

EXPLORATION OF BARRIERS IN ACHIEVING PROACTIVE ENVIRONMENTAL STRATEGIES IN A NATURAL RUBBER INDUSTRY : A CASE STUDY

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ABSTRACT

As the evolving of environmental issues over time, the development of environmental management approaches in industries began to shift to the prevention of pollution to reduce environmental impact. However, in practice, many obstacles encountered during the environmental management change to be more proactive. This study aims to explore the barriers of achieving the proactive environmental strategy in a rubber processing industry. Used a case study approach in a natural rubber processing factory, the data was collected through interviews with experts and sources as well as observation in the field. This study shows main barriers that faced by the company consist of financial issue, human resources, communities' pressure, technological change and communication with environmental experts. The results of this study suggest conducting cooperation with research institutions or environmental experts especially for skills that cannot be controlled by the manager or employees in the company.

Keywords : *proactive environmental strategy, barriers, natural rubber industry*

INTRODUCTION

Indonesia is the second largest natural rubber producer in the world after Thailand, approximately 25 % -27 % of the world's natural rubber needs is supplied by Indonesia (*Natural Rubber Trends and Statistics* 2010). The main types of natural rubber products in Indonesia are: crumb rubber, rubber sheet (Ribbed Smoked Sheet or RSS), concentrated latex, and crepe (Darmawan, Putra & Wiguna 2014). The primary rubber products can also be referred to as intermediate products, because they still require further processing to become finished products such as tires, gloves, shoe soles, etc. (Utomo, Hasanudin & Suroso 2012).

As one of the main commodities of the agricultural sector, Indonesia's natural rubber industries receive attentions with respect to the magnitude of potential wastewater, solid waste, as well as odour emissions resulting from the production processes chain (Hasibuan 2012). That was because the processing of rubber that is converted from latex into rubber primary product such as crumb rubber or concentrated latex requires a large amount of water, chemicals and energy. The natural rubber-processing sector consumes large volumes of water and energy and uses large amount of chemicals as well as

other utilities. Consequently, those primary stages create large quantities of wastes discharged to environment (Nguyen & Luong 2012; Wouapi & Maimo 2007). The uses of auxiliary raw materials such as chemicals at this stage of raw material handling and coagulation, as well as a large amount of water at the dilution phase, have potential of wastewater generation. While the smoking process and by-products can cause air pollution and odour (Jawjit, Kroeze & Rattanapan 2010).

Those environmental issues are driving the company to implement environmental management strategies to prevent environmental damage. One of the strategies is waste treatment at the end of process or often referred as end-of-pipe treatment. Many companies have been implementing environmental management systems and aim to comply with standards applicable environmental regulations in their country (Theyel 2000). However, several factors such as: the evolvement of environmental issues over time, decreasing the environmental capability to receive the waste that is formed, an increase in consumer awareness of environmentally friendly products and processes, as well as stringent environmental regulations, are pushing the company to review their environmental

management performance (Esty & Winston 2009). On the other hand, the existing environmental management such as 'end-of-pipe' treatment is uneconomic and cannot anticipate changes in environmental issues in the future (Welford & Gouldson 2002). Consequently, to sustain their business, companies must adapt to the changing external environment by continuing to innovate (Drucker 1999). One of those is innovation that aiming at environmental impact reduction, or also called environmental innovation (Horbach, Rammer & Rennings 2012), including change management approach from end-of-pipe treatment to a more proactive approach such as reducing pollutant since the beginning of the process.

A company is said to be environmentally innovative if they meet one of the several criteria such as the integration of environmental criteria into the design process or product, improvements in waste management and recycling process for either internal or external (Cleff & Rennings 1999; Kusumastuti 2015). The shifting from reactive into pollution prevention strategy show higher level of proactivity in terms of environmental management strategy in a company. This includes an environmental innovation in process (Kusumastuti 2015; Subramanian & Nilakanta 1996). However, in practice, these changes often confronted with obstacles that led to the adoption of this new approach have not been effective. Many research in determining the factors and barriers to the implementation of environmental management and innovation show the importance of exploring these inhibiting factors in the formulation and successful implementation of environmental improvement strategies. These obstacles need to be identified to determine strategies for decision makers in the company to overcome and avoid inhibitors the process of change (Hertzman & Kimplaire 2013). In addition, the obstacles in the process of achieving this strategy are important to note that the process of adoption and implementation of cleaner production work effectively (Shi et al. 2008).

Given the situation, the purpose of this study is to explore the barriers in the way of achieving proactive environmental strategies in a natural rubber company.

METHOD

To meet the objectives of this study, this research was conducted with three stages, namely:

- a. Field observations at the selected company.

- b. Interviews with the experts to identify any obstacles to the achievement of improvement experienced environmental management performance.
- c. Analysis on the main barriers that encountered in this study based on the perception of practitioners and experts.

This research was conducted in a rubber processing company in Central Java Province, Indonesia which is a unit of state-owned enterprises. The company manufactures quality rubber products such as RSS (ribbed smoked sheet) and cutting (pieces of rubber from the sorting process). This company employs 1,447 employees. Ribbed smoked sheet (RSS) is one of the processed products made from rubber plantations in Indonesia. RSS occupies the second largest rubber products after crumb rubber or SIR (Standard Indonesian Rubber).

Data Collection

- a. Secondary data

The secondary data were obtained from books, journals, research report, publications and documents that are relevant for this study. The documents include environmental regulations, the company's monthly production reports, and job training reports.

- b. Interview

The interview aims at generating primary data from source persons, who are selected through purposive method sampling (Palys 2008). The interview method is deployed to acquire the point of view of source persons in terms of environmental aspects in accordance with the context of this study. The total participants are eleven person that consist of:

- 1) Two representatives from Ministry of Industry who handle agricultural industry and green industry policy
- 2) Two representatives from environmental agency at the provincial level
- 3) Two representatives from R & D Agency pollution prevention
- 4) Two representatives from R & D Agency of natural rubber
- 5) Selected factory (director, technical manager, and employees).

The interview is a semi-structured interview, in which the main research question was explored and combined with derivative questions from primary research questions, following the context of this study and the roles of the participants. The interviews with experts

were held for thirty to sixty minutes, which then recorded and transcribed.

c. Observation

This stage focused on the performance of existing environmental management, to identify sources of pollution and their causes. Direct observation was performed at every stage of the production process to identify the practices that are inefficient and potentially cause environmental impacts in the company. At this stage, a checklist was used during the observation process, which consists of the data about raw material consumptions; production process, numbers of employees, waste management system; and additional qualitative information as needed.

Data Analysis

The data analysis used combination of interpretive and descriptive approach. To support reliability of data, this study used a triangulation method from multiple sources that contributes to the confirm-ability of research findings (Bossink 2007; Rowley 2002). The key interviews and sections of interviews were transcribed and categorized (Fischer & Schot 1993). Then the data analysis used explanatory approach with supporting literature and evidence (Elman 2005).

RESULT AND DISCUSSION

In accordance to the objectives of this study, which is to look for obstacles towards proactive environmental management practices, the data collected showed major obstacles as described as follows:

a. Financial issues

From the interviews, according to the director, they are still hampered by the financial problems of the directors who were in office previously. For regular funds, funds of directors board only decreased by only 80%. In addition to the obstacle above, another benefit consideration is when they were offered by an external expert to apply the wastewater recycling technology. The company said that it is difficult to measure the benefits earned by applying new environmentally friendly technologies. As the manager said that there is the potential for recycling of wastewater, but once calculated, the cost is enormous. They are very optimistic to provide the money to invest in the environmental technologies. However, the concern is that, as entrepreneurs, the investments that they put in for technology and innovation in all our production chain should provide benefits that

can be measured. Whether based on how long it will take for the capital back or the value of benefits to obtain. According to the manager, the environmental advantages it difficult to measure to determine the criterion of such advantages.

The description from the managers shows that financial consideration still one of the inhibitors of the new environmental approach in natural rubber industry. It was due to investments made to reduce the environmental impact remains a consideration for management, given the advantages gained by implementing more environmentally friendly technologies are difficult to estimate. While the opportunity to apply enough product differentiation is limited due to the applicable standards and supply natural rubbers worldwide determines the selling prices. Therefore, several alternatives to estimate the profits by implementing proactive environmental measures that can be done with an environmental costing approach that is suitable for the corporate (Moors, Mulder & Vergragt 2005). From those problems, it shows the necessity of a model that can measure environmental costs (Post & Altma 1994), to convince them to apply more environmentally friendly technologies. Meanwhile, to deal with the lack of capital costs for an environmental management improvement project, innovation in marketing can increase the financial strength of companies that could be allocated for investments in cleaner technology (Post & Altma 1994). Correspondingly, improvement in marketing strategies can be reinforced by using the competitive advantage of buyers who require environmentally friendly products (ater, Prašnikar & ater 2009).

b. Communication with external stakeholders

The location of a business that is close to other institutions (in this case the environmental expert or environmental research agency), will be beneficial for the adoption process of more proactive environmental management (Carruthers & Vanclay 2012). Nevertheless, the distant location of the plant to the city centre and the competent environmental agencies considerably hampers to the smooth process of communication and consultation for solving the problems related to the environmental management in the company. The manager considered it is time-inefficient. That is because face-to-face communication is considered by the company as effective way to communicate their environmental issue to the experts (Moore 2010). Although direct communication is necessary, it must also be ensured that the expected output from

communication can be useful, especially when face particular problems. To that end, it is important to develop a communication channel to the external environment experts, although sometimes necessary also direct meetings. This communication channel is expected as one of the lines consultations to address environmental problems that are happening in the company if the two parties are not the opportunity for a direct meeting (Polonsky 1995).

c. Human resources

In the factory itself, the human resources of the company were considered by his superiors have not been able to propose the improvement efforts that lead to the prevention of pollution. This is due to the lack of knowledge and expertise in the field of environmental-friendly practices. In daily operations, employees still receive direction from his superiors to conduct an efficient practice and do not pollute the environment. For example when an employee is cleaning the equipment, the supervisor must warn the employee to use water carefully and to close the tap after use. This means that increasing the environmental awareness of workers is important to achieve successful implementation. Besides, the focus of employees and the company is still dominated by production problems. Therefore, the engineering manager is open and welcomes any suggestions from environmental experts that can be applied in the factory to minimize environmental impact. However, the employee may not be interested to environmentally friendly practices because of lack of communication and training of management (Doody 2010). Therefore, it is necessary for the company to program an environmental management policy then deliver it to its employees so that it can be applied at the beginning. In addition to the role of leader and supervisor, also needed the support of all employees in the change of this practice in order to succeed (Baker 2009; Doody 2010).

d. Communities pressure

Although the company has fulfilled the requirements of wastewater disposal, if there is dissatisfaction from the public to the pollution situation, the community's pressure will be expected to continue (Wang 2000). In this case, the company had received a complaint from surrounding community due to their sewerage. The weak understanding of the community about the provision of wastewater

reuse also worsened the complaint issue. Basically, the result of waste treatment is not intended for irrigation of farmland without the certain conditions according to the applied law. Previously, the company had semi-open sewage for their effluent. The community that are majority farmers used the effluent to irrigate their fields. However, there was an inevitable occurrence befall their crops. Even though the cause could be not only from the company's wastewater, the representatives of residents who felt aggrieved demanded for corporate's responsibility. To overcome the problems with the residents, the company entered into a dialogue with them to find a solution. In addition, the company also asked for the input from the nearest environment agency to overcome the problem. In order to achieve a mutual benefit and prevent future conflict between the local communities and the company, the results of the discussion, which was also attended by representatives of various elements, reached an agreement that states that the company will not cover the risk that may arise by using the output of the wastewater treatment facilities. As the result of the negotiations, until this point, nobody has using the company's effluent for irrigation so the company has not been receiving complaint about the issue.

e. Technological change consideration

The director informed that when they conducted a study visit to Thailand and Malaysia. There they saw that in terms of production, they are more use of machinery. But they are not necessarily directly procure of new machines. That was because the diffusion of new technologies is often constrained by social and technical considerations (Cantono & Silverberg 2009). If the company's management decide to use more machines, they concern that this will affect the number of employees. Besides, the installation of new clean technologies is costly. It was also due to the installation of new technology requires additional investment in employee training and hiring external experts (Hilson 2000).

Therefore the managers needs to communicate to employees that with the addition of equipment will have no impact on the reduction of workers, but to further prevent the inefficiency of manpower and reduce the risk of workplace safety. Besides, the management also need a measurement to convince the corporate to use more environmentally-friendly technology and as a considerations to decision making.

From the main of the obstacles encountered in this study, some suggestions are given that are expected to solve the problems are as follows:

a. Personnel Environmental Strategy

This strategy relates to human resources constraint. Recognizing the importance of employees' participation in the environmental activities in the company, the company could implement personnel environmental strategy that is also enabled by management supports (Aster, Prašnikar & Aster 2009). The methods are by facilitating employees' training and building awareness about environmental issues. It is expected that the active role of workers and managers' support to be more proactive in the environmental management practices (Hanna, Rocky Newman & Johnson 2000).

b. R&D Cooperation strategy

There are certain area in environmental management that is not the company's ability. Those weaknesses of the company must be overcome to formulate the proactive environmental strategies and effective implementation. One way is by collaborating with experts in the field of environment.

Research collaboration with the environmental research institutions is considered as one of strategies to promote environmental innovation in the company (De Marchi 2012). Besides, the cooperation is not only on the instalation of new clean technologies but also in training and consultation in the field environmental management. In other words, some advantages such as knowledge transfer, exchange of resources, and organizational learning can be obtained by conducting joint research and development (Becker & Dietz 2004). Other benefits from adapting this strategy are efficiency, profitability, competitiveness rather than conducting an in-house research within the company.

CONCLUSION AND RECOMMENDATION

This study aims to explore barriers in order to achieve more proactive environmental practices in the natural rubber processing industry. The main obstacles encountered by companies to be more environmentally friendly include the financial considerations, human resources, community pressure, technological change as well as communication with the institutional environment. Those barriers cannot be generalized beyond the company

where the conditions and characteristics differ by region. However, this design is an appropriate template for a broader based study in the future. The results of this research highlight the practical implications by increasing employees' awareness for environmental-friendly knowledge and practices. As the strategic implications, this research also assists the company's management in environmental decision making by conducting a R&D collaboration with environmental experts. These results also suggest the government to assist industries in the environmental management and provide the industries with technical guide to awalys comply with the regulations. For theory building, the obstacles of that inhibit the proactive environmental implementation could be the basis for theory building of environmental innovation strategy.

Finally, the success of the implementation of proactive environmental strategies as well as overcome its inhibitors require cooperation and communication with expert stakeholders, and active participation from all company's elements.

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