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Short Communication

The Comparation of Entrepreneurship Efficiency Level Between Pelaihari District and Bajuin District by DEA Solver Method

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Abstract *- This research defined and compared entrepreneurship efficiency levels between two districts, particularly in the chips industry, by using DEA Solver Method. The result showed that the more companies were focused on labor, the more efficient they were received. This method could also be concluded that labor was the best criterion to define the efficiency level because all other criteria were focused on the benefit, not based on cost. As a result, the Bajuin district was more efficient (two companies in top rank) than the Pelaihari district (only one in top rank). By analyzing the efficiency level through DEA Solver Method, this research was able to be a role model due to the increased district's income in particular and regency's income in general.*

Keywords *- entrepreneurship, efficiency, agroindustry, DEA Solver*

I. INTRODUCTION

Agroindustry is one of the biggest resources in Indonesia. As a developing country, entrepreneurship is increasing as a field of economic development (Phatak and Ashwinikumar, 2017). Entrepreneurship in this area is capable of reducing the unemployment level. According to Widjaja and Mardanugraha (2019), by initiating an enterprise for workers before retirement capable of attaining financial independence, confidence towards entrepreneurship plays the role. The researchers conduct research on agricultural entrepreneurship, which is the management of natural resources, labor, capital, and other skills to produce an agricultural product efficiently. These agricultural or agribusiness commodities will be processed in the community, and the products produced by the agricultural entrepreneur will be distributed to the markets in the community.

In this paper, the study compares the entrepreneurship efficiency level between two districts in Tanah Laut using the DEA Solver method, the application that measures and analyzes some criteria as Input from samples. Several variables that affect the level of efficiency include production, production value, income, investments, and labor.

The method captures the top rank of companies from the districts that valued high-level efficiency until the lowest. The number of entrepreneurship in the Subdistrict is the subject of this research, which illustrates how to manage agricultural products to get quality and large profits from agricultural products through an analysis of the level of efficiency that includes the five variables mentioned above.

II. PREVIOUS STUDIES

Previous research that can be used as a reference addressed that the level of the entrepreneurial spirit of the entrepreneurs/small traders in improving their business, and this research are only to measure the soul level of small-scale entrepreneurs, which are the study population are all small entrepreneurs in their area (Fidiana, 2014). This study defines that the spirit of entrepreneurship of small businesses, particularly in the agroindustry area, motivated the efficiency level, supported by good communication between teamwork (Kavitha and Gunashekaran, 2014). Moreover, according to Firmana, Nurmalina, and Rifin (2016), who analyzed the profitability and efficiency using DEA, some marketplaces are inefficient because of the location. Some descriptions regarding the efficiency analysis were only focused on spirit and location through these previous studies. However, this paper offers more variables that can also influence the efficiency level: production; Production Value; Income, Invest; and labor.

III. THE PROPOSED METHODS

The study was conducted by inputting various types of data into the worksheet. Until then, it was automatically calculated by the DEA Solver application. After being calculated, numbers translated into varying efficiency levels for all objects (entrepreneurial variables) were issued. This research data was collected using interviews conducted with relevant agencies and literature study methods.

This research uses the DEA *Solver* with the BCC and CCR models to find out the Comparison of Entrepreneurship Efficiency Between Pelaihari and Bajuin Districts.

Model BCC *(Banker-Charnes-Cooper)* compares increasing *Input* and *output*, which are not the same. In order to obtain efficiency results using the BCC model, the formula is:

Step 1: Enter the following formula

$j = 1n\lambda j = 1$

Step 2: After entering the first formula, then enter this formula

$= {}_0; j = 1n\ \lambda_j\ y_{rj} \geq y_{r0,}\ r = 1,2,3, .., s$

${}_0x_{i0}$ - $j = 1\ n_j x_{rj} \geq 0,\ i = 1,2,3, .., m$

$j = 1n_j = 1; \lambda_{j,} \geq 0\ j = 1,2, .., n$

Moreover, Model CCR *(Charnes-Cooper-Rhodes)* is the maximum ratio between *Inputs* similar to *inputs.* Similar

Step 1: Enter the formula as follows.

$\sum v_i x_{i0} = 1$

Step 2: Then, enter this formula.

Max $z_0 = \sum u_r y_{r0}$; $r = 1su_r y_{rj}$ - $i = 1mv_i x_{ij}$

$i = 1mv_i x_{io} = 1$

$u_r \geq 0,\ r = 1,2,3, .., s;\ v_i \geq 0,\ i = 1,2,3, .., m$

Step 3: After entering formula 1 and formula 2, then enter the formula as follows.

$= {}_0$; subjecr to $j = 1\ n_j\ y_{rj} \geq y_{r0},\ r = 1,2,3, ..\ s$

${}_0x_{io}$ - $j = 1n_j x_{rj} \geq 0,\ i = 1,2,3, .., m$

$\lambda_j \geq 0,\ j = 1,2,3, ...\ n$

Table 1. Efficiency Level

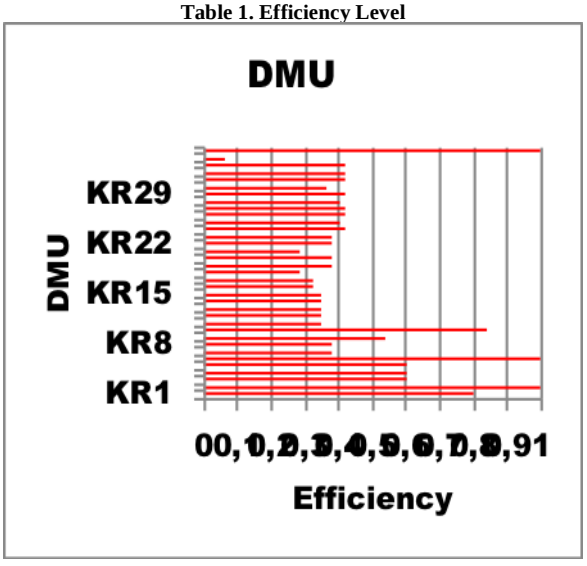
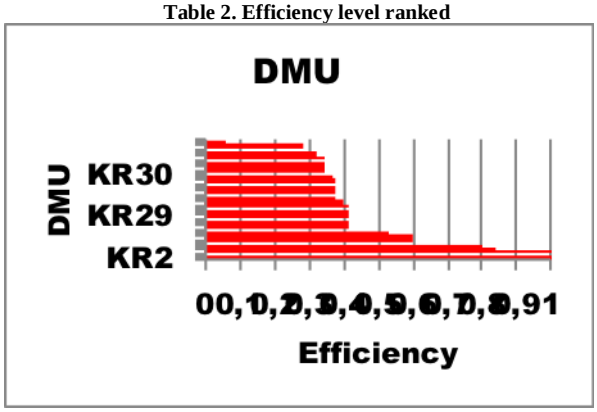


Table 2. Efficiency level ranked



IV. CONCLUSION

In this study, the subjects were 35 companies from the sub-districts of Bajuin and Pelaihari. These companies are the cassava chips industry. Based on the discussion in chapters I through chapter IV of this research on agricultural entrepreneurship, it discusses the management of natural resources, labor, capital, and *skills* in producing efficient and effective agricultural products by using several decision-making methods, including *Data Envelopment Analysis (DEA) Solver.*

Based on the *Data Envelopment Analysis* (DEA), the result is that we figured out that, in addition to using the DEA application *Solver*, we can also use the formula to find out the level of efficiency using the BCC and CCR models. It should be noted that the most important criterion in company operations is labor.

As a result, the high value of the labor criteria will encourage companies to become the best companies in the industry by managing these resources properly. In setting, labor criteria were the best criteria based on the *Best Worst Method* (BWM), which had a value of 0.465425532, meaning that it is very influential on the company's progress. While, the other criteria include production value (0.095744681), production value (0.159574468), income (0.05319149) and investment (0.22606383).

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