

Key factors for iso 14001 adoption and its ranking in industrial companies - case of morocco

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RESUME

Aujourd'hui, la norme ISO 14001 est devenue une référence essentielle dans le domaine de la gestion environnementale des entreprises. Il a été révélé que l'adoption de l'ISO 14001 peut être motivée par certains facteurs internes et externes. Le but de cet article est de classer les facteurs clés qui sont responsables de l'adoption de l'ISO 14001 dans les entreprises industrielles marocaines. Les principaux facteurs ont été définis par le biais d'une enquête exploratoire par questionnaire. Ensuite nous avons regroupé les facteurs selon la littérature. Un deuxième questionnaire détaillé a été envoyé aux entreprises de l'échantillon et un classement est effectué en donnant un poids à des facteurs en fonction des résultats de l'enquête. Nos résultats suggèrent que les principaux facteurs de la mise en œuvre et de la certification selon la norme ISO 14001 dans les entreprises marocaines sont la pression des clients et les exigences légales.

ABSTRACT

Today, the ISO 14001 standard has become an essential reference in the field of environmental management of companies. It has been revealed that the adoption of ISO 14001 can be motivated by some internal and external factors. The purpose of this paper is to rank the key factors which are responsible for ISO 14001 adoption in Moroccan industrial companies. The main factors were set through a first exploratory questionnaire survey. In the second step, we grouped the factors according to the literature. A second detailed questionnaire has been carried out and ranking is done by giving weightage to factors based on survey reports. Our findings suggest that the main drivers to implement and certify ISO 14001 standards in Moroccan companies are customer pressure and legal requirements.

Keywords: Environment, Environmental management system, ISO 14001 certification, Morocco

1. INTRODUCTION

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From the late 1990s until today, the adoption of environmental management systems by companies has increased significantly around the world. This is an environmental practice that has become increasingly widespread (Morrow and Rondinelli, 2002). From the 1990s, the first reflections on environmental management led to the establishment of management systems aimed at integrating environmental concerns into the daily activities of companies (Boiral, 2000). These reflections were followed by the launch, in 1996 by the International Organization for Standardization, of the ISO 14001 standard relating to the environmental management system. The international standard ISO 14001 is considered as the most advanced and widespread standard in terms of EMS. In recent years, ISO 14001 certification has grown significantly in most countries around the world.

From 1999 until the end of 2019, more than 310000 certificates had been issued, 487,950 sites certified in 197 countries, and more than 30 sectors covered by the certificates (ISO survey, 2019). Studies have shown that the degree of application of the standard can vary depending on several internal and external factors specific to each organization such as strategy, size, nature of activities, products or services, organizational culture, level of stakeholder mobilization, country of location, sector of activity highly regulated or not, and pressures from stakeholders (Nash and Ehrenfeld, 2001; Gendron, 2004; Boiral, 2004). In a recent research, Boiral *et al.* (2018) suggest that ISO 14001 adoption depend upon contingent (e.g. managerial commitment, employee motivation) and contextual (e.g. firm size, certification maturity) factors.

The objective of our article is to study the main factors for the adoption of ISO 14001 in Africa, where this subject is little discussed, and more particularly in Morocco. Our contribution consists in shedding light on this issue, notably by prioritising the above-mentioned adoption factors.

For this purpose, our paper reports the results of a survey that explored the main factors of the implementation of ISO 14001 standards for industrial companies based in Morocco, with the aim of ranking these factors that lead the companies to establish ISO 14001.

2. BACKGROUND AND LITERATURE REVIEW

The constant growth in the adoption of ISO 14001 has drawn the attention of numerous researchers who have studied a wide set of topics, including drivers leading companies to implement this standard. In our analysis below, we try to examine both theoretical and empirical studies to analyze the scientific debate in this field and identify the main causes for the introduction of ISO 14001. Besides, we tried to understand the adoption of ISO 14001 through these theories in the Moroccan context.

2.1. Institutional and Resource-Based View theories perspectives

From a theoretical point of view, the most frequent approaches applied to this issue are the institutional theory (Selznick, 1957; DiMaggio and Powell, 1983) and the Resource-Based View (RBV) theory (Barney, 1991; Wernerfelt, 1984).

From an institutional point of view, the adoption and diffusion of ISO 14001 are primarily related to coercive, mimetic pressure, and normative pressures. Coercive pressure refers either to the pressure exerted by entities with resources on which an organization depends, for example customers, administration, suppliers and investors, or to social or cultural expectations existing in an environment (Heras-Saizarbitoria *et al.*, 2011). Mimetic pressure arises when an organization, not knowing what to do, imitates what other competitors are doing. Normative pressure is linked to compliance with professional standards and practices developed in professional networks and employee movements, or prescribed in training and education methods (Daddi *et al.*, 2016). When these networks become formalized, they exert great influence and isomorphic behaviors in organizations (Baek, 2017).

However, this perspective is criticized by some authors who argue that the external pressure makes practices, such as the ISO 14001 system, to be introduced more by reason of social legitimacy than for a real concern for efficiency (Aravind and Christmann, 2011; Boiral, 2007; Montiel, Husted and Christmann, 2012).

The second theory, unlike institutional theory, explains the sources of motivation from an internal point of view. Resource-Based View scholars argue that a firm's resources with distinctive attributes and capabilities would lead to its competitive advantage (Barney, 1991; Wernerfelt, 1984). The resources include tangible assets, such as its financial assets, physical plant and equipment, raw materials, as well as intangible assets that include its reputation, culture, and intellectual property (Barney, 1991). ISO 14001 can be seen as an intangible resource (Orsato, 2006; Baek, 2017).

In the empirical literature reviewed, there is a large consensus among researchers on the main external drivers of ISO 14001. In this literature, we found specially the influence of customer pressure in one hand, and in other hand, pressure exerted by government regulations and incentives (Delmas and Toffel, 2008; Hsu *et al.*, 2013; Zailani *et al.*, 2012). Nevertheless, results show different internal factors. Thus, among the most cited drivers, there is the desire to improve the external image of the company. The certification is seen as a source of competitive advantage, improving the company's external perception (Schylander and Martinuzzi, 2007; Viadiu *et al.*, 2006) and exerting a positive effect on public opinion (Orsato, 2006).

Some authors like Neumayer and Perkins (2004), Gonzalez-Benito and Gonzalez-Benito (2005), Orsato (2006), Heras-Saizarbitoria *et al.* (2011) and Tupputa *et al.* (2016) underline the fact that, increase efficiency—that is, an improvement in performance, productivity, and profitability—persuade company managers to adopt certain voluntary practices. Other authors argue that companies perceive the certification as “the right thing to do,” without expecting an economic return in the short term. This ethical reason is seen as an environmental motivation that drives some companies to seek ISO 14001 Certifications (Gonzalez-Benito and Gonzalez-Benito, 2005; Boiral, 2007).

2.2. Application in Moroccan content

Institutional theory or external factors are relevant to understanding the adoption of ISO 14001 in Morocco for the following reasons: First, Morocco's commitment to international governance in the field of the environment is traduced in several ways. Morocco successfully hosts many international conferences and summits (UN’s COP22 or 22nd Conference of the Parties to the United Nations Framework Convention on Climate Change in 2016, 2nd annual Climate Change Summit in 2017); and in terms of renewable energy, Morocco has an abundance of renewable resources, especially wind and solar power, and is a leader among the MENA countries in deploying clean energy technologies (Šimelytė, 2020). The Moroccan government has put an ambitious goal of bringing national renewable electricity production to 52% by 2030.

Second, with reference to coercive pressures, the national sustainable development strategy in Morocco is supported by numerous legal measures. A certain number of texts are promulgated, particularly the texts relating to: Protection and enhancement of the environment (law n° 11-03), Environmental impact studies (Decree No. 2-04-563 and No. 2-04-563), Waste Management (Decree n°2-07-253; Decree n°2-09-284...), and many other legal measures reinforcing environmental control and management (Cf. Ministry of Energy, Mines and Sustainable Development - Department of Sustainable Development, <https://www.mem.gov.ma>).

Last, speaking of normative pressures, Morocco adopts many social and educational actions each year materialized by The Mohammed VI Foundation for Environmental Protection that was established in 2001. The foundation manages almost 20 programs in the fields of environmental education, coastline, air and climate, sustainable tourism, the palm grove of Marrakech, and Morocco’s historic gardens. (Cf. <https://www.morocoworldnews.com/2019/12/288644/looking-back-at-princess-lalla-hasnas-2019-environment-initiatives/>).

2.3. Lack of works in Africa

After an examination of the literature on the drivers leading companies to adopt ISO 14001 certification, it is found there is an absence of empirical work reported on main drivers of ISO 14001 certification in companies based in Morocco. In Africa, to the best of our knowledge, only one work has been done (Alemagi *et al.*, 2006) presenting the drivers of implementing EMS in Cameroon. After deep investigation, it has been found that work in the above-mentioned country would be very much unique, up-to-date, and useful for African companies as well as companies located in Morocco.

2.4. The evolution of ISO 14001 analysis

Before presenting the results of the main drivers of ISO 14001 certification in Morocco, we see the need for analyzing first the evolution of ISO 14001 in the timeline. This analysis is based on the “ISO Survey of Management System Standard Certifications – 2019” document (ISO survey, 2019). It is an annual survey conducted on the number of approved given certificates according to ISO management system standards worldwide. The providers of data are the certification bodies accredited by the IAF MLA Members (International Accreditation Forum - Multilateral Recognition Arrangement). Available data helps to synthesize what has happened and what is in process all over the world. It must be highlighted that the surveys claim that the collection of data was launched around the time of the start of the outbreak of the COVID 19 pandemic across the world. However, despite the challenges faced by the certification bodies to adapt to the new situation, the participation in the survey was good and comparable to the previous year.

The number of certificates shows an increasing trend between 1999 and 2016 (ISO survey, 2019). Up to the end of December 2019, more than 310,000 certificates had been issued in 197 countries worldwide (Cf. Table 1 and Figure 1). On the other hand, a drastic reduction of growth in 2017, 2018, and 2019 are, according to the survey’s explanatory notes, due to a change in the manner in which certificates are counted by data providers.

Table I: Worldwide total of ISO 14001 certificates since 1999 (adapted from ISO survey, 2019)

Year	World total	World growth - absolute numbers	Number of countries/economies
2019	312,580	5,984	197
2018	306,596	-11,345	190
2017	317,941	-28,206	181
2016	346,147	26,651	201
2015	319,496	22,760	201
2014	296,736	22,875	170
2013	273,861	13,009	171

2012	260,852	17,537	167
2011	243,315	2,824	157
2010	240,491	17,517	156
2009	222,974	34,403	160
2008	188,571	33,999	156
2007	154,572	26,364	149
2006	128,208	17,122	141
2005	111,086	20,578	139
2004	90,508	25,524	128
2003	64,984	15,544	114
2002	49,440	12,976	117
2001	36,464	13,617	112
2000	22,847	8,853	98
1999	13,994		84

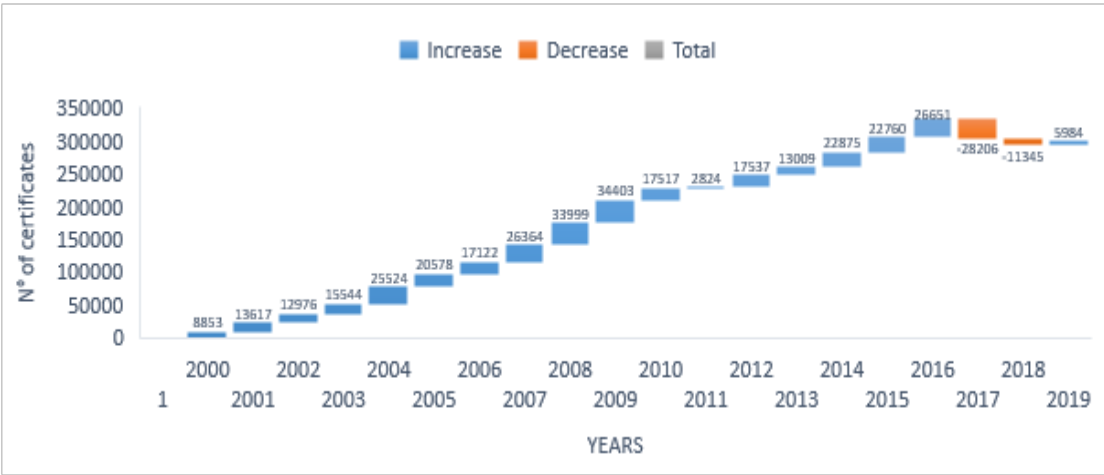


Figure 1. The annual growth in absolute numbers
Source: Own elaboration based on ISO survey (2019)

Examining the regional share of certificates in the period from January 1999 till December 2019, three elements were notably relevant. First, a continuous reduction of European countries’ percentage (compared to the overall number of certificates). Second, a parallel growth of East Asia and Pacific countries’ percentage. This phenomenon can be justified by the appearance of “emerging countries” such as China, for its large size represents 43.2% of total certificates in 2019. Third, only 0.9% of certificates were issued in African countries compared to the total issued certificates all over the world (Figure 2).

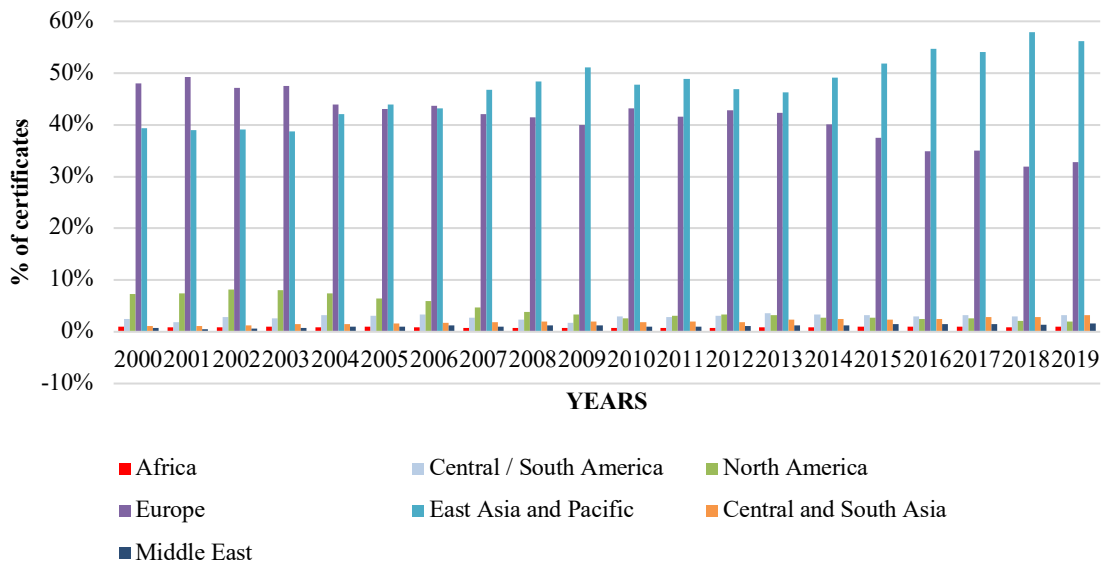


Figure 2. The Regional share - in %

Source: Own elaboration based on ISO survey (2019)

For better visualization and data analysis, figure 3 represents the evolution of the number of ISO 14001 certificates issued for countries that had more than 50 certifications on the African continent in 2019. It was noted that these countries show a pattern of growth regarding the certificates issued. The 8 countries studied were grouped according to the number of ISO 14001 certificates issued. Growth in the number of certificates issued is observed in most of the 8 countries studied (South Africa, Egypt, Tunisia, Morocco, Algeria, Nigeria, Kenya, and Zimbabwe). It can be seen in Figure 4 that countries with higher certification numbers are those stated by the African Development Bank as the largest economies contributing more than half of Africa’s growth in 2019. This fact is emphasized by Heras-Saizarbitoria et al. (2011) research, which states the environmental management system as a practical means for the implementation of an environmental approach, which can generate significant financial benefits and allow companies to grow and become more competitive: reduced costs and increased revenue, as presupposed by this research.

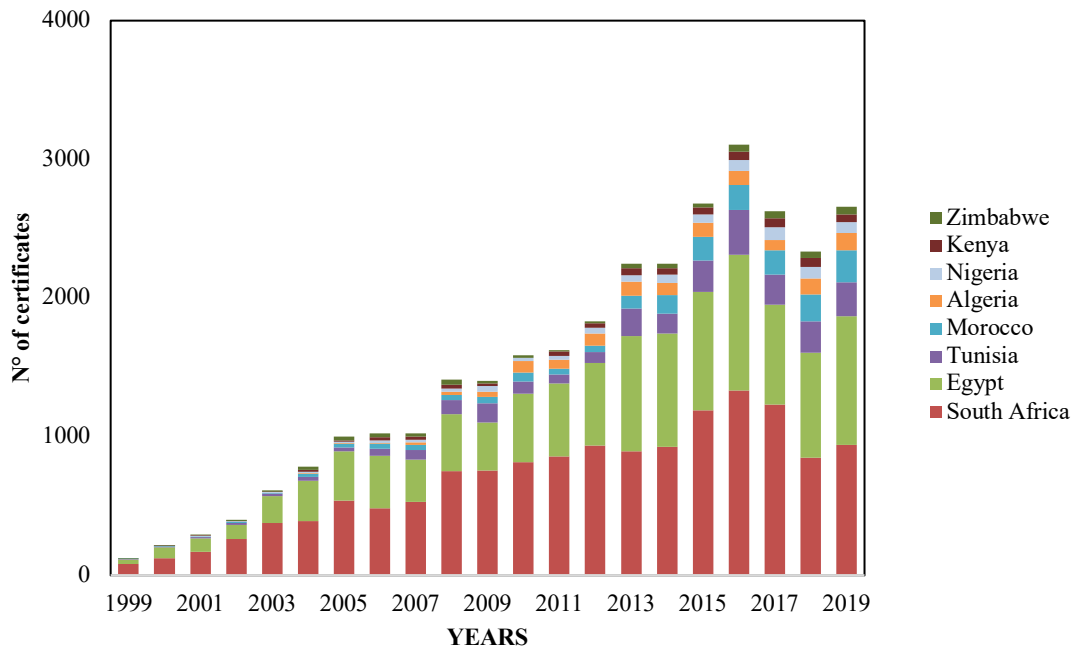


Figure 3. The ISO 14001 certificates evolution in Africa
 Source: Own elaboration based on ISO survey (2019)

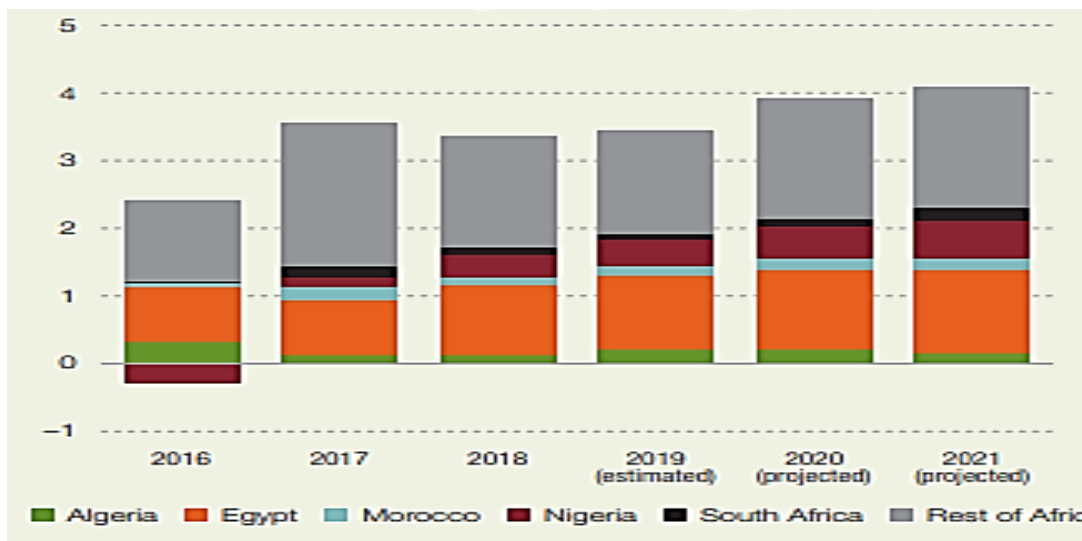


Figure 4. The big five economies of Algeria, Egypt, Morocco, Nigeria, and South Africa jointly accounted for 55 percent of Africa's growth in 2019
 Source: African Development Bank statistics.

Morocco, the country of our research, placed fourth with 231 certifications in 2019. Always switching between growth and decline, the evolution curve of the number of certificates for Morocco does not show a pattern of growth or stability regarding the certificates issued (Figure 5). The top five sectors in 2019, excluding unknown sectors, are transport, storage, communication (15), chemicals, chemical products, fibers (12), basic metal & fabricated metal

products (10), food products, beverage and tobacco (10), and other transport equipment (10) (Figure 6).

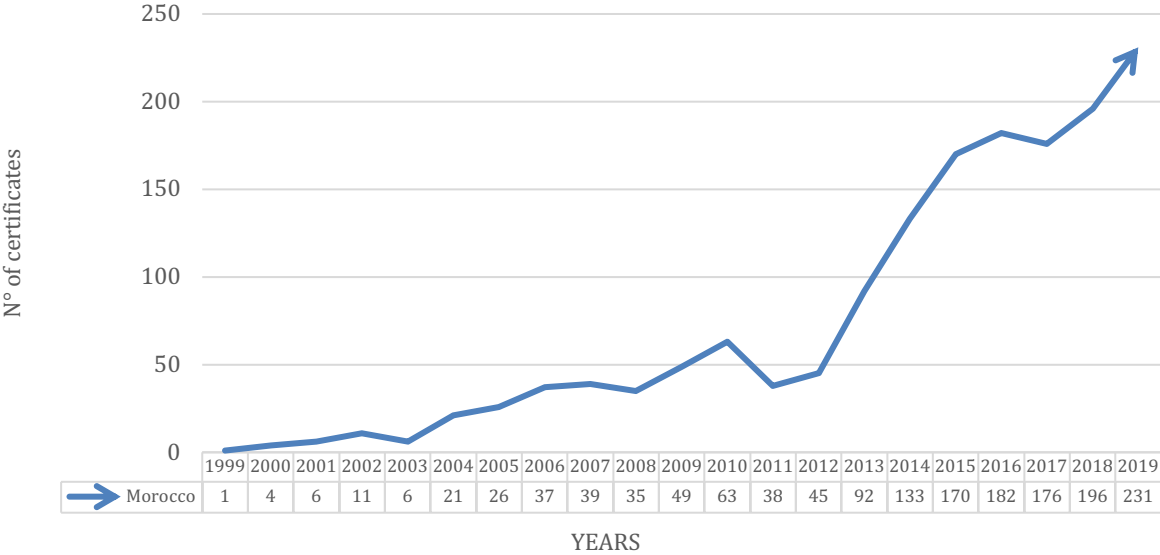


Figure 5. The ISO 14001 certificates evolution in Morocco
Own elaboration based on ISO survey (2019)

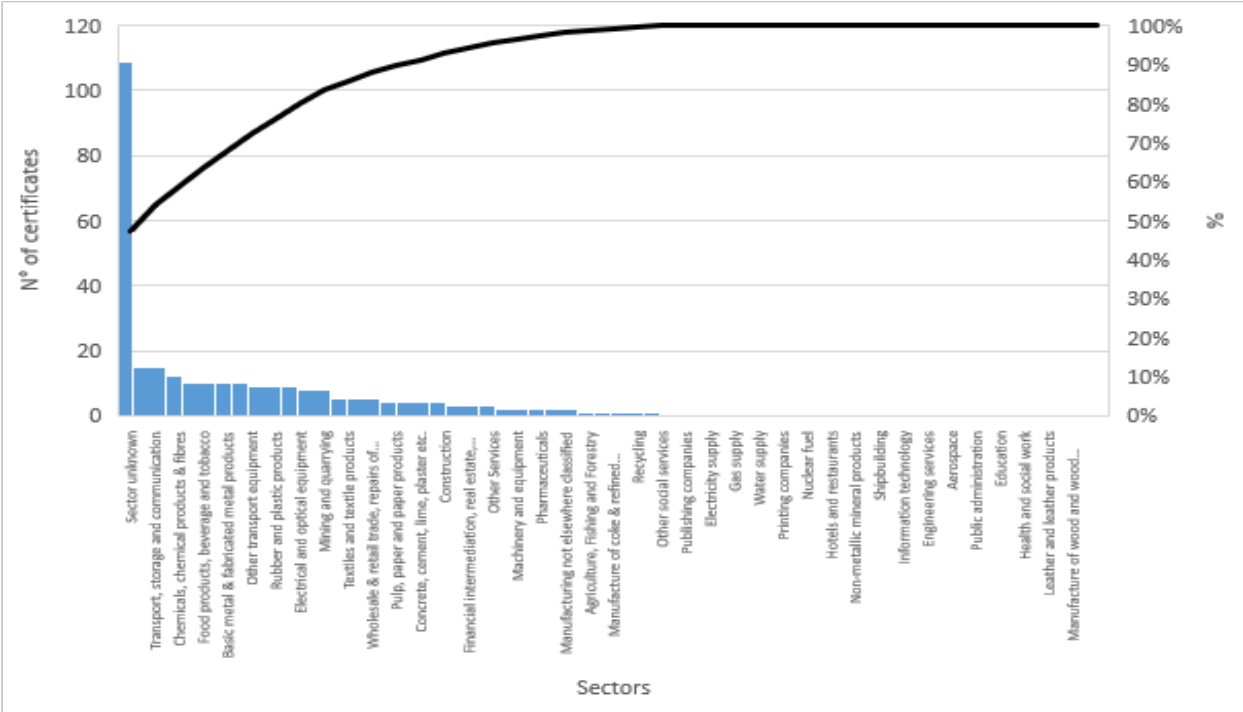


Figure 6. The share by sector in Morocco
Own elaboration based on ISO survey (2019)

3. METHOD

The present work takes the positivist position. It is also a quantitative research using a questionnaire survey. This exploratory descriptive research is part of a retrospective logic as the organizations chosen are already ISO 14001 certified or in process of certification. Thus, our study is carried out in three steps.

The first step was to identify the main factors through an exploratory questionnaire survey targeting the Moroccan industrial sector. We focused on industrial firms because their activities have negative impacts on the environment, and they are the major users of natural resources (Jansson *et al.*, 2017). The questionnaire consisted of 3 parts, namely: (i) the identification of companies, (ii) the presence of an EMS according to the requirements of ISO 14001, (iii) and finally, the adoption factors which encouraged the company to engage in an EMS according to ISO 14001 standard. A total of 100 questionnaires were sent, with a return rate of 41%. However, given the consideration of the presence of an EMS according to the requirements of ISO 14001 as a filter question, we only kept 28% of the responses.

In a second step, we carried out the pooling of factors to match the appointments and groups of adoption factors according to the literature. In total, we identified 8 factors. For example, the adoption factor "meeting the requirements and expectations of other interested parties" constitutes a pooling of the following factors: (i) improving the confidence of insurers and banks, (ii) meeting the requirements of the parent company, (iii) improve staff involvement and (iv) reduce the cost of insurance.

Thirdly, we carried out a second survey of the 28 companies that responded to the first questionnaire. It relates to the ranking in order of importance of the 8 adoption factors of ISO 14001. The ranking was done on a scale of 1 to 7 points, in ascending order of importance. In terms of data processing, the factors were classified according to the total points awarded by the 28 respondents. Then, the score for each factor was converted to a percentage of the total points obtained by all the factors.

Finally, to ensure the validity of our research, we made sure that the respondents were part of executives, managers, and professionals of various industries working on environmental management or QSE (Quality, safety, environment) management.

4. RESULTS AND DISCUSSION

From the first question, we recognize that almost 54% of the feedback refers to large enterprises where the size exceeds 250 permanent workforces (Criteria Defined by Bank Al-

Maghrib and the Professional Group of Banks in Morocco "GPBM"). This is followed by companies inferior to 250 employees with 28% and then Micro-enterprise with 18% (Figure 7).

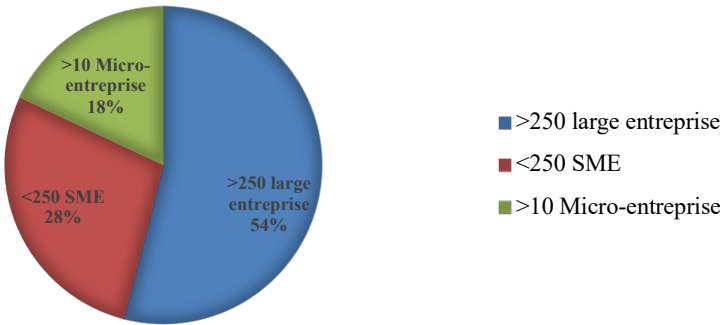


Figure 7. Respondents by Company Size

Source: Own processing based on the obtained data

As mentioned above in the methodology, in the second question of the first questionnaire, we asked whether industries were certified ISO 14001 or not. Twenty-eight industries (28%) responded that they were implementing ISO 14001 certification in their establishments, or they are in the process of implementation (Figure 8).

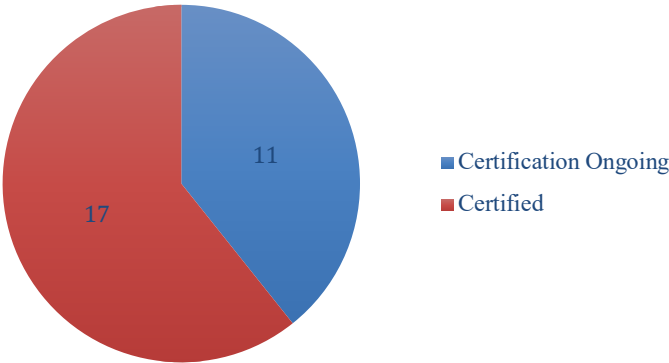


Figure 8. Number of Companies Certified ISO14001 and Ongoing Certification

Source: Own processing based on the obtained data

Based on the results obtained in this study, Figure 9 (below) indicates that among the most important reasons why Moroccan companies adopt ISO 14001 certification is the ‘customer pressure’ (rank-1). Thus, companies choose to adopt the ISO 14001 standard in order to differentiate themselves in the market (Boiral et al., 2018), and to increase customer satisfaction within the supply chain through greater confidence in the organization’s environmental management. This motivation is followed by ‘Meet the requirements and expectations of other

interested parties’ (rank-2) for more insurance savings and discounts, favourable loans... (Morrow and Rondinelli, 2002). In the third position comes the ‘Legal and regulatory requirement’ (rank-3) to reduce the risk of noncompliance with Moroccan environmental laws and regulations (Bansal and Bogner, 2002). The next major driver is ‘increase efficiency’ (rank-4) as it can lead to improving the performance, productivity, and profitability of the organization (Gonzalez-Benito and Gonzalez-Benito, 2005; Orsato, 2006). ‘Improve company’s image (rank-5) and ‘Competitive advantage’ (rank-6) will be enhanced by the public assertion of conformance to ISO 14001 or better certification of conformance by an accredited third-party certification body. ‘Cost savings’ (rank 7) by identification of cost reduction opportunities are mainly in waste disposal, energy, water, and raw material. Formally identifying and dealing with risk enhances the organization’s physical and financial protection against environmental mishaps. Top management can effectively address its risks and opportunities by integrating environmental management into the organization’s business processes, strategic direction, and decision making. This will align them with other business priorities and incorporate environmental governance into its overall management system. Lastly, ‘incentives’ (rank-8), in terms of grants, loans tax concessions, and other economic benefits can facilitate easy adoption, especially in SMEs.

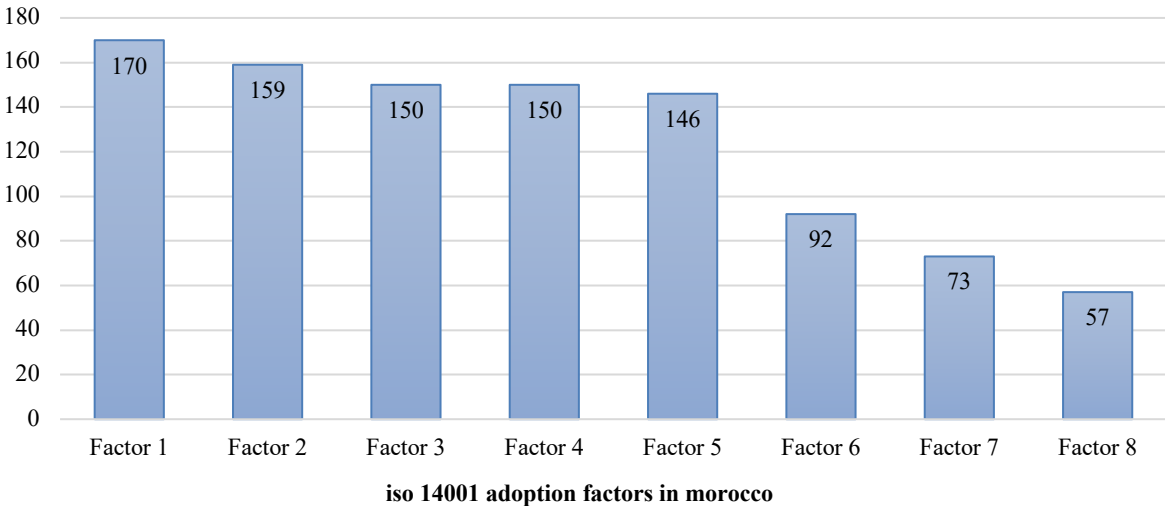


Figure 9. Ranking factors for ISO 14001 adoption in Morocco

Source: Own processing based on the obtained data

Among our eight factors, there is an absence of environmental drivers such as reduction of toxic release (Neves *et al.*, 2017) or environmental sensitivity (Heras-Saizarbitoria *et al.*, 2011; Gonzalez-Benito and Gonzalez-Benito, 2005; Gonzalez *et al.*, 2008; Hsu *et al.*, 2013;

Heras-Saizarbitoria *et al.*, 2011; Boiral, 2007). While the empirical study of 1264 German sites argues that among the most important reasons that German companies registered their EMS was to achieve continuous improvements in environmental performance (Morrow and Rondinelli, 2002). Also, according to a survey conducted in Africa from January 2005 to June 2005 involving industries along the Atlantic coast of Cameroon, environmental conservation is the main trigger or factor behind EMS implementation (Alemagi *et al.*, 2006).

This observation stresses the fact that ISO 14001 certification in Morocco is dominated by external factors (Customer, Other stakeholders, and Environmental legal requirements) rather than internal drivers (dealing with processes inside the corporation). Moral drivers (it is the 'right thing to do') are not at all considered as motivations for the certification. Thus, it may be concluded that ISO 14001 certification in Morocco is not 'voluntary' but necessary based on market pressures. A sociocultural study is necessary to examine this result.

5. CONCLUSION

In this article, we investigated via a survey the key factors which influence ISO 14001 adoption in Moroccan industrial companies. We identified eight factors, among which, customer pressure and legal requirement constitute the main important reasons of the adoption of ISO 14001. However, on the contrary to previous studies, we constate through our survey the absence of environmental drivers. These factors are considered in many previous researches as the most important factors in the adoption of ISO 14001 (Morrow and Rondinelli, 2002 ; Alemagi, *et al.*, 2006). We can conclude from this ascertainment that ISO 14001 certification in Morocco is more driven by external factors such as customer and environmental legal requirement. So ISO 14001 certification can be considered in Moroccan companies as a constraint or a reaction to customer and legal pressures.

Our study can be considered, to our knowledge, one of the first contributions in this subject in Morocco. Results can help companies to characterize ISO 14001 main adoption factors. To successfully implement ISO 14001 certification, the Environment, Health & Safety (EHS) managers should be aware of the drivers which can motivate the implementation process. Thus, the ranking factors would help managers to effectively utilize the academic knowledge for a better understanding of the main motivations to adopt ISO14001 certification in the Moroccan context.

Finally, like any research, our study presents some limits. First the number of companies studied is not high and therefore does not allow us to generalize the results. We suggest for the future research to expand the sample to a large number of companies. Second, as this is an

exploratory study, we used descriptive statistics to analyze the results of our survey. We suggest for future research to use more sophisticated statistical models, such as inferential statistics or models based on structural equations to draw deeper conclusions.

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