Effectiveness of ISO 14001: 2015 implementation in small and medium enterprises (case study: a laundry machine industry SME in Bantul Yogyakarta)

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Abstract. Many companies globally apply ISO 14001 including in Indonesia. In there, most of the implementers are largely established companies in terms of quality, financial, infrastructure documentation, knowledge and understanding of the ISO. ISO 14001 was issued in 2015 to replace ISO 14001: 2004 and consider a risk-based approach in its application. This research examines the SMEs laundry machine industry in Yogyakarta that attempts to implement and achieve ISO 14001: 2015 certificate. Research results inform the implementation of ISO 14001: 2015 in the SMEs industry to achieved the extended result and applied the risk-based approach. The description of every step is expected to give understanding and model for implementing ISO 14001:2015 in this case study location. This study finds out that SMEs can be effective in some of the clauses of ISO 14001:2015. With implementation ISO 14001:2015 in SMEs expected to change the environment for better, especially in reducing the impact of the waste produced where the waste contributes to the formation of greenhouse gases which means accelerating the occurrence of global climate change.

1. Introduction

The ISO 14001 Environmental Management System or in the Indonesian language is Sistem Manajemen Lingkungan (SML) is the second most popular standard after ISO 9001 [1]. Based on data from the International Standard Organization (ISO) in 2018, there are 307,059 companies in the world that have implemented ISO 14001 SML. Whereas in Indonesia there are 1,944 companies that have implemented ISO 14001 or 0.63 % of the total companies in the world that implement [1]. The implementation of the application of the Environmental Management System with ISO 14001 certification is not only a strategy that supports the environment but also offers many benefits for the organization [2].

In Indonesia, the implementation of SML 14001 became one of the indicators for the implementation of the Sustainable Development Goals (SDGs). Through Presidential Regulation No. 59 of 2017 concerning the Achievement of Sustainable Development Goals in Indonesia, it is stated that the achievement target of 12.6 was the increasing number of companies implementing SNI ISO 14001 certification (System Environmental Management/SML) until 2019. Based on this, the Government of Indonesia through the Ministry of Environment and Forestry or in the Indonesian Language is Kementerian Lingkungan Hidup dan Kehutanan (KLHK) along with several other government agencies carried out several programs to increase the number of ISO 14001 SML implementers. In creating the program, the Government must encourage and motivate organizations to implement an environmental
management system that can be certified for ISO14001 to obtain tangible and non-tangible benefits, which include improving organizational environmental performance to increase customer loyalty, improving organizational reputation, improving financial performance, and contribute to state economy [3]. In creating the program, the Government must encourage and motivate organizations to implement an environmental management system that can be certified for ISO14001 to obtain tangible and non-tangible benefits, which include improving organizational environmental performance to increase customer loyalty, improving organizational reputation, improving financial performance, and contribute to state economy.

Implementation of ISO 14001 SML especially ISO 14001: 2015 in SME is a challenge for SME. The success of implementing SML in SME depends on several things, one of which is the competence of employees. SME must be able to ensure that personnel carrying out work under the control of the organization and they care about: environmental policies, environmental aspects and related environmental impacts, contributing to the effectiveness of environmental management systems, implications if there is a mismatch of environmental management system requirements. The economic reasons and typical structure of the organization are the most important incentives to stimulate employees and the management team to adopt environmental management systems in SME [4]. Implementation of ISO 14001 contributes to reducing the impact of climate change by reducing the waste generated by SME.

Some previous studies have explained the implementation of ISO 14001 in SME as described [4] who argues that the application of ISO 14001 at the SME in India encourages minimization of waste and may contribute to reducing overall environmental impact but its implementation has not been fully effective; Sing et al [5] that states that SME must consider resource management, change management, labor and costs before adopting ISO 14001; G. Chinnasamy et al [6] states that high promotion of ISO14001 certification among small and medium enterprises is very useful if combined with participation in external networks that facilitate its implementation.

By improving environmental performance and compliance with regulations it is expected that SME can produce environmentally friendly products that come from production processes that pay attention to the environment so that they can compete in the global market and meet demand from consumers. In addition, with the implementation of SML, it is expected that the UKM economy can also increase so that it can provide added value for SME as stated by [7] that states that the application of ISO 14001 may be very useful to reduce environmental impacts which indirectly regulated and expensive.

This research will focus on seeing the effectiveness of the implementation of ISO 14001: 2015 in the Laundry Machine Industry SME in Bantul, Yogyakarta, which has implemented this ISO to improve environmental performance and fulfill environmental compliance obligations.

2. Material and method
This research employs observation method and documentation studies, where data collection is carried out systematically, observing, and recording the findings studied. A checklist made to compare real conditions with conformity to requirements in clause ISO 14001: 2015. Then the result analyzed whether it meets the standard or not.

3. Results and discussion
In order to protect the environment of an organization from environmental pollution, the organization must have environmental analysis. The environmental analysis identifies important aspects that represent relative indicators to partially measure environmental performance [8]. Environmental analysis and environmental performance can be applied through the application of clauses in ISO 14001: 2015. In ISO 14001: 2015 there are 10 clauses, namely: Scope, Normative Reference, Term and definition, Context of organization, Leadership, Planning, Support, Operation, Performance Evaluation, and Improvement. Of the 10 clauses which are indicators in the assessment of the application of ISO 14001: 2015 are from clause 4 to clause 10, while clauses 1 through 3 are information. As shown in the Table 1.
Table 1. Clauses in ISO 14001:2015

| Clauses | Explanation |
|---------|-------------|
| 1-3     | Information |
| 4-10    | Requirement |

In the picture above, it is explained that the implementation of ISO 14001: 2015 Clause uses P (Plan) D (Do) C (Check) and A (Action) cycles, where Plan is the application of clauses 4 and 6, Do is the application of clause 7, 8, Check id the application of clause 9, Action is the application of clause 10 while the clause 5 is support for other clauses. When observing the implementation of ISO 14001 in SME, we must have to make sure that the implementation based on PDCA cycles so that the objectives of implementing ISO 14001 as a whole can be achieved.

Based on the results of filling in the checklist and field observations, the results of implementation ISO 14001 in the research location are as follows:

3.1. Context of the organization

The organizational context discussed in the ISO 14001: 2015 standard considers the needs and expectations of the interested parties in the organization, the scope of the management system of the organization, and the environmental management system applied in the organization itself.

Each organization has different interests depending on the activities carried out by the organization and the stakeholders who are influenced and influential on the organization. Stakeholders are those that can affect the organization and can be affected by activities and decisions within the organization. There are 2 types of stakeholders, namely external and internal. External stakeholders establish manufacturing conditions, technical specifications, purchasing and use products while internal stakeholders, among others, organizational employees can influence the organization by carrying out construction and technology, producing and selling products [9]. In addition, it is determined by the scope of the organization where the scope of the organization is described as a factual statement and represents the business processes and operations of the organization which are included in the boundaries of the environmental management system and do not mislead interested parties. In this SME itself, the scope of the application of environmental management systems covers the entire process from purchasing raw materials, production, warehouses, until marketing. Then SME identifies the expectations of each
interested party in implementing ISO 14001 in SME. Table 2 explains needs and expectations from each stakeholder of Laundry Machine Industry SME which influences and is influenced by its activities.

Table 2. Needs and expectations stakeholders of this case study

| No | Stakeholders       | Needs                                | Expectations                                      |
|----|--------------------|--------------------------------------|---------------------------------------------------|
| 1  | Customer           | The machine is tough and safe to operate | The machine is durable, productive and environmentally friendly |
| 2  | Supplier           | Billing is not complicated            | Scheduled payment                                  |
| 3  | Employees          | K3 equipment is fulfilled             | Work safety guaranteed                             |
|    |                    | Periodic medical checkup              |                                                   |
| 4  | Government         | Follow the laws and regulations       | There is no environmental pollution                |
|    |                    | regarding the environment            |                                                   |
| 5  | Community          | Lack of environmental pollution       | Waste is managed well by the company               |

3.2. Leadership

Leadership here is the commitment of top management in ensuring environmental policies and targets that are set in accordance with strategic direction and organizational context. The presence of leadership as an important skill for professional case management practices and the impact of these relationships on client/support systems experience care [10]. Leadership is an important aspect of ISO 14001: 2015 when compared to previous ISO 14001, this is because of the main responsibility in order to ensure the environmental management system to fulfill the requirements and report the performance of environmental management system. Nowadays it is at the top management and cannot be delegated like at ISO 14001 beforehand.

Top management must also establish, implement, and maintain environmental policies within the scope of the applied environmental management system. The environmental policy of SMEs in this case study that is integrated with other management system policies implemented is committed to consistently being an environmentally friendly company that meets customer expectations by providing quality products that are standard and safe for health/environment, including compliance with applicable laws, develop employee competencies, and contribute to people's welfare.

3.3. Planning

In planning the implementation of ISO 14001: 2015, things that must be prepared by the organization are active in dealing with risks and opportunities and determining environmental goals and planning to achieve goals. Risk management requires an action or effort commonly called risk management as stated by (Wong, 2017). He states that risk management is carried out by utilizing the results of routine assessments to look for opportunities to improve the effectiveness of management systems, achieve better results and prevent negative effects. Besides the results of risk assessments can be used as references and information on data in determining operational controls and administrative controls to minimize risks related to the impact of environmental aspects [11].

In determining the risks and opportunities in the SME, the laundry machine industry is based on the existing processes in the SME. This is to make it easier in identifying the risks and opportunities of each activity in the SME. The risks will then be grouped according to the risk criteria that have been made previously to see which risks need to be controlled.

After determining the risks and opportunities, what must be done for the next is implementing the environmental goal. Organizations must set environmental objectives at functions and levels relevant by considering important environmental aspects of the organization and related compliance obligations. In addition, the organization also must consider the risks and opportunities that have been determined. Table 3 explain environmental objective in each department of Laundry Machine Industry SME which has different environmental objectives according to their duties and responsibilities.
Table 3. Environmental objectives of SME laundry machine industry

| No | Department                  | Environmental Objectives                                      |
|----|-----------------------------|----------------------------------------------------------------|
| 1  | HR, Finance, and Marketing  | 10% paper efficiency                                          |
|    |                             | The efficiency of electricity usage 3% every year             |
| 3  | Purchasing                  | Management of packaging raw materials                         |
| 4  | Production                  | Reduction of waste production 5% every year                   |

3.4. Support

In this clause, the support includes resources, competence, concern, communication and documented information. SME resources are very limited, both in terms of quantity and knowledge. In implementing environmental management systems must understand ISO 14001: 2015 and other related environmental regulations. Individual competency in ISO 14001 certification is explained by institutional pressure, company motivation for certification, intermediary certification competencies, and by the complexity of the company's internal processes [12]. Factors that SME must consider before adopting ISO 14001 include resource management, change management, labor, and costs [5].

The main difficulties revealed in relation to ISO 14001 environmental management system certification are difficulties in changing corporate culture, high certification costs and the difficulties in motivating personnel [13]. Therefore, guidance from other parties is still needed so that the environmental management system can be implemented well in SME.

The organization must be able to ensure that personnel carrying out work under the control of the organization care about: environmental policies, environmental aspects and related environmental impacts, contribution to the effectiveness of environmental management systems, implications if there is a mismatch of environmental management system requirements. The economic reasons and typical structure of the organization are the most important incentives to stimulate employees and the management team to adopt environmental management systems in SME [3].

From evaluation in this research location, the organization has done a training needs analysis to all their employees dan to make all the analysis can be well done, the competence of SME Employees in implementing ISO 14001 is good enough and above average. SME Employees know the policy and targets of the company environment. They also know the rules about the environment, types of waste, and how to handle the waste. The things that still need to be improved is positive motivation and good cooperation between the leaders and employees of SME in maintaining consistency in the application of this standard.

And for implementation of information control, the organization in this research not optimal due to the limitations of technology and resources for storing documented information. They still use a laptop in each employee in the office that can be accessed by anyone so it cannot be controlled.

3.5. Operation

In the operation clause, the organization must establish, implement and control the processes needed to meet the requirements of the environmental management system. The specified processes are determined by considering the risks and opportunities that have been previously set. Some processes that are not assembled or have no significant impact on environmental aspects will be eliminated. The organization must consider that the availability of human resources and the cost aspect are the important aspects of the operational control process. Furthermore, the organization also must make procedures for emergency preparedness and response.

In this research, the organization can have been able to ensure the entire production process is carried out in accordance with the scope of the environmental management system. Procedures that have been made can take control of the product manufacturing process not polluting the environment in the application of ISO 14001. They also have made emergency preparedness and response procedures and conducted socialization for all employees.
3.6. Performance Evaluation
Monitoring, measurement, analysis and evaluation are conducted periodically by SME. Monitoring and measurement of the resulting liquid waste are carried out periodically every 3 months by sending waste samples to the local environmental laboratory. This application of ISO 14001 may be very useful for reducing environmental impacts that are indirectly regulated and expensive, like confronting the impact of expensiveness which is extremely regulated or the general impact of it which is not expensive and not regulated [7]. Through the existence of an environmental management system, it is expected that the SME environment can be managed properly so that the waste produced does not have a negative impact on the environment.

System evaluation is carried out repeatedly, internal audits are carried out in an integrated manner with other management systems that are implemented and carried out once a year. Likewise, the management review is also scheduled to be conducted once a year. Evaluation of this system is important to maintain the effectiveness of the management system that has been implemented by SME. Implementation and operation and management review significantly affect the success of implementing ISO 14001 for workers in a positive way.

The organization in this research, have done internal audits and management review to ensure the management system is running well. Furthermore, they also make regular monitoring of their waste by periodic waste testing in the laboratory.

3.7. Improvement
SME must determine the opportunities for improvement and implement the actions needed to achieve the expected results from the implementation of the environmental management system. The main benefits identified from environmental management system certification are the prevention of environmental risks and protecting the image of the company in the surrounding customers [14].

The opportunity for this improvement comes from the results of monitoring, measuring, analyzing and evaluating environmental performance and fulfilling compliance obligations. In addition, opportunities for improvement are also a result of the environmental management system audits and management reviews that have been carried out. For supervisors, implementation and operations, as well as examining and corrective actions, significantly influence the success of implementing ISO 14001 positively [15].

The SME organization had made corrections dan corrective action from nonconformities that published when auditing internal and management review. They also conduct continuous improvement to prevent nonconformities repeated.

4. Conclusion
In the application of ISO 14001: 2015 at the study location, several clauses that have been applied were found, such as determining the context of the organization, identifying aspects and environmental impacts and improving environmental performance, especially in terms of the management of the waste produced. The thing that still needs to be improved is positive motivation and good cooperation between the leaders and employees of SME in maintaining consistency in the application of this standard and control of documented information that is not optimal due to the limitations of technology and resources for storing documented information. With implementation ISO 14001:2015 in SMEs expected to change the environment for better, especially in reducing the impact of the waste produced where the waste contributes to the formation of greenhouse gases which means accelerating the occurrence of global climate change. This research is a suitable reference for future studies that are relevant and similar in this field. The researcher recommends further research to improve and expand the benefits and motivations in the implementation of ISO 14001: 2015 for SME.

Reference
[1] ISO 2017 The ISO Survey [Online] Available: https://www.iso.org/the-iso-survey.html [Accessed: 29-10-2019]
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