JPEK (Jurnal Pendidikan Ekonomi dan Kewirausahaan)
Vol. 9, No. 2 Agustus 2025, Hal. 896–907
DOI: 10.29408/jpek.v9i2.30250
E-ISSN: 2549-0893

Efficiency Analysis of Government Expenditure in Districts/Cities of West Nusa Tenggara Province: A Dea Approach (2021-2023)

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Received: 11 Mei 2025 | Revised: 28 Juli 2025 | Accepted: 24 Agustus 2025

Keywords:
Data Envelopment Analysis; Efficiency; Local Government Spending

Abstract
This study aims to analyze the level of efficiency of local government spending in the health and education sectors of districts/cities in West Nusa Tenggara Province (NTB) using the Data Envelopment Analysis (DEA) approach for the 2021-2023 period. This study uses secondary data, which is analyzed by Constant Return to Scale (CRS) with output-oriented assumptions to evaluate the relative efficiency of 10 districts/cities. The results showed that the level of efficiency of regional expenditure in the health sector was only Central Lombok Regency and East Lombok Regency which achieved a perfect efficiency score when viewed from the output of health outcomes (in this study Life Expectancy and Number of people with health insurance and Maternal Mortality Rate) and inputs (health expenditure budget and number of health workers). In terms of education expenditure efficiency, Bima City is the only city in West Nusa Tenggara that reaches the perfect efficiency level, when viewed from the Average Years of Schooling, School Participation Rate and Expected Years of Schooling as outputs, education expenditure budget and number of schools as inputs. Meanwhile, other regions in West Nusa Tenggara are still at the low efficiency level.

Kata Kunci:
Data Envelopment Analysis; Efisiensi; Pengeluaran Pemerintah Daerah

Abstract
Penelitian ini bertujuan untuk menganalisis tingkat efisiensi pengeluaran pemerintah daerah di bidang kesehatan dan pendidikan kabupaten/kota di Provinsi Nusa Tenggara Barat (NTB) menggunakan pendekatan Data Envelopment Analysis (DEA) periode 2021-2023. Penelitian ini menggunakan data sekunder, yang dianalisis dengan *Constant Return to Scale* (CRS) dengan asumsi *output-oriented* untuk mengevaluasi efisiensi relatif 10 kabupaten/kota. Hasil penelitian menunjukkan bahwa tingkat efisiensi belanja daerah bidang kesehatan hanya Kabupaten Lombok Tengah dan Kabupaten Lombok Timur yang mencapai skor efisiensi sempurna bila dilihat dari output capaian kesehatan (dalam penelitian ini Umur Harapan Hidup dan Jumlah penduduk yang memiliki jaminan kesehatan dan Angka Kematian Ibu) dan input (anggaran belanja kesehatan dan jumlah tenaga kesehatan). Dalam hal efisiensi pengeluaran bidang pendidikan, Kota Bima merupakan satu-satunya kota di Nusa Tenggara Barat yang mencapai tingkat efisiensi sempurna, bila dilihat dari Rata-rata Lama sekolah, Angka Partisipasi Sekolah dan Harapan Lama Sekolah sebagai output, anggaran belanja pendidikan dan jumlah sekolah sebagai input. Sementara daerah lainnya di Nusa Tenggara Barat masih berada pada tingkat efisiensi rendah.
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INTRODUCTION

Human development is defined as the process undertaken in an effort to improve the quality of life of every person and is measured by the Human Development Index (HDI), which is an important indicator to measure the success of efforts to improve the quality of human life (Mukti & Auwalin, 2020). The Human Development Index does not only focus on economic growth, but includes three main dimensions: health (measured through life expectancy at birth), education (measured through average years of schooling), and a decent standard of living. Education is an important component of the human development process and is one of the main focuses of public policy in many countries. The goal of improving the quality of education is to produce high-quality human resources, which can help economic growth and improve people's quality of life (Nasution et al., 2025).

According to Regulation No. 23 of 2014 on Regional Government, district/city governments have the authority to manage regional finances independently in order to support development and improve community welfare. As a country with a system of regional autonomy and fiscal decentralization, local governments in Indonesia have the freedom to develop their respective regions. Fiscal decentralization is designed with the assumption that local governments better understand the needs and conditions of each region. Local governments are required to manage finances effectively and transparently to ensure sustainable development and improved quality of public services. The government conducts various programs to develop the region, which can increase economic growth and community welfare. With fiscal decentralization, local governments are expected to better understand the needs and conditions of their respective regions. Fiscal policy plays a strategic role in providing services in health and education, contributing to the success of both sectors (Putri et al., 2022).

Efficiency measurement can be done using a nonparametric approach, based on what is found and observed from the population, and assessing efficiency relative to the observed units. This method is called Envelopment Analysis (DEA) (Israwan et al., 2016). DEA, first introduced by Farrell (1957) and popularized by Charnes, Cooper, and Rhodes (1978), assumes that there is a frontier on the production curve. This DEA method uses linear programming to construct the production frontier (Pratama et al., 2017). This study discusses local government spending on education and health. It is expected that education can improve the knowledge and ability of human resources to participate in the development process. Health factors are also very important to increase the productivity of human resources. In addition, good health conditions will encourage the progress of an area (Pratama et al., 2017). Increases in government spending on health and education are sometimes not directly proportional to increases in health and education indicators. This is because increased government spending on health and education is not accompanied by appropriate programs and strategies to achieve indicator targets and improve public services, leading to inefficiencies in government spending (Putri et al., 2022).

From BPS NTB data (2023), the HDI of Mataram City (81,15) far exceeds that of North Lombok Regency (68,02) with a difference of 13,13 points. The education sector faces serious challenges, where the average years of schooling (RLS) in North Lombok is only 6,39 years, far below Bima City (10,95 years). Although NTB's HDI as a whole has increased, the growth has been uneven, and some indicators such as Expected Years of Schooling (HLS) tend to stagnate. In the health sector, disparities in access to services are still evident despite the province's Life Expectancy (UHH) increasing by 0,69 years from 2021 to 2023.

Many studies have been conducted on the efficiency of local government spending in education and health. Theoretically, previous studies tend to concentrate on measuring technical efficiency using Data Envelopment Analysis (DEA), without considering the multidimensional Human Development Index (HDI).

Although education and health expenditures in NTB have increased, the results are not always in line with improvements in HDI indicators. For example, the Expected Years of Schooling (HLS) in NTB is stagnant and North Lombok's RLS is far below the national average. This suggests possible inefficiencies caused by misbudgeting, weak evaluation and monitoring, or inappropriate programs. However, previous studies have not thoroughly studied the basis of this issue, especially in terms of fiscal decentralization and regional autonomy governed by Law No. 23 of 2014. In addition, the geographical condition of West Nusa Tenggara (NTB) Province, which consists of islands (Lombok and Sumbawa), diverse topography, remote areas, and vulnerability to natural disasters such as earthquakes and floods, creates special challenges in assessing the efficiency of regional expenditure, particularly in the education and health sectors.

Previous research was conducted in areas with developed infrastructure and relatively low disaster risk. Meanwhile, the geographical characteristics of NTB Province, namely islands (Lombok and Sumbawa), remote areas, and vulnerable to earthquakes and floods, create special challenges in the distribution of education and health spending. This geographical factor was not considered in previous studies, even though it affects operational costs, service access, and program effectiveness. BPS NTB data (2023) shows that the low Average Years of Schooling (RLS) of North Lombok (6,39 years) is not only caused by budget constraints, but also by geographical factors such as the lack of road and transportation infrastructure. NTB's archipelagic characteristics lead to imbalances in the distribution of human resources responsible for providing public services. In remote areas such as Sumbawa Island or the mountainous region of Lombok, the shortage of educators and health workers has been a long-term problem. Therefore, this study not only measures expenditure efficiency, but also emphasizes how NTB's geographical context, such as island isolation and disaster vulnerability, is an important factor that distinguishes it from similar studies in other regions. The purpose of this study is to analyze the level of efficiency of local government spending in the education and health sectors of districts / cities in West Nusa Tenggara Province in 2021-2023.

Efficiency Theory

Efficiency is the ratio of optimal values of inputs and outputs (Rambe, 2020). This can be done by comparing the input with the minimum input required to produce the output, or with the output that is the maximum potential output that can be obtained from the input, or with a combination of both forms (Wahyudi et al., 2015). If a certain product or work result can be achieved using the least amount of resources, the operational process is considered efficient (Putra & Anitasari, 2020). Efficiency emphasizes the importance of measuring how much of the budget allocated to infrastructure, education, or health sectors is able to produce significant outcomes. There are three factors that cause efficiency, namely if with smaller inputs produce the same output, greater output produces greater output, and the same input produces greater output (Rapiuddin & Rusydi, 2017).

Data Envelopment Analysis (DEA)

The Data Envelopment Analysis (DEA) method was created as a tool to evaluate the performance of an activity in an entity unit (organization). The DEA model was first developed

by Charnes, Cooper, and Rhodes (1978), and was created to evaluate the relative efficiency of Decision Making Units (DMUs) in an organization by considering inputs and outputs. The DEA model also calculates the technical efficiency of all units (Jamaludin, 2019).

DEA allows the calculation of technical efficiency procedures, such as input oriented or output oriented. The objective of the input oriented method is to find out how much the quantity of inputs can be reduced proportionally without changing the quantity of outputs, while the objective of the output oriented method is to find out how much the quantity of outputs can be increased proportionally without changing the quantity of inputs used (Rapiuddin & Rusydi, 2017). In DEA measurement, there are 2 assumptions, namely *Constant Return to Scale* (CRS) and *Variable Return to Scale* (VRS). The *Constant Return to Scale* (CRS) model assumes that the ratio between additional inputs and outputs is the same, which means that if there is an additional input of x times, then the output will also increase by x times. Whereas, in the Variable Return to Scale (VRS) model, the financial performance/facilities and services (DMU) do not or have not operated at an optimal scale. In this model, the assumption used is that the ratio between input and output additions is not the same (VRS). In other words, every additional input of x times will not cause the output to increase by x times, meaning that the output can be greater or smaller than x times (Azmi, 2020).

According to Avkiran (1999: 206), DEA is a non-parametric linear programming method that calculates the ratio between inputs and outputs for each reported unit. Relative efficiency scores are usually expressed between zero and one, or 0 to 100 percent, and decision-making units with scores less than one are considered inefficient relative to other units (Jamaludin, 2019). In DEA accounting, weights must be universal and cannot be negative. Thus, each DMU in the sample should be able to use the same set of weights to evaluate its ratio (total output weights/total input weights), not more than 1 (total output weights/total input weights ≤ 1) (Azmi, 2020).

METHODE

This research was conducted in NTB Province which consists of 10 districts/cities as DMU. The type of data used in this study is secondary data, namely data that has been officially recorded and published by the Central Statistics Agency (BPS), the Directorate General of Fiscal Balance (DJPK), and other related agencies during the 2021-2023 period. To find out how efficient government spending is in achieving education and health indicators, the data analysis method used is Data Envelopment Analysis (DEA). DEA as a non-parametric analysis technique allows the use of various inputs and outputs in a linear model. The DMUs selected in this study are based on local government spending on the health and education sectors from 2021-2023. The DMUs studied in this research are districts / cities in West Nusa Tenggara Province for the 2021-2023 period, totaling 10 districts / cities. The DMU of this study can be seen in Table 1.

Table 1. DMU Classification of Regency/City in NTB Province

No.	District/City	*Decision Making Unit* (DMU)
1	West Lombok Regency	DMU 1
2	Central Lombok Regency	DMU 2
3	East Lombok Regency	DMU 3
4	Sumbawa Regency	DMU 4

5	Dompu Regency	DMU 5
6	Bima Regency	DMU 6
7	West Sumbawa Regency	DMU 7
8	North Lombok Regency	DMU 8
9	Mataram City	DMU 9
10	Bima City	DMU 10

This study uses an output-oriented approach to measure relative technical efficiency non-parametric analysis of data collection. This approach uses the Constant Return to Scale (CRS) approach. The focus of output-oriented assumptions is to maximize output with fixed inputs available. To calculate the relative efficiency, a linear program model is used as follows:

Maximize, Zk= $\frac{\sum_{r=1}^{s} u_{rk}.Y_{rk}}{\sum_{i=1}^{m} V_{ik}.X_{Ik}}$

If it is assumed that DEA has no efficiency greater than 100% or 1, then the formulation is as follows:

$$\frac{\sum_{r=1}^{s} u_{rk}.Y_{rk}}{\sum_{i=1}^{m} V_{ik}.X_{Ik}} \leq 1, k = 1,2 \ldots, n$$

Weights are not negative

Urk ≥ 0; r=1,…s

Vik ≥ 0; i=1,…m

With:

Z_k = DMU efficiency k

Y_{rk} = output j for DMU k

u_{rk} = output weight

X_{Ik} = input i for DMU k

V_{ik} = input weight

The input variables and output variables for the health and education sectors can be seen in Table 2.

Table 2. Classification of Input and Output Variables

Variable	Health	Education
Input Variable	- Health spending budget - Number of health workers	- Education spending budget - Number of schools
Output Variable	- Maternal Mortality Rate (MMR) - Life Expectancy (UHH) - Percentage of population with health insurance	- Average Years of Schooling - Expected Years of Schooling - School Enrollment Rate

RESULTS AND DISCUSSION

In this study, the Data Envelopment Analysis (DEA) method is used to measure the value of system technical efficiency and cost by using DEAP 2.1 software to evaluate the relationship between inputs and outputs. This research data is analyzed through Decision Making Units (DMU). The DMU selected in this study is based on local government spending on the health and education sectors from 2021-2023. The DMU for this research meets the Data Envelopment Analysis DMU criteria because it is a government agency that has homogeneous characteristics and objects.

The DMUs studied in this research are districts/cities in West Nusa Tenggara Province for the 2021-2023 period, totaling 10 districts/cities. In the calculation of education sector efficiency, there are 2 input variables and 3 output variables, while in the calculation of health sector efficiency, there are 2 input variables and 3 output variables. Thus, this study has fulfilled more DMUs than the number of input and output variables.

Table 3. Regional spending on health sector in West Nusa Tenggara Province

District/City	2021	2022	2023
West Lombok Regency	Rp 318.420.302.826	Rp 371.540.840.595	Rp 398.497.289.893,00
Central Lombok Regency	Rp 432.407.541.283	Rp 374.872.023.506	Rp 421.089.349.004,00
East Lombok Regency	Rp 650.512.989.482	Rp 654.857.047.000	Rp 715.580.990.095,00
Sumbawa Regency	Rp 324.022.309.889	Rp 461.069.745.292	Rp 451.167.410.613,00
Dompu Regency	Rp 216.697.238.032	Rp 224.626.222.031	Rp 254.938.850.584,00
Bima Regency	Rp 348.710.038.453	Rp 326.745.614.572	Rp 410.260.948.860,00
West Sumbawa Regency	Rp 160.960.947.711	Rp 175.934.108.776	Rp 158.609.371.678,00
North Lombok Regency	Rp 198.801.623.471	Rp 202.675.375.571	Rp 180.894.126.461,00
Mataram City	Rp 377.297.114.935	Rp 355.071.224.239	Rp 420.917.586.137,00
Bima City	Rp 121.397.464.264	Rp 163.565.010.696	Rp 127.015.618.801,00

Source: Directorate General of Fiscal Balance

Based on Table 3, district/municipality health expenditure budgets in West Nusa Tenggara Province increased relatively from 2021-2023 except for Central Lombok Regency, North Lombok Regency, and West Sumbawa Regency where the budget in 2023 was smaller than in 2021. However, Central Lombok Regency achieved a perfectly efficient average score (1,000) for the 2021-2023 period with a small budget. Compared to East Lombok Regency, which achieved a perfectly efficient average score with the highest expenditure budget.

Table 4. Regional spending in the education sector in West Nusa Tenggara Province

District/City	2021	2022	2023
West Lombok Regency	Rp515.828.566.220	Rp516.061.093.055	Rp589.445.168.563
Central Lombok Regency	Rp688.837.442.045	Rp815.614.327.423	Rp821.370.893.517
East Lombok Regency	Rp911.914.908.752	Rp1.017.718.696.184	Rp1.037.357.349.631
Sumbawa Regency	Rp491.119.320.698	Rp537.907.918.989	Rp615.664.265.867
Dompu Regency	Rp299.804.693.132	Rp312.063.066.493	Rp320.687.231.559

Bima Regency	Rp615.623.252.229	Rp573.748.100.745	Rp615.700.924.918
West Sumbawa Regency	Rp249.569.890.228	Rp269.385.112.001	Rp279.201.238.682
North Lombok Regency	Rp219.166.879.953	Rp222.920.447.454	Rp271.690.849.447
Mataram City	Rp364.836.134.267	Rp362.171.784.237	Rp403.520.503.058
Bima City	Rp215.678.740.098	Rp224.349.162.973	Rp210.334.460.849

Source: Directorate General of Fiscal Balance

Based on Table 4, the education expenditure budgets of districts/municipalities in West Nusa Tenggara Province increased relatively from 2021-2023, except for Bima Regency and Bima City, where the expenditure budget in 2023 was smaller than in 2021. However, with a small budget Bima City was able to achieve a perfect efficiency score (1.000) for three consecutive years.

Table 5. Health Sector Input and Output Data (2023)

District/City	MMR	UHH	Percentage of People with Health Insurance	Expenditure Budget	Number of Health Workers
West Lombok Regency	128	72,37	61,46	Rp398.497.289.893	2211
Central Lombok Regency	127	71,39	48,23	Rp421.089.349.004	3923
East Lombok Regency	100	71,72	55,8	Rp715.580.990.095	5801
Sumbawa Regency	77	72,41	60,12	Rp451.167.410.613	3353
Dompu Regency	66	71,54	62,57	Rp254.938.850.584	2382
Bima Regency	100	71,65	61,42	Rp410.260.948.860	3829
West Sumbawa Regency	43	72,65	99,75	Rp158.609.371.678	1215
North Lombok Regency	26	71,26	86,46	Rp180.894.126.461	1231
Mataram City	87	74,65	98,94	Rp420.917.586.137	5966
Bima City	177	72,97	87,43	Rp127.015.618.801	1396

Source: BPS

Table 6. Education Sector Input and Output Data (2023)

District/City	APS	RLS	HLS	Expenditure Budget	Number of Schools
West Lombok Regency	93,12	6,87	13,98	Rp589.445.168.563	882
Central Lombok Regency	89,42	6,61	13,87	Rp821.370.893.517	1775
East Lombok Regency	90,26	7,12	14,06	Rp1.037.357.349.631	1900

Sumbawa Regency	91,23	8,52	13,24	Rp615.664.265.867	615
Dompu Regency	91,38	8,97	13,83	Rp320.687.231.559	484
Bima Regency	92,68	8,29	13,65	Rp615.700.924.918	804
West Sumbawa Regency	92,19	8,98	13,66	Rp279.201.238.682	193
North Lombok Regency	90,94	6,39	13,01	Rp271.690.849.447	347
Mataram City	94,67	9,56	15,67	Rp403.520.503.058	345
Bima City	94,55	10,95	15,06	Rp 210.334.460.849	165
Source: BPS					

In Table 7. The efficiency score of health expenditure in districts/cities in West Nusa Tenggara Province for the 2021-2023 period shows significant differences in performance between regions. Central Lombok and East Lombok districts have consistently achieved perfect efficiency (score 1,000), which is the ideal benchmark for other regions. Meanwhile, Kabupaten Sumbawa Barat recorded the lowest performance with an average efficiency of only 0.397, followed by Kota Mataram (0.707) and Kota Bima (0.726) which showed unstable fluctuations. West Sumbawa district is of particular concern with the lowest efficiency (average 0.397). This low efficiency correlates with its geographical condition as an archipelago with limited transportation access, hindering the distribution of health logistics and medical personnel.

Table 7. Efficiency Score of Health Sector in NTB Province

No	District/City	Efficiency			Average Efficiency
		2021	2022	2023	
1	West Lombok Regency	0,929	1,000	0,798	0,909
2	Central Lombok Regency	1,000	1,000	1,000	1,000
3	East Lombok Regency	1,000	1,000	1,000	1,000
4	Sumbawa Regency	0,938	0,861	0,908	0,902
5	Dompu Regency	1,000	0,829	0,826	0,885
6	Bima Regency	1,000	0,812	0,877	0,896
7	West Sumbawa Regency	0,347	0,298	0,546	0,397
8	North Lombok Regency	1,000	0,717	0,558	0,758
9	Mataram City	0,557	1,000	0,563	0,707
10	Bima City	0,802	0,403	0,973	0,726

Central Lombok and East Lombok districts were recorded as having perfect efficiency (1.000) for three consecutive years. This shows consistency in optimizing resources, running a transparent government, and implementing evidence-based health policies (Kemenkes, 2024). The consistency of average efficiency values in districts/cities from all research objects, only Central Lombok and East Lombok districts reached the maximum efficiency level of 100%. This is supported by optimal budget allocations for basic health services, including stunting reduction and immunization programs (Gizi, 2023). The Central Lombok Government has also committed to providing easy and fast health services, this can be seen from the achievement of Central Lombok Regency which has succeeded in achieving universal health coverage (UHC) to improve public health services.

Table 8. Access to Health Services in Districts/Cities of NTB Province (2023)

District/City	Health Facilities	Health Workers	People with health insurance (%)
West Lombok Regency	22	2.211	61,46
Central Lombok Regency	35	3.923	48,23
East Lombok Regency	43	5.801	55,8
Sumbawa Regency	29	3.353	60,12
Dompu Regency	12	2.382	62,57
Bima Regency	23	3.829	61,42
West Sumbawa Regency	10	1.215	99,75
North Lombok Regency	9	1.231	86,46
Mataram City	27	5.966	98,94
Bima City	10	1.396	87,43

Table 8 shows that there are significant differences in the allocation of health facilities, health workers, and health insurance coverage in districts/municipalities of West Nusa Tenggara Province. Although West Sumbawa only has 10 health facilities and 1,215 medical personnel, its health insurance coverage reached 99,75%, the highest in NTB Province. However, the lack of health facilities and personnel means that budgets may be allocated for service mobility or emergency programs, which can increase operational costs in remote islands.

On the other hand, Mataram City has 5,966 health workers and 27 health facilities, achieving 98,94% health insurance coverage. With adequate infrastructure and good geographical accessibility, the budget can be optimally allocated to improve service quality such as training health workers and procuring modern facilities. In contrast, North Lombok district, which consists mostly of mountainous areas, has only 9 health facilities despite health insurance coverage reaching 86.46%. Limited physical access causes existing health facilities to be overburdened. Bima City and Dompu District show that the number of health workers is not always directly proportional to service coverage. In Dompu, health insurance coverage is low (62,57%), although health workers are sufficient, this may be due to the uneven distribution of health workers or lack of supporting facilities in remote areas. According to BPS NTB data (2023), health services are difficult to access as 60% of villages in Dompu district are in rural areas with poor road access.

Table 9. Efficiency Score of Regional Spending on Education Sector in NTB Province

No	District/City	Efficiency			Average Efficiency
		2021	2022	2023	
1	West Lombok Regency	0,704	0,692	0,888	0,761
2	Central Lombok Regency	0,692	0,692	0,706	0,697
3	East Lombok Regency	1,000	0,750	0,750	0,833
4	Sumbawa Regency	0,923	0,923	0,923	0,923

5	Dompu Regency	1,000	0,923	0,997	0,973
6	Bima Regency	1,000	0,923	0,923	0,949
7	West Sumbawa Regency	1,000	0,923	1,000	0,974
8	North Lombok Regency	0,750	0,750	1,000	0,833
9	Mataram City	0,900	0,900	0,900	0,900
10	Bima City	1,000	1,000	1,000	1,000

Data on the efficiency of the education sector in West Nusa Tenggara (NTB) Province shows that there are differences in performance between regions, which are influenced by local policies and geographical factors. For three consecutive years, Bima City has achieved perfect efficiency (1.000). Its relatively urbanized geography, which facilitates access to education infrastructure and the distribution of resources such as teachers and learning facilities, is thought to have contributed to this success. In contrast, Central Lombok district has the lowest average efficiency (0.697), with scores stagnating between 0.692 and 0.706.

East Lombok district has the highest education budget (IDR1,04 trillion) with the largest number of schools (1,900), but the average years of schooling (7,12 years) and APS (90,26%) are not much different from other regions such as Dompu which has a lower budget (IDR320 billion). This suggests potential inefficiencies in budget allocation in East Lombok.

In contrast, with a lower budget but fewer schools, Kota Mataram and Kota Bima achieved the highest average years of schooling and APS (9,56 years and 94,67% for Mataram; 10,95 years and 94,55% for Bima). This suggests that urbanization and population concentration make access to education easier, hence more budget efficient. Island regions such as West Sumbawa and North Lombok face significant geographical challenges. West Sumbawa has only 193 schools with a budget of IDR279 billion, but achieved an APS of 92,19% and an average years of schooling of 8,98 years, higher than the more developed West Lombok. Special programs such as boarding schools or transportation assistance for students in remote areas can influence this success. With a budget of IDR271 billion and 347 schools, North Lombok has the lowest average years of schooling (6,39 years). This is thought to be due to limited road infrastructure and teacher shortages in mountainous areas.

West Sumbawa district shows a unique pattern with perfect efficiency (1,000) in 2021 and 2023 but drops to ,923 in 2022. Despite having a high level of efficiency (0,974), the APS is relatively low (92,19%), indicating a mismatch between budget allocations and education outcomes. As an archipelago, geographical conditions lead to high operational costs for teacher and student transportation. As a result, although the budget is well managed, access to education is still hampered.

These findings are in line with the theory of fiscal decentralization, which says that local governments have autonomy that allows them to make policies according to specific needs. However, these findings also reveal weaknesses in policy implementation, such as uneven resource allocation and weak program evaluation. For example, even though East Lombok receives the highest education budget (IDR 1,04 trillion), the educational outcomes are not much different from Dompu, which has a lower budget. This suggests that increased budgets must be balanced with strategic planning, such as optimizing the number of schools, improving the quality of teachers, or using technology to reach remote areas.

CONCLUSION

Based on the results of the analysis of regional expenditure efficiency in the health and education sector of Regencies/Cities in West Nusa Tenggara Province (NTB) using the Data Envelopment Analysis (DEA) approach from 2021–2023, it shows that there are significant differences in budget optimization between regions. In the health sector, the achievement of average efficiency scores in all districts/cities is 2 (two) efficient districts, namely Central Lombok Regency and East Lombok Regency, and the one with the lowest average efficiency score is West Sumbawa Regency with an average efficiency score of 0.397.

Meanwhile, the calculation of the efficiency of government spending in the education sector in the regency/city governments in West Nusa Tenggara Province during the 2021-2023 period shows that only Bima City achieved an average score of perfect efficiency, and the one that achieved the lowest average efficiency score was Central Lombok Regency with an average efficiency score of 0,697. The efficiency of regional spending in NTB is influenced by a combination of technical, geographical, and local policy factors. Districts/cities with high efficiency, show the importance of targeted budget allocation, transparent resource management, and data-driven programs. Meanwhile, low-efficiency areas need to improve budget allocation strategies, improve program monitoring, and address geographic challenges through innovations such as mobile health services or boarding schools. The policy implications of these findings are the need to integrate geographical factors in budget planning, increase the human resource capacity of local governments, and collaboration between regions to share best practices. Further research can expand the scope of variables, such as including service quality or community participation, as well as analyze the impact of fiscal decentralization policies longitudinally to understand long-term trends.

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