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Economic Growth Improvement Strategies with Infrastructure Investment Approach in Situbondo District

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Abstract In an effort to boost a region's economic growth, infrastructure development is a highly significant aspect. This study aims to explain the relationship between the development of road infrastructure and regional economic growth in Situbondo Regency. It is anticipated that highly connected metrics would be utilized to evaluate national and regional initiatives. Furthermore, it may demonstrate the impact of investment in public works infrastructure, particularly infrastructure, on the success of economic sector development and provide strategic suggestions to boost economic growth. This research use the approach of Correlation and Regression Test Analysis in order to examine the close relationship between two or more variables. In the meanwhile, the secondary data utilized includes information on five indicators of public works infrastructure. Following are the Gross Regional Domestic Product (GRDP) statistics and its nine components as income-based indices of economic progress. Indicators of GRDP economic development and indicators of public works infrastructure, such as roads, bridges, and irrigation, are correlated, according to the findings of the correlation test conducted from 2014 to 2018.

Keywords: Road infrastructure, Indicators of GDP, Economic growth, Infrastructure investment, Situbondo district

INTRODUCTION

Economic expansion is one evidence of a successful economic development process. Economic growth is the development of economic activities that increase the quantity of products and services generated in a community, hence enhancing its wealth (Sukirno, 1994). Capital accumulation is an essential component of economic progress. Capital accumulation may be accomplished by investments that expand the physical stock of capital, such as the purchase of new factories, machinery, equipment, and raw materials, so as to permit a rise in production, which will eventually stimulate economic development.

A process of capital accumulation involving direct production investment must be accompanied by infrastructural investment (Todaro, 2000). Investments in infrastructure are essential for supporting and integrating all economic activities so that they operate efficiently and effectively. One of the cornerstones of economic development is investment. The investment may consist of either physical capital or human resources. There is little question that physical capital investment stimulates economic expansion. Humans also play a vital role in economic growth, as shown by the allocation of investment money and regional expenditures for the improvement of human capital quality by different parties, including the private sector and the government.

In this instance, infrastructure investment costs are distributed to promote economic development in a region. So that the availability of suitable infrastructure will aid in the production or distribution of products and services across areas, hence fostering economic development.

According to the 2013-2033 Situbondo Regency Spatial Plan (RTRW), Situbondo Regency has natural qualities and people resources that have the potential to serve as competitive advantages for the development of the plantation, agricultural, industrial, tourist, and marine fisheries sectors.

Situbondo Regency's extensive coastline (as a natural resource) has a lot of development possibilities that may be used as additional development strengths. Capture fisheries and aquaculture operations in coastal waters, tourism, and the development of seaports in various important places, which are backed by industrial sectors, are potentials in these regions.

Situbondo Regency also has competitive industries, such as rice, cattle, and plantations. Therefore, it is necessary to adopt strategic measures, such as improving access and optimizing sectors in undeveloped regions by constructing district infrastructure.

The purpose of this study was to understand the link or effect between the development of public works infrastructure, particularly road infrastructure, and regional economic growth in Situbondo Regency.

This research was also undertaken to assess the regional economic development indicators that are influenced by road infrastructure and to develop strategies for boosting economic growth in Situbondo Regency.

Theoretical Background

Infrastructure

In general, infrastructure is viewed as a physical product, such as roads, drainage networks, drinking water networks, and power installations associated to the setting of civil and urban infrastructure.

However, infrastructure is not limited to the above description; operational processes and development policies are also considered infrastructure.

This debate became known as Hard Infrastructure and Soft Infrastructure; ultimately, these two forms of infrastructure are intertwined to provide infrastructure services as a whole. According to this concept, infrastructure encompasses a larger scope (Arman, 2008).

Economic Growth Theory

1. Classical Economic Theory

The classical flow arose at the end of the eighteenth century and was pioneered by Adam Smith, who asserted that technical advancements and population expansion produced economic progress.

Capital creation is essential to technological advancement. With the accumulation of capital, it will be possible to apply specialization or labor division in order to boost labor productivity. The effect will promote greater investment and capital stock, which is anticipated to spur technical advancement and income growth.

A rise in income increases the prosperity and general well-being of a people. A rise in wealth supports a rise in population, leading the law of growing returns to decline, which in turn decreases capital accumulation.

2. Neo Classical Theory

Classical flow is replaced by Neoclassical style. Several Neo-Classical scholars contributed numerous concepts to the theory of economic development, including the following:

- Capital accumulation is a significant contributor to economic expansion.
- The process of economic expansion is slow.
- The process of economic expansion is harmonic and cumulative.
- Neo Classical flow is enthusiastic towards expansion (development).

3. Keynesian and Post Keynesian Theory

Due to the slow movement of wages, Keynes argues that the capitalist system would not inevitably result in full employment. The consequence is equilibrium underemployment, which is correctable by policy. Monetary or fiscal measures to promote aggregate demand.

The Post-Keynesian School extended Keynes's theory into a theory of long-term output and employment that examines short-term variations to predict long-term trends. Unless real income likewise improves, per capita income will drop as the population grows. In addition, as the work force expands, production must rise to sustain full employment. To avoid idle capacity, real revenue must grow if there is investment.

Gross Regional Domestic Product (GRDP)

The Gross Regional Domestic Product (GRDP) data, both at current prices and constant prices, is an essential statistic for determining the economic circumstances of a region during a certain time period. GRDP is the total value of final products and services generated by all economic units in a specific region (Badan Pusat Statistik Bojonegoro, 2011).

GRDP on the basis of current prices defines the additional value of goods and services estimated using the existing prices each year, while GRDP on the basis of constant prices describes the added value of same products and services determined using the prevailing prices in a certain year. Changes in the structure and pattern of economic activity of a region, also known as changes in economic structure, will result from economic development carried out in both urban and rural regions over a period of time.

The distribution of each component that makes up a region's economy, often expressed as a percentage, is the definition of economic structure. Economic growth is a dynamic indicator of the movement or change in the level of the economy over time. This shift or movement is quantified using a single metric/period referred to as economic circumstances in the base year.

GRDP Structure by Business Field

Based on the Central Bureau of Statistics (BPS) GRDP Structure by Business Fields are grouped into 17 business fields according to (KBLI 2009 and KBKI 2010) as follows:

1. Agriculture, Forestry and Fisheries.

2. Mining and Quarry.

3. Processing Industry.

4. Electricity and Gas Supply.

5. Water Supply, Waste Management, Waste and Recycling 6 6. Construction.

6. Wholesale and Retail Trade; Car and Motorcycle Repair.

7. Transportation and Warehousing.

8. Provision of Accommodation and Drinks.

9. Information and Communication.

10. Financial and Insurance Services-Food Crops Financial Intermediary Services.

11. Real Estate.

12. Company Services.

13. Government Administration, Defense and Mandatory Social Security.

14. Education Services.

15. Health Services and Social Activities.

16. Other Services.

Infrastructure Investments and Regional Economic Development

According to the research of economic development theory by Marzuki (2005), Sjafrizal (2008), and Arman (2008), suitable infrastructure is required to establish and expand economic activity. If there was originally no road access and later a road was constructed, then this access would promote economic activity. In a business community, for instance, there was no power at first, but after it was installed, commercial activity would expand.

Without enough infrastructure development, other development investment activities, such as industrial activities, would certainly not rise much. Physical infrastructure, particularly the road network as part of the national spatial organization, has a significant correlation with the socioeconomic development and cultural life of an area. In the economic perspective, roads as social capital for the community constitute a pillar of economic development; hence, achieving significant economic growth without proper roads is challenging.

According to Arman (2008), the economic advantages of road infrastructure are substantial if the infrastructure is designed to meet the demands of the community and the expanding corporate world. The advantages of infrastructure (measured by the length of paved roads) for improving the diversity of food crops in Java have a far greater impact on food crop productivity than the development of irrigation. According to Haris (2010), infrastructure is the engine of economic development. Infrastructure is seen as the engine of national and regional growth in terms of the deployment of public and private funds. In a macroeconomic context, the availability of infrastructure services influences the marginal productivity of private capital, but in a microeconomic setting, the availability of infrastructure services influences the reduction of production costs.

Each physical infrastructure contributes directly or indirectly to the economic prosperity of an area. The existence of road infrastructure, for instance, plays a crucial role in supporting the ongoing activities of other sectors, and serves as infrastructure for the movement of transportation of raw materials for production as well as infrastructure for the movement of marketing and distribution of goods and services produced.

METHOD

Data Collection Technique

All of the data utilized in this research are secondary sources. Several indicators of public works infrastructure, such as the subsector of community development and water resources, are represented by the data sources used in this investigation. Indicators of public works infrastructure in Situbondo Regency include: (1) Road Distance, (2) Quantity of Bridges, and (3) Irrigation Duration.

In addition to data related to indicators in the public works infrastructure sector, additional data used as indicators of economic development include Gross Regional Domestic Product (GRDP) statistics relating to income sectors in Situbondo Regency, such as:

1. Agriculture, Forestry, and Fisheries.
2. Mining and Quarry.
3. Processing Industry.
4. Electricity and Gas Supply.
5. Water Supply, Waste Management, Waste and Recycling.
6. Construction.
7. Wholesale and Retail Trade; Car and Motorcycle Repair.
8. Transportation and Warehousing.
9. Provision of Accommodation and Drinks.
10. Information and Communication.
11. Financial and Insurance Services - Food Crops Financial Intermediary Services.
12. Real Estate.
13. Company Services.
14. Government Administration, Defense and Mandatory Social Security.
15. Education Services.

16. Health Services and Social Activities.

17. Other Services.

Data related to indicators of public works infrastructure and GRDP were obtained from the Public Works Office of Situbondo Regency, Situbondo Regency Water Resources Development Agency (PSDA), Central Statistics Agency (BPS)

Data Processing Techniques

After it has been determined that the data indicators employed use the correlation test technique, data processing is performed. Positive or negative correlations may be determined via the correlation test. The formation of a correlation is based on time series data from the last five years. The time series data consist of GRDP and public works infrastructure indicator data. The collected correlation test results will be utilized to determine the value of the prediction/forecast (Santosa, 2005).

The prediction/regression method is formed on the basis of a generic model, which describes the variables involved. In general, there are two types of variables, namely independent and dependent variables. If the independent variable is notated X, while the dependent variable is notated Y where the Y variable is not only influenced by one X variable but several X variables, then the generic model is as follows:

$Y = f(X1,X2,X3,….Xn)$

By using the forecast/regression method, the form of the model becomes:

$Y = a + b1\ x1 + b2\ x2 + b3\ x3 + ……. + bn\ xn$

Description:

Y = Economic Growth Indicators (GRDP).

a, b1, b2, b3 = Regression Constant.

x1, x2, x3 = Public Works Infrastructure Indicators that Have a High Impact.

A statistical tool, SPSS for Windows, is used on the computer to process the data for this study. A scatter plot or graph illustrating the connection between two variables is used to illustrate the current trend. Measures of public works infrastructure are employed as independent factors, whereas indicators of GRDP economic growth are used as dependent variables. The resulting image provides an early insight of the nature of the link and correlation between these variables.

FINDINGS AND DISCUSSION

GRDP and 17 sectors as measures of economic development according to business fields are the amount of payment earned by production factors involved in the production process in a geographical area over a certain time period. These production elements include labor, land, capital, and enterprise. In the meanwhile, production

factors are compensated by a commercial surplus (interest, capital, profits, land rent, wages, and salaries).

Table 1. GRDP of Situbondo Regency on the basis of constant prices by business field (million rupiah).

Category	GRDP of Situbondo Regency on the Basis of Constant Prices according to Field Business (Million Rupiah)				
	2014	**2015**	**2016**	**2017**	**2018**
A. Agriculture, Forestry, and Fisheries	3511850.20	3622214.40	3717861.70	3753205.80	3768052.20
B. Mining and Quarry	219963.80	222930.50	225890.10	239802.60	248978.20
C. Processing Industry	1656676.90	1785473.60	1907530.70	2067764.80	2281752.10
D. Electricity and Gas Procurement	8004	8179.80	8444.60	8810	9076.90
E. Water Supply, Waste Management, Waste and Recycling	14748.80	15080.70	15413.70	16125.70	16801.70
F. Construction	846752.30	839964.20	866471.60	922455.30	975137.50
G. Wholesale and Retail Trade; Car and Motorcycle Repair	1630007.70	1733484.20	1850943.60	1995221.20	2152952
H. Transportation and Warehousing	255348	274218.30	293011.80	314950.30	339084.10
I. Provision of Accommodation and Food and Drink	171639.60	186272	202618.30	220887	239366.40
J. Information and Communication	631562.60	672597.20	721052.20	771825.90	828707.50
K. Financial Services and Insurance	305874.60	332217.70	359010.40	382714.40	408269.60
L. Real Estate	165546.80	178860.10	194346.80	206852.20	219986.80
M N. Company Services	43646.80	46570.60	49651.40	52999.70	57222.40
O. Government Administration, Defense and Mandatory Social Security	368820.10	378990	392088.50	404466.60	420206.70
P. Education Services	414481.80	447350.20	477149.90	498090	530755.50
Q. Health Services and Social Activities	99379	101846	104344.90	109385	115173.20
R, S, T, U. Other services	228070.70	240233.90	251928.40	264902.90	282683.70
GROSS REGIONAL DOMESTIC PRODUCT	**10572373.70**	**11086483.20**	**11640758.60**	**12230459.30**	**12894206.40**

BPS (Central Bureau of Statistics) Situbondo

Meanwhile, infrastructure indicators within the scope of the Public Works sector of Situbondo Regency include the length of the road, the number of bridges, and the length of irrigation.

Table 2. Infrastructure investment in Situbondo.

Indicator	2014	2015	2016	2017	2018
Road Length (Km)	981.837,00	984.367,00	1.038.140,00	1.038.140,00	1.039.1630,00
Amount	210,00	210,00	285,00	289,00	293,00
Bridge (Unit)	1463110,00	1463110,00	345954,00	345954,00	345957,00

Public Works Office of Situbondo Regency

Correlation Analysis

Based on the results of calculations through the SPSS program, it can be seen that the variables that have a correlation are variables with a significance degree of less than 0.05. So, the variables that have a correlation include:

- Trade sector by road.
- Agriculture, forestry, and fisheries with bridges.
- Information and communication with bridge.
- Financial and insurance services with a bridge.
- Real estate with bridge.
- Agriculture, forestry, and fisheries with irrigation.
- Real estate with irrigation.

Table 3. Results of SPSS correlation analysis

Correlations

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R, S, T, U
Road	Pearson Correlatio	,692	,702	,767	,469	,792	,829	-,960*	,307	,571	,745	,706	,698	,703	,328	,400	,665	,770
	Sig. (2-tailed)	,400	,110	,114	,426	,111	,083	,002	,519	,315	,149	,183	,190	,136	,590	,494	,221	,128
	N	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bridge	Pearson Correlatio	,925*	,784	,852	,257	,838	,785	-,318	,712	,303	,883*	,898*	,907*	,873	,682	-,236	,668	,865
	Sig. (2-tailed)	,025	,116	,067	,738	,062	,116	,602	,177	,620	,047	,038	,033	,053	,204	,703	,217	,058
	N	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Irrigation	Pearson Correlatio	-,916*	-,743	-,818	-,205	-,793	-,743	,266	-,786	-,286	-,853	-,872	-,882*	-,842	-,580	,342	-,686	-,834
	Sig. (2-tailed)	,029	,151	,091	,741	,110	,150	,665	,180	,529	,066	,054	,048	,074	,306	,606	,226	,079
	N	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

From the analysis's findings, it can be inferred that:

The Pearson correlation coefficient of -0.985 between Wholesale and Retail Trade Sector; Car and Motorcycle Repair and Total Road Length in Situbondo Regency is quite high (negative). The negative indication suggests that by reducing the road's length, the Wholesale and Retail Trade Sector; Car and Motorcycle Repair will rise.

According to the Pearson correlation coefficients of 0.925 and 0.916, the association between the Agriculture, Forestry, and Fisheries Sector and the Number of Bridges and Irrigation Length in Situbondo Regency is quite strong (positive). This indicates that expanding the number of bridges and irrigation systems will benefit the Agriculture, Forestry, and Fisheries Sector.

According to the Pearson correlation coefficients of 0.883 and 0.898, the association between the Information and Communications and Financial Services and Insurance industries and the Number of Bridges in Situbondo Regency is quite strong (positive). Knowing that a growth in the number of bridges would boost the Information and Communication as well as the Financial Services and Insurance industries.

The Pearson correlations between the Real Estate sector, Number of Bridges, and Irrigation Length in Situbondo Regency are quite high at 0.907% and 0.882%, respectively (positive). This suggests that the real estate market in Situbondo Regency will expand as a result of increased tourism to the Number of Bridges.

Regression Analysis

After identifying the sectors with a correlation, a test of regression is conducted to establish the strength of the link between variables. According to the results of the regression study, the infrastructure indicators in Situbondo Regency have a very substantial impact on the economic growth indicators of the GRDP, as shown by the following findings:

- Trade sector by road (97%).
- Agriculture, forestry, and fisheries with bridges (85.5%).
- Information and communication with bridges (78%).
- Financial and insurance services with bridges (80.7%).
- Real estate with bridge (82.3%).
- Agriculture, forestry, and fisheries with irrigation (83.9%).
- Real estate with irrigation (77.7%).

CONCLUSION

The findings of the correlation test between 2014 and 2018 indicate a correlation between measures of GRDP economic development and indicators of public works infrastructure, including roads, bridges, and irrigation.

Indicators of public works infrastructure, namely roads, bridges, and irrigation, have a significant influence on seven types of GRDP economic growth indicators, namely: (a) Agriculture, Forestry, and Fisheries, (b) Wholesale and Retail Trade; Car and Motorcycle Repair, (c) Information and Communication, (d) Financial Services and

Insurance, and (e) Real Estate, according to the results of a regression test with a significance level of 0.05.

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