



Eco-Friendly Based Micro, Small and Medium Enterprises Empowerment Model

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Abstract. Green business causes a few negative impacts on the environment, both the natural environment, society, and the economy. People are now thinking about the importance of saving the earth and its ecosystem. Therefore every business sector has a moral obligation to run an environmentally friendly business. The purpose of this study is to create an ecologically friendly MSME Empowerment model that is useful for improving the community's economy in the cracker processing industry sector in Kurau Village, Koba District, and Central Bangka Regency. The approach chosen in this study is a quantitative and quantitative research using interviews, observation, and FGD (Focus Group Discussion) techniques, which involved 33 respondents from the cracker processing industry in Kurau Village. The sampling technique used to obtain respondents was a non-probability sampling technique with saturated samples (census). Based on data processing and analysis, it is found that: First, the production process is intended to cover aspects of the production program efficiency, input materials, energy, water, process technology, and human resources. Elements of the production efficiency program further strengthen the production process. Second, environmental management and work safety are meant to cover aspects of waste and the work environment. Elements of the work environment further strengthen ecological management and work safety. Third, company management includes parts of operational standards, charity or donations, and awards. The aspect of operational standards also supports company management.

Keywords: Green Industry · Processing Industry · UMKM Empowerment Model

1 Introduction

In relation to business sustainability, green business is an important issue for future economic growth. Green business is a business that causes little negative impact on the environment, both the natural environment, society and the economy. People are now thinking about the importance of saving the earth and its ecosystem [1]. Therefore, every business sector has a moral responsibility to run an environmentally friendly

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business. MSMEs in Indonesia are still the business sector with the majority compared to large industries. The rapid growth of MSMEs in Indonesia is inseparable from the characteristics of MSMEs which are a business sector that is resistant to global risks. Need to know, MSMEs have a significant contribution in reducing the quality of the environment caused by waste produced in various forms, production processes that are not yet efficient both in the use of raw materials, energy, and the use of other supporting materials.

Along with the times, people as consumers are increasingly aware of the importance of a healthy lifestyle so they want companies to produce products that are environmentally friendly. The existence of demands from society that companies can produce products that are environmentally friendly and use production processes that do not damage the environment encourages the need for attention from companies and SMEs to innovate in creating environmentally friendly products. Product innovation that is environmentally friendly will improve the performance of SMEs in addition to the support from entrepreneurial orientation and corporate social responsibility carried out by the company [2].

There are several previous studies that have relevance to this research. The challenges ahead in the development of SMEs are felt to be even greater [3]. Economic globalization and trade liberalization as well as the harsh demands on environmental issues make SMEs have to really improve and equip themselves with various capabilities in accordance with the demands of environmental change itself. The influence of green practices on expected performance outcomes in food and beverage Micro, Small and Medium Enterprises in the Special Region of Yogyakarta as a research context. MSME is a type of business with an investment value that is not too large, so that almost all people can build this business, however, not all people have awareness of environmental sustainability [4]. With that, MSMEs are one of the business groups that contribute to environmental pollution, even though it is still on a small scale, but the impact it will have in the future will be very large. The types of businesses in the food and beverage sector are considered to represent almost a portion of the number of MSMEs in the Special Region of Yogyakarta. Based on this assessment they were selected as the sample in this study, the following conclusions were obtained: Green Practices partially affect Economic Performance; Green Practices partially affect Social Performance; Green Practices partially affect Operational Performance; and Green Practices partially influence Environmental Performance.

To encourage conventional MSMEs to become environmentally friendly, various information is needed, both internally and externally. From the internal side, aspects that need to be known include: the awareness and perceptions of business actors regarding environmental issues, the interest, interest, and readiness of business actors, as well as the efforts they have made or are currently making to switch from conventional to environmentally friendly systems. Other important information needed is the various obstacles or difficulties that may be faced by MSMEs, both management, technical, marketing aspects, and financing aspects required by business actors in their efforts to migrate from conventional to environmentally friendly systems. From the external side,

The application of MSMEs to become environmentally friendly cannot be done drastically, efforts need to be made in stages so that the implementation can be maximized.

Especially for the Bangka Belitung area itself, there is no MSME sector that has really implemented green business. Therefore it is felt that an initial study is needed to determine the level of readiness of MSMEs in implementing an environmentally friendly context.

This research will focus on studying the readiness of environmentally friendly MSMEs in the context of a green industry. More specifically, this research needs to be conducted in order to find out the readiness of SMEs in the cracker processing industry sector in Kurau Village to become environmentally friendly SMEs, as well as what constraints and strategies can be implemented to encourage SMEs to become environmentally friendly businesses.

2 Theoretical Review

2.1 Micro Small and Medium Enterprises

Based on the Law of the Republic of Indonesia Number 20 of 2008 concerning Micro, Small and Medium Enterprises, the meaning of MSMEs is: (1) Micro Enterprises are productive businesses owned by individuals and/or individual business entities that meet the criteria for Micro Enterprises as regulated in the Law this; (2) Small business is a productive economic enterprise that stands alone, which is carried out by individuals or business entities that are not subsidiaries or not branch companies that are owned, controlled, or become part either directly or indirectly of medium or large businesses that are meet the criteria for Small Business as referred to in this Law; and (3) Medium Enterprises are productive economic businesses that stand alone, carried out by an individual or business entity that is not a subsidiary or branch of a company that is owned, controlled, or becomes part, directly or indirectly, of a Small Business or a large business with a total net worth or annual sales proceeds as stipulated in this Law (Law of the Republic of Indonesia Number 20 of 2008) [5].

The definition of MSMEs according to the Ministry of Cooperatives and MSMEs Small Enterprises, including Micro Enterprises are business entities that have a net worth of at most Rp. 200,000,000, excluding land and buildings for business premises and having annual sales of at most Rp. 1,000,000,000. Meanwhile, Medium Enterprises are business entities owned by Indonesian citizens who have a net worth of more than Rp. 200,000,000 to Rp. 10,000,000 excluding land and buildings.

Then in the perspective of its development, according to Law no. 20 of 2008, SMEs can be classified into 4 (four) groups, namely: (1) Livelihood Activities, are SMEs that are used as work opportunities to make a living, which are more commonly known as the informal sector. Examples are street vendors; (2) Micro Enterprise, are SMEs that have craftsman characteristics but do not yet have entrepreneurial characteristics; (3) Small Dynamic Enterprise, which are SMEs that have an entrepreneurial spirit and are able to accept subcontracting and export work; and (4) Fast Moving Enterprise, an UKM that already has an entrepreneurial spirit and will transform into a Big Enterprise (BE) [6].

2.2 Green Industry

The definition of Green Industry in Law no. 3 of 2014 concerning Industry is an Industry which in its production process prioritizes efficiency and effectiveness in the use of

resources in a sustainable manner so as to be able to align Industrial development with the preservation of environmental functions and to provide benefits to society [7]. Green Industry is the commitment of every industry to reduce the impact on the environment due to the production process and the products it produces through the efficient use of resources continuously and is low in carbon which is applied to the selection of raw materials, production processes, final products, and services in an activity/industry [8].

Green industry is a concept of industrial development that is economically, environmentally and socially sustainable, where every type of industry has the potential to be “green”. In the Action Plan for the Manila Declaration, the necessary steps have been formulated to reduce the intensity of natural resource use and carbon emissions from the industrial sector in Asia, as well as to monitor efforts on a national scale. In the declaration, the pillars included in the green industry are the clean production of environmentally sound products and services as well as growth and competitiveness. Overall, the green industry concept is a way of developing a sustainable industrial sector, both economically, environmentally and socially. Industries that can implement a green industry are industries engaged in the “environmental good” sector and services, including: the recycling industry, waste treatment, waste destruction, waste transport, environmental consultants, waste water treatment industry, air pollution control, processing equipment waste, the manufacturing industry and installation of renewable energy equipment, energy consultants, specialized environmental measurement and analysis laboratories, and industries that produce clean technology. Consumption of natural resources per capita in the Asian region is much lower than that of developed countries [9]. A green industry is an industry that in its production process prioritizes efficiency and effectiveness in the use of resources in a sustainable manner so as to be able to align industrial development with the preservation of environmental functions and to provide benefits to society (Draft Industrial Law) [10].

3 Method

The method used in this research includes qualitative and quantitative research. Due to this study to find, analyze, describe in detail the knowledge or information on the research subjects studied. The data sources used were through FGD (Focus Group Discussion) and in-depth interviews by gathering information including: various aspects related to the current real conditions, as well as the reasons or background for an action, views or opinions, and the expectations of the target respondents. The sample used is a saturated sample of 33 MSMEs in Central Bangka Regency. The selected SMEs are SMEs in the processing industry sector in Kurau Village.

The analysis techniques used in this study include: (1) Descriptive Analysis, which is a set of activities that aim to extract various information from related data, and in the form of tabulations and pictures so that they are easy to understand and able to generate ideas; (2) Correspondence Analysis (AK) is an analysis that displays rows and columns simultaneously from a two-way contingency table, which can then be expanded to a multi-way contingency table [11]; and (3) Thurstone Analysis, this method is a technique ranking of a set of attributes based on psychometric measures, which is based on the Law of Comparative Judgment [12]. Each product or service attribute has a different

level of importance in meeting the needs or desires of its users. This causes consumers to generally choose a product that has prioritized attributes.

4 Results and Discussion

4.1 Production Process

The intended production process includes aspects of the production efficiency program, input materials, energy, water, process technology, and human resources. Aspects of the production efficiency program have company policy criteria in implementing production efficiency and the level of achievement in implementing the company's commitment to increasing production efficiency. It can be seen in Table 1:

Based on Table 1, the aspect of the production efficiency program is more influenced by the company's policy criteria in implementing production efficiency than the criteria for the level of achievement in implementing the company's commitment to increasing production efficiency. This is because the company's policy criteria for implementing production efficiency have a greater value, namely 3.26. The average score for the aspect of the production efficiency program is 3.00. This means that in production efficiency activities, MSMEs already have a plan (work plan). Have a commitment and carry out activities according to plan, but have not yet carried out an evaluation. The achievement level of implementation of commitments has also reached 31–45%.

Furthermore, the material input aspect has criteria for proof of purchase of input material, the ratio of product to input material, efforts to efficiently use input material, substance of input material, and handling of input material. The results of data collection can be seen in Table 2:

Table 1. Production efficiency program

Production Efficiency Program	Mark	Average
Company policy in implementing production efficiency	3.26	3.00
The achievement level of implementing the company's commitment to increasing production efficiency	2.74	

Table 2. Input Materials

Production Efficiency Program	Mark	Average
Proof of purchase of input materials	3.13	2.86
Ratio of product to material input	3.19	
Efforts to efficiency the use of input materials	2.00	
The substance of the input material	3.13	
Handling of input materials	2.84	

Table 3. Energy

Production Efficiency Program	Mark	Average
Energy efficiency efforts	1.19	0.99
Efforts to use renewable energy	0.84	
Carry out energy management activities as evidenced by the existence of records	0.94	

Table 4. Water

Water	Mark	Average
Water efficiency/conservation efforts	2.26	1.13
Carry out water management activities as evidenced by the existence of records	0.00	

Based on Table 2, the material input aspect is more influenced by the criteria for the ratio of product to material input compared to the criteria for proof of purchase of input material, the criteria for efficiency in using input materials, the criteria for the substance of input materials, and the criteria for handling input materials. This is because the criterion for the ratio of product to material input has a greater value, namely 3.19, which means that the use of input material produces an average of 65%–75% per unit product.

Furthermore, the energy aspect has criteria for energy efficiency efforts, efforts to use renewable energy, and carrying out energy management activities as evidenced by the existence of records. It can be seen in Table 3:

Based on Table 3, the energy aspect is more influenced by the criteria for energy efficiency efforts compared to the criteria for efforts to use renewable energy and the criteria for carrying out energy management activities is evidenced by the existence of records. This is because the criterion for energy efficiency measures has a higher value, namely 1.19. From the results of data processing, it was obtained that the average value of the energy aspect was 0.99, which means that MSMEs have carried out efficient use of energy below 2.5%.

Furthermore, the water aspect has criteria for water efficiency/conservation efforts and carrying out water management activities as evidenced by the existence of records. It can be seen in Table 4:

Based on Table 4, the water aspect is more influenced by the criteria for water efficiency/conservation efforts than the criteria for carrying out water management activities as evidenced by the existence of records. This is because the criteria for water efficiency/conservation efforts have a higher value, namely 2.26. From the results of data processing, it was obtained that the average value of the water aspect was 1.13, which means that MSMEs have made water use efficiency below 4%.

Table 5. Process technology

Process Technology	Mark	Average
Implementation of reduce and reuse programs	2.13	1.98
Improvement of process technology and machine/equipment	2.19	
Implementation of production process SOP	1.26	
Reject product rate to total product	2.35	

Table 6. Human resources

Human Resources	Mark	Average
Basic training program	2.23	2.23

Furthermore, the process technology aspect has criteria for implementing reduce and reuse programs, improving process technology and machinery/equipment, implementing production process SOPs, and rejecting product rates to total products. It can be seen in Table 5:

Based on Table 5, the process technology aspect is more influenced by the reject product level criteria for total product compared to the criteria for implementing the reduce and reuse program, the criteria for improving process technology and machinery/equipment, as well as the criteria for implementing SOPs for the production process. This is because the criterion for the level of reject products to total products has a higher value, namely 2.35. From the results of data processing, it was obtained that the average value of the process technology aspect was 1.98, meaning that MSMEs had implemented a process of reducing raw materials and already had plans for modifying machines and equipment, MSMEs also already had SOPs even though the implementation was only partial. In addition, the rate of reject products is also below 2%. Furthermore, the human resource aspect has basic training program criteria.

Based on Table 6, the human resource aspect is only influenced by the basic training program criteria. The score obtained on average for the aspect of human resources is 2.23, which means that MSMEs have received basic training programs that are in accordance with industry needs of 35%–65%.

The conclusions for the assessment aspects of the production process can be seen in Table 7:

Based on Table 7, the production process is dominated by aspects of the production efficiency program with a value of 3.00. Furthermore, the aspect of process technology with a value of 2.98. Next, the material input aspect with a value of 2.86. Then, the aspect of human resources with a value of 2.23. Finally, the water aspect with a value of 1.13 and the energy aspect with a value of 0.99. The average value of the production process is 2.20.

Table 7. Production process

Production Process	Mark	Average
Production Efficiency Program	3.00	2.20
Input Materials	2.86	
Energy	0.99	
Water	1.13	
Process Technology	2.98	
Human Resources	2.23	

Table 8. Waste

Waste	Mark	Average
Waste management	1.74	1.71
Waste utilization	1.39	
Waste quality testing	0.00	
Fulfillment of waste quality standards	2.84	
Fulfillment of waste gas and dust quality standards	2.58	
Waste management	1.74	

4.2 Environmental Management and Occupational Safety

Environmental management and work safety are intended to cover aspects of waste and work environment. The waste aspect has criteria for waste management, waste utilization, waste quality testing, fulfillment of waste quality standards, and fulfillment of gas and dust waste quality standards. Can be seen in Table 8:

Based on Table 8, the waste aspect is more influenced by the criteria for fulfilling the waste quality standards compared to the criteria for waste management, the criteria for waste utilization, the criteria for testing the quality of waste, and the criteria for fulfilling the quality standards for gas and dust waste. This is because the criteria for fulfilling the waste quality standard have a greater value, namely 2.84. From the results of data processing, it was obtained that the average value of the waste aspect was 1.71, which means that waste processing is immediately disposed of according to applicable regulations, waste utilization is used by other parties but not for the production process, waste quality testing is carried out periodically over 1 year, 70%–80% fulfillment of liquid waste quality standards as well as gas and dust waste quality.

Furthermore, the work environment aspect has Safety, Occupational Health and Environment criteria. Can be seen in Table 9:

Based on Table 9, the work environment aspect is only influenced by the Occupational Safety, Health and Environment criteria. From the results of data processing, the average

Table 9. Work environment

Work Environment	Mark	Average
Safety, Occupational Health and Environment	2.52	2.52

Table 10. Environmental management and occupational safety

Environmental Management and Occupational Safety	Mark	Average
Waste	1.71	2,12
Work environment	2.52	

Table 11. Operational standards

Operational Standards	Mark	Average
Product	3.58	2.44
Management system as evidenced by documents	1.29	

value of work environment aspects is 2.52, which means that MSMEs have installed HSE signs and provided first aid kits.

Conclusions for the Aspects of the assessment of environmental management and work safety can be seen in Table 10:

Based on Table 10, environmental management and work safety are further strengthened by work environment aspects with a value of 2.52. The rest is waste aspect with a value of 1.71. The average value for environmental management and work safety is 2.12.

4.3 Company Management

The intended management of the company includes aspects of operational standards, charity or donations, and awards. Aspects of operational standards have product criteria and management systems that are proven by documents. It can be seen in Table 11:

Based on Table 11, aspects of operational standards are more influenced by product criteria than management system criteria as evidenced by documents. This is because the product criteria have a greater value, namely 3.58. From the results of data processing, it was obtained that the average value of the operational standard aspect was 2.44, which means that around 15–30% of products have certificates and the management system already has a plan and implements it in writing.

Furthermore, the aspect of charity or donation has criteria of concern for social, economic and surrounding environment. The results of data processing can be seen in Table 12:

Table 12. Charity

Charity	<i>Mark</i>	<i>Average</i>
Concern for social, economic and environmental	1.42	1.42

Table 13. Award

Award	<i>Mark</i>	<i>Average</i>
Company participation in events related to business improvement	2.74	1.66
Awards in the industry within the last 1 year	0.58	

Table 14. Company management

Company Management	<i>Mark</i>	<i>Average</i>
Operational Standards	2.44	1.84
Charity	1.42	
Award	1.66	

Based on Table 12, the charity or donation aspect is only influenced by the criteria of concern for the social, economic and surrounding environment. From the results of data processing, it was obtained that the average value of the charity or donation aspect was 1.42, which means that there is concern for the social, economic and surrounding environment in accordance with the demands of the community in the MSME environment.

Furthermore, the award aspect has criteria for company participation in events related to increasing business and awards in the industrial sector within the last 1 year, while the results of data collection can be seen in Table 13:

Based on Table 13, the award aspect is dominantly influenced by the company’s participation criteria in events related to increasing business compared to the award criteria in the industrial sector in the last 1 year. This is because the criteria for company participation in events related to business improvement have a greater value, namely 2.74 so that the average value of the award aspect is 1.66, which means that the average MSME has participated in 1 activity that related to the increase in related businesses.

The conclusions for the assessment aspects can be seen in Table 14:

Based on Table 14, company management is further strengthened by aspects of operational standards with a value of 2.44. Furthermore, the award aspect with a value of 1.66. Finally, the aspect of charity or donation with a value of 1.42 and the aspect of energy with a value of 0.99. The average value of company management is 1.84.

Overall the results of the research regarding the readiness of implementing green industry, the production process has an assessment weight of 70% and the highest criterion in the production process is the production efficiency program. The weight for

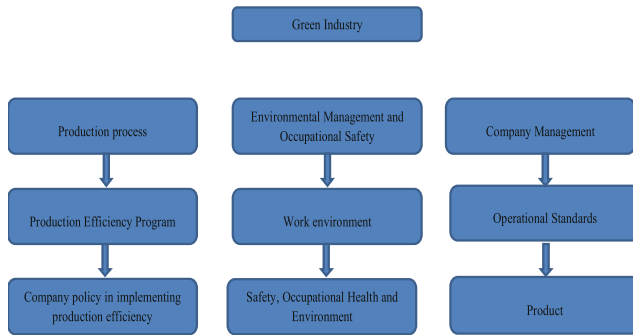


Fig. 1. Eco-friendly based micro, small and medium enterprise empowerment model in Central Bangka Regency

the assessment aspect of work environment management is 20% and the highest criterion is the work environment. The management of this company itself has a weight of 10% and the highest criteria are operational standards. So that it can be described as an eco-friendly based micro, small and medium business empowerment model in Central Bangka Regency as follows: (Fig. 1).

5 Conclusions and Recommendations

This research focuses on studying environmentally friendly MSMEs in the context of green industry. More specifically, this research needs to be conducted in order to find out the readiness of SMEs in the cracker processing industry sector in Kurau Village to become environmentally friendly SMEs, as well as what constraints and strategies can be implemented to encourage SMEs to become environmentally friendly businesses. There are 33 cracker processing industry centers in Kurau Village. Based on data processing and analysis it was found: First, the intended production process includes aspects of the production efficiency program, input materials, energy, water, process technology, and human resources. The production process is further strengthened by aspects of the production efficiency program. Second, environmental management and work safety which are intended to cover aspects of waste and work environment. Environmental management and work safety are further strengthened by work environment aspects. Third, the intended management of the company includes aspects of operational standards, charity or donations, and awards. The management of the company is further strengthened by aspects of operational standards. It can be concluded that, Kurau Village SMEs have readiness in implementing green industry. As a follow-up to the results of this study, the researchers provided advice to the government, both Central Bangka Regency, Koba District, Kurau Village as policy makers and realize programs related to empowering environmentally friendly MSMEs that are beneficial for improving the community's economy. In addition, to the community, especially those who have MSMEs in the cracker processing industry sector in Kurau Village, Koba District, Central Bangka Regency, as well as the creation of expansion of employment opportunities and increase

the economic income of the community. More shortened and adapted to the research objectives or policy benefits what to do.

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