

# Effectiveness of EMS in Tunisian companies: framework and implementation process based on ISO 14001 standard

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**Abstract** This paper reports environmental analysis results of food and tannery Tunisian companies to identify the features of environmental management system (EMS) that is implemented recently. EMS via ISO 14001 has become one of the principal tools used by companies to handle environmental aspects and impacts through their various complex activities interacted with environment. While several companies have implemented and maintained a formal EMS, it has related mainly to their benefits in short term without responding to the sustainable development recommendations and practices. This study focuses on the strong linkage between the EMS effectiveness of food–tannery Tunisian companies and sustainability. A proactive environmental management approach is proposed and adopts a qualitative and quantitative assessment for factor analysis. It provides a strategic EMS framework and principles for sustainability to evolve the future enterprises' benefits that has a clear influence on environmental performance in long term.

**Keywords** Environmental analysis–performance · EMS · Food–tannery companies · Sustainability · Proactive environmental management

## 1 Introduction

Over the last few decades, the growing bodies of norms like the ISO 14000 standards (for Environmental Management System, EMS) were formally adopted since 1996 by ISO organization. ISO 14001 represents a voluntary international environmental requirement, which is likely adopted by a vast majority of corporations. Its major focus is on structure, implementation and maintenance of a formal environmental management system (Curkovic and Sroufe 2010). Moreover, ISO 14001 standard provides an EMS for managing

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and improving performance regarding all environmental regulatory requirements, pollution prevention and continuous improvement through effective management of an organization's environmental impacts (Kaur 2011). In addition, it should limit environmental degradation and pollution which are caused by several industries through no rational consumption of water, energy and materials via their activities such as production, transport, provision of support service and management.

EMS implementation in such enterprise based on ISO 14001 standard offers policy prompts for targeted environmental management improvements (Singh et al. 2014). ISO 14001 contributes to managerial efficiency for enterprise, increases staff motivation, reduces pollution and builds customer loyalty and trust with enterprise (ISO 14001 2004). The implementation of ISO 14001 enhances employees' awareness on pertinent environmental regulations, organizational image of enterprise and improve mainly an EMS to solve environmental issues for efficiency (To and Tang 2014).

In some cases, such data obtained from assessment indicate that EMS causes effective improvement in environmental performance, even in short periods (Daddi et al. 2011) or both in short and in long terms (Testa et al. 2014). It provides indicators that bring significant improvement in their management system related to environmental issues. For example, for the US multinational firms who wish to compete internationally, ISO 14001 registration is the only recognized international standards for EMS (Curkovic and Sroufe 2010).

Several enterprises support a weak view of sustainability because of the overwhelming dominance of an economic perspective in decision making (Morrison and Fisher 2006). However, environmental management practices increase effectively business friendly to environment shifts in performance which may also be the outcome of larger business decisions (e.g., outsourcing, plan modernization) or external pressures (environmental legislation, media reporting) (Gerald et al. 2004). The analysis of the determining factors for the adoption of environmental practices, such as an environmental management system, focuses on the different sources of stimulus that guide the development of these tools, which will encourage the company to participate (Reed 2008; Blanco et al. 2009).

Nowadays, resulting from the limitations of the current environmental management practices, the international community needs to redefine the approach to improve environmental state and foster sustainable development (UNEP 2013). While several companies have implemented and maintained a formal EMS, it has related mainly to their benefits in short term without responding to the sustainable development recommendations and practices (Dooris 1999; Alshuwaikhat and Abubakar 2008). In other case, the linkage between EMS and sustainability in Tunisian companies is still weak. The weakness returns mainly to the few initiatives taking by managers to seek a deeper understanding and incitation by government (Granly and Welo 2014). However, the compliance of an EMS to an international standard such as ISO 14001 does not guarantee the implementation of an effective management practices (Testa et al. 2014). On the other hand, the difficulty in assessing the environmental performance and the number of methodological challenges facing enterprises has been emphasized. For instance, the life cycle assessment of products (Zhang et al. 2014). Nevertheless, the results of other studies show that the official EMS does not substantially influence the environmental performance of companies (Daddi et al. 2011).

The main objective of this study focuses on the strong linkage between the EMS effectiveness implemented recently in food-tannery Tunisian companies and sustainability. This paper attempts to conceptually describe sustainability for environmental management. It will give Tunisian enterprises (certified or not certified under the ISO 14001 standard) a framework for environmental performance and proposes principles to reach

sustainability. However, taking such initiative for EMS, implemented recently, does not ensure always sustainability because the system is still quite performant. It should acquire maturity to guaranty enterprises' benefits in long term. Otherwise, the implementation of ISO 14001 (environmental management system) is expected to be a factor to the future business success of companies. The findings of other research indicate that market and cost reduction are the key drivers for sustainability (Granly and Welo 2014). As specific targets, this paper provides firstly a strategic EMS framework and principles for environmental performance of food–tannery companies. Secondly, a qualitative and quantitative method of measuring the effectiveness of EMS enterprises is carried out to assess the proactive environmental management (EPM). Many firms, through reluctant adoption or willing change, have found that pro-environmental stance can enhance a number of goods (Campos et al. 2015). Thirdly, survey results are presented and discussed in terms of aspects significance in food and tannery companies as small and medium enterprises (SMEs). As a consequence, the importance of managing environmental activities to prevent negative aspects and impacts on the environment has been highlighted. This case study is not representative for food and tannery industries, but rather exemplary. Although many environmental protection initiatives have been taken at some industries, it should adopt a more systematic or proactive approach PEM to foster the reducing of environmental impacts by best practices to reach cleaner production, eco-efficiency and life cycle assessment (Campos et al. 2015).

## 2 Literature review

### 2.1 Enterprise's challenges against international treaties and agreements

Over 500 international environmental agreements have been signed since 1972 (Stockholm Conference 1972), the generation of sustainable development concept during Brundtland Commission (1987) and other treaties such as trade in endangered species, hazardous wastes, climate change, biological diversity and desertification (UNEP 2013). During the Rio de Janeiro conference of 1992, the promotion of sustainable development concept has been highlighted to save earth. Enterprises should respect the different declarations signed under the supervision of the United Nations like Montreal Protocol (2000) for CFC restrictions and uses (medical research), Kyoto protocol (1998) for CO<sub>2</sub> emissions and Agenda 21 recommendations for the new millennium (Clemencon 2012). These treaties, agreements and declarations reach the sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission 1987). For an enterprise to be sustainable, it must reduce pollution for the benefit of the environment, stimulate economic growth and integrate social responsibility in their system. This is conduct to install policies, objectives, processes and procedures to achieve sustainability. In particular, means enterprises must begin to adhere to international environmental standards and respond to other market pressures that focus on the environmental implications of products and services (Gerald et al. 2004). Moreover, organizations which deliver products or services must re-think and re-construct their environmental policies and practices in order to contribute to the corporate responsibility at local, national and international levels (ISO 26000 2010). Eventually, the difficulty in assessing the link between EMS and environmental performance stems from a number of methodological

challenges (Daddi et al. 2011). It should focus on challenges in implementing a functional ISO 14001 environmental management system (Searcy et al. 2012).

## 2.2 Progress toward environmental and sustainable society

To achieve sustainability, environmental management practices in industries must ensure more sustainability through the integration of three strategies, which are EMS, Economic performance and social progress (Alshuwaikhat and Abubakar 2008). The improvement in a company's position in the market, the transition from conventional to sustainable practices, the improved relationship with society due to better environmental performance and the improvement in waste processing were the extracted latent constructs of the benefits derived (Psomas et al. 2011). Other studies have shown that the outcome of implementing proactive environmental work in the long run by switching to new technologies (e.g., based on cleaner or renewable fuels) or by improving energy efficiency (F. Testa et al. 2014) can generate a competitive advantage and extraordinary benefits (Wolff 1998). Moreover, both EMS and sustainable development have thus evolved to achieve an understanding that is holistic and ecological, and their agendas similarly embrace a wide range of interacting social, economic and healthy aspects (Dooris 1999). Typically, at present in industry, sustainability is actually a rather wider concept comprising a broad set of "quality of life" or "corporate social responsibility" measures embracing financial, social and environmental concerns (Payne and Raiborn 2001). According to several studies, strategic environmental assessment (STEA) aims to identify, predict and evaluate environmental, as well as potentially socioeconomic, consequences of strategic initiatives, such as program planning or policies in advance of any decisions on EMS implementation (Fischer and Seaton 2002; Sadler 2005; Sadler and Verheem 1996). The promulgation of STEA is primarily associated with the concept of sustainable development (Gachechiladze and Fischer 2012). Corporate vision and organizational structure represent the drivers for a set of mechanisms that legitimate and consolidate the integration of sustainability. The clear definition of the role of sustainability within the firm is the implementation of an education program to promote sustainability internally and externally, the implementation of clear mechanisms for communication and monitoring and finally, the implementation of a system of recognition and valorization of sustainable practices and initiatives (Petrini and Pozzebbon 2009).

## 3 Methodology

The methodology of this study consists of measuring the compliance of environmental aspects through the environmental analysis process (survey and questionnaire) in food and tannery Tunisian firms ("aspect is an element of activities, products or services of an organization that has, or may have an impact on the environment" from ISO 14001). Many previous studies on the effectiveness of EMS adoption measured the environmental performance at the facility level by using self-reported data collected by questionnaire (Cmoglio and Bolta 2012; Testa et al. 2014). In our study, the qualitative and quantitative methods are chosen through respecting all applicable environmental regulations for food and tannery industries in relation to environmental impacts. As a result, the questions aim to obtain qualitative and quantitative results on improvements in energy and water saving, and pollutants affecting soil, air, water, human being and noise. The term of significance appears and depends on the no compliance of enterprises' activities. The presence of regulatory framework has been used as a criterion variable to highlight the significance of a

particular aspect. If the enterprise does not apply applicable laws and other regulatory requirements, it does not ensure compliance. On the other hand, the diversification of criteria is related not only to the regulation framework but also to the technical issues (S: severity of the impact on the environment; P: probability of occurrence; CL: control level) and conduct sometimes to the no compliance, too. Two factors limit the aspect's or impact's significance: the significance rate (calculated from the combination of severity, probability of occurrence and control level) and the no compliance with applicable laws and regulatory requirements. All of significant environmental aspects should be taking in priority by the enterprise to control significance and reduce negative impacts generated from these aspects which affecting soil, air, water, human being and could generate noise. The output of enterprise activities in number or percentage of aspects' significance (high, medium and low) should be treated as priority by enterprise. It could measure and assess the environmental performance and effectiveness of food and tannery companies, which implement EMS. Eventually, it gives us also a framework and principles for EMS effectiveness. Therefore, environmental performance should cover all activities and conduct to the sustainability.

## 4 Results and discussion

### 4.1 EMS effectiveness and assessment

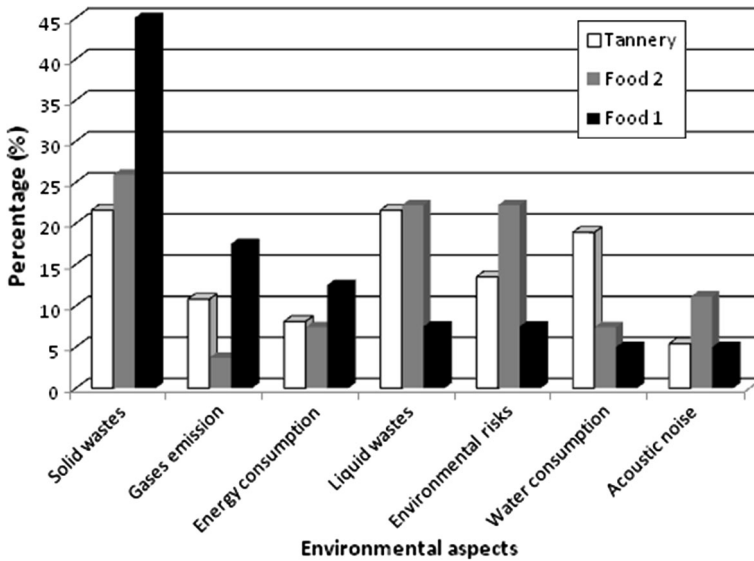
In this study, a suitable method for measuring, evaluating and comparing environmental analysis results of two different Tunisian companies has been investigated (see Table 1). Environmental analysis detects sensitive activities inside enterprise limiting the environmental performance process. The aspects significance conduct to the negative impacts and could measure in part environmental performance and features for such enterprise.

Table 1 presents a mapping of environmental aspects and their significance in food and tannery Tunisian companies. The aspects' significance is divided into three categories: very, medium and low significance. In this study, food 2 company reveals a less number of aspects significance (9 significant aspects) in comparison with the food 1 enterprise which has 16 significant aspects. The measure of performance depends in part on aspects and their significance. The company's activities generate aspects, especially solid and liquid wastes, energy and water consumption, gases emission, environmental risks and acoustic sound (see Fig. 1). The most important aspect for all companies is about waste management.

The main environmental performance indicators from aspects were determined. Indicators of competitiveness can refer to many aspects (Daddi et al. 2015). The qualitative indicators represent: firstly, the compliance with the combination of severity, probability of occurrence and control level, and secondly, the compliance with applicable laws and other requirements. Concerning quantitative indicators, this study highlighted the volume of water consumed, the acoustic noise, the amount of gases emitted, the risks on the environment, the solid and liquid wastes produced and the total of energy consumed. The ratio in percentage of aspects' significance gives the real state of these companies for their EMS effectiveness. It deduces from Table 1 that food industry maintains an effective EMS better than Tannery firm. It does not always guaranty this performance and forgot the quite number of aspects' significance appeared in food industries. Enterprises have the opportunity to identify a common environmental performance indicator (EPI) to reach effectiveness. The use of indicators as management tools demonstrates the effectiveness of the organization to ensure clear operational and environmental conditions. Nevertheless, a

**Table 1** Environmental aspects according to the significance rate and regulation framework

| Company | Environmental aspects | Significance aspects | Significance |        |     | Significance from regulation | Significance rate | Significance percentage (%) |
|---------|-----------------------|----------------------|--------------|--------|-----|------------------------------|-------------------|-----------------------------|
|         |                       |                      | Very         | Medium | Low |                              |                   |                             |
| Food 1  | 40                    | 16                   | 12           | 3      | 1   | 11                           | 5                 | 40                          |
| Food 2  | 27                    | 9                    | 6            | 1      | 2   | 5                            | 4                 | 34                          |
| Tannery | 37                    | 26                   | 22           | 3      | 1   | 14                           | 12                | 70                          |



**Fig. 1** Representation of environmental aspects in percentage

performance indicator system should be deployed based on the organization's mission and related to strategies via the identification of critical success factors of its business (Campos et al. 2015). The aspects significance should be taking with strong priority in the strategy of each enterprise and conducts it to redefine policy, fixing smarter objectives (divided them into goals and targets according to aspects) and to clarify responsibilities. The assessment of deployed actions and their performance could be measured during the following environmental analysis. The concept is to monitor the degree of efficiency of such action after its achievement. For instance, the change in state of significance aspects means that they must be controlled by the enterprise. It should discuss environmental issues associated with corrective and preventive actions, objectives and targets, internal and external auditing, and integrating change into management systems to reach performance (Searcy et al. 2012).

From Table 2, the main environmental performance indicators from impacts were illustrated. Quantitative indicators revealed the rate of soil, air and noise pollution, the human being affected and the waste water volume produced. For food industry, the soil contamination represents the most affected area, whereas Tannery SME conducts the water contamination according to their activities (see Table 2). Moreover, for negative impacts, it emerges that tannery company state had more difficulty in achieving improvements for their impacts, especially the generation of waste water (77 % of total negative impacts).

**Table 2** Representation of negative impacts generated from significance rate

| Company | Negative aspects | Soil pollution | Human being | Water pollution | Acoustic pollution | Air pollution |
|---------|------------------|----------------|-------------|-----------------|--------------------|---------------|
| Food 1  | 16               | 13             | 0           | 1               | 1                  | 1             |
| Food 2  | 9                | 5              | 0           | 1               | 2                  | 1             |
| Tannery | 26               | 1              | 0           | 20              | 0                  | 5             |

The output of enterprise activities in number or percentage of aspects' or impacts' significance (high, medium and low) should be treated in priority by enterprise. It could measure and assess the environmental performance and effectiveness of food and tannery companies, which implement EMS. Environmental performance indicators could show clearly how the organization is performing, and provide to the food and tannery enterprises basis for future objective to be smarter and improvements such as management of energy, natural resources or waste which could affect current performance. Up to now, most of the firms have kept the question of sustainability separated from considerations of business strategy and performance evaluation, areas that are often dominated by purely "economic" performance indicators (Petrini and Pozzebon 2009). It should combine applicable indicators from the organizational value and environmental profile with more business-specific performance indicators based on ISO 14031. Indicators were used to evaluate environmental performance overtime within certified factories (pre- and post-certification). Management performance indicators and operational performance indicators should be identified according to the ISO 14031 (Nguyen and Hens 2015). Other studies revealed that qualitative and quantitative indicators were chosen through respecting all applicable environmental regulations, documenting and analyzing all the environmental impacts according to the typical pollutants (Zhang et al. 2014). For instance, energy-intensive industries can reduce their CO<sub>2</sub> emissions by decreasing activity levels, by switching to new technologies (e.g., based on cleaner or renewable fuels) or by improving energy efficiency (F. Testa et al. 2014). In this sense, environmental management accounting (EMA) can generate management performance indicators, which are an organization's environmental performance indicators that provide information about management's efforts to influence the organization's environmental performance (Schram 2003). As perspective, food and tannery industries should stick sustainability with business strategy and performance assessment, responding to the main objective of this study that gives recommendations and strategic EMS framework for enterprise's sustainability.

The linkage between EMS effectiveness and sustainability is measured quantitatively from Tables 1 to 2 through environmental analysis. It appears the significance rate of three Tunisian companies. The lowest percentage in terms of significance rate reflects that enterprise (food 2) implemented EMS adequately and more effectiveness than others listed in this study. It reflects an environmental performance and stick to the sustainability concept. However, performance improvement can be operationalized in very different ways, for instance, as absolute reductions in emissions or improved eco-efficiency. In this case study, the priority for improvement should be focused in soil contamination and water treatment. After that, other negative impacts will be treated in second step to ensure compliance of all enterprise aspects (see Table 2). Consequently, impact will be controlled and their negative effects will be reduced. These initiatives respond effectively to the approach of proactive environmental management and strategies (PEMS) proposed in this study, and it is at the heart of rational environmental assessment (REA) with EMS implementation. Moreover, the environmental performance and sustainability framework could evolve in long term for Tunisian companies economical and environmental benefits. It should examine the business practicality of integrating an environmental management system (EMS) into enterprises, describes how it can contribute to cleaner production in the industry and provides guidelines to facilitate implementation.

In the same context, food and tannery companies should adopt a proactive environmental management (PEM). The environmental performance of all enterprise's activities is relative to their outputs/outcomes. In practice, the evaluation of process inputs, like time consuming and cost, is more difficult than outputs, particularly the environmental impact statement



(Sheate 2012). This is really a compliance of the inputs side to the organization in an environmental protection spirit. Tunisian enterprises face some issues concerning especially water, energy consumption and their effects on the final product, which should be friendly to the environment. In efforts to increase resource productivity while adapting costs, an EMS could be adopted to bring about rationalization in the use of inputs (resources) such as energy and raw materials, and at the same time, to reduce outputs such as wastes (Khanna and Anton 2002). Thereafter, the presence of regulatory framework obliges Tunisian enterprises to ensure compliance and allow them to reduce impact's significance (see Table 1). Moreover, ISO 14001 is a commitment to continually improve and goes beyond simply complying with environmental regulations (Curkovic and Sroufe 2010). Consequently, the adoption of an EMS could improve reputation and image of these companies, especially relations with customers, investors, local communities and other stakeholders (Biondi et al. 2000; Khanna and Anton 2002). One of its most important issues is in improving the environmental awareness of enterprise manager and workers, and in clarifying everyone's responsibility for environmental improvements. It is implemented via continuous process when environmental sustainability practices will be continually improved and evaluated by regular environmental audits (Alshuwaikhat and Abubakar 2008).

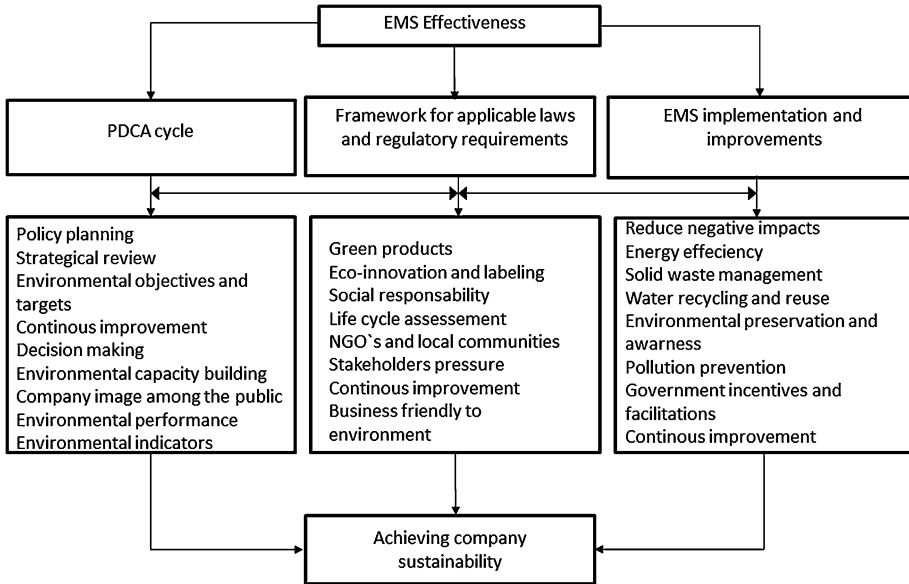
Food and tannery enterprises should measure, manage and communicate whether their environmental performance is inherently well placed. These enterprises should improve their processes, reduce product costs in compliance of regulatory requirements and stakeholder expectations in order to take advantage from government and get to new market opportunities. For instance, the food industry operates in an economy and in a society increasingly concerned with wide and diverse environmental issues. The environmental awareness process must be active inside food industry via continuing food security alarms (Segarra-Oña et al. 2011).

In general, the management performance analysis reveals that the certified companies run more comprehensive programs to address environmental policy, to increase management involvement and employee participation, and to provide environmental training and initiative in order to reduce negative impacts on environment (Nguyen and Hens 2015). By keeping records of the disposal amount and monitoring changes in waste, enterprises are able to find what caused the excess consumption. In turn, by monitoring waste they also can monitor some parts of the manufacturing process (Curkovic and Sroufe 2010). As a first indication drawn from the literature, that concerns the extreme heterogeneity of factors driving companies to implement an EMS. These vary significantly in connection with different aspects like the size of organization (SMEs or large companies), its sector (e.g., type of manufacture), the national or international contexts. (Biondi et al. 2000).

This case study is not representative for food and tannery industries, but rather exemplary. Although many environmental protection initiatives have been taking at some industries, it should adopt a more systematic or proactive approach for environmental management and strategies (PEMS) to foster the reducing of environmental impacts by best practices. Eventually, ISO 14001 registration will enhance the image of social responsibility of firms, such as reducing the risk environmental incidents, and produce improved relations with top management and more collaboration within corporate groups to which the firm belongs (Matouq 2000).

## 4.2 Strategic EMS framework and principles for sustainability

This paper proposes a strategic EMS framework and principles for effectiveness and sustainability (see Fig. 2). It gives also a real model for Tunisian companies to reach more



**Fig. 2** Strategic EMS framework and principles for sustainability

sustainability and get perspectives for a good environmental management practices. This framework recommends adopting three strategies, namely PDCA cycle; framework for applicable laws and regulatory requirements; and EMS implementation and improvements. Each strategy has some initiatives, in interaction with others, that could lead to achieve sustainability inside Tunisian companies as can be seen in the framework of Fig. 2.

*4.2.1 PDCA cycle*

The continuous improvement reflects a good environmental management system and is holistically based on the Plan-Do-Check-Act (PDCA) business process implement model (Gordon et al. 2010). Deming theory or PDCA cycle stimulate to improve products, services or processes inside companies. Other widely used methods of continuous improvement such as six sigma, lean and total quality management emphasize employee involvement and teamwork; measuring and systematizing processes; and reducing variation, defects and cycle times. To support continuous improvement, business professionals continually examine their processes to discover and eliminate environmental problems. Therefore, EMS requires from organizations to formulate an environmental policy for planning, implementing, monitoring and measurement for effectiveness (Gordon et al., 2010). The objectives and targets shall be specific, measurable, accuracy, realistic, timing, extending and rewarding where practicable, and consistent with the environmental policy, including the commitments to prevention of pollution, to compliance with applicable laws and other regulatory requirements. An organization’s environmental performance criteria set by management are evaluated based on environmental aspects and impacts performance to meet objectives of the EMS in a sustainable way (Gordon et al. 2010).

A sustainable strategy should focus on continuous improvement to achieve environmental performance, improved internal management methods and improved stakeholder’s satisfaction. Public authorities, which represent a part of stakeholders (NGOs, citizens,

etc.), are considered as the main external pressure to improve environmental performance, especially in water consumption, energy efficiency, waste management and emissions into the atmosphere (Daddi et al. 2011). ISO 14001 helps enterprises to establish policy and to achieve its own objectives. This means that in order to ensure environmental improvement, a company must set goals, plan management activities and technology investments (Iraldo et al. 2009). The assumption is that better environmental management will lead to improve environmental performance (Theyel 2000). Conceptually, management control of an organization requires managers to link decision making to strategic objectives and to link performance outcomes to the implementation of these decisions. However, it is often difficult to determine what management decision processes and actions are most effective in translating strategic objectives into achieved performance (Wisner et al. 2009).

#### 4.2.2 *Framework for applicable laws and regulatory requirements*

EMS implementation provides also a comprehensive framework of obligations under applicable laws and how the organization works to ensure compliance for sustainable development. The presence of regulatory framework should be used as a criterion to assess the significance of a particular aspect (Biondi et al. 2000). In fact, several firms are familiar with legal compliance as an important environmental performance indicator. Enterprises should identify common environmental performance indicator (EPI) to reach effectiveness and efficiency and respond to the EPMS. The strategies must be transformative, i.e., redefining policy, fixing smarter objectives and targets, etc. The evaluation of enterprise capacity to achieve continuous improvement in their environmental performance is based on the diversification of criteria during the environmental analysis process, the regulatory obligation and other external pressures like social progress and eco-labeling which have a positive effect to access to new market, in terms of culture, social perceptions driving to the social acceptability and consumer demand (Ekins 2011). It aims also to build capacity for implementation of environmental management systems (EMS) as effective and strategic tools for improving the environment in order to achieve tangible impacts and improvements.

The regulation context should be more coherent with the concept of sustainability. This regulation should consist of three aspects, including likely accumulative impacts on affected areas (see Table 1), likely long-term impacts on environmental and human health, and the relation among economic, social and environmental benefits as well as that between short-term and long-term benefits (Jia et al. 2011). Such impacts can occur at many stages of the product or service's life cycle from input of process to ultimate output (Lewandowska 2011). Its argues that, both PEMS and REA help enterprises to change their actual strategy toward sustainability, it needs to extend its boundaries from assessing strategy formulation and it is able to integrate the environment throughout planning as well as implementation (Gachechiladze and Fischer 2012). In addition, SME shall define environmental policy and ensure that, within the defined scope of its environmental management system, it includes a commitment to comply with applicable legal requirements and with other regulatory requirements to which the SME subscribes which relate to its environmental aspects. Enterprise shall ensure that the applicable laws and other regulatory requirements to which the SME subscribes have been taking into account in establishing, implementing and maintaining its environmental management system. Furthermore, the legacy of protectionism and state involvement has not been eliminated, so that often competition is weak and monopolies are deeply ingrained. Among the regulation of economic activity in developing countries, environmental regulation is unsurprisingly often the weakest of all. In addition, eco-efficiency profiles can stimulate firms to

implement EMS in response to the need to monitor and reduce compliance cost for present or future environmental regulation (Schram 2003) and to reach corporate environmental management (Khanna and Anton 2002). Eventually, SMEs that are ISO 14001 indicate that the benefit market and the cost reduction are the key drivers for the eco-products (Granly and Welo 2014).

#### 4.2.3 EMS implementation and improvements

An EMS, which is the component of the overall management system that includes organizational procedures, environmental responsibilities and green processes, can help SMEs comply with environmental regulation, identify technical and economic benefits and ensure corporate environmental policies. It stimulates a proactive behavior at a managerial level and induces the implantation of an EMS (Darnall et al. 2008). To facilitate implementation, it should examine the business practicality of integrating an environmental management system (EMS) into enterprises, describes how it can contribute to cleaner production in the industry and provides guidelines. Furthermore, eco-labeling could also be used as a marketing tool where customers are sensitive to environmental issues (Hesan et al. 1997). Proactive environmental management and strategies, PEMS, depend essentially on capacity analysis of used methods for process effectiveness such as significant impact identification, impact prediction and evaluation (Jia et al. 2011). The feedback coming from environmental analysis report could assist food and tannery enterprises to assess and improve their strategic planning via environmental issues and their management like sustainability of activities, life cycle of product, cleaner production, energy cost, trades and global issues to the environmental regulation (see Fig. 2). The assessment of environmental regulation and its implementation have reflected changing policy paradigms in environmental governance (Sheate 2012). The evolution of sustainability has highlighted the need for measurement, continuous improvement and relationships to performance (Curkovic and Sroufe 2010). A such rational environmental assessment (REA) seeks to influence the outcomes of a specific decision-making process inside enterprise; and the transformative strategy which induces environmental ethics, educations (Jia et al. 2011) and that social learning may be a potential benefit that might flow from the REA process (Fitzpatrick 2006; Kornov and Thissen 2000).

Several studies reveal that EMS implementation increases staff motivation and improves profit, performance and opportunity, customer loyalty, trust and reputation of SMEs (Sambasivan and Fei 2008). The implementation of ISO 14001 includes better business control, transparency/openness, marketing advantages, cost reduction, less injury/environmental accidents, more research and development, improvement in operation efficiency and work culture (Tan 2005).

The system can also provide a methodical approach to planning, implementing and reviewing an organization's environmental management. Implementation of EMS involves companies taking the following steps:

- Should identify common environmental performance indicator (EPI) to reach EMS effectiveness and efficiency of food and tannery industries
- Adopt proactive environmental performance management and strategies (EPMS)
- Ensure the presence of regulatory framework for compliance
- Guaranty transformative strategy: redefine policy, smarter objectives and targets, etc
- Get potential benefits (economic, environmental and social) in short and long terms to achieve sustainability relevant to the enterprise's environmental aspects.

To realize eco-friendly product or service, it should contribute to the construction of a sustainable enterprise through which resources and energy circulate. SMEs should introduce new resources referred to green process activities aimed at reducing the environmental impacts in such areas as resources, input, chemical substances use and energy consumption to the greatest extent possible from all the processes involved in food and tannery manufacturing. These companies should pride itself on being as eco-friendly as possible (although it had not gone for ISO 14001) and ensured that it recycled packaging and manufacturing materials where it could (Bryant and Harbison 2010). Performance improvements can be operationalized in very different ways, for example, as absolute reductions in emissions or improved eco-efficiency (Testa et al. 2014). Moreover, the effective project scheme for proactive environmental management, PEM, tries to understand the role of proactive environmental management tools and incremental organizational eco-innovation in creating value in food sector by means of an analysis of the effects of the ISO 14001, and firms with the most proactive practices exhibited a significantly positive financial performance (Segarra-Oña et al. 2011). This linkage between environmental challenge and economic opportunity recurs throughout the discussion of eco-innovation. The environmental performance of all enterprise's activities is relative to their outputs/outcomes. In practice, to reach performance, the desired outcome should be realized on time and with suitable budget. For the communication process and involvement, the organizational structure is the driver for a set of organizational mechanisms that will legitimate and consolidate the integration of sustainability: the implementation of clear mechanisms for communication and monitoring (Petrini and Pozzebbon 2009). A long-term strategy for communication shall establish the policies for economically, socially and environmentally sustainable development, its goal being sustainable improvement in the well-being and standard of living of current and future generations. This is conduct to exchange between different stakeholders to address environmental problems and explore possible solution such as PEM, to discuss the partnership issues related to the socioeconomically development and environmental performance of such food and tannery enterprises.

Eventually, rational environmental assessment (REA) is consistent with its commitment to compliance. Enterprise shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable laws and other regulatory requirements. SMEs should ensure both internal and external audits. It shall keep records of the results of the periodic evaluations. Environmental assessment aims to identify, predict and evaluate environmental, as well potentially socioeconomic, consequences of strategic initiatives, such as programs plans or policies in advance of any decisions on EMS implementation. Essentially, the analysis of methodologies used for identifying and assessing environmental aspects (e.g., brainstorming, screening processes, inspections, analyzing process by process, environmental aspects grip, point estimation method or ABC analysis) (Byggeth and Hochschorner 2006; Stowe 2001).

## 5 Conclusion

In this study, EMS effectiveness of Tunisian companies is based on ISO 14001 standard. However, the understanding, the interpretation and the implementation of this standard in two different sectors (food and tannery) are not always simple and depend mainly to misunderstandings, resistance to change, attitudes and inability of long-term planning, etc. It sometimes

requires a technical knowledge of environmental issues, especially on the definition of criteria for selecting significant aspects or during the measurement of continuous improvement. Environmental analysis identified aspects' significance that represent a relative indicator to measure in part environmental performance (case study of food and tannery companies), not only in manufactories but also for other structures delivering services like universities, hospitals, banks. The performance depends on several initiatives taking by decision makers, and it demonstrates that the application of EMS provides environmental and management advantages:

- Adopting a transformative strategy
- Defining the EMS framework and principles for effectiveness and efficiency according to their activities
- Integrating the corporate or the social responsibility inside enterprise
- Evolving relationship between sustainability and environmental performance via PEMS
- Projecting in the near future an environmental database to help enterprise in decision making and planning about energy and water consumptions, pollution prevention and conformity with regulation.

In addition, the results obtained contribute in framework designing for activities' sustainability of food and tannery industries via EMS implementation in terms of waste management, water, materials and energy uses, as well as gases emission, acoustic sound and their environmental risks. Otherwise, for an enterprise to be sustainable, it should contribute to the economic development of the country, promote environment and foster accountability toward society. So that food and tannery companies could translate their initiatives in success stories, which could be followed by other companies for the benefit of all. That's why, enterprise could gain a competitive advantage or motivations and perceived benefits (e.g., fiscal facilitations from authorities) (To and Tang 2014). Eventually, with the emerging of new environmental, social regulation and standards, further researches are essential to quantify environmental performance based on managerial and operational indicators. The main question in this study, as perspective, will concern the assessing of the link between environmental performance and sustainability that depends on a number of methodological challenges.

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