



Government Spending Effect on HDI Indragiri Hilir: An ECM Approach

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Article Information Abstract

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Indragiri Hilir Regency has the second lowest Human Development Index compared to the newly established regencies and cities in Riau province. However, Indragiri Hilir Regency has a relatively high allocation of development budget and per capita income compared to other regencies and cities. The objectives of the study were to determine whether the effect of the Indragiri Hilir government expenditure realization on the Human Development Index is cointegrated, to examine the long-term impact of expenditure realization on education, health, infrastructure, environmental, and social protection functions on the Human Development Index in Indragiri Hilir, and to analyze the short-term effects of environmental and social protection functions on the Human Development Index. The study employed the Error Correction Model (ECM) method, utilizing data from the period 2007 to 2021 obtained from the Directorate General of Fiscal Balance (DJPK) of the Indonesian Ministry of Finance for independent variables, while dependent variables were sourced from the Central Statistics Agency (BPS). The study findings revealed that government spending has a cointegrated influence on the Development Index. Furthermore, it was observed that the realization of government spending on education, health, and infrastructure functions did not significantly affect the Human Development Index in the Indragiri Hilir regency. In contrast, the realization of government spending on environmental functions showed a significant positive correlation. Similarly, the realization of Indragiri Hilir's government spending on social protection functions had a significant negative correlation. Therefore, the government of Indragiri Hilir Regency should assess expenditure realization on education, health, and infrastructure functions and introduce innovative programs. Increased spending on social protection led to a reduction in the Human Development Index.

INTRODUCTION

Indragiri Hilir Regency is a Level II Region in Riau province after it was expanded from Central Sumatra to Riau province through the Law of the Republic of Indonesia Number 6 in the Year 1958, where the other Level 2 region consists of Kampar Regency, Indragiri Hulu Regency, Bengkalis regency, Riau Islands and Pekanbaru Municipality (Sujianto, 2010).

Indragiri Hilir Regency is one of the 12 regencies and cities in Riau province. The establishment of the Indragiri Hilir regency began with the governor's decree of Riau (Riau Province) Number 052/5/1965 on the preparation area of Indragiri Hilir regency dated April 27, 1965 (Asmara, 2020). After the governor of Riau Province issued a letter regarding the preparation for the establishment of Indragiri Hilir Regency, the next stage was born Act No. 6 of 1965 on the establishment of Indragiri Hilir Regency Level II dated June 14, 1965, with its implementation starting on November 20, 1965 (Indonesia, 1965).

In 2022, Indragiri Hilir regency turned 57 years old with a population of 658,025 across 20 sub-districts (BPS, 2022b). The economic activities of the people in the Indragiri Hilir regency are mostly farmers engaged in coconut plantations (Antarariau, 2016). In contrast, the majority of the population of Indragiri Hilir regency is a labor force category with age above 15 years of 363,588 people or 55.25% of the total population (BPS, 2022a). The population of Indragiri Hilir Regency in 2022 has a life expectancy (AHH) of 67.98 and an average length of schooling (RLS) of 7.24 (BPS, 2021b).

Indragiri Hilir Regency, one of the 12 regencies and cities in Riau province, had the second lowest Human Development Index (HDI) in 2021, surpassing only Meranti Regency (BPS, 2021a). The newly expanded regency/city, which includes Pelalawan, Kuantan Singingi, Siak Regency, Rokan Hulu, Rokan Hilir, and Dumai City, has a higher HDI than Indragiri Hilir (Sujianto, 2010). Whereas Indragiri Hilir regency was much earlier standing in the Regency /city.

Table 1. HDI Regency / City of Riau Province in 2019 – 2021

Regency/City	Year		
	2019	2020	2021
Kuantan Singingi	70.78	70.31	70.60
Indragiri Hulu	70.05	69.83	70.01
Indragiri Hilir	66.84	66.54	66.63
Pelalawan	71.85	71.56	72.08
Siak	74.07	73.68	73.98
Kampar	73.15	72.83	73.02
Rokan Hulu	69.93	69.38	69.67
Bengkalis	73.44	73.46	73.58
Rokan Hilir	69.40	69.15	69.34
Kepulauan Meranti	65.93	65.50	65.70
Pekanbaru	81.35	81.32	81.58
Dumai	74.64	74.40	74.75
RIAU	73.00	72.71	72.94

Source: Central Statistics Agency Riau, 2022 (Processed)

In 2021, when comparing the per capita income of the population in Indragiri Hilir Regency with other districts and cities in Riau Province, it ranked eighth. However, there are still four districts in Riau Province with a lower per capita income than Indragiri Hilir Regency.

These districts and cities include Indragiri Hulu, Kampar, Rokan Hulu, and Meranti Islands. Two of the four districts mentioned, Kampar and Indragiri Hulu districts, have been designated as districts for a considerable period. This information is presented in the following table.

Table 2. Annual Per Capita Income of Districts / Cities in Riau Province

Regency/City	Year		
	2019	2020	2021
Kuantan Singingi	IDR 72.143.005,54	IDR 71.186.530,25	IDR 72.638.852,11
Indragiri Hulu	IDR 67.603.380,80	IDR 67.101.572,83	IDR 68.785.789,46
Indragiri Hilir	IDR 60.457.724,70	IDR 68.599.118,35	IDR 71.306.196,57
Pelalawan	IDR 71.002.870,01	IDR 90.016.100,67	IDR 91.515.413,36
Siak	IDR 108.912.174,79	IDR 116.414.836,00	IDR 116.874.387,97
Kampar	IDR 59.565.856,25	IDR 61.117.929,66	IDR 62.018.368,95
Rokan Hulu	IDR 36.267.785,93	IDR 45.392.039,33	IDR 46.855.900,32
Bengkalis	IDR 133.293.001,96	IDR 130.587.956,55	IDR 129.431.948,16
Rokan Hilir	IDR 64.993.428,94	IDR 72.182.854,88	IDR 72.297.357,26
Kepulauan Meranti	IDR 68.077.308,70	IDR 61.537.532,26	IDR 62.106.416,50
Pekanbaru	IDR 63.132.891,77	IDR 70.168.016,47	IDR 73.014.453,26
Dumai	IDR 80.492.014,56	IDR 77.649.582,36	IDR 80.594.895,07
RIAU	IDR 71.087.948,57	IDR 76.630.848,16	IDR 77.993.328,20

Source: Source: Central Statistics Agency Riau, 2022 (Processed)

A notable disparity in rankings becomes evident upon comparing the data presented in Table 1 and Table 2. Specifically, Indragiri Hilir Regency ranks among the bottom two regarding HDI. During the annual per capita income calculation, Indragiri Hilir Regency falls within the middle range, with four districts having a per capita income lower than that of Indragiri Hilir Regency.

HDI affects a person's welfare level because the HDI can be influenced by the quality of education, health quality, and access to information (Land, 2015). With the second lowest HDI level in Riau province, it can be interpreted that the education, health, and access to information in the Indragiri Hilir regency is still low. In contrast, the Indragiri Hilir Regency is over half a century old.

Economic growth is indispensable in alleviating poverty by increasing government spending to increase people's per capita income (Sasmal & Sasmal, 2016). The annual per capita income of the population of Indragiri Hilir regency is not in the upper range or lower range. However, the HDI population of Indragiri Hilir is still low.

Agriculture dominates the work undertaken by the people of the Indragiri Hilir Regency. The coconut farming sector is the sector that most affects the income of the Indragiri Hilir Regency and absorbs the most labor (Aris et al., 2016). Therefore, it needs special attention to the components of the coconut farming sector: human resources, infrastructure, and access to information. This can be realized by increasing government spending through infrastructure construction to increase the community's welfare (González-Eguino, 2015).

There are fluctuations in the realization of expenditure based on the functions of education, health, infrastructure, society, and environment in the Indragiri Hilir Regency. From 2019 to 2021, the functions of the environment and infrastructure (housing and public facilities) experienced a decrease. As for the health function, education is a distant decrease in spending from 2020 to 2021. In contrast, the function of social protection spending witnessed an increase in 2020 compared to 2019; however, there was a decrease in 2021. This information is illustrated in the following table.

Table 3. Realization of Government Expenditure Based on Function in The Budget of Indragiri Hilir Regency

Spending Function	Year		
	2019	2020	2021
Environment	IDR 12.719.310.060	IDR 12.503.245.227	IDR 11.814.473.940
Housing and Public Facilities	IDR 132.992.769.282	IDR 91.505.900.360	IDR 60.255.087.180
Health	IDR 391.820.186.792	IDR 445.277.010.703	IDR 59.557.737.170
Education	IDR 577.295.080.875	IDR 582.034.801.956	IDR 111.738.282.834
Social Protection	IDR 25.395.493.382	IDR 30.963.372.733	IDR 10.346.378.750

Source: Directorate General of Fiscal Balance (DJPK), 2022

When comparing the spending realization for the health shopping function in Indragiri Hilir Regency with other districts and cities in Riau Province in 2019, it is the second highest after Bengkalis Regency. In the function of education expenditure realization, Indragiri Hilir regency is

in the upper range of 12 regencies and cities in Riau province. While in social protection, Indragiri Hilir Regency occupies the second position after Rokan Hilir Regency. This can be seen in the following table.

Table 4. Realization of Government Expenditure in Riau Province in 2019 (in IDR)

Regency/City	Environment	Housing and Public Facilities	Health	Education	Social Protection
Bengkalis Regency	43.370.557.355	821.424.436.269	460.135.250.540	998.333.063.035	32.655.953.182
Indragiri Hilir Regency	12.719.310.060	132.992.769.282	391.820.186.792	577.295.080.875	25.395.493.382
Indragiri Hulu Regency	10.406.891.168	207.501.708.325	211.476.273.404	486.069.503.982	30.492.663.142
Kampar Regency	28.235.546.289	459.545.144.580	364.311.738.684	932.802.125.108	22.459.265.476
Kuantan Singingi Regency	16.187.040.899	210.954.210.790	194.632.229.871	535.574.533.613	11.842.254.550
Pelalawan Regency	22.447.560.980	133.815.280.985	211.243.180.529	449.989.307.050	24.564.489.579
Rokan Hilir Regency	30.216.709.454	401.255.331.316	227.597.586.164	540.440.865.694	45.422.908.559
Kab. Rokan Hulu	21.056.988.101	327.041.690.863	216.890.778.565	537.898.119.427	21.061.380.666
Siak Regency	382.009.477.280	8.755.645.697	237.943.494.777	501.565.349.857	27.742.897.342
Dumai City	24.892.072.662	149.994.045.574	350.923.387.980	367.613.549.408	24.107.818.905
Pekanbaru City	116.741.263.539	437.964.362.703	237.043.965.246	665.621.338.475	31.745.359.412
Kepulauan Meranti Regency	14.159.615.811	215.338.388.368	164.776.876.944	257.430.974.967	17.571.246.462

Source: Directorate General of Fiscal Balance (DJPK), 2022

In 2021, spending on health and education functions of Indragiri Hilir regency is still at Level 4 out of 12 districts and cities in Riau province. For infrastructure spending reflected by the function of Housing and public facilities

spending, Indragiri Hilir regency is ranked 6, so there are still areas that spend on infrastructure under Indragiri Hilir regency. The crotch can be seen in the following table.

Table 5. Budget for Districts and Cities in Riau Province in 2021 (in IDR)

Regency/City	Environment	Housing and Public Facilities	Health	Education	Social Protection
Bengkalis Regency	43.370.557.355	821.424.436.269	460.135.250.540	998.333.063.035	32.655.953.182
Indragiri Hilir Regency	12.719.310.060	132.992.769.282	391.820.186.792	577.295.080.875	25.395.493.382
Indragiri Hulu Regency	10.406.891.168	207.501.708.325	211.476.273.404	486.069.503.982	30.492.663.142
Kampar Regency	28.235.546.289	459.545.144.580	364.311.738.684	932.802.125.108	22.459.265.476
Kuantan Singingi Regency	16.187.040.899	210.954.210.790	194.632.229.871	535.574.533.613	11.842.254.550
Pelalawan Regency	22.447.560.980	133.815.280.985	211.243.180.529	449.989.307.050	24.564.489.579
Rokan Hilir Regency	30.216.709.454	401.255.331.316	227.597.586.164	540.440.865.694	45.422.908.559
Kab. Rokan Hulu	21.056.988.101	327.041.690.863	216.890.778.565	537.898.119.427	21.061.380.666
Siak Regency	382.009.477.280	8.755.645.697	237.943.494.777	501.565.349.857	27.742.897.342
Dumai City	24.892.072.662	149.994.045.574	350.923.387.980	367.613.549.408	24.107.818.905
Pekanbaru City	116.741.263.539	437.964.362.703	237.043.965.246	665.621.338.475	31.745.359.412
Kepulauan Meranti	14.159.615.811	215.338.388.368	164.776.876.944	257.430.974.967	17.571.246.462

Source: Directorate General of Fiscal Balance (DJPK), 2022

The improvement of a nation's development through HDI is influenced by the progress of its community education (Land, 2015). A better quality of public education improved the competence of the community and positively impacted the HDI of a nation. For this reason, education is an essential factor in human development. Government spending on health functions can increase the HDI of a region, which is manifested in the activities of community health centers financed by local governments (Lengkong et al., 2019). This means that the greater the education expenditure, the better the public health.

Improving infrastructure is one of the methods to enhance human resources. The more lavish government spending to build infrastructure affected the improvement of the quality of human resources, as reflected by the IPM (Mahulauw et al., 2016). Therefore, the realization of government spending, especially in the field of infrastructure, must be improved in order to have an impact on increasing the HDI.

While government spending on social protection was reduced when the quality of human resources increased, it was interpreted that the minor government expenditure on social protection functions indicated an increase in the HDI in the region (Setiawan, 2020). Therefore, if

the expenditure on social protection from year to year is getting smaller, then the area or region already has qualified human resources.

Attention to environmental improvement had a significant effect on improving the quality of human resources. Where HDI is strongly influenced by environmental concerns such as emission reductions in daily activities (Biggeri & Mauro, 2018). The interpretation of this is that when the government's concern for the environment is reflected in the implementation of environmental spending, it has the potential to elevate the region's Human Development Index (HDI).

Economic growth is the most influencing factor of HDI in Riau province (Chalid & Yusuf, 2014). GDP indicates economic progress that reflects growth (Supartoyo et al., 2014). Human development can be realized depending on the government's expenditure, which can be reflected in the Human Development Index (Palayukan, 2019).

RESEARCH METHODS

The study used secondary data obtained from the release of government institutions. The data used for research is Human Development Index (HDI) from the Indonesian Central

Statistics Agency. Data on the realization of regional expenditures based on education, health, social protection, environment, and infrastructure are reflected through the functions of Housing and public facilities. The data obtained from the release of the Directorate General of Fiscal Balance (DJPK) Ministry of Finance of Indonesia provides valuable insights. The Data is used from 2007 to 2021 or for 15 years with an annual data type. The study began in 2007 because the data on the realization of regional expenditure was seen from the functions available from 2007. In 2021 use projection data based on data trend charts using microsoft excel 2010 for education, health, social protection, environmental, and infrastructure functions.

This research applied regression equation to determine influence between the independent and dependent variables. The resulting equation is a direct (spurious) regression (Insukindro, 1991). Using an Error Correction Model (ECM), analysis avoided the pseudo equation, as it captured the trend in the data and the relationship between variables, making it particularly useful in research that utilized secondary data. The error correction model (ECM) approach, which analyzes the cointegration relationship between independent and dependent variables in both the long and short term, has been widely used (Sodeyfi & Katircioglu, 2016) as for one analysis used in ECM using multiple regression (Zhang et al., 2018). The ECM approach was popularized by Engle and Granger and first used by Sargan (Gujarati et al., 2015). The form of the equation of the Error Correction Model:

$$Y = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \dots \alpha_n x_n \dots (1)$$

$$C_t = b_1(Y_t - Y_t^*) + b_2\{(Y_t + Y_{t-1}) - f_t(Z_t - Z_{t-1})\} \dots (2)$$

$$EC = D\ln x_{t-1} + D\ln x_{2t-1} + D\ln x_{3t-1} + \dots D\ln x_{nt-1} \dots (3)$$

$$D\ln Y_t = \beta_0 + \beta_1 D\ln x_1 + \beta_2 D\ln x_2 + \beta_3 D\ln x_3 + ECT + \mu_t \dots (4)$$

Where C_t is a timed error seen. $D\ln$ is a variable change that has been done in the test stationery. Being μ_t is the residual of the

equation. Moreover, t is the period. ECT is an error correction term for correcting errors in the estimation period. The analysis tools to formulate the ECM equation using the E Views 10 application. The steps taken to use ECM are through stationary Test (root test), cointegration test, and classical assumption test (Basuki, 2016).

The Human Development Index is used as an independent variable because the welfare of society can be reflected in the HDI. Meanwhile, to realize prosperity through HDI, it takes significant government intervention through programs that can be realized through government spending based on the work plan agreed upon between the government and legislative. Not all functions of the work program are taken as independent variables (X) for the study but are expenditure functions that are directly capable of influencing per capita expenditure of the population per year, life expectancy, and average length of schooling (Arofah & Rohimah, 2019).

For the dependent variable (Y) using the Development Index and the independent variable (X) using the realization of expenditure on health functions, the realization of expenditure on education functions, the realization of expenditure on environmental functions, the realization of expenditure on social protection functions and the realization of expenditure on infrastructure functions reflected in the realization of expenditure on housing and public facilities functions. In addition to the above, there is a reason to reflect the infrastructure with spending on housing and public facilities functions because the designation of activities and their uses are the same in the details of government spending (Performance.id, 2020).

RESULTS AND DISCUSSION

This study applied short-run and long-run estimation using error correction model. This study constructs some combination of independent variables to develop an Error Correction Model equation that explained below:

$$DLnHDI_t = \beta_0 + \beta_1 DLnHealth_t + \beta_2 DLnEducation_t + \beta_3 DLnInfrastructure_t + \beta_4 DLnEnvironment_t + \beta_5 DLnSocial\ Protect_t + ECT + \mu_t \dots (5)$$

Where, $DLnHDI_t$ is Dependent variable differentiated in the first order; the rest variables are independent variables that are differentiated in the first order; ECT is Residual / error long-term equation in the period t-1, and μ_t .

Before looking at the relationship in the short term, first do the estimation for the long term with the following equation model

$$HDI_t = \beta_0 + \beta_1 Health_t + \beta_2 Education_t + \beta_3 Infrastructure_t + \beta_4 Environment_t + \beta_5 Sosial\ Protect_t + e \dots (6)$$

Where HDI is an independent variable that is not differentiated for long-term equations, likewise, the independent variables, namely health spending, education spending, infrastructure spending, spending on the environment, and spending on social protection, are not differentiated in the equation to see their effects in the long term. So there is no need to see the same mistakes in the previous period. The results of the equation in the long term are in the following table.

Table 6. Long-Term Estimated Results

Variable	Coefficient	Prob.	R - Square
KES/Health	9.90E-12	0.2629	
LIH/ Environment	2.78E-10	0.0267	
PEN/ Education	-1.02E-12	0.9261	
PFU/ Infrastructure	1.16E-12	0.9619	0.707048
PSO/Sosial Protect	-1.71E-10	0.0442	
C	64.55080	0.0000	
F-Statistik	4.344342	0.027382	

Note: Significants at P-value $< \alpha = 5\%$

Source: Data Processed, 2022

A unit root test is conducted on the data before using the data to see the short-term estimation results. The unit root test is to see if the data is stationary. From the test, all independent and dependent variables pass on the change of the first data derivative (first different) except the health shopping function. Where the results of the health expenditure function stationery passed the second data derivative changes (second different), this can be seen in the following table.

Table 7. Root Test

Variable	t-Statistic	Prob.
D(IPM)	-3.746195	0.0171
D(KES,2)	-3.875510	0.0166
D(LIH)	-4.421198	0.0062
D(PEN)	-3.644968	0.0220
D(PFU)	-3.406117	0.0348
D(PSO)	-5.301083	0.0016

Source: Data Processed, 2022

Furthermore, the cointegration test is to see whether the dependent and independent variables have a long-term or short-term relationship. This can be done by creating a residue with the name ECT on the results of long-term estimates—furthermore, the residue in the root test with significant results at the data level. The estimated results can be seen in the following table.

Table 8. Cointegration Estimation Results

Null Hypothesis: ECT has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=1)		
	T-Statistics	Prob.*
Augmented Dickey-Fuller test statistic	-6.286053	0.0002

Source: Data Processed, 2022

From the test of cointegration can be seen that the probability's smaller than α 0.05. Therefore, it can be classified that the data in the estimation equation have long-term and short-term relationships or are cointegrated.

After fulfilling the provisions in estimating using ECM, the derived data can be regarded by adding multiple ECT variables that function to correct equations or estimate results with lag 1 (Basuki, 2016). This can be seen in the following table. From the cointegration test, it can be seen

that the probability is smaller than (0.05). Therefore, it can be classified that the data in the estimated equation has a long-run and short-run relationship or is cointegrated.

After fulfilling the provisions in estimating using ECM, the derived data can be multiple regression by adding ECT variables that correct the equation or the estimated results with lag 1 (Basuki, 2016). This can be seen in the following table.

Table 9. Short-Term Estimated Results Error Correction Model

Variable	Coefficient	Prob.	R-squared
D(KES,2)	5.83E-12	0.6375	0.936287
D(LIH)	3.89E-10	0.0009	
D(PEN)	6.92E-12	0.2267	
D(PFU)	-2.40E-12	0.8086	
D(PSO)	-2.20E-10	0.0076	
ECT-1	0.940859	0.0408	
C	1.909054	0.0352	
F-Statistics	14.69549	0.002345	

Source: Data Processed, 2022

In the study, the linearity test is not used. This is because the research only proves the hypothesis and does not search for the best model. Therefore, linearity tests can be ignored (Hidayat, 2018).

As for the data normality test, autocorrelation test, multicollinearity test, and heteroskedasticity test are still used. Normality tests must be met, and autocorrelation, multicollinearity, and heteroskedasticity tests must be free from ECM estimates (Hidayat, 2018). This we can see in the following table.

Table 10. Classical Assumption Test of Short-Term Estimation Results Error Correction Model

Test Assumptions	Test Equipment	Value/*F-Stat./**Obs. R ²	Prob.
Normality	Jarque-Bera	0,291	0,864
Autocorrelation	Breusch-Godfrey Serial Correlation LM Test:	*0,4211	0,8620
Heteroscedasticity	Breusch-Pagan-Godfrey	**0,3122	0,9088
Multicollinearity	Varian Inflation Factors	Nothing exceeds the value of 10	

Source: Data Processed, 2022

From the table above, it can be concluded that the normality test is fulfilled because the probability is close to 1 and the Jarque-Bera value is close to 0. This means that the estimated data has been well distributed to be used for multiple linear regression. In the autocorrelation test, the probability value is greater than p-value and it can be explained that the estimation equation

does not occur autocorrelation relationship between variables. The probability value is greater than the p-value in the heteroscedasticity test. The equation exhibits homoscedasticity rather than heteroscedasticity. For the multicollinearity test, the central value of each variable in the Variant Inflation Factors (VIF) is

not more than 10. Therefore, it can be interpreted that the equation is free from multicollinearity.

Estimation results in the long-term and short-term that the probability is less than α the variable environment (LIH) and variable social protection (PSO). While the variables of Education (PEN), health variables (KES), and infrastructure (PFU), the probability is greater than the α . From the comparison of probability value and α that affect HDI Indragiri Hilir regency significantly is the realization of environmental spending and social protection functions. While the realization of the function of education expenditure, health expenditure, and infrastructure expenditure (housing and public facilities) did not significantly affect the IPM of Indragiri Hilir regency.

In the simultaneous test, all independent variables significantly affect the IPM of the Indragiri Hilir Regency. This can be seen from the smaller probability that the value is 0.027382 than the α (5%) in the long term. So also, in the short term, the independent variables, namely the realization of the function of education spending, health spending, infrastructure spending, environmental spending, and social protection spending, together significantly affect the IPM of Indragiri Hilir Regency. Where the probability value of 0.002345 is less than the value of α (5%). So that in the long term and short term, the independent variables in the estimation equation affect the HDI of Indragiri Hilir regency significantly (significantly).

In the long term, the independent variable is the realization of the function of education expenditure, health expenditure, infrastructure expenditure (housing and public facilities), and environmental expenditure can affect the HDI of Indragiri Hilir Regency with a coefficient of determination of 0.707048. This explains that the independent variable can affect the dependent variable by 70.70%, and 29.30% is influenced by variables not contained in the estimation equation.

In the short term, there is an increase in the value of the coefficient of determination of 0.936287, or it can be explained that the independent variable can affect the dependent

variable of 93.63%. In contrast, the remaining 6.37% is influenced by other variables not contained in the equation. Therefore, it can be said that the greater the effect of realizing the function of education spending, health spending, infrastructure spending, environmental spending, and social protection spending on IPM Indragiri Hilir district in the short term than in the long term.

This can be interpreted that the remaining influences that are not included in the estimation equation are the realization of expenditure on economic functions, tourism functions, public service functions, order and security functions, tourism functions, and culture contained in the DJPK report from 2007 to 2021 as well as other factors outside of government spending. The influence of these variables is smaller than the independent variables in the estimation equation in influencing the HDI of Indragiri Hilir Regency both in the long and short term.

In the long term and short term, from the results of estimates that the variable realization of expenditure on education functions and health realization has no natural effect (significant) on HDI Indragiri Hilir. The coefficient value of the variable realization of education function expenditure in the long term amounted to -1.019380970 and in the short term amounted to 6.92233093339. While the variable realization of expenditure on health functions in the long-term coefficient value of 9.903050006 and the short term of 5.83199311098. With probabilities in both variables greater than 0.05.

This is not following the results of Susye Marlen Ketsy Lengkong's research in 2019, which said that the allocation of education and health budgets from the government was able to affect the HDI of Bitung City (Lengkong et al., 2019). The same thing was also conveyed by Marsel Palayukan in 2019 in his research results that education spending and health spending were able to significantly affect the HDI of Southeast Sulawesi province with a positive correlation (Palayukan, 2019). While in Indragiri Hilir regency, the two variables did not significantly affect the Human Development Index.

It should be with a portion of the budget for education of 20%. Of course, the education sector significantly influences the community's welfare, such as the increase in HDI. However, in the Indragiri Hilir Regency, the education sector has not been able to directly and significantly influence HDI. This is contrary to the government's attention to the education sector because the government has made regulations to allocate more spending on education based on the 1945 Constitution Article 31 Amendment 4 mandate. The reason for the inability of education spending to significantly affect the increase in HDI, according to Winarti and Yulia in 2014, is that government spending that has been budgeted 20% is not only used for educational facilities but also allocated to employee salaries and other education costs (Winarti & Yulia, 2014).

In the health sector, there is also an increase in the budget, for the national level by 5% and for the minimum budget of 10%. This is contained in Law Number 36 of 2009. Since the legislation's implementation, the budget and the realization of expenditure in the health sector have increased. This is also supported by research from Meylina Astri in 2003, which states that health expenditure does not significantly influence the Human Development Index (Astri & Pd, 2013). Meanwhile, in the Indragiri Hilir Regency, the realization of expenditure in the health sector did not significantly impact the Human Development Index in the short and long term. According to Suparno, realizing expenditure in the health sector can not have a significant effect because the allocation used for the health sector in its implementation is not always used to improve facilities and human resources in the health sector. This is due to weaknesses in program planning and supervision (Suparno, 2015).

In the variable realization of infrastructure function, spending has no significant effect on IPM Indragiri Hilir both in the long and short term. A variable coefficient value of expenditure realization of infrastructure functions in the long term amounted to 1.15517880027. While in the short term, the value of the coefficient of

expenditure realization variable infrastructure function to the HDI of 2.39863389202.

There is no effect of variable expenditure realization of infrastructure functions to IPM in Indragiri Hilir regency. Not the same as the research presented by Abdul Kadir Mahulauw and Dwi Budi Santosa (2016) with the results of their research that government spending in the infrastructure field significantly affects HDI in Maluku Province.

The budget allocation for infrastructure is increasing every year. The allocation from the APBD for infrastructure is at least budgeted at 40% outside of revenue sharing and/or transfer to the regions based on domestic regulation number 84 of 2022. Meanwhile, in the Indragiri Hilir district, spending on infrastructure in the long and short term each year has no significant effect on HDI. This is in line with Mohanty's research in 2016 for the reason that the lack of influence of infrastructure with HDI due to infrastructure development is not following the facilities needed by the community and the lack of sustainable planning from the development that has been done (Mohanty et al., 2016).

The variable realization of Environmental function expenditure, both in the long and short term, significantly affects the IPM Indragiri Hilir Regency. In the long term, if the realization of Environmental function expenditure rises by 1%, it increases the HDI in Indragiri Hilir Regency by 2.78%. Meanwhile, if the realization of Environmental function expenditure increases by 1% in the short term, it increases HDI by 3.89% in Indragiri Hilir regency.

The results of this study are the same as those of Mario Biggeri and Vincenzo Mauro (2018), where research showed that the environment could affect HDI significantly, such as concern for the environment in improving air emissions for the community.

The variable of Social Protection function expenditure realization in both the long and short term significantly affects HDI in Indragiri Hilir regency with a negative correlation. The value of the coefficient in the long term amounted to 1.70776263397, and in the short term amounted to 2.19828396092. Hal explained that if the

realization of spending on social protection functions increased by 1%, it would reduce the HDI in Indragiri Hilir Regency by 1.70%. While in the short term, if the realization of expenditure on social protection functions increases by 1%, it reduces the HDI in Indragiri Hilir Regency by 2.198%. This is the same as the results of Hidarini & Bawono's research (2020) which states that spending on social functions has a significant effect and is negatively correlated with Indonesia's HDI.

CONCLUSION

The study results found that government spending on realizing the expenditure function of Education does not affect human development in Indragiri Hilir seen from the value of HDI significantly. The wrong factors include the weakness of the education system, which is seen as unsuitable on target in carrying out expenditures for education so that it cannot affect human development significantly (Agustina et al., 2016). Next is the importance of involving the private sector in building education to improve human development by absorbing CSR for education and Government Accountability in carrying out expenditures in Education (Cockx & Francken, 2016).

Realizing health function expenditure did not significantly affect human development in Indragiri Hilir regency. The factor that causes no natural effect (significant) is that the government is not evenly distributed in the construction of health facilities. Where health facilities are only concentrated in urban areas and minimal in rural areas (Agustina et al., 2016).

In realizing infrastructure function spending, there is no significant influence on human development in the Indragiri Hilir regency. Therefore, there is a need for reform measures in spending and managing funds for infrastructure so that the realization of government spending on infrastructure functions significantly affects the Human Development Index (Carvalho et al., 2016).

The realization of government spending on environmental functions significantly affects. Therefore, the Government of Indragiri Hilir

Regency should increase its environmental spending so that human development (HDI) in Indragiri Hilir Regency improves.

While the realization of social protection function spending significantly affects human development with negative correlation in Indragiri Hilir regency. Therefore, the Government of Indragiri Hilir Regency should be able to implement efficiency and effectiveness in spending on social protection functions in Indragiri Hilir Regency so that the Human Development Index (HDI) in Indragiri Hilir Regency increases. If the government of the Indragiri Hilir Regency spends more on social protection, it reduces the HDI in the Indragiri Hilir Regency.

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APPENDIX**Tabel 11.** Results of Independent Variable Data Projection In 2021

Variable	Projection Equation	R ²	Result
Environment/LIH	$y = -1E+09x + 3E+10$	0,1651	11134682001
Housing and Public Facilities/PFU	$y = 4E+09x + 9E+10$	0,0589	156514931434
Health/KES	$y = 3E+10x - 5E+10$	0,7954	394378204935
Education/PEN	$y = 3E+10x + 2E+11$	0,3485	602357936041
Social Protection/PSO	$y = 1E+09x + 1E+10$	0,1892	36371614088

Source: Data Processed, 2022

Table 12. Research Data

Year	IPM	LIH	PFU	KES	PEN	PSO
2007	73,89	14105884046	9505715458	51112348694	61126421873	7545943759
2008	74,41	44499200384	124662033645	61804871017	110628708244	9528590535
2009	74,95	38308022325	159167810833	61064187901	315154741444	17081920575
2010	61,98	11306262675	51751444920	70887132687	337013345380	19380588758
2011	62,82	11874477156	153736725103	82767339172	497951457256	21528488681
2012	63,04	11141022631	187795167186	101643750145	573477921352	38224613275
2013	63,44	15116422176	200340837510	131581650042	560025883527	44592456366
2014	63,80	7936792727	11915620382	14900632243	2235970523	2777687105
2015	64,80	26509653383	29993179169	103500910980	81691243751	39236101676
2016	65,35	29372068063	245537267157	245527844975	539771545971	50916513160
2017	66,17	13673218599	239549214663	309120572545	570761417923	24767454477
2018	66,51	12631669058	116879031517	328213705545	554252067259	22278613556
2019	66,84	12719310060	132992769282	391820186792	577295080875	25395493382
2020	66,54	12503245227	91505900360	445277010703	549286158310	30963372733
2021	66,63	11134682001	156514931434	394378204935	602357936041	36371614088

Source: Data Processed, 2022