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A Comparative Study of Local Government Expenditure Efficiency in Poverty Alleviation in Bengkulu Province

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A R T I C L E I N F O

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A B S T R A C T

The objectives of this study are to (1) measure the efficiency of government expenditure in reducing poverty in 10 districts/cities in Bengkulu Province in 2017 and 2021 and (2) compare the levels of efficiency. The analysis method used is Data Envelopment Analysis (DEA) with a Variable Return to Scale (VRS) approach, employing an Output-Oriented model. The inputs considered are economic spending and community welfare, while the output measured is the poverty level. The results of the study indicate that in both 2017 and 2021, there were three efficient districts. In 2017, the districts that demonstrated relative efficiency were the Kaur, Lebong, and Central Bengkulu Regencies. In 2021, the efficient districts were Muko-muko, Kepahiang, and Central Bengkulu Regencies.

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INTRODUCTION

Poverty is when a person cannot meet their basic needs; this capacity varies because of many poverty levels (Ngubane et al., 2023). Poverty has been a challenge faced by governments worldwide for a long time. Poverty triggers a series of problems, such as hunger, disease, and social conflicts, which adversely affect the stability and development of human society. Therefore, poverty alleviation has always been an important goal of the United Nations for sustainable development (He et al., 2023).

The island of Sumatra is known as the area with the largest government expenditure after Java. However, this province has always experienced a continuous increase in poverty, one of which is Bengkulu province. From 2017-2021, Bengkulu Province became the province with the second largest number of poor people after Aceh on the island of Sumatra. The poverty rate in Bengkulu province tends to decrease yearly, but in 2020, the poverty rate increased by 15.30%, increasing from 14.91% in 2019. This happened because, in 2020, there was a Covid-19 pandemic.

The poverty alleviation program run by the government through various agencies has yet to be fully successful, as can be seen from the fact that there are still poor people in every district/city in Bengkulu Province. Although efforts from the central and local governments through pro-poor programs have reduced poverty rates, this problem still exists. This shows the need for more effective policies to deal with poverty comprehensively and address this issue (Pratama & Utama, 2019).

In addition to the above programs, government spending can also be a solution to reduce poverty rates because, if done productively, this can encourage economic activity in an area. According to Keynesian theory, government spending can increase output and reduce the rate of reaction because through various government projects, labour can be absorbed, and people's incomes increase. This impact, in turn, will contribute to the improvement of the overall welfare of the community (Florennica & Febriani, 2023).

Government spending plays a strategic role in various world economies and is an important tool in public sector policy. No economy can survive without government spending on the welfare of its citizens and encouraging economic activity (Onuoha & Agbede, 2019). Measuring efficiency is a major issue in the public sector economy. How local governments allocate the budget efficiently continues to be the focus of attention, especially in efforts to improve people's welfare. Of course, achieving prosperity in each region takes a long time (Rambe et al., 2024).

The management of public resources is part of the principal-agent problem, where the principal (public) needs more information about the intentions and actions of the agent (government) when spending public money. This situation of information asymmetry can lead to less than optimal results because the government does not act in the public interest and realizes waste and wasteful expenditure (Montes et al., 2019).

Based on the explanation above, there are indications that government spending in Bengkulu Province is inefficient in dealing with poverty problems. This study aims to (1) measure the efficiency of government expenditure in reducing poverty in 10 districts/cities in Bengkulu Province in the 2017 and 2021 government periods and (2) compare the efficiency level between the 2017 and 2021 government periods.

THEORETICAL REVIEW

Government spending is part of fiscal policy, which is the government's action to manage the economy by setting the amount of revenue and expenditure each year. This is reflected in the State Revenue and Expenditure Budget (APBN) document at the national level and the Regional Revenue and Expenditure Budget (APBD) at the regional level (Nahumuri, 2019).

It has been widely recognized that public spending efficiency, defined as the government's ability to maximize its economic output or minimize spending to a certain extent, is an important aspect of supporting a country's economic performance. Governments in developing and developed countries are faced with the demand to manage tax money collected from their citizens more efficiently as a form of responsibility to the community (Brini & Jemmali, 2015). Thus, efficiency in public spending is not only a matter of savings but also a matter of optimizing the benefits that the wider community can feel.

Government efficiency is achieved when the government is able to provide optimal results for its citizens. If all other factors are considered constant, a government that can produce more output with fewer inputs is considered more efficient than one that requires more input for smaller output. Less efficient spending shows that the government can still increase revenue without increasing costs or reducing costs without reducing the results obtained (Mohanty & Bhanumurthy, 2021).

Regarding government spending, PP 58/2005 ps 27 (5) classifies government spending according to functions into 10 functions. Therefore, to measure the efficiency of government expenditure in this study, 2 expenditures are used to achieve output: economic expenditure and social protection. Previous research using social protection spending as an input was conducted by (Antonelli & De Bonis, 2019; Cyrek, 2019; Frenda et al., 2021). Economic spending as an input used to measure government spending efficiency still needs to be widely used by research; some studies that have used economic spending have been conducted (Lee et al., 2019; Chan & Karim, 2012). other research using economic, educational, health and social protection expenditure inputs (Havizd & Rambe, 2023).

Previous research has used poverty as an output to measure the efficiency of government spending; Fonayet et al. (2020) measured the efficiency of social spending to reduce poverty in the European Union (EU) in 2007 and 2017 using the DEA method. Ambarkhane et al. (2020) measured the efficiency of the Indian state in reducing poverty using the DEA and public policy, where he researched 19 countries covering 90% of the population in 2006, 2010, and 2014. Meanwhile, Nur Aprida & Azansyah (2024) measured the efficiency of

government spending in reducing poverty in 10 districts/cities in Bengkulu Province using the DEA method.

Another study that does not only use poverty as an output was conducted by Cyrek (2019), which measured the efficiency of social spending in reducing poverty and income inequality in 27 EU countries from 2007-2016 using the DEA method. Rambe et al. (2022)assessed the efficiency of local government spending in seven regions of Indonesia in pro-growth and poverty alleviation, comparing data before and during the pandemic in 2015-2019 and 2020 using the DEA method. Zameer et al. (2020) explored the role of technological innovation, financial development, and globalization in poverty alleviation efficiency in China from 2007-2018, with GDP per capita and poverty rate as outputs measured by the DEA method. Meanwhile, Dinar (2022) and Siahaan & Rambe (2023) combine poverty and unemployment to measure government expenditure efficiency.

METHODOLOGY

This study uses quantitative descriptive research to measure the efficiency of government expenditure in reducing poverty at the end of the 2017 and 2021 government periods in Bengkulu Province. Local government spending efficiency is measured to compare which districts/cities are relatively efficient in using the budget to reduce poverty. The inputs used are expenditure on economic and social protection in Bengkulu Province. Input data was obtained from the Ministry of Finance of the Republic of Indonesia. The Output used is the poverty level (one Output). Outbound data was obtained from the Central Statistics Agency (BPS) of Bengkulu Province.

The number of regencies/cities in Bengkulu Province is 10, so the DMU used is 10. Efficiency measurement was carried out using the Data Envelopment Analysis (DEA) method with the Variable Return to Scale (VRS) approach using the Output Oriented model. In using DEA, higher variable values mean better conditions. Therefore, the Output used, namely the poverty rate, is calculated as the percentage of the non-poor population (formula: 100% - poverty rate) = % of the non-poor population, for local government spending amounting to billions of Rupiah.

The efficiency model in this study is presented as follows:

Objective function
$\text{Max } E = \mu 1Y1 + \mu 0$ ..... (1)
Subject to
$\upsilon 1X1 + \upsilon 2X2 = 1$ ..... (2)
$\mu 1Y + \mu 0 - (\upsilon 1X1 + \upsilon 2X2) \leq 0$ ..... (3)
$\mu 1,, \upsilon 1,2, \geq 0$ ..... (4)

Information:

Y1 = percentage of the population that is not poor, X1 = economic spending, X2 = social welfare spending, E = efficiency value, μ1 = weight for input Y, υ1,2 = weight for output X.

RESULTS AND DISCUSSION

Table 1 shows the data processing results on the relative efficiency of economic expenditure and social welfare costs from 10 districts/cities in Bengkulu Province using the DEA method for 2017 and 2021. The relative efficiency score ranges from 0 to 1, where a score of 1 indicates maximum efficiency (Coelli et al., 2005; Cooper et al., 2002).

Table 1. Relative efficiency of government expenditure in South Sumatra in 2017 and 2021.

Efficiency Score	**2017 Amount (%)**	**Local government**	**2021 Amount (%)**	**Local government**
0.862-0.919	5 (50%)	South Bengkulu, seluma, Bengkulu city,Rejang Lebong dan kepahiang	2 (20%)	kaur and seluma
0.920-0.949	1 (10%)	North Bengkulu	3 (30%)	South Bengkulu, Bengkulu city and Rejang Lebong.
0.950-0.985	1(10%)	Muko-muko	2 (20%)	Lebong and North Bengkulu.
1	3(30%)	Kaur, Lebong and Central Bengkulu.	3(30%)	Muko-Muko, Kepahiang and Central Bengkulu.
mean	0.937		0.962.	

Source: Authors calculations (DEA)

In the 2017 government period, out of 10 districts/cities, 3 showed relative efficiency, namely Kaur, Lebong, and Central Bengkulu Regencies. Meanwhile, in 2021, other government periods showed that there were 3 relatively efficient districts, namely Muko-muko, Kepahiang, and Central Bengkulu Regencies. These three districts can reduce poverty levels by utilizing per capita government spending in the economic and social protection sectors compared to other districts/cities in the same province.

The efficient average score is used to see the average level of efficiency. The average efficiency score in the 2017 government period was 0.937. In 2017,

it was shown that most regencies/cities have a relatively low efficiency. This is reinforced by the fact that most districts/cities (50%) have an efficient score between 0.862-0.919. Moreover, 20% have a spending efficiency rate of only 0.920-0.985. Compared to the efficient score in 2017, there was an increase in 2021, where the average efficient score was 0.962.

Of the three relatively efficient districts/cities, only Central Bengkulu Regency remains consistently efficient even though there has been a change of government. In 2017, Kaur Regency efficiently used government spending to reduce poverty levels, even though the available budget was the least compared to other districts/cities. However, during the 2021 government period, Kaur Regency showed the lowest efficiency score, even though the budget provided was much larger than during the previous administration.

The large number of relatively inefficient districts/cities in Bengkulu province, even the lowest level of 0.862, deserves serious concern. Using relatively inefficient economic spending and social protection in districts/cities, the poverty level should be reduced optimally. Relatively efficient districts/cities can be peers for relatively inefficient districts/cities. The inefficient Regency/City Desk for peers is presented in Table 2.

Table 2. peers and number of benchmark provinces

Year	**peer**	**Number of Inefficient Provinces for benchmarks**
2017	Central Bengkulu	7
	Lebong	1
2018	Central Bengkulu	7
	Muko-muko	7

Source: Authors calculations (DEA)

From Table 2, 3 relatively efficient districts are not necessarily peers yearly. Namely, Lebong Regency can only be a peer for 2 inefficient districts/cities in 2017. Furthermore, of the 3 relatively efficient regencies, Central Bengkulu Regency is the district that is most used as a peer. Therefore, the DEA declared the Central Bengkulu Regency the relatively most efficient district in Bengkulu Province in 2017 and 2021, using 2 types of government spending to reduce poverty.

To be more efficient, all districts/cities can refer to Central Bengkulu Regency because it is the district that made the most peers in 2017 and 2021. Based on the inputs and outputs obtained from the Central Bengkulu Regency, the DEA method provides information on how much output must be achieved by relatively inefficient districts/cities, considering economic spending and social protection. Thus, inefficient districts/cities can find out the additional outputs needed to be efficient. Table 3 and Table 4 present information on the relatively inefficient radial movement of districts/cities in 2017 and 2021. The

higher the efficiency level of the district/city, the less radial movement needs to be improved.

Table 3 : Radial movement in relatively inefficient districts/cities in 2017

Reducing poverty levels (amount %)	**Number of Regencies/City**	**Regency/City that is relatively inefficient**
1.297-4.700	2 (20%)	Muko-muko and North Bengkulu.
4.701-85.60	2 (20%)	Kepahiang and Rejang Lebong.
8.561-12.650	3 (30%)	Bengkulu city, Seluma and South Bengkulu.

Source: Authors calculations (DEA)

In 2017, it was illustrated that less efficient regencies/cities must increase their output to achieve efficiency. South Bengkulu Regency is the area that needs to increase output the most. This step is expected to reduce the poverty rate by 12,650%. On the other hand, the Muko-muko Regency only needs a slight increase in output, which is expected to reduce the poverty rate by 1,297%. In addition, local governments that still need to be more efficient can also use other relatively efficient regions to increase efficiency.

Table 4 : Radial movement in relatively inefficient districts/cities in 2017

Reducing poverty levels (amount %)	**Number of Regencies/City**	**Regency/City that is relatively inefficient**
0.441-4.485	2 (20%)	North Bengkulu and Lebong
4.486-7.111	2 (20%)	Rejang Lebong and Bengkulu City
7.112-7.413	3 (30%)	South Bengkulu, Seluma and Kaur

Source: Authors calculations (DEA)

In 2021, Kaur Regency needs the most increase in output, which is expected to reduce the poverty rate by 7.413%. Although in 2017, Kaur Regency managed to achieve efficiency levels, in 2022, this district is actually the least efficient. On the other hand, North Bengkulu Regency only experienced a slight increase in output, which is expected to reduce the poverty rate by 0.441%.

CONCLUSIONS AND RECOMMENDATIONS

Based on the study results, there are differences in the level of efficiency of local government expenditure in poverty alleviation in Bengkulu Province during the two periods of 2017 and 2021. The average efficiency score in 2017 was

0.937; there was an increase in efficiency score in 2021, where the average efficiency score was 0.962. In 2017, out of 10 districts/cities, 3 districts showed relative efficiency, namely Kaur, Lebong, and Central Bengkulu Regencies. Meanwhile, in 2021, there are also 3 relatively efficient districts, namely Muko-muko, Kepahiang and Central Bengkulu Regencies. Of the 3 relatively efficient districts in 2017 that became peers, namely Lebong and Central Bengkulu Regencies. Meanwhile, in 2021, namely Muko-muko and Central Bengkulu Regencies. Central Bengkulu Regency consistently maintained its efficiency across both periods, positioning itself as a benchmark for other regions striving to optimize their spending.

The implications of this study emphasize the critical importance of improving budget allocation strategies to enhance efficiency in poverty alleviation efforts. Inefficient districts should draw lessons from efficient regions like Central Bengkulu, which has consistently demonstrated effective use of public spending. This can be facilitated through inter-regional collaboration, structured training programs, and systematic knowledge-sharing initiatives. Furthermore, local governments need to implement comprehensive, data-driven monitoring and evaluation frameworks to promptly address inefficiencies and ensure that resources are channeled effectively into priority sectors such as social protection and economic development. These strategic steps will support sustainable poverty reduction and foster inclusive economic growth across Bengkulu Province.

FURTHER STUDY

Future research is recommended to examine the factors (inputs) that can reduce poverty in Bengkulu Province. For example, adding more inputs such as government spending on education, health, and other sectors could be considered. Moreover, the study could include more outputs to broaden its analysis. Further research could also expand the analysis to other regions or provinces, allowing for comparative studies that highlight regional disparities and strategic potential for national improvement. Finally, studying the long-term impact of efficient government spending on poverty alleviation and overall economic development would provide actionable recommendations for policymakers to ensure sustainable progress.

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