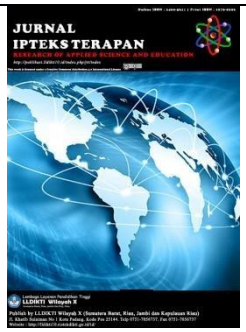

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IMPLEMENTATION OF ECO-INNOVATION AND SUSTAINABLE MANUFACTURING TOWARDS THE CIRCULAR ECONOMY GROWTH OF MSMEs IN LANGSA CITY

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Abstract

This research was conducted to determine the Implementation of Eco-Innovation and Sustainable Manufacturing for the Circular Economy Growth of MSMEs in Langsa City. Testing in this study uses quantitative research, namely by conducting response surveys using questionnaires. A total of 100 responses consisting of MSMEs in the food and beverage sector in Langsa City. The questionnaire was tested using SPSS Version 23. The results of the coefficient of determination test, namely the R-Squared value produced still tend to be small, which is only 31.3%, in influencing the circular economy. However, if tested for individual influence on the circular economy, partially Eco-Innovation still has no influence on the circular economy. however, if tested by multiple linear regression, Eco-Innovation still has hope in increasing the circular economy of MSMEs by 0.250 or 25%. If tested individually, namely a partial test, Suistanable Manufacturing has a significance value of 0.00 < 0.05. So it can be concluded that the hypothesis is accepted because Suistanable Manufacturing has an effect on the circular economy. Likewise, the results of multiple linear regression Suistanable Manufacturing have a regression coefficient of 0.620. A positive coefficient means that every 1% increase in Manufacturing Power will increase the Circular Economy by 0.620 or 62%.

Keywords: Eco Innovation, Suistanable Manufacturing, Circular Economy.

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INTRODUCTION

The development of micro, small and medium-sized enterprises (MSMEs) becomes one of the factors that can be used to evaluate the growth of the economy. The green economy that can be realized is in the micro, small and medium-sized enterprise sector (UMKM), which can start from UMKM that is in coastal areas such as Langsa. Based on the growth of UMKM in Langsa, according to data of the Central Statistical Agency of Langsa (2022), there are 24.864 UMKM, both traditional and non-traditional enterprises.

Kecamatan *Subdistrict*	Jumlah UKM *Number of UKM*
(1)	(2)
Langsa Timur	1 791
Langsa Lama	4 534
Langsa Barat	5 332
Langsa Baro	6 480
Langsa Kota	6 547
Jumlah/*Total*	**24 684**

Sumber/*Source*: Dinas Perindustrian, Perdagangan, Koperasi dan UMKM Kota Langsa/ *Industrial, Trading, Small and Middle Cooperative Service of Langsa Municipality*

Figure 1. Number of MSMEs in Langsa City in 2022

Encouraging green economy practices will contribute to economic recovery and increase employment opportunities. In Antaranews, Minister of Cooperation and Small and Medium Enterprises Teten Masduki (2023) mentioned, currently there are 65 million UMKM or the equivalent of 99.9% of the world's population enterprise in the homeland, and absorb 97% of the labour force and contributes 61.7% to GDP. (PDRB). According to the data of the Central Statistical Agency of Langsa City (2022) for the last 5 years, the overall value of PDRB Langsa city on the basis of constant prices has increased every year, since 2018 with a value of Rp 3.69 trillion then increased to Rp 4.15 trillions in 2022.

Grafik 3.2 PDRB Menurut Lapangan Usaha Atas Dasar Harga Konstan Kota Langsa, 2018-2022

Figure 2. GRDP According to Langsa City Business Field in 2022

The UMKM can be the strongest push point for achieving the economic growth of the community. Today, the green economy is developing towards creating awareness among UMKM actors to create enterprises that not only advance the economy but also sustainable environment and products. The circular economy itself is an approach that aims to extend the life cycle of a product, raw material, or existing resource so that it can be used sustainably and eventually reach zero waste. Therefore, UMKM is expected to be able to manage its business by creating a circular effect. According to the Ministry of Construction and Construction in 2021, the largest waste producer is the Food and Beverage Sector (UMKM) of 57.5 million tonnes of waste with a projected increase in waste in 2030 of 54%, then the Construction Sector also produces waste of 29 million tonnes with a projection of

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increase in wastes in 2030, of 82%, and followed by other UMKMs.

The circular economy can be a solution to the problems of waste management, residual raw material management, and other problems. Thus giving a positive impact of a change of mentality and awareness of UMKM perpetrators to product innovation, environmentally friendly production processes, 3R waste management (reduce, reuse, recycle) even enhance the positive image. UMKM in society. An example of circular economics research is research done. Pereira (2022) in his research also revealed that SMEs in India participate and contribute to the development of the circular economy.

A circular economy can be launched by creating environmentally friendly products or by environmental innovation. Eco-innovation is product innovation that helps reduce the impact of environmental damage. Eco-friendly innovation can be achieved by modifying products, processes, and services to protect the environment. According to Leskova (2019), environmentally friendly innovation contributes positively to sustainable development and competitive economy for UMKM. Valdez (2021) also affirmed in his study that eco-innovation affects SMEs' performance to help them become more competitive. It is also supported by research by Sari (2023) and Eryc (2023), that eco-innovation has a significant influence on UMKM performance.

In addition to creating environmentally friendly products, it is also necessary to pay attention to how to reduce and transform such products into waste-free products. One of the solutions is suistanable manufacturing, which is the production of products, from raw materials to finished products, which minimizes the negative impact on the environment, especially for processes that use raw materials from nature. According to Mathiyazhagan (2019), the industry is currently making significant efforts to ensure that the processing activities of sustainable products and suistanble manufacturing are done well. Where the use of sustainable production processes and systems is aimed at changing the focus of product management that previously only pressed costs based on economic factors, it is now necessary to switch to sustainable manufacturing technologies taking into account the environmental and social impact of the production process (Prasetyo & Wicaksono, 2019).

RESEARCH METHODS

Quantitative research is used in the form of survey research, where survey research is carried out by taking samples from a population and using a questionnaire as the primary data collection tool. A quiz is a data collection technique that involves preparing closed and open questions to be filled by respondents by choosing one of the available alternative answers. (Sugiyono, 2020). To evaluate each answer respondents use a likert scale that is by giving weight to the question. This value will be used as an evaluation index. The population in this research is the UMKM that exists in the City of Langsa. Where the criteria of the sample research is, UMKM Langsa that has an active business during the research period and UMKM

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Sub Sector Food and Beverage. With as many responses as 100 respondents. The data was processed using the Statistical Package for Social Science (SPSS) program.

RESULTS AND DISCUSSION

Validity shows how well an instrument measures the concept or variable in question, and validity tests will measure the instrument, which is an important component of many studies and is used to collect data from a representative number of respondents from the population or sample studied. The instruments to be tested for validity are Eco-Innovation with 8 questions, Suistanable Manufacturing with 8, and Circular Economy with 8.

Variabel	Item	Korelasi Pearson	r_{tabel} (n=70)
Eco Innovation (X1)	X1.1	0.558	0.2352
	X1.2	0.462	0.2352
	X1.3	0.685	0.2352
	X1.4	0.639	0.2352
	X1.5	0.644	0.2352
	X1.6	0.552	0.2352
	X1.7	0.574	0.2352
	X1.8	0.731	0.2352
Suistanable Manufacturing (X2)	X2.1	0.458	0.2352
	X2.2	0.777	0.2352
	X2.3	0.548	0.2352
	X2.4	0.581	0.2352
	X2.5	0.421	0.2352
	X2.6	0.451	0.2352
	X2.7	0.583	0.2352
	X2.8	0.422	0.2352
Circular Economic (Y)	Y.1	0.306	0.2352
	Y.2	0.676	0.2352
	Y.3	0.644	0.2352
	Y.4	0.604	0.2352
	Y.5	0.838	0.2352
	Y.6	0.572	0.2352
	Y.7	0.684	0.2352
	Y.8	0.586	0.2352

Table 1. Validity Test Results

The validity test results indicate that the instrument or measuring instrument used in the study is capable of measuring the variable or concept in question accurately and correctly. In other words, if the validity testing results show the instrument is valid, then the instrument can be reliable to measure what is measured.

Next is a reliability test, in the context of reliability research measuring the extent to which an instrument can measure the same concept or variable consistently. A reliable tool will give a relatively stable and consistent result if used repeatedly in similar situations.

Variabel	Cronbach's Alpha
Eco Innovation (X1)	0,755
Suistanable Manufacturing (X2)	0,624
Circular Economic (Y)	0,777

Table 2. Reliability Test Results

A reliable reliability test results indicate that the instrument or measuring instrument used in the research has the ability to deliver consistent results. A trusted instrument produces a stable and consistent result when used repeatedly. This ensures that the data obtained from the instrument consistently reflects the desired structure or variable. Reliability is an important quality of a measuring instrument so that accurate and reliable measuring instruments will support the validity of research results.

Next is a determination coefficient test commonly called R squared (R2) is a statistical method used to measure the magnitude of variation of a variable (binding variable) that can be explained or predicted by one or more free variables in a regression model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577[a]	.332	.313	3.401

a. Predictors: (Constant), Sustainable Manufacturing, Eco-Innovation

Table 3. R Square Test Results

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Based on the test results, an R value of 0.577 is obtained which indicates that Eco-Innovation and Suistanable Manufacturing are closely correlated. At the same time, the Adjusted R-Squared value is 0.313, R-squared values range from 0 to 1, which means that the model can predict variability of dependent variables perfectly. The R- Squared also explains that the impact of Eco-innovation and suistanable manufacture on the circular economy is 31.3%, while 68.7% is described by other variables that have not been studied. The next is a partial test, to assess whether each independent variable individually contributes significantly to the dependent variable in the model.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.308	5.258		-.059	.953
Eco Innovation	.250	.149	.183	1.676	.098
Suistanable Manufacturing	.620	.142	.477	4.363	.000

a. Dependent Variable: Circular Economic

Table 4. Partial Test Results

Based on the results of the test, it is known that the significance value for Eco-Innovation is 0.098 > 0.05. So it can be concluded that the hypothesis is rejected because of the absence of the influence of Eco-innovation on the Circular Economy. As well as the significant value of Suistanable Manufacturing is 0.00 < 0.05.

A double linear regression analysis is performed to determine the direction and the extent of the influence of independent variables on dependent variables. (Ghozali, 2018).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.308	5.258		-.059	.953
Eco-Innovation	.250	.149	.183	1.676	.098
Sustainable Manufacturing	.620	.142	.477	4.363	.000

a. Dependent Variable: Circular Economic

Y= -0.308+ 0.250X1 + 0.620X2 + e

Table 5. Double Regression Analysis Test Results

A negative marked constant indicates that there is no influence between the free variable and the bound variable, indicating that if the value of the Eco-Innovation and Suistanable Manufacturing variables is zero or constant, then the Circular Economy has a change of 30.8%. The Eco-innovation variable has a regression coefficient of 0.250. A positive-marked cofficient means that every 1% increase in Eco-inovation will increase the UMKM Circular economy by 0.250 or 25%. Suistanble Manufacture has a recovery coeffice of 0.620. A positive indicator means that any 1% increase on

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Suistantable Manufactures will improve the Circulary Economy by 0.620 or 62%.

Based on the results of the above study, it can be explained that in the determination coefficent test, the R-Squared value still produced tends to be small, namely 31.3%, only to have an impact on the circular economy. This is because, in Indonesia itself including in the province of Aceh, especially in Langsa City, the implementation and application of circular economy including in terms of Eco-Innovation and Suistanable Manufacturing is still less socialization and its application, including in UMKM food and beverage sector in the City of Langsa.

So the influence given in improving UMKM circular economics still tends to be small. Because from the point of view of consumers, also still not pay attention to this in determining the choice to buy a particular product at UMKM based on the concern of UMKM on the environment and processing of products to produce zero waste. Additional policies and other programs are needed, both in advance and behind. Some of the policies and programmes that can be implemented include setting policies at the level of the living environment and industry specifically regulating the application of the circular economy, increasing the capacity and knowledge of the human resources involved, as well as strengthening the institutions that serve as a reservoir for achieving common goals. (Sartono, 2022). Because basically the circular economy will bring a positive change to the UMKM. Min research (2021) stated from his research that circular economics influences SMEs in China that influences from internal factors namely its resources and capabilities, as well as from external factors such as political, economic, social, and legal aspects. Mura (2020) in his research also stated that companies that apply circular economy practices view it as a business opportunity rather than a cost, thus showing that circular economics can represent a source of value creation for companies, especially SMEs. Pereira (2022) in his research also revealed that SMEs in India are involved and contributing to the growth of the circular economy.

However, if the individual variable's influence on the circular economy is tested, partially Eco-Innovation still has no impact on the circulary economy. This is because UMKM food and beverage sector, has not yet had product innovations that support the concept of green economy, UMKM products food and drink sector also still tends to normal and has not found the development of innovative products that are based on green economics, because the new change is a challenging action to be taken. (Alfakihuddin, 2022). Sobczak's study (2022) based on a literature review suggests that the economic transition driven by eco-innovation to a circular economy requires specific solutions. But despite this, if in the double linear regression trial, Eco-Innovation still has hope in improving the UMKM circular economy. Because of the results of the double-lineary regression test, the positive coefficient is marked that an increase in Eco-innovation of 1% will increase the Circular Economy of UMKM by 0.250 or 25%. A percentage that is not too large, but gives hope in applying Eco-

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Innovation to UMKM in order to create a circulary economy. Because basically if Eco-Innovation is implemented according to Al-Hanakta (2023) in his research that the larger the eco-innovation of environmentally friendly products the greater the performance of a business.

If tested individually or partially, Suistanable Manufacturing has a significance value of 0,00 < 0,05. Thus it can be concluded that the hypothesis is accepted because the influence on the circular economy. Also, the linear regression result of Suistanable Manufacturing has a regression coefficient of 0.620. A positive indicator means that any 1% increase in Suistenable Manufacture will increase the Circular Economy by 0.620 or 62%. This is due to the food and beverage sector, although it has not yet been able to create a green product innovation or Eco-Innovation, but UMKM has started implementing suistanable manufacturing, i.e. product production activities, from raw materials to finished products, starting to minimize negative environmental impacts, including the management of waste that can be used as livestock feed, or the simulation of waste using non-plastic bags, sustainable raw material selection, and the optimization of production processes to reduce environmental footprint. Where the use of sustainable manufacturing processes and systems aims to change the focus of product management that previously only minimized costs on its economic factors, but now has to switch to sustainable manufacture technology that takes into account the environmental and social impact of its production processes. (Prasetyo & Wicaksono, 2019). It is also supported by Ghafoorpoor (2019), the handling of product material with a sustainable manufacturing approach will show a competitive advantage in its business performance.

Sustainable manufacturing is interrelated with the circular economy, where both processes are achieved by processing raw materials to waste in an attempt to minimize negative effects on the environment. So when sustainable manufacturing is well implemented, food will boost the growth of the circular economy. Based on the literature research carried out by Sari (2022) on 1651 related articles in 2015-2020, the results of the analysis show that studies on sustainable manufacturing and the circular economy continue to increase every year.

CONCLUSION

The conclusion of this study is that the circular economy is very important to implement. Because basically the circular economy itself is an approach to prolonging the life cycle of a product, raw material, or existing resource, so that it can be used sustainably, and ultimately create waste. (zero waste). As for the results of this study, the result of the determination coefficient test, the R-Squared value produced, tends to be small, only 31.3%, in giving an impact on the circular economy. This is because, in Indonesia itself, including in the province of Aceh, in particular the city of Langsa, the implementation and application of circular economy including in terms of Eco-Innovation and Suistanable Manufacturing is still less socialization or its implementation.

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However, if the individual variable's influence on the circular economy is tested, partially Eco-Innovation still has no impact on the circulary economy. This is because the UMKM food and beverage sector, has not yet had product innovations that support the concept of green economy, but if in the trial of double linear regression, Eco-Innovation still has hope in increasing the circular economy UMKM 0.250 or by 25%. A percentage that is not too large, but gives hope in applying Eco-innovation to UMKM in order to create a circulary economy. If tested individually or partially, Suistanable Manufacturing has a significance value of 0,00 < 0,05. Thus it can be concluded that the hypothesis is accepted because the influence on the circular economy. Also, the linear regression result of Suistanable Manufacturing has a regression coefficient of 0.620. A positive indicator means that every 1% increase in Suistenable Manufacture will increase the Circular Economy by 0.620 or 62%. This is due to the food and beverage sector, although it has not yet been able to create a green product innovation or Eco-Innovation, but UMKM has begun to implement suistanable manufacturing, i.e. product production activities, from raw materials to finished products, successfully minimizing waste management, sustainable raw material selection, and optimization of production processes to reduce environmental footprint.

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