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Map of Economics Damage Based on Gross Regional Domestic Product Data at Constant Price (Case Study: Bangkalan Area)

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Abstract**—** *Bangkalan Regency is a district ranked 125th in Indonesia with a GRDP of 17,019 billion rupiah. Economic growth in the Bangkalan area experienced ups and downs, the highest increase in 2014 with a figure of 7.19 and the highest decline in 2015 of -2.66. With an unstable economic condition, it has the potential to cause regional economic vulnerability. This paper aims to determine economic vulnerability in the Bangkalan Regency area. The object of this research is the Bangakalan Regency with the sub-district as the analysis. This analysis uses Geographical Information Systems. Based on the results of the analysis of economic vulnerability mapping, 100% of areas in Bangkalan Regency experience very high economic vulnerability, areas that are in the high economic vulnerability category with a score of 1 including Kamal, Bangakalan, Socah, Labang, Kwanyar, Modung, Galis, Burneh, Tanah Merah, Socah, Tragah, Blega, Klampis, Arosbaya, Sepulu, Geger, Tanjung Bumi, Kokop, Kamal, Labang. a score of 0.333 is Banyuates.*

Keywords**—** *Geographical Information Systems, Economic Vulnerability, GRDP.*

I. INTRODUCTION

Indonesia is a country with a high poverty rate, 50.6% of the total population of Indonesia in 2009 lived below the poverty line (Indonesia-Investment, 2015). In 2014, it was known that 60 million people or 25% of the total population of Indonesia lived slightly above the poverty line. The fact is that even though there has been a decrease in the number of people living above or below the poverty line, the poverty rate in Indonesia is still high (Indonesia investment, 2015). East Java as one of the provinces in Java Island is one of the provinces with a high poverty rate, Bnagkalan Regency is included. The high poverty rate in Bangkalan Regency indicates that the unemployment rate in Bangkalan Regency is also fairly high. This is because the unemployment rate has a positive influence on the poverty rate (Wahyudi and Rejekiningsih, 2013). The location of Bangkalan Regency where the Suramadu bridge was built did not have a significant effect on improving the regional economy. Bangkalan Regency is still classified as a disadvantaged area when viewed from the per capita income and economic growth which is still below the average economic growth in East Java.

This shows that the condition of Bangkalan Regency is not yet stable. Poverty and low regional competitiveness is indicated by the low economic growth rate of Bangkalan Regency and the position of Bangkalan Regency which is included in the category of underdeveloped areas in East Java Province, indicating that Bangkalan Regency is an area that is in an unstable condition. This is what encourages researchers to conduct research related to economic vulnerability in Bangkalan Regency

II. BASIC THEORY

Economic Vulnerability According to Briguglio Based on a perspective that emphasizes risks in economic development, Briguglio (1992, 1993) pioneered research related to areas that are prone to economic vulnerability due to shocks that can affect state performance. According to Briguglio et al. (2008), economic vulnerability is an economic condition that is vulnerable to external shocks and increases due to economic openness. According to Cordina (2004), economic vulnerability is a study of the specific aspects of a country's weakness that can increase threats to economic growth and state performance, especially those that have an impact on the country's per capita income. Viewed from a perspective that emphasizes risk in economic development or from a macroeconomic point of view, Briguglio (1992) in Cordina (2004: 21-22) sparked research related to economic vulnerability by examining "shocks" received by a countries in influencing their country's performance. After that, began to appear literature that leads to measures in analyzing economic vulnerability. There is a statement that regions with high per capita income will tend to be more vulnerable when they get "shocks" than areas with lower per capita income, which is better known as the Vulnerability Dilemma or commonly called "Vulnerability Dillema". Shocks that are meant are shocks that can affect the condition of the country's economy, both from outside and from within.

Based on the established EVI, several variables are then constructed that make a small developing country vulnerable. There are 5 main things that influence it, namely the small size of the country, the remote location of the country, the tendency to be exposed to natural disasters, the vulnerable environmental conditions and several other factors. Judging from the 5 main variables developed by Briguglio (1995), then further elaboration by the United Nation (2011) in Seth and Ragab (2012)

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Tabel 1
Faktor Eksternal Kerentanan Ekonomi

Faktor Eksternal	Variable
Keterbukaan Ekonomi	Rasio Transaksi Internasional Terhadap GDP
	Ukuran Pasar Domestik
	Ketersediaan Sumberdaya
	Kemampuan Produksi Sumberdaya (barang dan jasa)
	Keterbatasan Pemenuhan Sumberdaya yang pada akhirnya meningkatkan impor
	Tingkat partisipasi dalam perdagangan nasional
Konsentrasi Ekspor	
Ketergantunagn Pada Impor	Rasio impor energy, makanan dan penawaran industry terhadap GDP
	Ukuran wilayah
	Ketersediaan sumberdaya
	Subtitusi impor

Sumber: Briguglio, 2004

Tabel 2
EVI yang Dikembangkan oleh *United Nation (2011)*

Komponen	Sub-Indeks	Variabel
Indeks Akibat	Ukuran	Ukuran populasi
	Lokasi	Kondisi yang Terpencil
	Struktur Ekonomi	Konsentrasi ekspor
		Total hasil pertanian, kehutanan, dan perikanan dalam GDP
	Lingkungan	Populasi di kawasan pantai
Indeks Guncangan	Guncangan terhadap Kondisi Perdagangan	Ketidakstabilan espor barang dan jasa
	Guncangan alam	Korban bencana alam
		Ketidakstabilan hasil produksi pertanian

Sumber: United Nation (2011) dalam Seth dan Ragab (2012)

Basically, economic vulnerability has 2 main concepts, namely microeconomic vulnerability and macroeconomic vulnerability. From a microeconomic perspective, economic vulnerability focuses on the impact of shocks on individuals or households, where household income is the main influence. The decline in the level of household income makes a household unable to meet basic needs, which will gradually lead to household poverty. Meanwhile, from a macro perspective, economic vulnerability focuses more on the impact of shocks on economic growth. Economic vulnerability is the vulnerability of a country during a financial crisis. This financial crisis will have an impact on the outcome, where there will be major changes in the rearrangement of the market (when viewed from a macroeconomic point of view) (Seth and Ragab, 2012). Economic vulnerability, especially macroeconomics, is closely related to poverty, even though poverty usually more impact on microeconomic vulnerability. Shocks and instability not only cause an increase in the poverty rate, but also leave people trapped in poverty. In other words, the income of the poor is directly affected by an increase or decrease in the national economy, where their income will fall when the national economy is unstable and will also increase when the national economy increases.

III. Research Methodology

The research methodology can be seen in Figure 1.

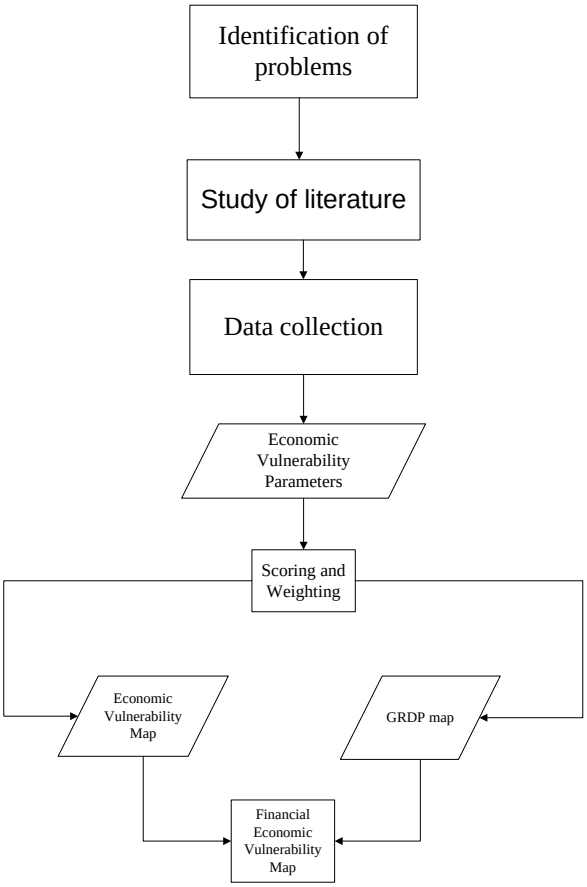

Fig. 1. Research methodology

IV. Data Analysis Method

The method of analysis used in this research is quantitative analysis method. The quantitative analysis method is used by using the Superimpose / overlay analysis approach with a Geographical Information System (GIS).

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V. Economic Vulnerability Analysis

Matters that affect economic vulnerability are GRDP per sector and land use (cultivation area). The parameters used are the productive land area in rupiah and the PDRB calculation per sector. Due to the lack of updating of existing data in the study area, the researchers limit the economic vulnerability to only the calculation of the productive land area which is converted into rupiah and eliminates the calculated value from the GDP per sector.

TABLE 3. List of Economic Vulnerability Parameters

Parameter	Bobot (%)	Kelas			Skor
		Rendah (0.333)	Sedang (0.667)	Tinggi (1)	
Lahan Produktif	60	<50 juta	50-200 juta	>200 juta	Kelas/ Nilai Maks Kelas
PDRB	40	<100 juta	100-300 juta	>300 juta	
Kerentanan ekonomi = (0.6*skor lahan produktif) + (0.4*skor PDRB)					

Sumber : Perka Badan Penanggulangan Bencana No. 2 Tahun 2012

VI. Results and Analysis

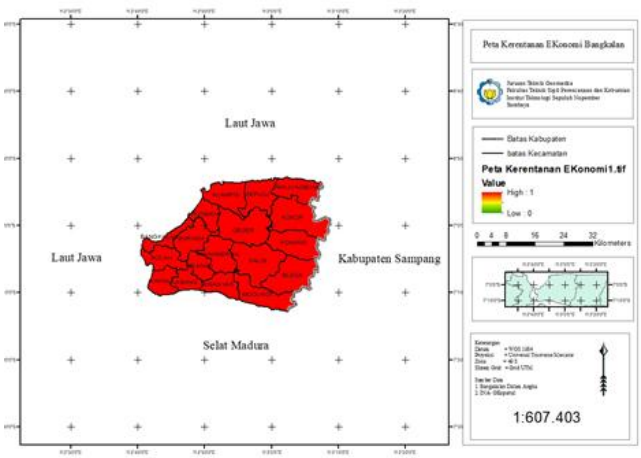

Fig. 2. Economic Vulnerability Map of Bangkalan

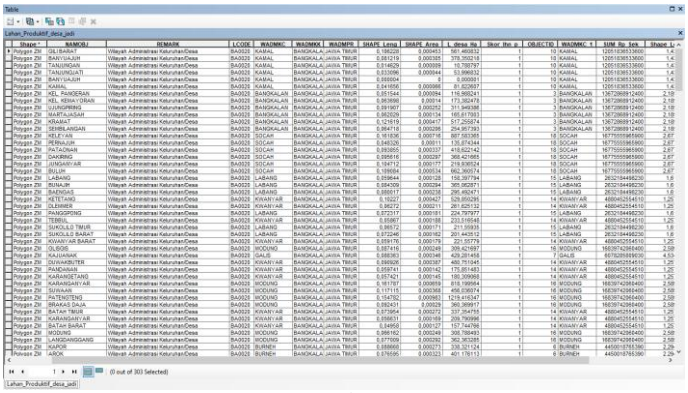

Fig. 3. Statistical data from productive land

Analysis

Based on the results of the analysis of economic vulnerability mapping, 100% of the areas in Bangkalan Regency experience very high economic vulnerability, areas that are in the high economic vulnerability category with a score of 1 including Kamal, Bangakalan, Socah, Labang, Kwanyar, Modung, Galis, Burneh, Tanah Merah, Socah, Tragah, Blega, Klampis, Arosbaya, Sepulu, Geger, Tanjung Bumi, Kokop, Kamal, Labang After that, the regions that were in the medium category with a score of 0.6666 were Sreseh, Tambelanga, Jrengik, and the last area that was in the low category with a score of 0.333 was Banyuates.

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