



# Efficiency of the Weaving Tie MSME Production Process for Implementing Green Economy in Kupang

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**Abstract – This study aimed the performance efficiency of Weaving Tie MSMEs in Kupang through the Data Envelopment Analysis (DEA). There were 60 MSME involved as sample of this study. The input consisted of overall capital dan operational, labor and transportation cost while the output was profit, asset and earnings. The finding showed that among the 60 MSME, there were inefficient management in 8 MSME and only 10 remaining had excellent efficient management, the rest have an effective enough to implement green accounting.**

*Keywords—efficiency, green economy, green accounting*

## I. BACKGROUND

According to regulation number 20 of 2008 concerning Micro, Small and Medium Enterprises Article 3 it states that Micro, Small and Medium Enterprises aim to grow and develop their business in the framework of building a national economy. Micro, Small and Medium Enterprises (MSMEs) in Indonesia occupy a strategic position in Indonesia's economic development map. MSMEs in Indonesia are the basis of a growing economy among the people who have the potential to be upgraded to become the backbone of the country's economy. One of the MSME fields that contributes a lot to local strengthening such as absorbing labor and being able to compete globally is the Batik/ Weaving Tie Cluster. The increasing demand for batik and weaving tie was strengthened by the declaration of Indonesian Batik and Weaving tie as a world cultural heritage by UNESCO in 2009. Kupang as one of the Weaving tie producers also had the opportunity to be able to increase its exports after the implementation of the ACFTA in East Nusa Tenggara Province.

Unfortunately, the production of weaving tie in Kupang is obstructed by the availability of natural resources which are increasingly difficult to obtain with good quality standards. As a result, the price of the weaving tie products is very high, that is why weaving tie is difficult to compete with the prices of batik products or woven fabrics from other regions. This is the background for researchers to conduct research related to the application of a green economy, namely a concept that is able to balance economic interests and natural resources needs, where the main requirement for implementing a green economy is an MSME that is efficient in using resources in its production process. So researchers will use the Data Envelopment Analysis (DEA) method to measure the efficiency of ikat weaving MSMEs in order to formulate strategies for implementing a green economy for sustainable economic growth.

## II. LITERATURE REVIEW

### A. Efficiency Measurement

The concept of efficiency was born from a fundamental economic concept. However, the concept of efficiency can be defined from different perspectives and backgrounds. Efficiency, in general, can be directed to the concept of achieving results with optimal use of resources. In economic theory, there are two general concepts of efficiency, namely efficiency in terms of economic concepts and efficiency in terms of production processes. Efficiency in the economic concept has a wider scope from a macro perspective, while efficiency in the production concept is seen from a micro perspective. The production concept is limited to looking at the relationships and operations in the production process, namely the conversion of input into output [2]. Efficient in the production concept tends to assess operations, so efficiency in the production concept is generally seen from a cost perspective. According to Farrell, company efficiency consists of two components, namely technical efficiency and allocative efficiency [3]. Technical efficiency reflects the company's ability to produce output with a number of available inputs. Meanwhile, allocative efficiency reflects the company's ability to optimize the use of inputs with the price structure and production technology. These two measures are then combined into economic efficiency. This study uses the concept of technical efficiency, which shows the relationship between input and output in a production process. Thus, a production process is said to be efficient if the use of a certain amount of input can produce maximum output.

### B. Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is a mathematical programming model used to calculate the relative efficiency of a unit compared to other units that use a variety of similar inputs and outputs. DEA is a mathematical program optimization method that measures the technical efficiency of an Economic Activity Unit (UKE), and compares it relative to other UKE [4].

DEA was first introduced by Charnes et al. in 1978 and 1979. The DEA approach emphasizes a task-oriented approach and focuses more on an important task, namely evaluating the performance of the decision-making unit. This technique can be used to find out how efficient an Economic Unit is in utilizing input resources to produce maximum output [5]. Efficiency determined by the DEA method is a relative value, not an absolute value that can be achieved by an organization. Economic businesses that have the best performance can be given a score of 100% and 0% -99% for Economic Units that have below performance. DEA analysis can be used in a variety of ways to improve the production operations of an economic unit and to determine how an economic unit can become more efficient. Some of the uses of DEA include peer groups, identifying efficient operations, setting targets, identifying efficient strategies and monitoring efficient changes over time. DEA was developed as an extension of the classical Engineering ratio method for efficiency. DEA determines the maximum ratio for each economic unit of the weighted amount of output to the weighted amount of input.

### C. Green Economy Concept

Green economy is defined as an economy concept that is able to increase human welfare evenly and significantly, by minimizing the risk of environmental damage and ecological scarcity. Green economy has the priority of increasing investment in the economic sector, which is built on the basis of natural capital, but at the same time strengthening natural capital itself [6]. Green economy separates the relationship between economic growth and excessive use of natural resources and environmental damage through the development of new products, production processes, services and ways of life. In essence, the green economy encourages the production of low-carbon products, including during the distribution process. Now the green economy more widely includes changes in water use, biodiversity, forests, lifestyles, agriculture as well as emission reduction strategies, including mitigation and adaptation strategies to climate change [7]. The concrete manifestation of the application of elements in the context of the green economy concept is found in various program policies or activities that lead to economic improvement or growth, including consideration of aspects of creating decent jobs, alleviating poverty which has a positive impact on the environment. However, programs and activities or policies implemented to accelerate the spirit of a green economy are certain to incur costs and benefits as a result of these activities. Therefore, we need an indication that shows the value or ratio to be able to state whether the policy or production process is feasible or not for the future.

### D. SWOT Measurement

Decision making is often a difficult thing for everyone, but humans are always looking for ways to make their every need easier, one way to make decision making easier is with a SWOT analysis. [8] Wardoyo explained that SWOT analysis is a strategic decision-making process that is always related to the company's mission, goals, strategy and policies. As a strategic planner, in implementing a SWOT analysis, you must pay attention to various aspects related to the factors that influence it. SWOT analysis allows a company or organization to analyze and identify positive and negative factors that influence the company or organization both externally and internally [9]. The purpose of a SWOT assessment is to facilitate the development of complete awareness of all factors that influence plans in strategy and decision making, as well as expectations of achievement that are applied to all aspects of the company or organization. The SWOT assessment is divided into elements which are grouped into four categories, namely: Strength, Weakness, Opportunity, Threat.

### E. Strategy Formulation

Strategy is a plan prepared by leaders in an organization to determine work programs that will later be implemented to achieve a common goal. In other words, strategy can be interpreted as a continuous and adaptive response to external opportunities and threats as well as internal strengths and weaknesses that can affect the organization. [10] Bryson explains that strategy can be viewed as a pattern of goals, policies, action programs, decisions or resource allocation that defines how an organization is, what it does and why it does it. So it can be concluded that strategy formulation must pay attention to the goals and objectives that will be achieved in the future, besides that an organization must always interact with the environment where the strategy will be implemented, so that the strategy does not conflict but is in line and in accordance with environmental conditions and looking at capabilities. internal and external which includes the strengths and weaknesses of the organization.

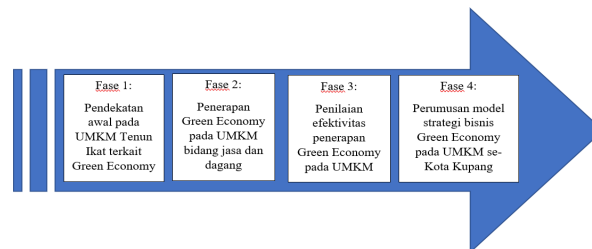
## III. METHOD

The analysis related to the implementation of green economy in this study used a sample of Ikat Weaving UMKM in Kupang. The number of samples to be used in this study are about 24 MSMEs of weaving tie, taken from 4 MSMEs of weaving tie from 6 sub-districts in Kupang City. Weaving tie MSME has chosen because MSME is the type of economic business whose production process still depends on the availability of natural resources for supporting raw materials as a function of the dyeing. The MSMEs used as samples will first be measured of energy efficiency in their production process, then researchers carry out green industry clustering using standards determined by the Ministry of Environment and Ministry of Industry. Each MSME

size has a different size, meaning that Micro Enterprises, Small Enterprises and Medium Enterprises will use different sizes. The last stage is the use of SWOT to analyze in more depth regarding what type of strategy is most suitable to be applied to the Ikat Weaving UMKM.

The types of data used in this study are primary and secondary. It is primary because the researcher obtains it directly from the source, either individual or group sources. This research obtained primary data through field survey activities and conducting interviews with Weaving tie MSMEs which are used as research samples. Later the primary data will be divided based on assessment criteria, such as the production process which consists of raw materials, water supporting materials, process technology and production results with a weight of 70%, while company management such as the management system gets a weight of 20% and environmental management which consists of providing raw materials, waste management facilities and emissions will be given a weighting of 10%. Weaving tie MSMEs that have a weight of more than 50% will be included in the category of MSMEs that have made efforts to implement a green economy, and MSMEs that have a weight of more than 90% can be categorized as MSMEs that have implemented green economy principles in a sustainable manner.

The following is the research roadmap:



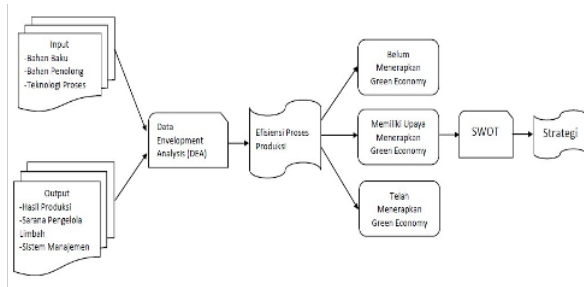
After making these measurements, this study will use the SWOT method based on David's concept [11]. Through this analysis, the researcher will conclude which strategy is most suitable for the sampled MSMEs. SWOT analysis will use the Internal Factor Evaluation (IFE) matrix and the External Factor Evaluation (EFE) matrix where IFE includes strengths and weaknesses and EFE includes challenges and opportunities [12]. The highest total score is 4.0 and the lowest is 1.0 with an average of 2.5. If the Ikat Weaving UMKM weighs below 2.5, the company is considered weak in external factors, while the weight is above 2.5, the company is considered strong in external circumstances. The weight measurement will ultimately directly indicate which strategy is most suitable for implementation. There are 4 strategies based on the SWOT concept, namely the SO strategy (using strengths to seize opportunities), the WO strategy (using opportunities to cover weaknesses), the ST strategy (using strengths to overcome threats), and the WT strategy (using weaknesses to avoid threats). For more details, it can be seen from the research flow diagram below:

#### IV RESULT

Based on the research conducted, it was found that there were 10 samples of MSMEs which The finding showed that among the 60 MSMEs, there were inefficient management in 8 MSMEs and only 10 remaining had excellent efficient management, the rest had an effective enough to implement green accounting. This shows that inefficient MSMEs need to increase their business in terms of output or reduce their business input. For 8 inefficient MSMEs to be able to increase efficiency to 100%, they need to reduce each input by  $100\% - 90.91\% = 9.09\%$  and maintain each output. Accounts that need to be reduced are operational capital, overall capital, labor and transportation costs.

With an efficient value that has not yet reached 100%, it means that the 8 MSMEs found have low performance. Low performance is caused by a large labor load which results in non-optimal work so that inadequate labor optimization will increase operational capital and overall capital used, and transportation costs will result in a decrease in the Company's profits. On average, the inefficiency value is around 70% - 90%, indicating that it is possible that the MSMEs are able to carry out product functions with existing asset managers but have not yet reached optimality. Three MSMEs have achieved optimum profits but not yet optimum turnover and assets. The remaining 5 MSMEs are optimal in terms of turnover and total assets, but not optimal in terms of profits.

If linked to green accounting, MSMEs are required to allocate new burdens, namely environmental burdens as a result of the use of natural resources for the running of the business. However, if you look at the results obtained, the majority of MSMEs in Kupang City have not been able to implement green accounting. This is because business managers have not yet found the optimum point for using business costs, such as labor costs and transportation costs.



## V. CONCLUSION

Based on the analysis results, it can be concluded that of the 60 MSMEs, it turns out that there are 10 excellent efficient MSMEs, 8 inefficient MSMEs and the rest are quite efficient. So it can be concluded that most are not ready to implement green accounting because these MSMEs have not been able to find the optimum point in their business expenses, so they have not been able to allocate environmental costs as a result of implementing green accounting.

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