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THE ENVIRONMENTAL MANAGEMENT ACTIVITIES AND SUSTAINABLE COMPETITIVE ADVANTAGE ON THE MARKET

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Abstract. Currently, an ever-increasing number of organizations are recognizing the importance of environmental protection. One of the progressive decisions for the company's management is the implementation of an environmental management system. Through environmental management implementation, companies can find solutions to manage individual business activities which do not cause environmental degradation. The environmental management system will ensure optimal management of the company's activities so that environmental risks are minimized. Considering the above-mentioned, the main objective of the presented article is to evaluate the environmental management system and call attention to the benefits and risks that affect the company's competitiveness. The world is changing, and organizations in general can assume a key role in fulfilling the 2030 Agenda, because only by correctly setting up the individual processes can organizations positively influence the reduction of their costs, the creation of profit and competitiveness in today's turbulent market. The implementation of environmental management systems is also supported by the selected organization. The organization's integrated management system mitigates the impact on environmental pollution and increases its competitiveness, which also adjusts the results of the questionnaire survey conducted with the organization's managers. In addition, the implementation of environmental management systems allows the organization to analyze not only the impact on the environment or its competitiveness but also the future direction of the organization.

Keywords: environmental management, environmental management system (EMS), ISO 14001, competitive advantage, Agenda 2030.

JEL Classification: Q01, Q54, F18.

Introduction

The most pressing issue on the planet is climate change, which is an increasing threat to society and demands collaborative efforts to change technologies, production methods, and consumption patterns. The current circumstance requires reversing the trends by changing to a more sustainable model of production and consumption (Durán-Romero et al., 2020). Conditions and technologies for sustainable manufacturing are no longer an option; rather, they are an unavoidable choice as a result of the ever-increasing concern to protect the environment from industrial pollution. Having compatible production technologies is one aspect of this extremely complex issue. However, it is also necessary to have an appropriate management system or a specific set of laws to reduce pollution (Alberti et al., 2000; Mol & Sonnenfeld, 2000). This is the situation that forces companies worldwide to adopt various standards, such as ISO 14001 as an international standard focused on environmental management in organizations, or the EMAS scheme as a voluntary environmental management tool for organizations that want to evaluate and improve their environmental performance. Products, procedures, and management are all examples of environmentally friendly practices which can be implemented in the company's performance. The company will consider environmental factors in these reasons to maintain control over polluting emissions or the desire to increase visibility in the community where the company operates (Alberti et al., 2000; Hall, 2001). The global economy is leading to rapidly expanding standardization of products, processes, and management;

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this green growth, which combines environmental goals with economic and social ones, has emerged as an alternative development strategy in recent years (Ikram et al., 2020). On the other hand, many companies are struggling with financial problems, which acts as a barrier to focusing on environmental goal (Hupková et al., 2022). The increased use of formal environmental management systems (EMS) like ISO 14001 has been accompanied by the eagerness of businesses to increase their productivity and economic performance in response to demands from the market (Prajogo et al., 2014). This study links the dynamic concept of green growth with management and ISO 14001 implementation.

1. Literature review

Different authors' definitions of the environmental management system are very similar. The British Standards Institute defines the environmental management system (EMS) as the responsibilities, practices, procedures, processes, and resources of the organization that determines and implements an environmental policy, which typically includes commitments to cut down on waste, pollution, energy, resource use, establishes goals, and evaluates the organization's environmental performance. Companies in the Slovak Republic have been gradually adopting several concepts and tools for measuring and managing performance (Dobošová et al., 2022). EMS as a systematic approach helps organizations improve environmental performance by evaluating and tracking environmental issues, minimizing risk, and reducing business overheads. Accredited EMS results in greater environmental engagement, accountability, and integrity (Pour, 2012; D'Souza et al., 2019; Croner-i, 2022). Currently, there are three main EMS models available for different types of organizations (ISO 14001, ISO 14005, and, the Eco-management and Audit Scheme – EMAS). The most commonly used is the ISO 14001 certification (Omri & Hadj, 2020). According to Zorpas (2010), voluntary self-regulatory initiatives like the eco-management and audit scheme (EMAS) and the international environmental management system standard ISO 14001 aim to give all businesses the tools they need to come up with methodical strategies to increase environmental performance. Implementing EMS in the company is positively associated with the reduction of harmful emissions and positively correlated with environmental performance (Halis & Halis, 2016; Huang & Ho, 2017).

Several ISO standards aid in the monitoring of climate change, the quantification of greenhouse gas emissions, and the dissemination of best environmental management practices. A remarkable example of contribution to the Sustainable development goals (SDGs) of Agenda 2030, namely Goal 13: Climate Action Take urgent action to combat climate change and its impacts, is the ISO 14000 family of environmental management system standards, which provide organizations with useful tools for controlling their environmental impact (Climate Action, 2022).

ISO 14001 is the standard that is used most frequently to help organizations of all sizes and types, including private businesses, non-profits, and government agencies, improve their environmental performance. ISO 14001 as a certifiable process-oriented standard adopted voluntarily can be applied across different industry sectors and geographic regions (Dissou, 2005; Baek, 2018; Heras-Saizarbitoria & Boiral, 2013). Even though some experts consider this standard to be a "soft law" solution because they are not legally enforceable, it may be able to fill many governance and accountability gaps for which there is no applicable regulation or enforcement Organizations that implement this standard in its entirety can gain a competitive advantage over their rivals, build their reputation, and increase their legitimacy among stakeholders (Nakamura et al., 2001; Beck et al., 2017; Balluchi et al., 2021).

ISO 14001:2015 *Environmental Management Systems. Requirements with Guidance for Use* developed by International Standards Organization's Technical Committee ISO/TC 207 and its various sub-committees explain the essential requirements for certification in environmental management, such as frameworks, audits, communications, labeling, life-cycle analysis, and methods to mitigate and adapt to climate change. In general, it identifies the requirements for an efficient environmental management system and encourages organizations to minimize their impact on the environment toward achieving continuous improvements in their organizational approaches (Chiarini, 2019; Bravi et al., 2020; ISO 14001:2015, 2022; Camilleri, 2022).

The ISO 14001 implementation makes significant advancements, not only from an organizational point of view, as evidenced by cost savings, shorter delivery times, resource optimization, improved management control, and enhancements in employee results, as evidenced by satisfaction with motivation, but also from a market point of view, as evidenced by enhancements in customer satisfaction, image, relationship with suppliers, and improved positioning in the market, among other factors (Darnall et al., 2010; Djekic et al., 2014; Mazzi et al., 2016).

2. Material and methodology

Several research methods were used in the methodology aimed at achieving the primary goal of this paper. The synthesis, analysis, and selection approach was primarily applied in this study. In this context, professional literature, scientific articles, statistical data, and scientific studies were primary and secondary sources of information. The organization in this study was selected based on the progress, it has been making in the field of environmental management in recent years and is taking a progressive approach to reducing the impact on the environment. The primary data was gathered through the

use of a questionnaire survey as the basis for the analysis. The scaling technique was used for measuring respondents' attitudes and opinions. Statements on which the respondents expressed their degree of agreement or disagreement were scaled by using a five-point Likert scale ranging from "strongly agree", through "neutral attitude", which is the midpoint of the scale, to "strongly disagree". The questionnaire was filled in by the environmental managers or people from the top management in charge of environmental management. Due to its many applications, the questionnaire is one of the most widely used methods in the social sciences. We can quickly and jointly determine the facts, opinions, attitudes, preferences, or needs and interests of the respondents while maintaining their anonymity by using the questionnaire as the primary research method. The data can be well evaluated, depending on the type of question, and the answers from the various groups can be easily compared because the wording is consistent. In principle, the survey's purpose and target audience determine the questionnaire's content, number, and type of questions.

The questionnaire consisted of four main parts measuring the impact of the implementation of the ISO 14001 standard on the:

- sustainability of the company
- company's financial resources
- on customer relations
- on the processes in the company

The survey was conducted from November 2022 – January 2023 by emailing a link to an electronic questionnaire to avoid the need for the researcher to be present.

2.1. Characteristics of the company

The organization used in this study was founded on a green meadow and has been operating in the Slovak market for 15 years. Its parent company is based in Austria and has been active in the industrial sector since 1927. Within a globally active group, our selected company is an important manufacturing plant in the field of friction lining technology, which is used in transmissions, axels, brakes, and engines of cars, construction machinery, tractors, or mining technology. Management prioritizes four core values, namely technology leadership, lifelong learning, entrepreneurship, and passion for success. The basis of the company's new strategy is its mission "Technology for a cleaner planet". This mission gives the company direction, motivation, and a driving force toward more sustainable production.

Management is used in the company as a tool for increasing productivity, competitiveness, and environmental level. Increased competition and growing customer requirements have forced companies to look for new methods to achieve better efficiency. Many studies found that implementing an environmental management system in particular, standard ISO 14001 had performance benefits through continuous improvement and by undertaking environmental initiatives (Sroufe, 2009; Fura, 2013; de Jong et al., 2014; Su et al., 2015).

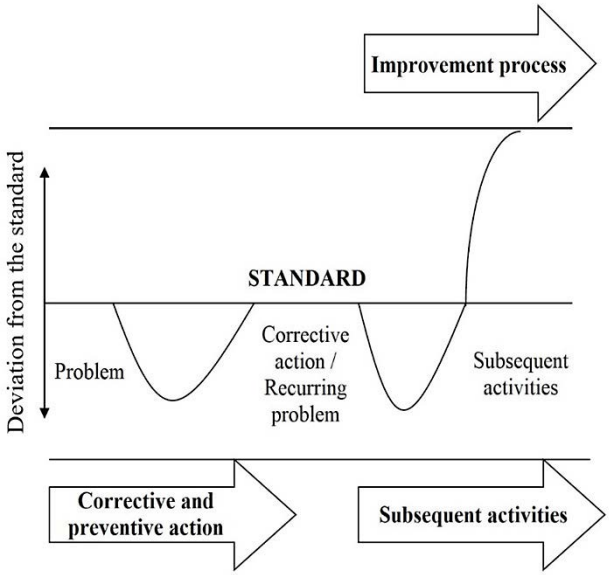

Figure 1. Management review process

The company operates an integrated management system that helps it to increase the quality of production while simultaneously reducing the impact on the environment. Utilizing an integrated management system, a management review process is implemented in the company, which makes it possible to improve the strategic direction of the company.

In case of disagreement, corrective action will be taken to eliminate negative impacts (Figure 1). However, all disagreements must be proportionate to the seriousness of the problem and the impact on the environment. The owners of the process where the disagreement occurred are responsible for correcting the activity. The continuous improvement process concerns the entire organization and all employees in it, regardless of competence.

Environmental protection is also part of the company's integrated management system. The company has implemented an environmental management system according to the ISO 14001 standard and applied several ecological principles. They ensure these through the correct identification and understanding of requirements and expectations from interested parties. The result is an increase in trust between customers and the company, prevention of unwanted results, or the possibility of increasing market share and subsequent improvement of the company's competitiveness in today's turbulent market.

2.2. Respondents' profile

The subject of a questionnaire survey carried out for managers in the company was the impact of the ISO 14001 standard on the sustainability of the company, relations with customers, and the impact of the company's financial resources and processes.

A total of 31 managers took part in the survey, i.e. 88% of the total number of 35 managers in the organization (Figure 2).

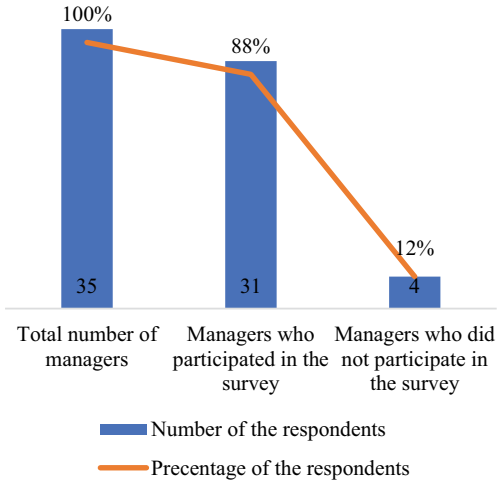

Figure 2. The study sample

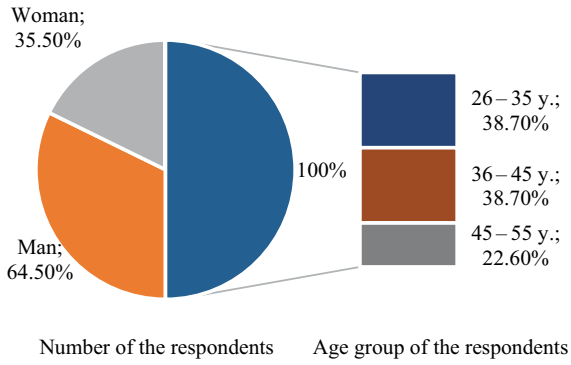

Figure 3. Structure of the respondents

Management positions in the selected company are occupied by more men, which was also reflected in the structure of the respondents. 64.5% of men and 35.5% of women took part in the survey. From the age structure of the respondents, three categories were represented. The same percentage of respondents, namely 38.7%, was in the age categories of 26–35 years and 36–45 years. The company is mainly managed by the younger generation, which has a positive effect on solving environmental problems, as this generation is increasingly interested in this issue (Figure 3).

2.3. Statistical analysis

The relationships between categorical variables were examined using the statistical technique known as the chi-square test of goodness. Particular qualitative statistical characteristics, particularly the measurement of dependencies (associations), were the focus of attention. We employ the CHIQ.INV function and the necessary formulas in Microsoft Excel to carry out the statistical analysis. The XL Stat statistics program from Addinsoft (version 2019.2) was then used to evaluate all of the data. The alpha value is chosen and our null and alternative hypotheses are defined. Our willingness to take a risk to demonstrate our independence was set at $\alpha = 0.05$. If the critical value (p-value) is less than a significant level (α), the alternative hypothesis is accepted and the null hypothesis is rejected. If the dependence between the analyzed features is confirmed, we used Cramer's V-coefficient and Pearson's C-coefficient to determine the degree of dependency.

3. Final survey results and discussion

The concept of the ISO 14001 is that a company can improve its environmental performance by systematically identifying and managing its environmental tasks. These tasks can be achieved through pollution prevention and by complying with the applicable laws. Given that ISO 14001 certification is regarded as an important criterion for measuring a company's enthusiasm for voluntary environmental regulation, ISO 14001 certification is an essential means for businesses to obtain a competitive advantage. ISO 14001 adoption also guides managers in developing an environmental policy by specifying the routines to apply to control the firm's environmental impact (Wang & Zhao, 2020; Sam & Song, 2022; Arocena et al., 2023).

A survey among management employees in the company pointed out that the implementation of the ISO 14001 standard significantly changed the company's attitude toward sustainability. Thanks to the ISO 14001 system, the selected company can constantly improve its environmental behavior in the organization, which is also confirmed by 41.9% of managers. The standard also helps managers to constantly monitor applicable legislation and prevent environmental risks in the company. Also, more than 19% of managers perceive the impact of ISO 14001 as a benefit to solving more environmental problems in the company (Figure 4).

According to the result of the questionnaire survey presented in Figure 5, up to 80.6% agree that the implementation of the ISO 14001 standard has affected the company's financial resources because the certification process brings increased costs for the company. An interesting finding is that 48.4% of the respondents expressed a neutral attitude in the case of cost reduction after the implementation of the ISO 14001 standard in the long term. This may be the tendency of specialist managers to focus on short-term profit maximization, which is at odds with sustainability. Similar results were also observed in the case of the perception of financial return compared to the initial investment when 51.6% of managers agreed and 38.7% of managers took a neutral position.

Without the implementation of the ISO 14001 standards, the company could lose some customers. As we see in Figure 5 80.6% of respondents also perceive the significant impact of the ISO 14001 standard on relations with customers, while they are primarily aware of the improvement in communication. 16% of respondents had a neutral attitude towards customers, and 3.2% do not

identify with this influence. According to the respondents, the biggest impact on customers is the improvement of the company's reputation after the introduction of the ISO 14001 standard. The standard also contributes to taking into account the interests of the company's stakeholders, strengthening relationships with customers, and motivating suppliers to adopt an environmental management system (Figure 6).

Companies are increasingly adopting the ISO 14001 standards in their business models to achieve more efficient use of resources and sustainable development. To the customers, it is a signal of their environmental responsibility. Certification provides information that allows customers to identify environmental responsibility as a criterion in their purchasing decisions and thus prefer to support companies with high-quality environmental performance. We can state that modern consumers are becoming increasingly interested in environmental issues (King et al., 2005; Aravind & Christmann, 2011; Švikruhová et al., 2022).

The survey found that there is strong support and motivation from top management in the company in the management of environmental management. This support is crucial at ISO 14001 because without it the company could hardly enforce real environmental protection at the corporate level. Up to 74.2% of respondents believe that ISO 14001 has caused comprehensive integration of environmental management into company management. In terms of environmental protection, after the implementation of ISO 14001, we found that 25.8% of respondents expressed a favorable attitude and 64.5% agreed that the standard affects environmental protection and 9.7% were not known to express. Implementation of ISO 14001 brings to the company of innovation and improvement of overall efficiency, thanks to which the company has a leading technology position and excels in global competition (Figure 7).

Through the statistical analysis of the achieved results, we examined the degree of dependence between the

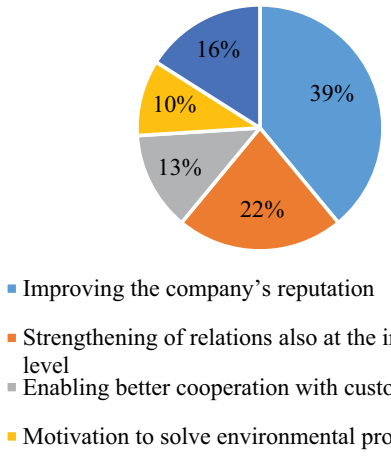

Figure 6. Impact on customers after the implementation of ISO 14001 standard

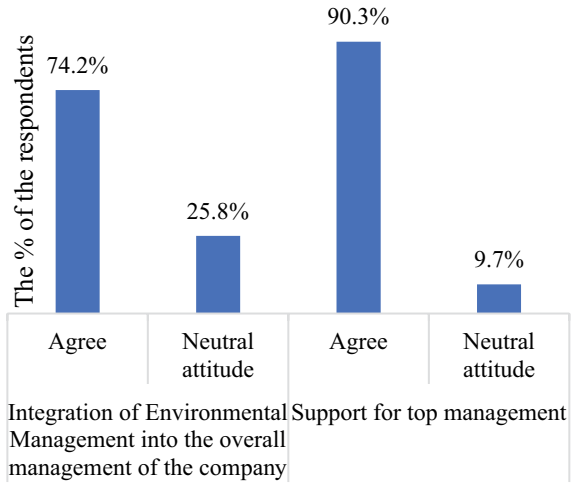

Figure 7. Impact of ISO 14001 on processes in the company

selected qualitative features. Association testing consists in determining whether there is a dependency between features. We examined 2 groups of qualitative statistical features:

1. The dependence between the age and the motivation of employees after the introduction of ISO 14001 for behavior at work that takes the environment into account.
2. The dependence between age and consideration of the environmental dimension of changes when adopting new proposals for changes and technologies after the implementation of ISO 14001.

The critical value of the chi-square of the first group of qualitative statistical features acquires a value [12.59] which is lower than the value of the chi-square [14.98]. This means that there is a statistical dependence between the age and the motivation of managers after the introduction of the ISO 14001 standard to behave at work that considers the environment. In the next step, we determined the intensity of this dependence. We used Pearson's r and Cramer's V that takes on values in the interval from 0 (no relationship) to 1 (perfect relationship). In our case, Pearson's r reached the value of [0.57] and the Cramer's V reached the value of [0.49], which means that it is a moderately strong statistical dependence. The value of the chi-square of the second group of qualitative statistical features acquires a value [2.55]. The critical value of acquires value is [9.49]. From the comparison of these two values, we concluded that there is no statistical dependence between age and consideration of the environmental dimension of changes when adopting new proposals for changes and technologies (Figure 8).

Conclusions

The ISO 14001 standard not only affects the sustainability of the company but also significantly affects the company's financial resources, customers, and processes. From the results of the questionnaire survey conducted among managers in the selected company, we came to

the conclusion that there is strong support from management in the field of environmental management within the company, which results in the successful implementation of the ISO 14001 standards. This is manifested in a significant way primarily in the saving of material and energy requirements and in the increase of the company's competitiveness. The implementation of the ISO 14001 standard changed also the environmental behavior of the company and the attitude of employees when adopting new processes. From the statistical evaluation, we came to the conclusion that there is a statistical dependence between age and the perception of environmental responsibility. Young people are quite keenly aware of the impacts and seriousness of the climate crisis we are facing, which is also reflected in the results of surveys, which confirmed that the implementation of the environmental management system according to the ISO 14001 standards changed the attitude of employees towards responsibility for environmental impacts. The employees take into account the environmental dimension when accepting new process proposals, which was reflected in the innovation of technologies. Based on a questionnaire survey, we found that a large amount of paperwork is related to the implementation of the ISO 14001 standards. Selected recommendations were introduced for the company based on the request that was received. The company should increase qualifications in the field of the environment at the workplace. As part of the efficiency of environmental management in the company, we recommend increasing and constantly re-educating the company's employees in the field of environmental protection. Regular retraining must also be ensured for internal auditors who are responsible for the internal audit of environmental management. In this way, the company can ensure that internal audits are carried out regularly, according to the program. We recommend that companies minimize the printing of documents as much as possible, or use double-sided printing on recyclable paper. The company should focus on the use of inkjet printers as opposed to laser printers, which have a lower impact on the environment. Of course, we know that our research has its limitation. We understand this research as a pilot and in the future, we plan to expand the research sample to include companies operating in the same industry and compare the results achieved. The current economic model based on the concept of a linear approach makes it possible to extract natural resources and export them to the opposite end of the world, where they are changed into products that the consumer buys, uses, and in the end throws away. This system is unsustainable, whether economically, socially, or environmentally. Sustainability and environmental protection are currently the key activities that not only companies but also society must address and apply in everyday life. One of the solutions by which the company can improve its environmental behavior is the implementation of an environmental management system according to the ISO 14001 standards, which will provide the company with an organizational framework for environmental protection and enable it to respond promptly to changing environmental conditions. On the basis of domestic and foreign studied literary sources, we can conclude that by implementing the environmental management system, the company can decrease its impact on environmental pollution. The involvement of the entire management in the implementation of ISO 14001 is very important. When implementing an environmental management system according to ISO 14001 standards, continuous education of all company employees and proper communication at all levels of management is important. The initial costs related to the implementation of the standard are higher, but in the long term, the result can lead to an increase in the company's competitiveness. The implementation of the ISO 14001 standard brought, in addition to cost reductions, benefits in the form of energy savings, reductions in fossil fuel consumption, reductions in material and energy requirements, and, as a result, the elimination of waste. The selected company has become a market leader in the field of technology thanks to the implementation of ISO 14001 standards, which caused solutions and consideration of the environmental dimension when adopting new processes.

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References

Alberti, M., Caini, L., Calabrese, A., & Rossi, D. (2000). Evaluation of the costs and benefits of an environmental management system. *International Journal of Production Research*, *38*(17), 4455–4466. https://doi.org/10.1080/00207540050205226

Aravind, D., & Christmann, P. (2011). Decoupling of standard implementation from certification: Does quality of ISO 14001 implementation affect facilities' environmental performance? *Business Ethics Quarterly*, *21*(1), 73–102. https://doi.org/10.5840/beq20112114

Arocena, P., Orcos, R., & Zouaghi, F. (2023). The scope of implementation of ISO 14001 by multinational enterprises: The role of liabilities of origin. *Journal of Environmental Management*, *327*, 116844. https://doi.org/10.1016/j.jenvman.2022.116844

Baek, K. (2018). Sustainable development and pollutant outcomes: The case of ISO 14001 in Korea. *Corporate Social Responsibility and Environmental Management*, *25*(5), 825–832. https://doi.org/10.1002/csr.1498

Balluchi, F., Lazzini, A., & Torelli, R. (2021). The credibility of environmental issues in non-financial mandatory disclo-

sure: Measurement and determinants. *Journal of Cleaner Production*, *288*, 125744. https://doi.org/10.1016/j.jclepro.2020.125744

Beck, C., Dumay, J., & Frost, G. R. (2017). In pursuit of a 'Single Source of Truth': From threatened legitimacy to integrated reporting. *Journal of Business Ethics*, *141*(1), 191–205. https://doi.org/10.1007/s10551-014-2423-1

Bravi, L., Santos, G., Pagano, A., & Murmura, F. (2020). Environmental management system according to ISO 14001:2015 as a driver to sustainable development. *Corporate Social Responsibility and Environmental Management*, *27*(6), 2599–2614. https://doi.org/10.1002/csr.1985

Camilleri, M. A. (2022). The rationale for ISO 14001 certification: A systematic review and a cost–benefit analysis. *Corporate Social Responsibility and Environmental Management*, *29*(4), 1067–1083. https://doi.org/10.1002/csr.2254

Chiarini, A. (2019). Factors for succeeding in ISO 14001 implementation in Italian construction industry. *Business Strategy and the Environment*, *28*(5), 794–803. https://doi.org/10.1002/bse.2281

Climate Action. (2022, November 10). *ISO*. https://www.iso.org/sdg/SDG13.html

Croner-i. (2022, June 9). *An introduction to environmental management systems* (*EMS*): *In-depth*. https://app.croneri.co.uk/topics/introduction-environmental-management-systems-ems/indepth

Darnall, N., Henriques, I., & Sadorsky, P. (2010). Adopting proactive environmental strategy: The influence of stakeholders and firm size. *Journal of Management Studies*, *47*(6), 1072–1094. https://doi.org/10.1111/j.1467-6486.2009.00873.x

De Jong, P. J., Paulraj, A., & Blome, C. (2014). The financial impact of ISO 14001 certification: Top-line, bottom-line, or both? *Journal of Business Ethics*, *119*(1), 131–149. https://doi.org/10.1007/s10551-012-1604-z

Dissou, Y. (2005). Cost-effectiveness of the performance standard system to reduce CO2 emissions in Canada: A general equilibrium analysis. *Resource and Energy Economics*, *27*(3), 187–207. https://doi.org/10.1016/j.reseneeco.2004.06.003

Djekic, I., Rajkovic, A., Tomic, N., Smigic, N., & Radovanovic, R. (2014). Environmental management effects in certified Serbian food companies. *Journal of Cleaner Production*, *76*, 196–199. https://doi.org/10.1016/j.jclepro.2014.04.062

Dobošová, Ľ., Hupková, D., Švikruhová, P., Beňuš, O., & Gurčík, Ľ. (2022). Analysis of deviations – the role of controlling in small and medium sized agricultural enterprises. *AGRIS On-Line Papers in Economics and Informatics*, *14*(1), 33–43. https://doi.org/10.7160/aol.2022.140103

Durán-Romero, G., López, A. M., Beliaeva, T., Ferasso, M., Garonne, C., & Jones, P. W. (2020). Bridging the gap between circular economy and climate change mitigation policies through eco-innovations and Quintuple Helix Model. *Technological Forecasting and Social Change*, *160*, 120246. https://doi.org/10.1016/j.techfore.2020.120246

D'Souza, C., Marjoribanks, T., Young, S., Mort, G. S., Nanere, M., & John, J. J. (2019). Environmental management systems: An alternative marketing strategy for sustainability. *Journal of Strategic Marketing*, *27*(5), 417–434. https://doi.org/10.1080/0965254X.2018.1430054

Fura, B. (2013). Improving ISO 14001 environmental management systems. *Polish Journal of Environmental Studies*, *22*(6), 1711–1721. http://agro.icm.edu.pl/agro/element/bwmeta1.element.agro-7a62a011-3a21-443c-a049-4e3b4d75fab6

Halis, M., & Halis, M. (2016). Relationship between environmental management systems implementation and environmental performance: Findings from Turkish EMS certificated businesses. *International Journal of Organizational Leadership*, *5*(2), 137–150. https://doi.org/10.33844/ijol.2016.60330

Hall, J. (2001). Environmental supply-chain innovation. *Greener Management International*, *2001*(35), 105–119. https://doi.org/10.9774/GLEAF.3062.2001.au.00010

Heras-Saizarbitoria, I., & Boiral, O. (2013). ISO 9001 and ISO 14001: Towards a research agenda on management system standards*. *International Journal of Management Reviews*, *15*(1), 47–65. https://doi.org/10.1111/j.1468-2370.2012.00334.x

Huang, C., & Ho, Y. (2017). Governance and economic growth in Asia. *The North American Journal of Economics and Finance*, *39*, 260–272. https://doi.org/10.1016/j.najef.2016.10.010

Hupková, D., Dobošová, L., Synetska, Y., & Loučanová, E. (2022). The level of planning in small and medium-sized enterprises in the agricultural sector in Slovakia in relation to green controlling considering climate change. In *Proceedings of the International Scientific Days 2022: Efficient, Sustainable and Resilient Agriculture and Food Systems – the Interface of Science, Politics and Practice*. Slovak University of Agriculture in Nitra, Slovakia. https://doi.org/10.15414/isd2022.s1.07

Ikram, M., Zhang, Q., Sroufe, R., & Shah, S. A. A. (2020). Towards a sustainable environment: The nexus between ISO 14001, renewable energy consumption, access to electricity, agriculture and CO2 emissions in SAARC countries. *Sustainable Production and Consumption*, *22*, 218–230. https://doi.org/10.1016/j.spc.2020.03.011

International Organization for Standardisation. (2015). *Environmental management systems* (*ISO 14001:2015*). https://www.iso.org/standard/60857.html

International Organization for Standardisation. (2019). *Environmental management systems – Guidelines for a flexible approach to phased implementation* (*ISO 14005:2019*). https://www.iso.org/standard/72333.html

King, A. J., Lenox, M., & Terlaak, A. (2005). The strategic use of decentralized institutions: Exploring certification with the ISO 14001 management standard. *Academy of Management Journal*, *48*(6), 1091–1106. https://doi.org/10.5465/amj.2005.19573111

Mazzi, A., Toniolo, S., Mason, M., Aguiari, F., & Scipioni, A. (2016). What are the benefits and difficulties in adopting an environmental management system? The opinion of Italian organizations. *Journal of Cleaner Production*, *139*, 873–885. https://doi.org/10.1016/j.jclepro.2016.08.053

Mol, A. P., & Sonnenfeld, D. A. (2000). Ecological modernisation around the world: An introduction. *Environmental Politics*, *9*(1), 1–14. https://doi.org/10.1080/09644010008414510

Nakamura, M., Takahashi, T., & Vertinsky, I. (2001). Why Japanese firms choose to certify: A study of managerial responses to environmental issues. *Journal of Environmental Economics and Management*, *42*(1), 23–52. https://doi.org/10.1006/jeem.2000.1148

Omri, A., & Hadj, T. B. (2020). Foreign investment and air pollution: Do good governance and technological innovation matter? *Environmental Research*, *185*, 109469. https://doi.org/10.1016/j.envres.2020.109469

Pour, M. S. (2012). The effects of good governance on environmental quality. *Australian Journal of Basic and Applied*

Sciences, *6*(8), 437–443. https://www.cabdirect.org/cabdirect/abstract/20133032560

Prajogo, D. I., Tang, A. K., & Lai, K. (2014). The diffusion of environmental management system and its effect on environmental management practices. *International Journal of Operations & Production Management*, *34*(5), 565–585. https://doi.org/10.1108/IJOPM-10-2012-0448

Sam, A. G., & Song, D. (2022). ISO 14001 certification and industrial decarbonization: An empirical study. *Journal of Environmental Management*, *323*, 116169. https://doi.org/10.1016/j.jenvman.2022.116169

Sroufe, R. (2009). Effects of environmental management systems on environmental management practices and operations. *Production and Operations Management*, *12*(3), 416–431. https://doi.org/10.1111/j.1937-5956.2003.tb00212.x

Su, H., Dhanorkar, S., & Linderman, K. (2015). A competitive advantage from the implementation timing of ISO management standards. *Journal of Operations Management*, *37*(1), 31–44. https://doi.org/10.1016/j.jom.2015.03.004

Švikruhová, P., Zabojníková, V., & Kapsdorferová, Z. (2022). Environmental management in the field of sustainable development. In *The 12th International Scientific Conference „Business and Management"*. Vilnius Gediminas Technical University. https://doi.org/10.3846/bm.2022.764

Wang, J., & Zhao, M. (2020). Economic impacts of ISO 14001 certification in China and the moderating role of firm size and age. *Journal of Cleaner Production*, *274*, 123059. https://doi.org/10.1016/j.jclepro.2020.123059

Zorpas, A. A. (2010). Environmental management systems as sustainable tools in the way of life for the SMEs and VSMEs. *Bioresource Technology*, *101*(6), 1544–1557. https://doi.org/10.1016/j.biortech.2009.10.022