining competitive advantage, countries and companies that best understand it and can work within it will be better positioned to increase trade and market access" (IISD 1996).

The World Trade Organization (WTO) is one organization where anti-competitive national standards can be adjudicated between countries. ISO 14001 has gained special prominence in this arena: the WTO views voluntary standards as "technical regulations", and thus outside the restrictions placed on national standards by its Technical Barriers to Trade (TBT) agreement (Mallett, 1999). Under the TBT, "the governments of about 130 signer nations are obliged to give preference to international standards as a basis for their technical regulations. In addition, the TBT agreement encourages national and regional standards developers to defer to international standards in their activities" (Mallett, 1999). Some observers have warned that this could in effect set the ISO standards as the "ceiling" above which higher national standards could be regarded as trade barriers (Clapp, 1999; Mallett, 1999).

A November 1995 survey of eleven top US manufacturers, chosen for their representativeness of the economy at large, found that the main perceived advantage of becoming ISO 14001 certified was "being able to market to customers who require ISO 14001 certification" (Burdick, 1995). While most respondents saw powerful positive implications for the trade, none of them responded that ISO 14001 would have negative implications for their trade competitiveness. This data indicates that at least among this sample of large US industrials, trade considerations are a powerful motivator for companies to become ISO 14001 compliant.

The Challenges of ISO 14001 for ELDCs

Implementing ISO 14001 will not be without difficulty for ELDCs, which have fewer human and capital resources to devote to the task. A 1999 OECD report on Trade, Environment and Development examined the case of widespread implementation of ISO 14001 in ELDCs, arguing that the challenges faced are complex enough that "the successful introduction of EMS may require a step-by-step approach, from a rather simplified model of management to more complex schemes requiring improved environmental performance" (OECD 1999). This report identifies four major obstacles to the introduction of EMS into ELDCs: underdevelopment of institutions, infrastructure, and environmental regulation, and potential friction between local environmental priorities and those of foreign trade partners.

The first of these obstacles arises from the underdevelopment of the existing institutional environment in ELDCs. This environment does not offer testing facilities, metrology, and certification services required for widespread registration. The need to hire external consultants to meet domestic shortages in expertise raises costs compared to those countries where local expertise exists. Furthermore, local training and education institutions in ELDCs are less likely to include environmental aspects in their research programs as a matter of course.

The second obstacle identified by the OECD involves shortcomings in technical and physical infrastructure. This would include industry, managerial procedures in local firms, transportation networks, communications and energy systems, sewerage and water distribution systems, and more advanced industrial and toxic waste disposal services.

The third obstacle to widespread adoption is the lack of coherence of domestic environmental regulation in many ELDCs. The OECD document states that two core principles of EMS are continuous efforts to improve environmental performance and compliance with national regulations. Compliance is generally weak where enforcement is weak and where regulations are not set up to deal with real conditions or the ability of companies to evade or adapt to ineffective regulation. Under these circumstances, "compliance is difficult enough: the opportunities for continuous improvement are even more limited" (ibid).

The fourth obstacle is the possibility of frictions between domestic environmental priorities and those of foreign trade partners. These may arise when the priorities set by the importing firm's environmental criteria differ from the supplier country's priorities (ibid). Examples include the disputes between the US and Asian shrimp fisheries over turtle-proof nets, agricultural tariffs in the EU and Japan, and the dispute between the US and Mexico over dolphin-safe tuna. Disputes such as these tend to arise over trade in environmentally sensitive goods (WTO, 1999).

ADVANTAGES AND DISADVANTAGES OF ISO 14001

In addition to concerns that ELDCs may have weaknesses that impede the widespread adoption of ISO 14001, the standard itself has been criticized for flaws arising from its development and structure. It is argued that these flaws deter ELDCs from effectively adopting the standard on the same pervasive level seen in EMDCs, and as a result discriminate against them. In the next section the advantages and disadvantages of the standards are considered.

The advantages of the standard for ELDCs

Advocates of ISO 14001 argue that it presents organizations in ELDCs an opportunity to become globally competitive (Shah, 1996; Kirkpatrick, 1995). Furthermore, its open and voluntary nature accommodates organizations of all sectors, sizes, and countries (McReary, 1996; Zuckerman, 1996). Other supporters argue that it will reduce the trade barriers posed by the individual environmental regulations of each country by providing a common environmental minimum that will comply with all but the strictest national regulations, producing a "level playing field" (Hotter, 1997; Tibor & Feldman, 1996).

A UNIDO survey of environmental managers in 31 ELDCs identified three advantages for ELDCs implementing ISO 14001: helping demonstrate conformity with domestic environmental legislation, meeting overseas consumer demand, and reducing the costs of implementing mandatory standards (UNIDO, 1996). Clearly, there are some benefits from implementation of ISO 14001 for ELDCs.

Criticisms of the standard

Critics counter that ISO 14001 creates newer, subtler barriers to trade, while being ineffective at reducing the environmental impacts of organizations operating within ELDCs. They contend that ISO 14001 presents several disadvantages to organizations in ELDCs. These include that its creation was dominated by business actors from EMDC industry and lacked transparency, that the private sector in ELDCs will largely be deterred from adopting it because of the high costs of certification, and that even if widespread certification should occur, ISO 14001 gives advantages to TNCs and provides no guarantee that environmental performance will improve in these countries. Each of these arguments is examined individually and in more detail below.

1. ELDCs were excluded from developing the standards, and ISO lacks transparency

The first of these criticisms is that ISO 14001's development occurred in a manner heavily dominated by the EMDC participants, and may not adequately address the concerns of participants from the developing world. Table 2 shows the participation of ELDCs in the International Organization for Standardization, and in TC207, the committee that developed the ISO 14000 series.

Table 2: Participants in the development of ISO 14001

Participant's region	*International Organization for Standardization (ISO) Status*		*Technical Committee TC207*	*EMS Subcommittee SC1*
	Member	*Observer*		
Sub-Saharan Africa	*8*	*4*	*5*	*4*
Total ELDCs	*57*	*33*	*42*	*28*
Total Countries in ISO	*84*	*33*	*68*	*51*

(Davy, 1998)

These statistics indicate broad representation, but disguise weaker influence. The basic building blocks used during the development of ISO 14001 were EMAS and BS7750. These standards were developed by European organizations for use by European organizations, with little regard for the circumstances facing organizations in the developing world (Davy, 1998). Furthermore, critics argue that despite the efforts of ISO to encourage ELDC participation, development was guided and dominated by EMDC members - all 6 chairs of TC207 were from developed countries (ibid).

Clapp notes that private-sector EMDC actors dominated the standards-creation process. ISO is neither wholly private nor public, but a mix of private bodies and government bodies. EMDC delegations were largely made up of industry associations, while government bodies dominated the representation from ELDCs. Furthermore, all of the industrialized nations are represented as members, where as only about half of EMDCs are represented at all, and make up the bulk of correspondent or subscriber members. Those who are represented in this manner do not have voting rights or heavy involvement in technical committees like TC 207 (Clapp, 1999).

Development of these standards was akin to trade negotiations in complexity, scope, and importance for ELDCs (Davy, 1998). The emerging requirement of ISO 14001 certification for international trade has huge implications for ELDCs, as it requires them to invest in certification without having some of the financial and human resources available to organizations in the developed world. Despite this importance, it is difficult for these countries to engage in the development of this type of standard. Expenditures of time and expertise are required: "while the travel costs may be a deterrent, an even greater one is the need to devote the time and effort of several people to becoming expert in the issues, and to developing national positions that will serve the country's needs and have an impact on the process" (IISD 1996).

Critics contend that the development of ISO 14001 occurred in such a way that catered only the interests of industry, and not of government or of environmental interest groups: "ISO does not regularly involve citizens groups or other stakeholders in the development of national positions. Rather, Industry is dominant in the process, with some government involvement" (Clapp 1999). Nongovernmental organizations (NGOs) were also left out of the standards development process. The Worldwide Fund for Nature (WWF) criticized ISO for its failure to involve more developing country standards organizations and environmental NGOs (IER, 18 Sept. 1996). The WWF contends that the ISO lacked transparency and public accountability, citing the 1996 decision by the ISO to bar media access to its meetings (ibid). The legitimacy of international standards setting bodies such as the ISO to establish global norms for environmental behavior is also in question, especially when it is not clear that their membership and procedures are open and participatory (Clapp, 1999; Davy 1997).

The ISO responds to these criticisms by pointing out that TC207 has a Committee for Development (DEVCO) which has taken steps to ensure that there has been as widespread as possible participation by ELDCs in the standards development process. As delegations are self-funded, there is an unavoidable discrepancy between those countries with many resources to devote to standards-creation and those with fewer funds. Nonetheless, DEVCO has enlisted the assistance of the developed nation participants to subsidize costs for delegations from ELDCs, thus including them as much as possible in the process (TC 207, 1999).

The standard itself is "not rocket science: it basically requires organizations to define what they want to accomplish, develop a plan to accomplish it, measure to make sure that they accomplished it, and evaluate the process to determine opportunities to improve" (Bell, 1997). This simplicity and flexibility was intentionally included in the standards to allow different approaches to be used by organizations with different resources (Shoener, 1997) including those from ELDCs.

2. Organizations in ELDCs – especially SMEs - will be deterred from implementing because of cost

The second criticism is that organizations from ELDCs will be deterred from implementing ISO 14001 because of the high costs of certification. Although ISO 14001 is designed as a "one size fits all" solution that would ideally accommodate all firms, larger companies and those from industrialized countries have a clear advantage due to the expense and paperwork required for achieving and maintaining ISO 14001 certification (Silverstein, 1995). Access to skills and trained personnel, and the costs of implementation and certification are especially likely to adversely affect small and medium enterprises in the developing world. (Davy 1998; Brucato, 1995). A UNDP study estimates the cost for certification for SMEs in the developing world at between US$10,000 and US$30,000 depending on the size and nature of the site, and based on the use of US or European consultants (Davy 1998). Substantial maintenance costs, as much as US$25,000 per year, can also be expected given that facility registration to ISO 14001 may have to be renewed annually (Tilton, 1996).

However, if local auditors are available (as is the case in South Africa), costs are estimated at US$5,000 - 20,000 for certification, plus annual costs of US$4,000 – 5,000 (Clapp, 1999). Although meeting these costs will be especially difficult for SMEs to meet in ELDCs, the growing importance of the standards in trade and international competitiveness demonstrate that while there may be costs for implementing the standards, the opportunity costs of lost markets could well be higher. In addition, some of these costs may be recouped by increased operational efficiency brought about by implementation.

3. TNCs will have an advantage over local firms

Linked to this argument is the proposition that ISO 14001 gives TNCs operating in ELDCs a competitive advantage over their local counterparts. Transnational corporations already improve their profitability by distributing operations to countries where the costs of those operations can be reduced. Leonard argues that one element of this cost cutting is accomplished by locating operations in ELDCs, which have less strict, and consequently less expensive, environmental regulation. In this manner, ELDCs are used as "pollution havens" where TNCs can pollute without fear of financial or regulatory repercussions (Leonard, 1988). Critics of ISO 14001 argue that the standard might also have negative financial implications for organizations from ELDCs. By selectively implementing ISO 14001 and capitalizing on the exclusionary side effects of non-certification for ELDC organizations, TNCs exploit this standard to gain and maintain a competitive advantage over domestic companies (IISD, 1996; Silverstein, 1995).

Emissions control technology and management procedures prescribed by a management system can also contribute to this problem. TNCs may find a competitive advantage because "to the extent that environmental control measures require sophisticated technology, or technical and management expertise, TNCs may be better able to comply, and to comply at a lower cost, than local firms, thereby gaining a competitive advantage" (Pearson, 1987). In the guidelines for ISO 14001, there is no explicit requirement to comply with Best Available Control Technology (BACT) or Lowest Achievable Emissions Rate (LAER). This stems from the general guidelines being systems-based, rather than performance-based. However, in order to meet the pollution-prevention aspects of ISO 14001, in many cases technological and systemic improvements will be a de facto requirement.

Furthermore, some developing nations may have more lenient regulations, and the standard necessitates only that a site complies with the host country's regulations, however lenient they may be. Furthermore, the method of compliance to these regulations is left up to the company (Tremblay, 1996). As a result, the environmental impacts of TNCs may become greater rather than improve because they can locate in countries with the most lenient environmental laws while still offering suppliers and consumers an ISO 14001-compliant production site (Brucato, 1995).

Many criticisms of the pollution haven hypothesis have appeared in recent years. One of the basic assumptions of the pollution haven hypothesis is that the developing world has a higher theoretical assimilative capacity for environmental impacts. Studies have shown, however, that ELDCs may in fact have a lower assimilative capacity based on differing climates, geology, hydrology, and land-use (Pearson, 1987). Further, income based on sensitive environmental concerns, such as farming or fishing, raises local demand for environmental quality even above the levels expected in EMDCs (ibid). As a result, the local public expects a higher standard of environmental performance from foreign firms than from their domestic counterparts (Gladman, 1987). Critics of the pollution haven hypothesis suggest that there is an element of paternalism in the notion that developing countries cannot or will not establish environmental protection measures that will meet their own economic and social needs (ibid).

National environmental policies are slowly being put into place by ELDCs to monitor and regulate TNCs, but improved regulation by authorities in developing countries remains an important task. ISO 14001 provides ELDCs with an extra-regulatory tool to help improve the environmental performance of TNCs. Purely national systems of regulation can be evadeable, inefficient, incomplete, unenforceable, exploitable, or negotiable, often at the expense of environmental quality (Pearson, 1987). ISO 14001's voluntary nature and emphasis on continuous improvement increase the probability that environmental impacts will decrease, and by harnessing market forces, "green" processes can be encouraged across regulatory boundaries.

There is also evidence to suggest that the technical and systemic standards of plants operated by

TNCs in developing countries tend to be similar to those which TNCs operate in EMDCs, simply because it is more managerially efficient to standardize (Gladman, 1987). The case against multinational companies is unclear at best: "as regards direct environmental impact, there is no evidence to suggest that they are worse than some national companies, and a good deal of evidence to suggest that they can be better" (ibid). With support in both the producing countries and those countries importing the product, TNCs are more likely to remain cautious about certifying with ISO 14001, preferring to rely on more cost-effective internally developed management systems for improved environmental performance (Benchmark Environmental Consulting, 1995). This approach provides improved environmental performance without incurring the costs of third-party certification (Shah, 1996).

ELDCs are also supported by existing multilateral environmental agreements. One example can be found with Agenda 21 of the Rio Declaration. At the heart of Agenda 21 is a call for all countries to reduce the generation of hazardous wastes as part of a cleaner production approach. To achieve this goal it not only calls on government to promote emissions-reducing technology transfer but also asks industry to contribute particularly by deploying EMS. Agenda 21 encourages TNCs to "adopt standards of operation with reference to hazardous waste generation and disposal that are equivalent to or no less stringent than standards in the country of origin" (Clapp, 1999).

4. Certification, in and of itself, will not improve environmental performance.

Critics see voluntary environmental standards as a new tool of industry to "greenwash" the public, while environmentally dubious practices persist, particularly in the developing countries of Africa, Asia, and Latin America (Pratt, 1997). Because the guidelines for the standards do not emphasize performance based management, they do not require that every site that certifies with ISO 14001 achieve BACT or LAER standards, and provide little incentive to go beyond national regulations for technology performance or emissions (Davy, 1997).

Another aspect of this argument is that "these standards are not likely to make much difference in terms of environmental quality in developing countries, as the promotion of clean production and the transfer of clean technologies [called for by Agenda 21] from firms in industrialized countries are not required by the standards" (Clapp, 1999). Other critics also point out that while "end-of-pipe" emissions controls are included in the ISO definition of "pollution prevention", these end-of pipe measures are considered by some to be remedial, not preventative (IER, 21 Feb. 1996).

The creators of ISO 14001 never intended to produce a standard modeled on Agenda 21. The standard is not a policy recommendation for states, rather it is a set of guidelines meant to be implemented at the site level by organizations interested in improving environmental performance. Furthermore, ISO 14001 does not explicitly require BACT and LAER intentionally. Requiring that all certified sites meet this developed-world standard of performance would raise the costs of compliance beyond the reach of some organizations in less-affluent countries. Instead, ISO 14001 creates guidelines for a system which can, where warranted, involve BACT and LAER, without excluding companies unable to reach these standards from designing a system to manage their environmental impacts.

Furthermore, supporters of ISO 14001 point to a World Bank study of Mexican industry which showed companies that implemented ISO 14001 had improved environmental performance. This study also found a link between organizations with a policy of environmental reporting of the type encouraged by ISO 14001 with those that demonstrate better environmental performance (Dasgupta et al., 1997).

THE CASE OF SOUTH AFRICA

Determining the spread of ISO 14001 in South Africa

Having established the importance of the standard and the potential disadvantages and obstacles posed by the standard that are faced by developing countries, this paper examines the case of South Africa. This investigation begins by attempting to determine the how South Africa is faring with regards to implementation of ISO 14001, relative to other countries. There have been few attempts to compare the success of the acceptance of ISO 14001 on a country-to-country basis. Thus it is difficult to determine the extent to which organizations in South Africa are taking advantage of ISO 14001 to any greater or lesser degree than organizations in other countries.

As of December 20, 1999, 12,712 sites of organizations in 72 countries had adopted ISO 14001

(Ecology Symphony, 1999). Of these, 72 are from South Africa. Most measures of implementation on a country-to-country basis simply compare the number of certifications for each country without adjusting for factors such as size or relative wealth (Ecology Symphony, 1999; TC 207, 1999). The number of certifications per country is included in Appendix B. These raw numbers can disguise the true collective national effort invested in ISO 14001. Intuitively, a populous and wealthy country has more human and capital resources at its disposal to invest in the pursuit of widespread certification. Based on this assumption, extensive acceptance in the United States should be easier to achieve than in a less wealthy, less populous nation such as South Africa. Further, as a result of the compliance-based structure of ISO 14001, those countries whose environmental regulations are more expensive to comply with will always spend more and therefore appear to be higher in the rankings.

Another method of determining the effort that a country collectively puts into achieving widespread adoption of ISO 14001 is to compare the relative amounts of government spending which encourages ISO 14001 adoption as a proportion of total government environmental expenditure. This method is also flawed because in addition to the difficulty of determining which expenditures contribute directly and indirectly to ISO 14001 adoption, it also does not address the implications of the hybrid private / public nature of ISO 14001. In countries where environmental management systems are already fairly widespread, less government spending will be needed to encourage certification. Furthermore, countries that have a large pool of expertise in the private sector will be able to defray the costs of training and institutional development from government spending.

A third method involves simply looking at the number of certifications per GDP for a given year. Gross Domestic Product measures the value of a nation's output of goods and services for some period of time, usually a year. This method of analysis does not fully compensate for different sized countries. Large countries, such as India and China, can have large GDP. This does not mean that they are wealthy countries, they have fewer resources available to devote to ISO certification than many EMDCs because their GDP is divided among a much larger group of people. Countries with higher domestic economic output distributed among a small population have more resources certify a large number of sites as being ISO 14001 compliant. As a result this method distorts the indicator in favor of small countries with large per capita GDP, such as the Scandinavian countries, while overlooking the difficulties faced by countries with large populations and correspondingly large GDP, but with low per capita GDP. ELDCs fall into this category in disproportionate numbers.

Therefore, in order to judge the degree of widespread acceptance on a level playing field, one must look at an indicator that compares not only the number of certifications, but also the human and material capital at each country's disposal to achieve these certifications. One tool that can be used to estimate the success that the various actors within a nation have collectively enjoyed in extensively implementing ISO 14001 is the National ISO 14001 Performance Indicator, henceforth referred to as NIPI. This can be conceived of as a performance indicator with similar goals as the environmental performance indicators of ISO 14031, but applied to states rather than to individual sites or organizations. The indicator is simply the number of certifications (n) in a given year, in this case 1999, per Gross Domestic Product in US dollars (GDP) per capita (p) for the same year. The index has been multiplied by 100 to better demonstrate contrasts in Figure 1. The resulting formula is most simply expressed as:

$$1999 \text{ NIPI} = (n / \text{GDP} / p) * 100$$

This enables a one-to-one comparison, eliminating discrepancies caused by the inherent advantages of size and wealth. The benefits of the standard for each country can be measured against the number of people it is meant to serve (through protection against environmental damages) and the number and influence of the potentially damaging actors (as GDP measures, in monetary form, the amount of activity by producers). Population and GDP are derived from World Factbook data, ISO certifications are taken from Ecology Symphony data.

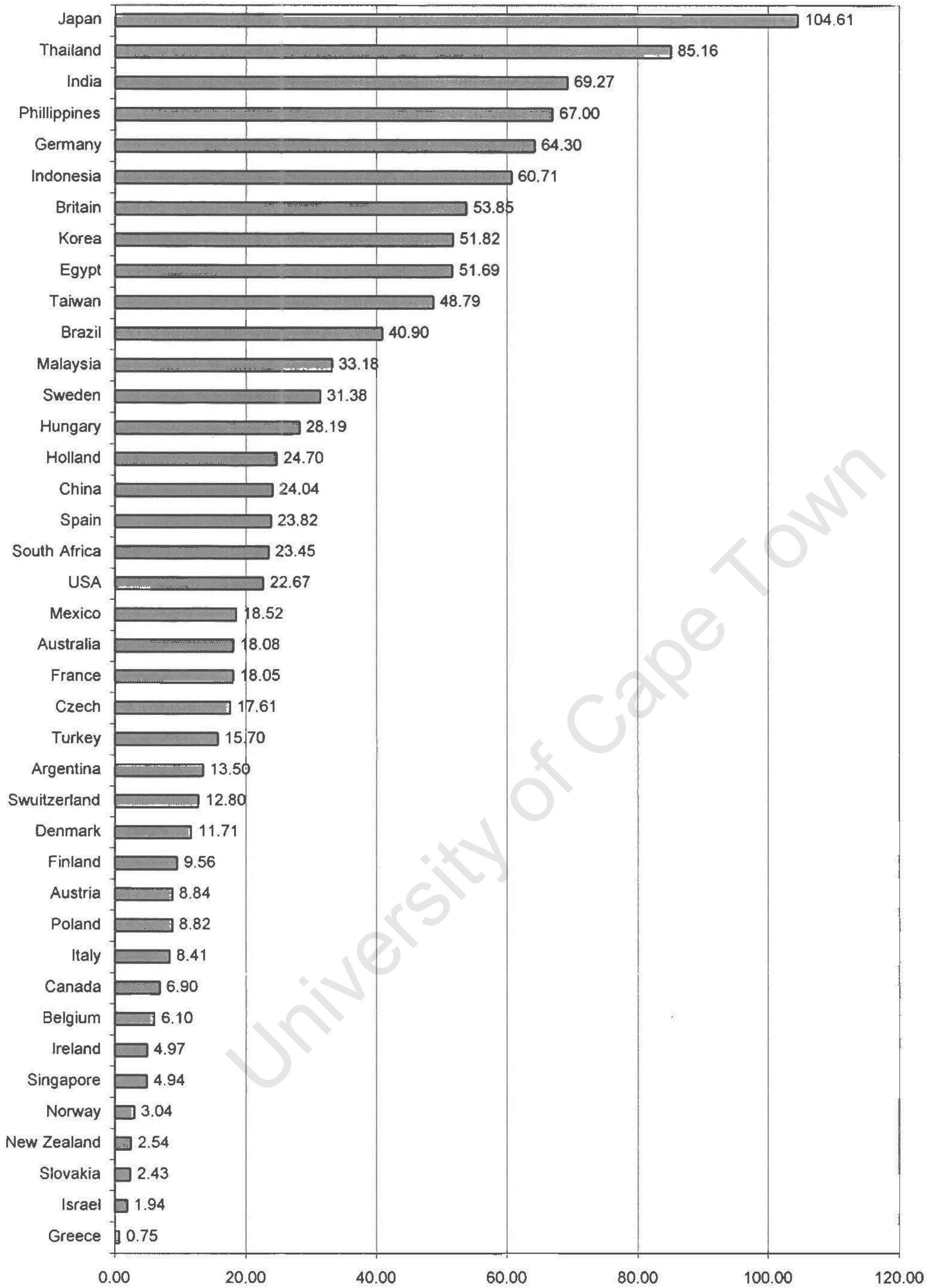
This analysis depends on GDP instead of Gross National Product (GNP). The theoretical differences between the two are slight and involve how to count earnings of assets owned by foreigners. Gross National Product counts the earnings in the homeland of the owner of the asset while Gross Domestic Product counts them in country in which the assets exist. ISO 14001 requires that the facility complies with all local legal requirements, and as a result certification is performed by host-nation certification bodies on a site-by-site basis, regardless of the organization's nation of origin. It is therefore important to measure per capita GDP rather than per capita GNP.

The countries compared with South Africa in this analysis are those which have domestically certified one or more ISO 14001 compliant sites or organizations. A complete table including the December 1999 number of certifications, population, GDP, GDP per capita, and National ISO 14001 Performance Indicator for each country with at least one ISO 14001 certified site is included in Appendix B.

There are clearly some limitations to the specificity of this index. The major limitation is that TNCs could be certifying at differing rates than local companies. This would cause TNCs to alter their host country's NIPI, despite the possibility that they are drawing on human, technical, or capital resources from outside the host country. This issue is dealt with in more detail later in this paper. Another issue arises from measuring GDP *per capita*. This even distribution of the country's domestic economic output among all its citizens disguises income disparity, which is especially a problem in South Africa, where the richest 10 percent of the population consumes 47 percent of its production (World Factbook, 1999). While these limitations exist, however, they do not invalidate this index as a tool to compare the degrees to which different nations are moving towards widespread acceptance of ISO 14001.

Figure 1 compares the relative acceptance of ISO 14001 as of December 1999 in 40 countries using the National ISO 14001 Performance Indicator described above. Only those countries with 10 or more ISO 14001 certifications are included here, the remainder are included in Appendix B.

Figure 1: NIPI analysis for the top 40 countries



One would expect to find many EMDCs ranking above South Africa in this analysis, however when examined in this manner, the data produce some surprising results. Japan leads the field, chiefly as a result of the overwhelming number of ISO 14001 certifications it possesses. Some of those countries which follow close behind, including Thailand, the Philippines, Indonesia, Korea, Taiwan, China, and Malaysia, are not historically considered EMDCs, and are classified as "medium-income" by the World Bank (World Bank, 1999). However, they can be classified as members of the so-called "Asian Tigers", whose economies are largely export-driven. In light of the arguments made that ISO 14001 is becoming a de facto requirement for trade competitiveness, it is perhaps not surprising to see them high on the list. Britain, Germany, Holland, Spain, and Sweden are all OECD countries which are integrated or associated with the common market of the EU, and as a result are well supported in the certification process and eager to remain competitive within that structure. More surprising are Brazil, Egypt, Hungary, and India, which, like South Africa, are low- or middle-income developing countries. South Africa appears eighteenth on the list, ranked above the rest of the developed world including the United States and the remainder of the OECD nations.

Table 3 demonstrates that when compared to other countries of similar population, GDP, and GDP per capita, South Africa appears to be enjoying a fair amount of success at implementing ISO 14001 extensively.

Table 3 – Comparison of National ISO 14001 Performance Indicators between South Africa and countries of similar size, economic output, and wealth.

Country	*Pop. (millions)*	NIPI
Spain	*39.3*	23.82
Colombia	*39.3*	0.93
Poland	*38.7*	8.82
South Africa	*38*	23.45
Argentina	*35.7*	13.50
Canada	*30.3*	6.90
Morocco	*29.7*	0.83

Country	*GDP (US$ billions)*	NIPI
Greece	*143*	0.75
Thailand	*135.2*	85.16
Vietnam	*134.8*	1.15
South Africa	*116.7*	23.45
Peru	*111.8*	0.24
Morocco	*107*	0.83
Nigeria	*106.2*	1.07

Country	*GDP/cap. (US$)*	NIPI
Mexico	*3240*	18.52
Turkey	*3185*	15.70
Hungary	*3157*	28.19
South Africa	*3071*	23.45
Czech	*2612*	17.61
Zimbabwe	*2339*	0.85
Thailand	*2231*	85.16

In order to explain this success, it is useful to examine how South Africa is affected by the four conditions outlined by the OECD which act as obstacles to widespread adoption if ISO 14001 in ELDCs. An examination of the South African case demonstrates that while some of these areas remain problematic for South Africa, others are less so due to the aspects of South African society and its economy which have developed-world qualities. These four OECD conditions include underdevelopment of institutional environments, infrastructure, and legal cohesion, and frictions between ELDC producers and EMDC trading partners.

The CIA and the World Bank classify South Africa as a middle-income developing country. Observers cite well-developed financial, legal, communications, energy, and transport sectors, a stock exchange that ranks among the 10 largest in the world, and a modern industrial infrastructure among South Africa's strengths (World Bank, 1999, World Factbook, 1999). With regard to infrastructural and institutional development, South Africa has developed-world aspects which give it advantages over many ELDCs.

In addition, South Africa also possesses human resources crucial to successful implementation of ISO 14001, available domestically in the form of consultants and metrology infrastructure (Stock, 1995; Soutter & Mohr, 1993). The South African Bureau of Standards (SABS) is a statutory body authorized by Act 29 of 1993 which provides extensive guidance with regards to ISO 14001 certification (SABS, 1999). South Africa also has other certification bodies which can certify sites as being ISO 14001 complaint. A complete listing is included in Table 4.

Table 4 -Companies who can certify organizations as ISO 14001-compliant in SA

AOQC - Moody International Assurance	*BVQI*
Dekra Certification Services	*Det Norske Veritas AS*
DQS	*Kennedy & Donkin Africa (Pty) Ltd*
Lloyds Register	*SGS South Africa (Pty) Ltd.*
South African Bureau of Standards (SABS)	*TUV Bavaria SA (Pty) Ltd.*
TUV Rheinland Quality Services (Pty) Ltd.	

(Compiled with assistance from KPMG Environmental Services and SABS).

This evidence suggests that South Africa is in a better position than many ELDCs with regards to its level of institutional development.

With regard to legal coherence, South Africa today boasts some of the most comprehensive environmental legislation in the world. Section 24 of Chapter 2 of the Constitution of South Africa guarantees all South Africans the right "to an environment that is not harmful to their health and well-being... [and to] have the environment protected for the benefit of present and future generations through reasonable legislative and other measures..." (SA Constitution, 1996). This basic right to a healthy environment is further supported by a series of laws passed by

Parliament, including the National Environmental Management Act No. 107 of 1998, the National Forests Act No. 84 of 1998, the National Water Act No. 36 of 1998, and the Mine Health and Safety Act No. 18 of 1996. The shortage of resources available to enforce these laws remains problematic. The recent Integrated Pollution Control & Waste Management Bill intends to introduce regulatory frameworks to ease the burden, however its effectiveness remains to be seen. ISO 14001 can also help ease this burden on SA environmental regulators. "An international norm requiring companies to be ISO certified, while not legally binding, will exert a tremendous commercial pressure on SA companies to upgrade environmental management systems and improve environmental performance. The ISO standards will probably have more effect than legislation in the 'greening' of South African business, given the weakness of SA's environmental enforcement programmes" (SAEP, 1999).

Many of the environmental concerns South Africa faces are shared with some other EMDCs, particularly the Southwestern US and Australia. These concerns include: "a lack of important arterial rivers or lakes, requiring extensive water conservation and control measures: growth in water usage threatens to outpace supply; pollution of rivers from agricultural runoff and urban discharge; air pollution resulting in acid rain; soil erosion; and desertification" (World Factbook, 1999). Furthermore, South Africa's chief exports are gold and other minerals, accounting for nearly 45 percent of total exports (World Factbook, 1999). These economic sectors are already subject to relatively strict environmental regulation, and are not considered environmentally sensitive goods (Xu, 1999). Because the identified trade frictions often arise over less-regulated and environmentally sensitive goods, ISO 14001 should do little to worsen trade relationships between South Africa and its trading partners. As a result, while South Africa can expect to experience frictions between its environmental priorities and those of EMDC importers, some of the environmental priorities faced in South Africa will overlap with many of those shared by its trading partners.

South African Perspective on criticisms of ISO 14001

South Africa is appears to be able to negotiate the obstacles which the OECD predicts will be faced by many other ELDCs. Criticisms of the standard itself remain however, including the participation by ELDCs in the development of the standards, the implications of the cost of certification for organizations in ELDCs, the advantages given to TNCs, and the actual effect the standard will have on improving environmental performance. The next section of this paper focuses on the South African perspective to these criticisms.

1. ELDCs were not sufficiently involved in developing ISO 14001

South Africa is in a special position relative to at least one of those problems identified by critics of ISO 14001: extensive participation in the development of the standard. Cuba and SA were only ELDC representatives at the first TC207 meeting in 1993 (Clapp, 1999), and the South African Delegation, led by representatives of SABS, has participated heavily throughout the development and propagation of the standard (SABS, 1999).

2. Organizations in ELDCs, especially SMEs, will be deterred from implementation because of cost

The unequal distribution of wealth under apartheid continues to profoundly affect the South African economy, and one element of reconstruction following the inauguration of multiracial government rule in 1994 has been emphasis on reducing the 30 percent unemployment in the country, best exemplified by the "Growth, Employment and Redistribution", or GEAR policy (World Bank, 1999, World Factbook, 1999). This policy framework includes the introduction of tax incentives to stimulate new investment in labor-intensive projects, expansion of basic infrastructure services, the restructuring and partial privatization of state assets, continued reduction of tariffs, subsidies to promote economic efficiency, improved services to the disadvantaged, and integration into the global economy (World Factbook, 1999). However, South Africa comes from a position of conflict between exports and employment. The apartheid legacy of protected, uncompetitive producers of exportable goods encouraged development of the best industrial infrastructure in Africa, but with the removal of international sanctions, South African producers now see a need to trim down on labor in order to reduce costs and thereby become competitive (Blumenfeld, 1994). South Africa already faces enormous problems in creating jobs that are internationally competitive: this cost has been estimated to be about R100,000 (US$16,750) per competitive job (Stoneman, 1994). In light of the 3.3 percent per annum growth of South Africa's eligible workforce, an annual investment of about R80 billion (US$13.4 billion) would be required, a significant proportion of a GDP whose 1998 real growth was only 0.3 percent (Stoneman, 1994, World Factbook, 1999). A de facto requirement to attain ISO 14001 certification can only add to these costs.

However, the data from the NIPI analysis suggest that many organizations in the South African economy do not seem to be deterred by these costs to a greater degree than in many other countries, including some from the developed world. This would indicate that among a growing number of certified companies, the advantages are perceived to outweigh whatever cost might be incurred.

The Southern Africa Environment Project reported that in 1997, Tosas, a joint venture between Total and SASOL, became the first ISO 14001 certified company in South Africa and the first petrochemical company to be certified worldwide (SAEP, 1999). The future adoption of ISO 14001 by SA organizations may follow the pattern of ISO 9000. In 1993, ELDCs had a total of 1015 companies registered to ISO 9000, 824 of which (82 percent) were in South Africa. By 1995, there were 8188 ISO 9000 certifications in ELDCs, 1492 of which were South African, accounting for all the ISO 9000 certifications in Sub-Saharan Africa (Davy, 1998). ISO 14001 is also gaining ground rapidly. There were 21 ISO 14001 certified facilities during the time the survey was being conducted in January 1999, and as of December 1999 that number had grown to 72.

While South African companies appear to be aiming at certification in ever-increasing numbers, the challenges presented by ISO 14001 will be especially difficult for companies with many environmental issues to address and limited experience with rigorous management systems. Small and medium size firms in ELDCs fall into this category in disproportionate numbers and are the companies that often have the greatest impacts on the human environment (IISD 1996).

1999 KPMG – UCT EMS Survey

To examine how the criticisms that the cost of implementation will discourage South African organizations (including SMEs) from certifying, and that the standards give a competitive advantage to TNCs, this paper will complement evidence from recent literature with the findings of a survey conducted by the author and a colleague in January 1999. A copy of the survey questionnaire is included in Appendix C.

The survey (Alheit & Keogh, 1999) was commissioned by KPMG's Environmental Unit in Cape

Town, South Africa, to examine how South African environmental managers in seven sectors of the South African economy are implementing EMS, and what the advantages and drawbacks of EMS are in the South African context. The research method included the use of a structured questionnaire which was faxed or emailed to a predetermined sample of organizations during January and February 1999. The objectives of the research necessitated a focus on organizations that either have an established EMS or are in the process of implementing one. The aim was not to include all potential participants, but to have a representative sample of the organizations that utilize EMS. Of the 112 organizations initially identified, 29 were immediately excluded because they did not wish to participate, could not identify an appropriate environmental representative, or that they did not have an Environmental Management System.

The resulting sample of 83 is likely to be indicative rather than exhaustive. Of the final sample, 60 organizations (72 percent) responded in a timely manner to the survey. South African-owned organizations comprised 85 percent of respondents, while foreign-owned enterprises comprised 15 percent. Because of the method used to choose organizations, this sample will necessarily show bias towards implementing EMS. However because the comparisons being made are between foreign proponents of EMS and domestic proponents of EMS to determine the relative adoption of ISO 14001, this data remains valid in spite of any bias.

Arguments that SMEs are at disadvantage – especially in ELDCs.

The high costs of certification and the lack of skills and resources required to implement and maintain an ISO 14001-based EMS might exclude small domestic enterprises from implementing the standard in ELDCs (Cascio, 1994; Brucato, 1995). Even in the developed world, concerns exist that ISO 14001 might present a difficult barrier from SMEs. In the 1996 WTO negotiations, delegates from the US, Canada, Mexico, and New Zealand raised concerns that it might exclude SMEs, particularly because of the cost of redundant registration schemes between ISO 9000 and ISO 14001 (Zuckerman, 1999). While no formal complaints have yet been lodged with WTO, the organization has established a committee to examine the issue (WTO, 1999).

SMEs are a particularly important constituency within the South African economy, they play a critical role in South African plans for economic development. SMEs provide a higher rate of absorption of labor in a country with a fast-growing workforce. SMEs also capitalize on the labor-intensive competitive advantages presented by this large workforce, while requiring less capital investment. In addition, SMEs play a critical role in the South African economy, contributing 45 percent of GDP in 1996 (Hesketh, 1996). Major constraints faced by SMEs in South Africa include a lack of access to markets, financing difficulties, and government policy and regulation (ibid). This information reflects the concerns that critics of ISO 14001 have raised, and as a result the standards could provide another impediment for the success of SMEs.

Survey data indicates that SMEs are not well represented in ISO 14001 certification in South Africa (Alheit & Keogh, 1999). Although many SMEs were identified during the process of selecting companies to participate in the survey, none of them met the criteria for participation: having an EMS, employing a person responsible for managing their environmental impacts, or a being willing to disclose information about their environmental management. Information from background interviews conducted in the course of this survey suggests that small and medium enterprises in South Africa are not certifying with ISO 14001. There is no data currently available to explain why this might be the case. Whether this is because the benefits of certification are outweighed by the costs at this level, because there is a perception that certification is unnecessary given the environmental impacts caused by firms of this size, or because of an absence of public or regulatory pressure to implement an ISO 14001 certified EMS, SMEs do not seem to view certification as a requirement.

3. TNCs will use ISO 14001 to gain a competitive advantage over domestic ELDC firms

The argument that TNCs are using ISO 14001 to gain a competitive advantage hinges on the proposition that these organizations will certify at higher rates than domestic producers, capitalizing on the benefits of certification and driving local competitors out of business. Therefore, to check the validity of this assertion, the proportion of South African and foreign owned firms which are adopting EMS (thus realizing the systemic advantages equally) must be compared with an eye towards the differences in how many of them are aiming for ISO 14001 certification, and its accompanying market-based advantages. A higher proportion of TNCs certifying with ISO 14001 among all TNC respondents would indicate that they were spending the extra money to achieve recognized certification. Matched with a significantly lower proportion of South African respondents doing the same, this would indicate that TNCs are, regardless of their intentions, gaining an advantage by certifying. If the proportion of TNC respondents certifying is not significantly greater, then they should be receiving no more widespread an advantage than their South African counterparts. Figure 2 shows the survey results which compare the proportions of ISO certified South African and foreign organizations, as well as the proportions from each which are aiming at certification in the near future (Alheit & Keogh, 1999)

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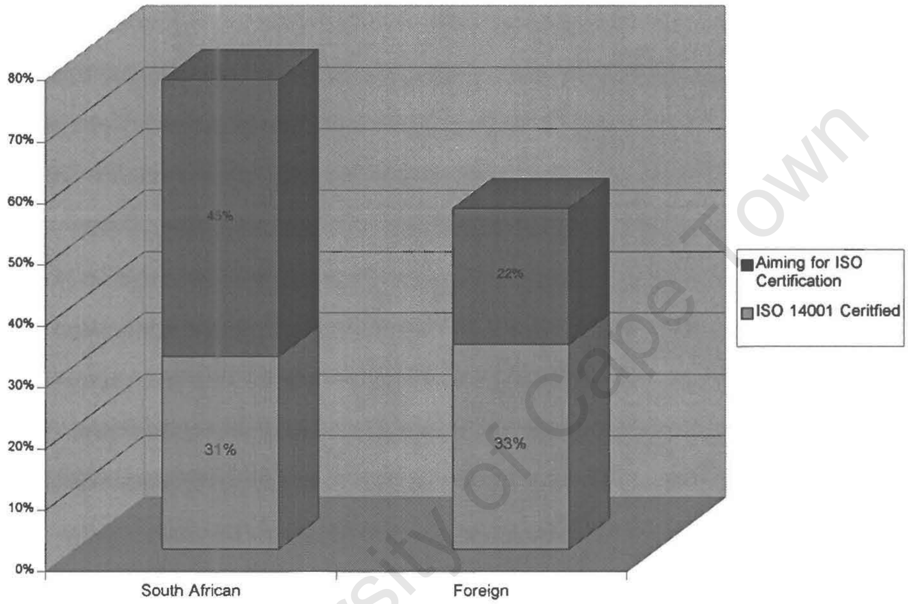
Figure 2: Proportion of South African and Foreign Organizations implementing ISO 14001 in 1999 KPMG Survey.



A roughly equal proportion of South African and foreign firms are already certified with the standard, while a greater proportion of South African firms (45 percent) are aiming towards certification in the near future than are foreign firms (22 percent). Therefore any advantage gained by TNCs is also being gained in similar proportions by SA firms. Thus at a national level of analysis South African firms are at no immediate disadvantage because of proportionately lower rates of ISO 14001 certification.

4. ISO 14001 will not improve the environmental performance of those who certify with it

There is a perception among environmental managers in a US survey that one critical weakness of ISO 14001 is that it does not necessarily improve environmental performance (Burdick, 1995). This perception is not shared by South African environmental managers in our survey, 87 percent of whom perceive that improving environmental performance is one of the primary advantages of ISO 14001 certification (Alheit & Keogh, 1999). However, there has been no research to date comparing the environmental performance of ISO 14001 certified and non-certified organizations in South Africa. The current state of knowledge suggests an agenda of research in several directions, although the empirical vacuum in this area dictates its status among the most pressing priorities To this end, research in South Africa that is modeled on the World Bank study of industry in Mexico (Dasgupta, et al, 1997) would be most informative.

Even in the absence of hard data, it can be logically deduced that widespread implementation of ISO 14001 in South Africa will improve environmental performance. The key assumption of ISO 14001 is that organizations that systematically manage their environmental impacts will improve their environmental performance, broadly measured. Much as quality cannot be introduced into a product at the end of the assembly line, so too ISO 14001 tries to incorporate environmental concerns into everyday operations. Based on this model, it becomes common sense that managing an environmental impact is better for environmental performance than not managing it.

Skeptics should not be too quick to point out what is missing from the standard until there is a greater understanding of what its real-world results are. Claims of inadequacy based simply on the text of the standard overlook the most critical facts: those of the common sense benefits that can be achieved. Until more research is performed to indicate the effectiveness of ISO 14001 at improving environmental performance in a cost-effective manner, the goal of environmental managers in ELDCs and EMDCs alike should be cautious encouragement of certification wherever environmental improvements can be achieved in a cost-effective manner.

Empirical data regarding the low number of SMEs certifying with ISO 14001 is also needed. Research to determine the extent of certification should be coupled with an agenda of inquiry into the motivations and deterrents that contribute to the total in the South African context.

CONCLUSIONS

ISO 14001 is increasingly significant for organizations of all sizes and in every country. Its mounting importance in trade considerations and status within and alongside government regulation portend a future where few organizations will be unaffected by it. The true promise of ISO 14001, however, is not whether it can produce dramatic results for a few highly sophisticated companies which are already effectively regulated at the state level. Rather, it is a less-ambitious vision that could have a much more significant impact: assisting the majority of average organizations in doing a good, if not perfect, job of managing their environmental impacts. Preliminary data suggests that ISO 14001 does improve both the environmental performance and the trade competitiveness of organizations, among other advantages. If this proves to be the case, then the more extensively a country is able to adopt ISO 14001, the more benefit it will receive.

The criticisms of the standard identified in this paper are not completely without basis, as there are theoretical indications that some structural issues of ISO 14001 are not best suited to small enterprises, particularly in ELDCs. However, widespread acceptance of EMS in some form, and of ISO 14001 certified EMS, does not intuitively pose negative environmental or competitive consequences for organizations in any country, regardless of its size and wealth. Currently, there are a larger number of ISO certifications in the developed world than in ELDCs, however this is not an effective method for measuring the extent of ISO 14001 adoption within a country. This overlooks the different challenges faced by ELDCs and the unequal number of actors and affected parties in environmental performance questions between countries. In order to measure the true extent of acceptance of ISO 14001 between countries, the National ISO 14001 Performance Indicator has been introduced in this paper, with the aim of compensating for difference in economic output and population.

ELDCs do face significant barriers towards widespread adoption. South Africa is in a better position than many other ELDCs with regard to the level of development of its infrastructure, institutions, laws, and trade relationships. Despite theoretical problems which critics of the standard had suggested, many ELDCs, including South Africa, are achieving widespread certification relative to the resources available for them to invest in this effort. When examined in this manner, data indicate that these ELDCs are finding greater acceptance relative to the resources available than many EMDCs, including the US and much of the EU. Literature and survey data indicate that in the South African case, the standard does not appear to be having negative impacts on the competitiveness or environmental performance of some key sectors of the economy. On a more focused level of analysis, however, it is clear that more small and medium enterprises could be encouraged to achieve ISO 14001 certification.

There has been widespread criticism of the standard, based not on real-world observation but on speculation arising from the wording of the standard. These criticisms include that it was not developed to be suitable for ELDCs, that it is too expensive, that it will give a comparative advantage to TNCs, and that it does not guarantee improved performance. Each of these criticisms suggest that ISO 14001 is not suitable or appropriate for ELDCs. Critics of the standard are missing a crucial point, however: that ISO 14001 should not be judged based on the text of its guidelines, but on the success it has in improving efficiency and performance in environmental management. Addressing the criticisms that have been brought to bear on the standard would require that the language of the guidelines be revised to include LAER, BACT, phase-in periods, and technology transfer provisions. However, in many cases, this would prove more exclusionary than inclusive. It would increase the burdens that would have to be borne by organizations interested in certifying and erase the advantages of the standard's "one size fits all" flexibility. Rather than creating a "magic bullet" to perfectly solve all concerns in a few high profile sectors, it more important to keep the standard open and flexible to increase the number of sites who can adopt it.

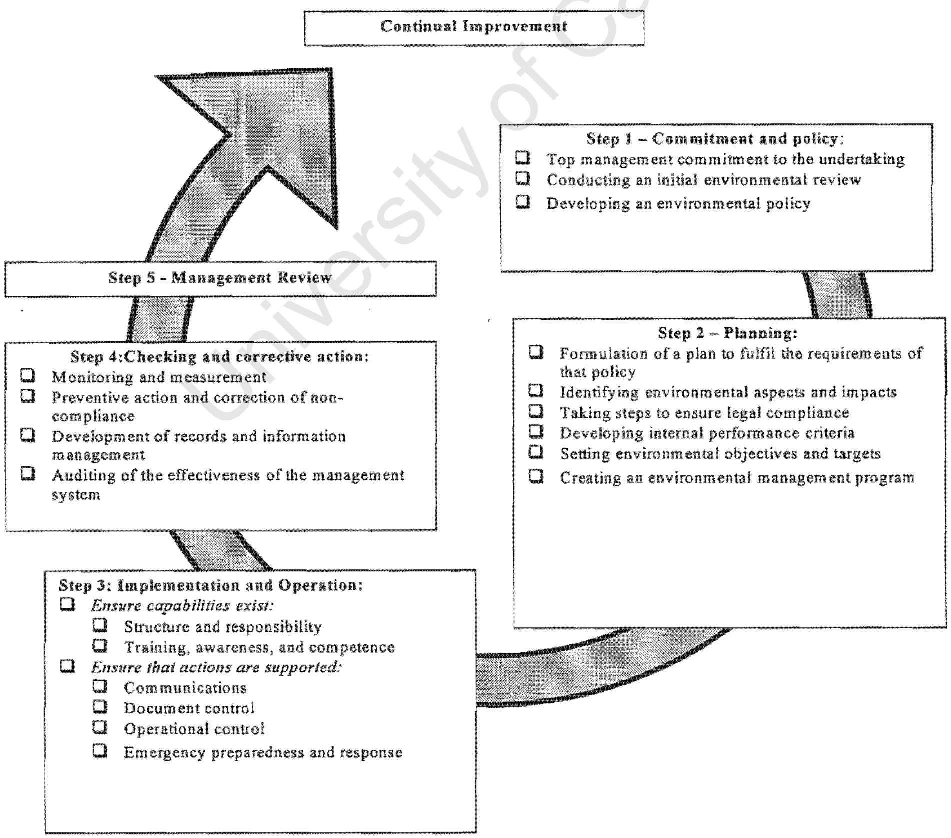
The goal for environmental managers should be improved environmental performance, and if necessary, a scaled-down form of ISO 14001, with initially less-ambitious goals can be introduced. Whatever steps are taken, some organizations will inevitably be disadvantaged. In response, steps to encourage widespread adoption should be taken and support given to organizations interested in certification but deterred by cost.

As there are now more than 70 ISO 14001 certifications in South Africa, and over 12,000 worldwide, the time has come for more detailed empirical inquiry into the effectiveness of ISO 14001 in improving environmental performance. South Africa is poised to benefit from the standard to a great degree, as it is a country where voluntary standards may prove able to do what regulation cannot. Additional data that would support the idea that ISO 14001 is effective at improving environmental performance would be a powerful tool in aligning forces to affect pervasive certification by many organizations in South Africa, as well as around the world.

APPENDIX A: THE ISO 14000 SERIES

The ISO 14000 series, first introduced by the International Organization for Standardization in 1996, are 17 standards which together specify the guidelines for environmental management as part of a company's environmental management system (EMS). These standards aim to provide a single system for organizations in all countries which aim to improve environmental performance systematically, achieve cost benefits by better managing the environmental aspects of their operations, gain credibility for their efforts to improve environmental performance, and ensure that suppliers and other partners show the same responsible behavior towards the environment. One of these, ISO 14001, provides specifications with guidance for use for EMS, and is the only standard to which a company can become certified. A graphic showing the major components of the ISO 14001 standard appears below in Figure 1a.

Figure 1a: Structure of an ISO 14001 EMS



The standards which collectively make up the ISO 14000 series are listed below.

ISO 14001:	EMS – Specifications with guidelines for use
ISO 14004:	EMS – General guidelines on principles, systems, and supporting techniques
ISO 14010:	Guidelines for environmental auditing – General principles
ISO 14011 :	Guidelines for environmental auditing – Auditing procedures – Auditing of Environmental Management Systems
ISO 14012:	Guidelines for environmental auditing – Qualification criteria for environmental auditors.
ISO 14020:	Basic principles of environmental labeling
ISO 14021:	Environmental labeling – Self-declaration environmental claims – Terms and Definitions
ISO 14022:	Environmental labeling – symbols (Type II)
ISO 14023:	Testing / verification methodologies for application in environmental labeling
ISO 14024:	Environmental labeling – Practitioner Programs – Guiding principles, practices, and certification procedures of multi-criteria programs
ISO 14031:	Environmental Management – Environmental Performance Evaluation
ISO 14040:	Life cycle assessment – general principles and practices
ISO 14041:	Life cycle assessment – Life cycle inventory analyses
ISO 14042:	Life cycle assessment – Life cycle impact assessment
ISO 14040:	Life cycle assessment – Life cycle improvement assessment

The technical committee for EMS, TC207, prepares the standards. Once prepared, the standards are voted on and promulgated by all members of the ISO. The standards are stand-alone, this means they can be implemented individually, without need for full-scale implementation of all of the standards.

Sources: A D Little, 1993; Tibor & Feldman, 1996; OECD, 1996.

APPENDIX B: NATIONAL ISO 14001 PERFORMANCE INDICATOR DATA

The countries below are ordered in rank, from highest NIPI index to lowest. The NIPI index for 1999 can be calculated by taking the 1999 number of certified sites per GDP per capita, and multiplying by 100.

Country	ISO certifications	Population (in millions)	GDP (in millions)	GDP per capita	NIPI index	Rank
Japan	2773	126.2	3345390	26509	104.61	1
Thailand	190	60.6	135200	2231	85.16	2
India	117	1000	1689000	1689	69.27	3
Philippines	50	73.5	54852	746	67.00	4
Germany	1460	82.1	1864207	22707	64.30	5
Indonesia	55	201.4	182467	906	60.71	6
Britain	1014	59	1111011	18831	53.85	7
Korea	463	46	410999	8935	51.82	8
Egypt	37	62	44383	716	51.69	9
Taiwan	611	21.7	271739	12523	48.79	10
Brazil	146	159.9	570733	3569	40.90	11
Malaysia	116	21.7	75857	3496	33.18	12
Sweden	850	8.9	241044	27084	31.38	13
Hungary	89	10.2	32200	3157	28.19	14
Holland	530	15.6	334670	21453	24.70	15
China	85	1250	4420000	3536	24.04	16
Spain	337	39.3	555989	14147	23.82	17
South Africa	***72***	***38***	***116692***	***3071***	***23.45***	***18***
USA	570	267.6	6728800	25145	22.67	19
Mexico	60	98.4	318848	3240	18.52	20
Australia	350	18.5	358226	19364	18.08	21
France	404	58.6	1311645	22383	18.05	22

Czech	46	10.3	26900	2612	17.61	23
Turkey	50	63.8	203174	3185	15.70	24
Argentina	81	35.7	214215	6000	13.50	25
Switzerland	413	7.1	229053	32261	12.80	26
Denmark	350	5.3	158475	29901	11.71	27
Finland	270	5.1	143986	28233	9.56	28
Austria	200	8.1	183281	22627	8.84	29
Poland	15	38.7	65800	1700	8.82	30
Italy	170	58.5	1181955	20204	8.41	31
Canada	148	30.3	649726	21443	6.90	32
Belgium	130	10.2	217368	21311	6.10	33
Ireland	96	3.6	69493	19304	4.97	34
Singapore	87	3.7	65146	17607	4.94	35
Norway	104	4.4	150290	34157	3.04	36
New Zealand	35	3.8	52405	13791	2.54	37
Slovakia	20	5.4	44500	8241	2.43	38
Israel	25	5.8	74639	12869	1.94	39
Iran	8	65	339700	5226	1.53	40
Zambia	1	9.6	8300	865	1.16	41
Vietnam	2	77.3	134800	1744	1.15	42
Tunisia	1	9.5	8300	874	1.14	43
Lebanon	5	3.6	15800	4389	1.14	44
Nigeria	1	113.2	106200	938	1.07	45
Pakistan	2	138.1	270000	1955	1.02	46
Colombia	6	39.3	254700	6481	0.93	47
Zimbabwe	2	11.2	26200	2339	0.85	48
Morocco	3	29.7	107000	3603	0.83	49
Malta	1	0.38	500	1316	0.76	50
Greece	10	10.7	143000	13364	0.75	51

Croatia	3	4.7	23600	5021	0.60	52
Jordan	2	4.6	15500	3370	0.59	53
Costa Rica	3	3.7	24000	6486	0.46	54
UAE	8	2.3	40000	17391	0.46	55
Chile	5	15	184600	12307	0.41	56
Guatemala	1	12.3	45700	3715	0.27	57
Barbados	3	0.26	2900	11154	0.27	58
Oman	2	2.4	18600	7750	0.26	59
Russia	1	146.4	593400	4053	0.25	60
Rumania	1	22.3	90600	4063	0.25	61
Peru	1	26.6	111800	4203	0.24	62
Uruguay	2	3.3	28400	8606	0.23	63
Liechtenstein	5	0.032	730	22813	0.22	64
Ecuador	1	12.6	58700	4659	0.21	65
Mauritius	2	1.2	11700	9750	0.21	66
Lithuania	1	3.6	17600	4889	0.20	67
Luxembourg	6	0.42	13900	33095	0.18	68
Estonia	1	1.4	7800	5571	0.18	69
Venezuela	1	23.2	194500	8384	0.12	70
Saudi Arabia	1	21.5	186000	8651	0.12	71
Puerto Rico	1	3.9	34700	8897	0.11	72
Total:	12712					

The population and GDP data are taken from the CIA World Factbook, while ISO registration data are from Ecology Symphony, a Japanese NGO which keeps current tallies of the number of ISO 14001 certified sites per country. All data are as accurate as possible, however because of problems with the 1996 census in South Africa, population figures have been revised. This analysis uses the latest informal population figure of 37.9 million people, rather than the potentially inflated official figure of 43.3 million, to reflect the most accurate available information. All ISO 14001 data is accurate as of December 20, 1999.

Appendix C: 1999 KPMG Environmental Management Systems (EMS) Survey

Questionnaire Respondent Details:

Name and position: ____________________

Postal address: ____________________

Please check as many boxes as are appropriate in responding to the following:

1. How does your organisation manage environmental issues?

- ❑ Through responses to environmental problems and issues only as and when required
- ❑ Through several environmental initiatives and projects on specific issues, e.g. recycling, donations or sponsorships
- ❑ Through an Environmental Management System (EMS) broadly based on environmental principles such as the IEF code of conduct or the Business Charter for sustainable development
- ❑ Through an Environmental Management System (EMS) developed to an internally defined corporate standard
- ❑ Through an integrated Environmental and Health and Safety management System
- ❑ Through an EMS developed along external guidelines such as ISO 14001,but not planning to certify to that standard
- ❑ Through an EMS developed along the ISO 14001 EMS guidelines, with the aim of achieving certification to this standard
- ❑ Through an EMS already certified against the ISO 14001 EMS standard

2. Which of the following practices or procedures form part of your organisation's Environmental Management Systems (EMS)?

- ❑ Environmental donations or sponsorship
- ❑ Recycling and energy saving in office and site buildings
- ❑ Implementing technology that has environmental benefit
- ❑ A formulated and documented Environmental Policy
- ❑ Maintaining a register of significant environmental effects or impacts of the organisation's activities, products or services
- ❑ Goals & objectives for future environmental performance
- ❑ Quantified targets against which to measure environmental performance
- ❑ A program for achieving stated environmental objectives and targets, specifying e.g. the designation of responsibilities, allocation of resources and time frames
- ❑ An inventory or register of relevant legislative & regulatory requirements and procedures for updating these
- ❑ A training program for all personnel involved in environmental management or whose work may cause significant environmental impacts
- ❑ Emergency response plans or procedures based on a comprehensive hazard assessment
- ❑ Periodic management reviews of the suitability, effectiveness & adequacy of environmental initiatives and/or an EMS
- ❑ Other (specify):

3. Which of the following techniques form part of your organisation's approach to environmental issues?

- ❑ Environmental impact assessments
- ❑ Environmental management programs
- ❑ Environmental risk or hazard assessment
- ❑ Life cycle assessment
- ❑ Eco labelling
- ❑ Public environmental reporting
- ❑ Environmental accounting system
- ❑ Internal environmental audits
- ❑ External environmental audits (by whom?):

4. Have you quantified the financial benefits of your EMS?

- ❑ Yes (Financial benefits):

- ❑ No

5. Have you quantified the financial cost of your EMS?

- ❑ Yes (Financial cost):
- ❑ No

6. What does this cost include?

- ❑ Personnel
- ❑ Training
- ❑ Capital expenditure (i.e. process technology)
- ❑ Information systems
- ❑ Sponsorships
- ❑ Consultants
- ❑ Other:

7. What do you perceive to be the benefits of having implemented and of maintaining your EMS?

- ❑ Improving the overall level of environmental performance
- ❑ Improving the environmental risk management system
- ❑ Controlling costs through more efficient use of materials, resources and energy
- ❑ Increasing assurance of compliance with environmental legislation and regulations
- ❑ Reducing the likelihood of unforeseen environmental liabilities
- ❑ Demonstrating due diligence in environmental management
- ❑ Decreasing insurance premiums due to decreased environmental risk
- ❑ Potential increase in market share resulting from 'greener' practices, products and services.
- ❑ Meeting the expectations of vendors and suppliers
- ❑ Protecting & enhancing the organisation's image
- ❑ Meeting the expectations or buying preferences of consumers or clients
- ❑ Ensuring acceptability in international trade and relations
- ❑ Improving the perceptions of the public and relationship with the community
- ❑ Other (specify):

8. What problems does your organisation experience in implementing environmental initiatives and/or an EMS?

- ❑ High investment costs
- ❑ Poor measurable return on investment or lack of anticipated cost savings
- ❑ Lack of top management commitment
- ❑ Uncertainty about the benefits of implementing an EMS
- ❑ Resistance to change in current business activities
- ❑ Lack of resources available for implementation
- ❑ Lack of public or stakeholder interest in improved environmental performance
- ❑ Potential for increased expectations by public and stakeholders
- ❑ Increased demands on administration and documentation
- ❑ Perceived or actual inflexibly of an EMS
- ❑ Lack of support, incentives and efficiency from government and local authorities
- ❑ Lack of improvement in environmental performance in spite of implementing an EMS
- ❑ Perceived conflicts of interest with other divisions, or business or corporate goals
- ❑ Other (specify): _________

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