SPATIAL DISTRIBUTION PATTERNS OF POVERTY AND ECONOMIC GROWTH FOR ACHIEVING SUSTAINABLE DEVELOPMENT TARGETS IN EAST JAVA PROVINCE

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ABSTRACT

Poverty and economic growth are still indicators of a country's success in managing its resources and population. Countries in the world have agreed to make poverty alleviation the first sustainable development priority. This article aims to look at the spatial distribution pattern of poverty and regional characteristics, as well as the pattern and structure of economic growth in city districts in East Java Province. The methods used include spatial autocorrelation analysis, regional financial capability analysis, Klassen typology, and regional characteristics analysis. Based on the pattern of poverty distribution for the period 2014 – 2023, poverty in East Java Province tends to change with the dominance of class 2 poverty. Sampang, Pamekasan and Sumenep regencies tend to experience a stable poverty pattern in Class 3. Pockets of poverty are clustered on Madura Island with a percentage poverty is above 18% and the characteristics of a low Human Development Index (HDI) value, low number of (people's business credit (KUR) recipients, inadequate sanitation, not very high economic growth, and frequent flood disasters. As many as 65.78% of areas in East Java Province have high financial capacity, so that policy direction can be focused on poverty pocket areas with a high percentage of poverty, through increasing HDI, optimizing KUR, fulfilling adequate sanitation, increasing disaster response, and developing leading sectors. for increasing Original Regional Income (PAD) and economic growth.

1. INTRODUCTION

The issue of poverty is a topic that is always the focus of discussion among nations in the world. World Bank data shows that currently as many as 700 million people in the world live in extreme poverty with an income of less than $2.15. The trend of extreme poverty in the world has increased since 2019 and reached its peak during the Covid-19 outbreak. Even though in 2022 the percentage of poverty will decrease, the amount of poverty has not returned to what it was before 2019. Gaps in access to education, health, infrastructure and basic and digital services are the cause of poverty. Slow economic growth as well as conflict and vulnerability are triggers for increasing poverty in a region. Climate change which has an impact on disasters, reduced livelihoods and employment opportunities can be the cause of increasing regional poverty levels. Most countries in the world have agreed to eradicate poverty as the first target of sustainable development (SDGs) by 2030.

Based on BPS data for 2023, the poverty rate in Southeast Asia has ranked Indonesia in 6th place with a poverty rate of 9.5% above Thailand and below Cambodia. Indonesia's poverty level in 2023 will still be above the world poverty average in the same year (BPS Indonesia, 2024). The number of extreme poor people in Indonesia reached 5.80 million people in March 2021. The condition of poverty in Indonesia can be seen from 47% or as many as 16 provinces in Indonesia have a poverty percentage above the national percentage, moreover 3 out of 5 provinces on the island of Java still have cases of extreme poverty. The region includes the provinces of West Java, Central Java and East Java. The number of poor people in East Java Province reaches 2.46 million people in 2021 and makes it the province with the most poor people on the island of Java, while in 2023 East Java's poverty percentage will reach 10.49% above the provinces of West Java, Banten and DKI Jakarta. One of the reasons for the high percentage of poverty in East Java is because 63.15% of the area or 24 city districts in this province have a poverty percentage above 9%.

Throughout the 2020 – 2023 period, the level of inequality between regions in Indonesia has shown a downward trend, although the value is not very significant, but the inequality gap between urban and rural areas is still very high. This will of course have a national impact, considering that 80% of Indonesia is rural. Villages with underdeveloped status are relatively poor in multidimensional terms with low income, high vulnerability, insecurity and marginalization (Fahad et al., 2023). Efforts to eradicate poverty in rural areas can be done by increasing economic growth through easy access to village services.

Indonesia's economic growth after Covid-19 experienced an increase of 5.31% in 2022, but in 2023 it experienced another decline of 0.19%. Economic growth is an important variable for every country because it can be a sign of progress that differentiates it from other countries that have low economic growth. Socio-political inclusion of the poor and vulnerable, increasing social security, activities that encourage opportunities for socio- economic growth, reducing vulnerability are poverty alleviation programs that have been implemented by many countries in making policies. The level of success of the program depends on the characteristics of each economic and socio-cultural region (Singh & Chudasama, 2020). Hutter et al. (2023) emphasized that economic growth is very important for achieving prosperity, overcoming poverty and paving the way towards sustainability.

Indonesia itself in BPS states that one of the indicators to determine the economic condition of a country can be using gross domestic product data. Increasing national economic growth is a positive impact obtained from economic growth in each region (Budihardjo et al., 2020). The level of economic growth can affect poverty, meaning that if economic growth increases, then poverty will decrease, and vice versa (Balasubramanian et al., 2023; Marrero & Servén, 2022; Ngubane et al., 2023). The success of economic growth is very dependent on success at the district or city level (Hidayah & Tallo, 2020). The growth rate of East Java Province throughout the last decade has fluctuated with a downward trend, with the lowest peak occurring in 2020 at -2.39%. Even though in 2021 the economic growth of East Java Province will begin to increase, the growth rate is not as high as in 2012, which reached more than 6.5%.

Spatial economic dynamics and poverty distribution can be examined through a comprehensive approach integrating geographic economic theory. Spatial poverty distribution is not merely a geographical issue, but a complex structural interaction between location, resources, and economic capabilities (Ravallion, 2020). Zhu et al. (2021) with their concept of "spatial poverty traps" explain the mechanism of poverty reproduction in specific geographical spaces, highlighting limitations in accessibility and social capital that influence poverty. Fujita & Krugman (2004) findings in new economic geography demonstrate how economic concentration and spatial differentiation create sustainable inequality cycles, where certain regions systematically experience economic marginalization. Balisacan, (2007) further strengthens the argument that spatial poverty distribution is a complex product of multidimensional interactions between economic structures, social capital, and regional development policies.

Therefore, the aim of the article is to identify the spatial distribution patterns of poverty, economic growth and regional characteristics of city districts in East Java Province and to develop policy directions for achieving sustainable development based on poverty conditions and characteristics of city districts in East Java Province.

2. RESEARCH METHODS

The research location is in East Java Province consisting of 30 districts and 8 cities with the northern border of the Java Sea, the southern border of the Indian Ocean, the western border of Central Java Province, and the eastern border of Bali Province.
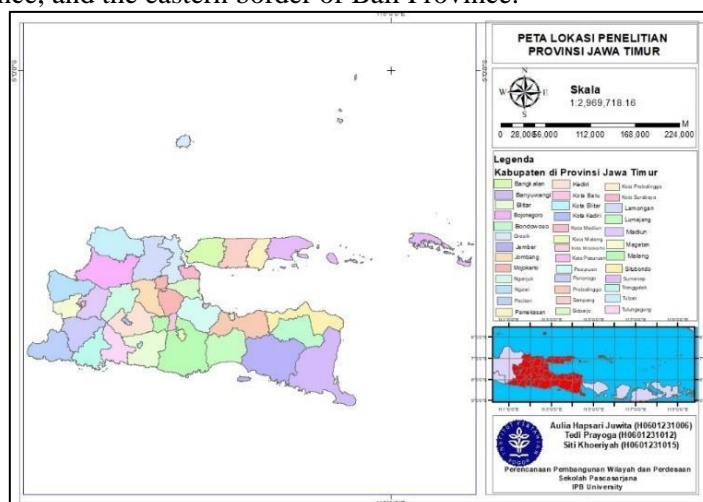

Figure 1. Research Location
Source: Author (2024)

The data used in this research is secondary data obtained from the Central Statistics Agency (BPS), including the percentage of poor people, economic growth rate, Original Regional Income (PAD), Gross Regional Income (GRDP), Human Development Index (HDI), Number of People's Business Credit (KUR) recipients, number of households with proper sanitation, and number of flood disasters. This research present: 1) Analysis of the spatial distribution pattern of poverty and analysis of local indicators of spatial autocorrelation to determine the distribution pattern of the percentage of poverty in the East Java Province region; 2) Analysis of economic growth is carried out by analyzing financial capabilities, as well as Klassen typology to determine the condition of the rate of economic growth and GDP per capita; 3)Analysis of the regional characteristics of East Java Province was carried out to group city districts that have the same characteristics; and 4) Formulation of policy directions is based on the results of previous analysis.

The first of analytical tools used is spatial autocorrelation. The estimated correlation between observed values related to location on the same variable is known as spatial autocorrelation. If the spatial autocorrelation value is positive, it shows that similar values from adjacent locations tend to be clustered, while if it is negative, it shows that adjacent locations have different values and tend to be spread out. Analysis of poverty distribution patterns in this research uses the Local Indicator of Spatial Autocorrelation (LISA) analysis which includes the Morant index, Morant's Scatterplot, Significant map, and Cluster map. The data used in the LISA analysis is the percentage of poor residents of urban districts in East Java Province in 2014, 2016, 2018, 2020 and 2022. The higher the location value, the adjacent locations have almost the same value or form a clustered distribution (Lee & Wong, 2001; Nardi et al., 2023). LISA calculations are carried out using the following formula:

$$Ii = Zi \sum_{i-1}^{n} WijZj \dots\dots\dots\dots (1)$$

Where as:
Ii   : LISA index of village i
Zi & Zj   : Data standardization
Wij   : Weighting between the i and j villages

LISA analysis uses Geoda software, and the results of spatial distribution pattern analysis are visualized using ArcGIS 10.8 software. The Morant index is used to determine spatial autocorrelation in each area of observation. If the Morant index value is close to 1, it means there is spatial autocorrelation, positive and negative values on the Morant index indicate a positive or negative autocorrelation relationship, while if the Morant index value is close to 0, it means the data is random. The pattern of grouping and distribution between locations is presented with Morant's Scatterplot, which shows the average of observations from locations neighboring the location in question (Lee & Wong, 2001). The quadrants in Morant's Scatterplot according to Nardi et al. (2023) as follows: 1) Quadrant I, HH (High - High) shows areas that have high observation values surrounded by areas that have high observation values; 2) Quadrant II, LH (Low - High) shows areas that have low observation values surrounded by areas that have high observation values; 3) Quadrant III, LL (Low - Low) shows areas that have low observation values surrounded by areas that have low observation values; and 4) Quadrant IV, HL (High – Low) shows areas that have high observation values surrounded by areas that have low observation values.

The second of analytical tools used is Klassen typology. Klassen typology is a regional economic analysis method used to describe the pattern and structure of sectoral and regional economic growth (Rahayu, 2010). This analysis aims to identify the economic growth position of city districts in East Java Province by comparing GDP per capita and the economic growth rate of each city district with GDP per capita and the aggregate regional economic growth rate. Klassen's typology produces 4 classifications with different characteristics (Sjafrizal, 2008) including regions in the category of rapidly developing and rapidly growing (quadrant I), depressed developed regions (II), underdeveloped or underdeveloped regions (quadrant III), and rapidly developing regions (quadrant IV).

The third of analytical tools used is regional Financial Capability. Regional financial capacity shows the ability of regional governments to finance the implementation of development, equity and justice tasks by maximizing all their potential (Vurry et al., 2018). How big a region's financial capacity is can be seen by looking at how much each source of Regional Original Income (PAD) contributes to the total PAD (Said & Bakar, 2021). Measurement of regional financial capacity is analyzed using the financial capacity index (Puspita, 2023), where the indicators used include share, growth, elasticity, and The financial capability index.

1) Share is a ratio that measures the extent of regional financial capacity to finance routine activities and development activities. Share is calculated by comparing PAD with total regional expenditure according to the following formula:

$$s\ (\%) = \frac{PAD}{Total\ Expenditure} \times 100 \dotfill (2)$$

2) Growth is a ratio that measures the ability of local governments to maintain and improve the success achieved from one period to the next. Growth is the difference between PAD in the observation year and the previous year. The growth formula is as follows:

$$g\ (\%) = \frac{(PAD_i - PAD_{i-t})}{PAD_{i-t}} \times 100 \dotfill (3)$$

3) Elasticity is the ratio of PAD growth to Gross Regional Income (GRDP) growth. Elasticity aims to measure the sensitivity or elasticity of PAD to the economic development of a region. Elasticity is measured using the following formula:

$$e\ (\%) = \frac{(PAD_i - PAD_{i-t})}{(PDRB_i - PDRB_{i-t})} \times 100 \dotfill (4)$$

4) The financial capability index is the calculated average of the Share Index, Growth Index and Elasticity Index. Calculation The index of each component is calculated using the following formula:

$$Indeks\ X = \frac{(Value\ x\ Measurement\ results) - (Value\ x\ Minimum\ conditions)}{(Value\ x\ Maximum\ conditions) - (Value\ x\ Minimum\ conditions)} \dotfill (5)$$

The Financial Capability Index (IKK) is measured by calculating the three indices with the following formula:

$$IKK = \frac{Xs + Xg + Xe}{3} \dotfill (6)$$

The classification of financial capability based on the 2003 BAPPENAS criteria is determined based on Table 1 below:

Table 1 Classification of Financial Capabilities

Financial Capability Index	Classification
0,00 – 0,33	Low
0,34 – 0,43	Middle
0,44 – 1,00	High

Source: BAPPENAS (2003)

The fourth of analytical tools used is regional characteristics. Regional characteristics are used to group districts/cities in East Java Province that have the same characteristics. The steps taken are through 2 stages of the clustering/grouping method including: 1) Hierarchical Clustering (Joining Tree Clustering) Joining Tree Clustering is a method of combining or grouping hierarchically by using the differences or distances between objects when forming clusters; and 2) Non-hierarchical clustering (K-Means Clustering). K-Means clustering aims to partition observations into K-Clusters where each observation is located, the cluster with the closest mean of a prototype of the cluster. The amalgamation (linkage) rule in this study uses Ward's method by minimizing the sum of squares (SS) of centric groups that can be formed at each step.

3. RESULTS AND DISCUSSION
Spatial Distribution Pattern of Regency/City Poverty in East Java Province

The pattern of poverty distribution in East Java Province for the period 2014-2022 (Figure 2) has changed, including in 2014 Banyuwangi Regency was in poverty class 2, then in 2016 it changed to poverty class 1, while Probolinggo Regency since 2014-2020 was in poverty class 3, changed become poverty class 2 in 2022. The number of districts in poverty class 3 has decreased, while the number of districts in poverty class 2 has increased. Bangkalan Regency, Sampang Regency and Sumenep Regency tend to experience a stable poverty pattern in poverty Class 3, this shows that the highest percentage of poverty in East Java Province in the 2014- 2022 period is in these three regencies.
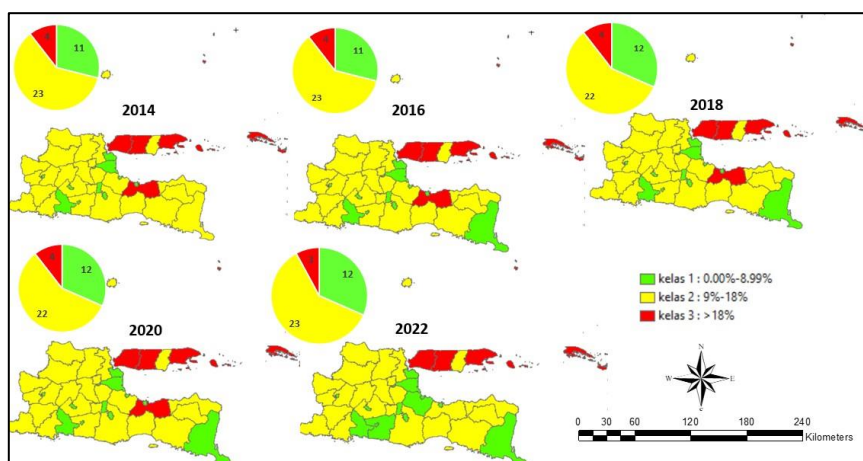

Figure 2. Distribution Pattern of Poverty Percentage on Regency/City of East Java Province
Source: Author (2024)

Poverty in urban districts in East Java Province has positive spatial autocorrelation throughout the period 2014 to 2022 with Morant index values ranging from 0.357 to 0.375, indicating that similar values from adjacent locations tend to be clustered. Based on the results of the analysis of the Local Indicator of Spatial Autocorrelation in Figure 5, it during the 2014-2022 period, pockets of poverty in East Java Province were clustered on Madura Island. Pockets of poverty on Madura Island have increased from 2014 to 2022, where initially in 2014 there were only 2 districts that were pockets of poverty, then this increased to 3 districts that were pockets of poverty in 2022 which included Sampang Regency, Pamekasan Regency, and Sumenep Regency. Pockets of poverty in Sumenep Regency tend to be stable during the period 2014 to 2022 (Figure 3).
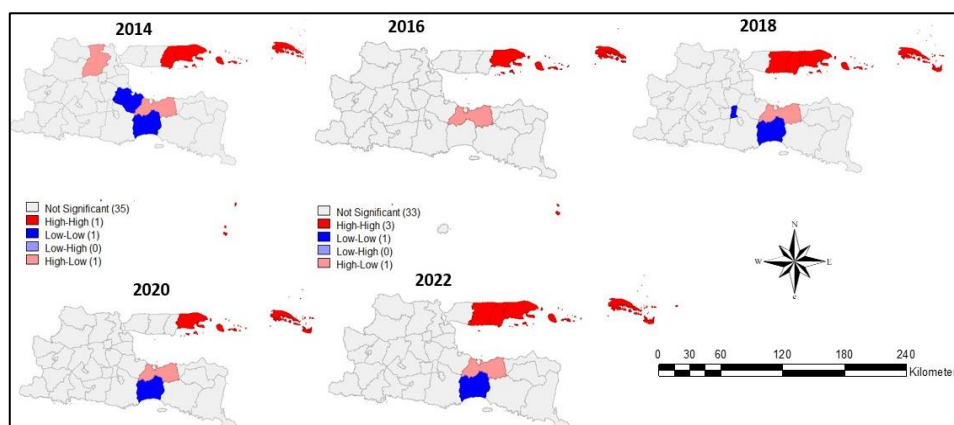

Figure 3. Local Indicator of Spacial Autocorrelation on Regency/City of East Java Province
Source: Author (2024)

Economic Growth and Financial Capability of Districts/Cities in East Java Province

As many as 42.1% of areas in East Java Province or 16 districts/cities are at a high level of economic growth but low GDP per capita (Rapidly Developing). Meanwhile, 31.57% of areas in East Java Province or 12 districts/cities are in quadrant III (underdeveloped) where economic growth is low and per capita income is also low. Bojonegoro Regency and Kediri City are 2 regions that have high GDP per capita but low economic growth (Depressed Progress). There are 4 districts and 4 cities in East Java Province which are in Quadrant I where economic growth is high and GRDP per capita is also high including Malang City, Madiun City, Surabaya City, Batu City, Pasuruan Regency, Sidoarjo Regency, Mojokerto Regency, and Gresik Regency (Figure 4).
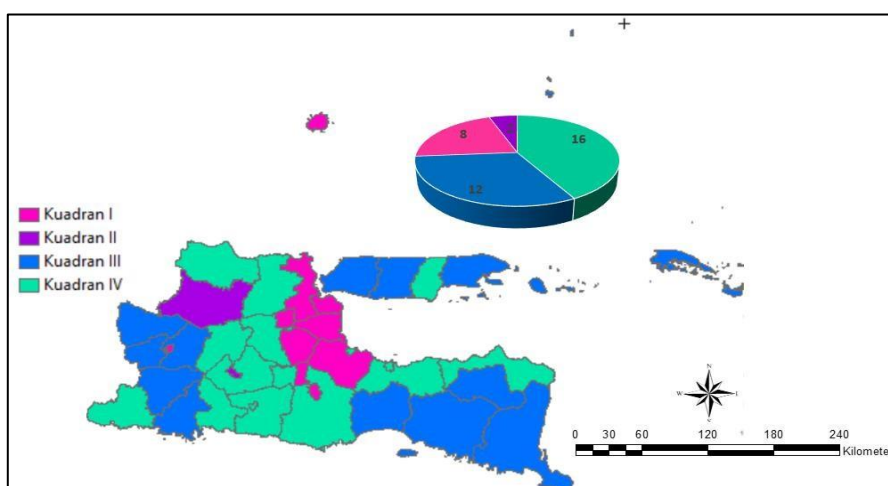

Figure 4. Classification of Regency/City Economic Growth in East Java Province
Source: Author (2024)

Figure 5 shows the average contribution of PAD to total expenditure in East Java Province during the 2019 - 2023 period of 18.7%, where 22 regencies and 2 cities have low PAD shares, while 8 regencies and 6 cities have high PAD shares. The average PAD growth for East Java Province during the same period was 8.24%. A total of 3 cities and 12 districts had high growth, while 6 cities and 16 districts had low growth. The average Financial Capacity Index (IKK) forcity districts in East Java Province for the 2019-2023 period is 44.8%. Madiun City and Mojokerto City have low IKK with values of 31.2% and 32.4% respectively, while the highestIKK is obtained by Surabaya City at 66.2%. A total of 20 districts and 5 cities are at high IKK,while medium IKK consists of 2 cities and 9 districts.
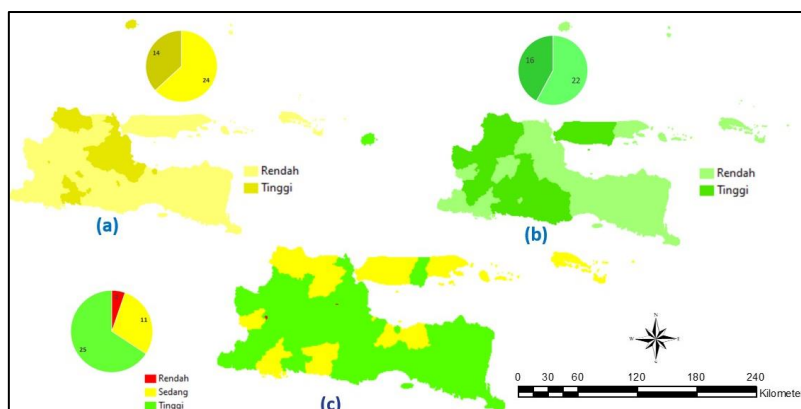

Figure 5. Share Index (a), Growth (b), and Financial Capability (c)
Source: Author (2024)

Characteristics of Regencies/Cities in East Java Province

Based on hierarchical clustering (joining cluster tree), figure 6 Districts/Cities in East Java Province are divided into 3 clusters grouped based on indicators of HDI value, percentage of poor population, economic growth, number of People's Business Credit (KUR) recipients, and number of flood disasters. As many as 34.21% of the area in East Java Province or 13 districts are in Cluster 1, while 15 districts or 39.47% of the area in East Java Province are in Cluster 2. All city areas in East Java Province are in Cluster 3 and only Magetan Regency which is in Cluster 3.
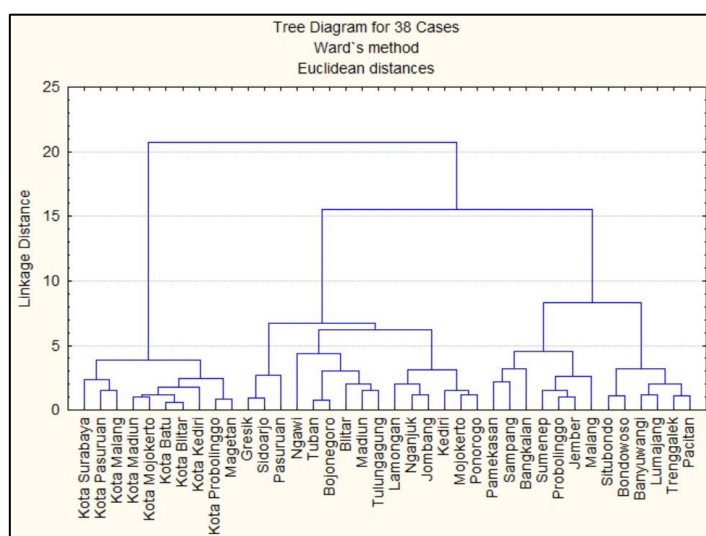

Figure 6. Joining tree for Regencies/Cities of East Java Province
Source: Author (2024)

Figure 7(a) shows the characteristics of areas in Cluster 1 characterized by low HDI, high percentage of poor people, moderate economic growth, low number of KUR recipients, low number of households with adequate sanitation, and frequent flooding events. The regions in Cluster 1 consist of 10 regions which include Trenggalek Regency, Malang Regency, Jember Regency, Bondowoso Regency, Situbondo Regency, Probolinggo Regency, Bangkalan Regency, Sampang Regency and Pamekasan Regency.

The characteristics of the area in Cluster 2 (Figure 7(b)) are characterized by moderate HDI values, a relatively smaller percentage of poor people compared to cluster 1, high economic growth, a relatively large number of KUR recipients, sufficient adequate sanitation, and flood events. which happens very often. The region in Cluter 1 consists of 17 regions which include Pacitan Regency, Ponorogo Regency, Tulungagung Regency, Blitar Regency, Kediri Regency, Lumajang Regency, Banyuwangi Regency, Pasuruan Regency, Mojokerto Regency, Jombang Regency, Nganjuk Regency, Madiun Regency, Ngawi Regency, Bojonegoro, Tuban Regency, Lamongan Regency, and Gresik Regency.

Meanwhile, Figure 7(c) shows the characteristics of areas in Cluster 3 characterized by high HDI values, low percentage of poor people, low economic growth, relatively large number of KUR recipients, sufficient quantity of proper sanitation, and very frequent flooding events. The region in Cluter 3 consists of 11 regions including Sidoarjo Regency, Magetan Regency, Kediri City, Blitar City, Malang City, Probolinggo City, Pasuruan City, Mojokerto City, Madiun City, Surabaya City and Batu City. In the 3 clusters above, a review of the HDI is carried out as a measure to see the quality of regional development using the human development index (Sirodj et al., 2023) and the gap in HDI values between clustering regions will certainly affect the HDI achievements of the entire region, if districts and cities are East Java with a low HDI value is not encouraged to accelerate the improvement of human quality on the HDI indicator, so the achievements of the HDI of other districts which have a high HDI are less meaningful.
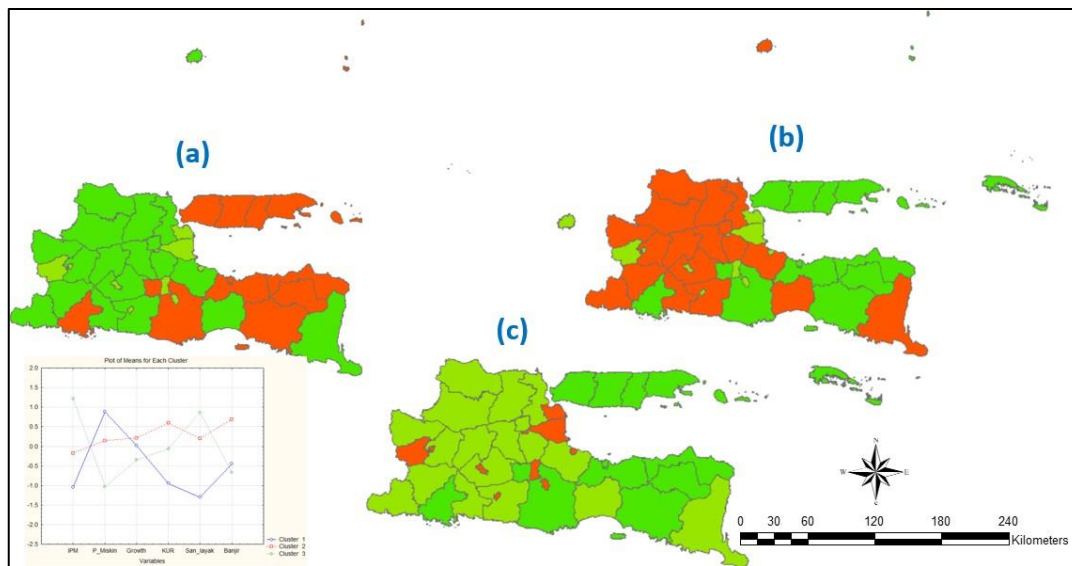
Figure 7. Characteristics of areas in Cluster 1(a), 2(b), and 3 (c)
Source: Author (2024)

Regency/City Development Policy Direction in East Java Province

The development policy direction scheme given to districts/cities leads to sustainability policies as presented in Figure 8 below.
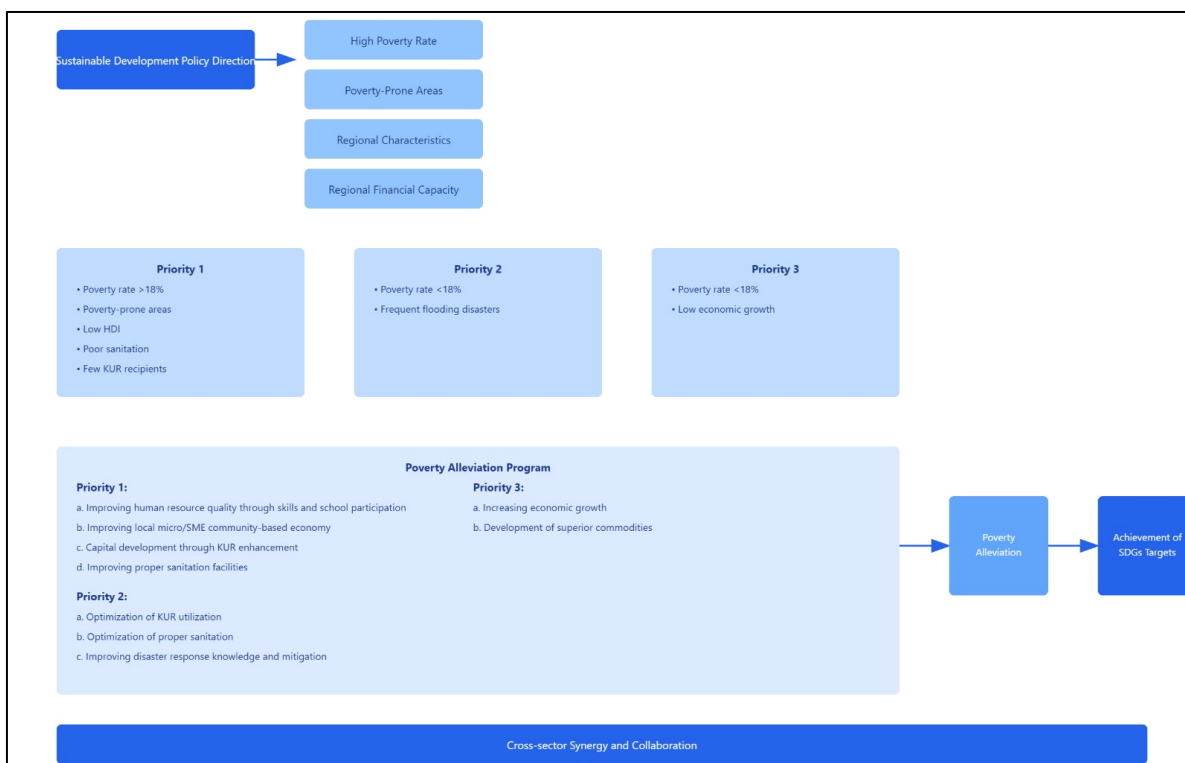

Figure 8. Sustainable Development Policy Direction
Source: Author (2024)

The policy direction that is formed should take into account the high percentage of poverty, pockets of poverty, regional characteristics and regional financial capacity. Determination of priority locations can be divided into 3. Locations with top priority (priority 1) are areas with the characteristics of a poverty percentage above 18%, being in a poverty pocket with a high poverty percentage, low HDI, very inadequate sanitation, small amount of KUR, as well as underdeveloped economic growth and frequent flooding events. Sampang Regency, Pamekasan Regency, and Sumunep Regency are in this cluster so that poverty alleviation programs that can be carried out in priority 1 areas include improving the quality of human resources through skills and school participation, improving the local micro economy & community-based MSMEs, developing capital through increasing KUR, and improving proper sanitation facilities for the community.

Areas in the second priority are areas with a poor population percentage of between 9% - 18% and flood disasters occur very frequently. The poverty alleviation programs that can be implemented include optimizing the use of KUR, optimizing proper sanitation, increasing knowledge of disaster response and disaster mitigation. The third priority is an area characterized by a percentage of poor people below 9% or low poverty and low economic growth. The poverty alleviation programs that can be implemented include increasing economic growth through developing sectors with potential to increase PAD and developing superior commodities

4. CONCLUSION

The poverty distribution pattern in East Java Province throughout the 2014 - 2022 period is dominated by a class 2 poverty distribution pattern, while the percentage of high poverty or more spread almost evenly in the districts on the Madura Island. Three districts on Madura Island (Sampang, Pamekasan and Sumenep districts) are the centers of pockets of poverty on Madura Island with a poverty distribution pattern of class 3 or more than 18%. As many as 42.1% of areas in East Java Province have high economic growth but low GRDP per capita (Quadrant IV), while 31.57% of areas in East Java Province are in quadrant III (Lagging behind). Bojonegoro Regency and Kediri City are 2 regions that have high GDP per capita but low economic growth (Quadrant II), the remaining areas in East Java Province are in Quadrant I.

The characteristics of districts/cities in East Java Province are divided into 3 clusters based on HDI value, poverty percentage, economic growth, number of KUR recipients, number of households with proper sanitation, and number of flood disasters. Cluster 1 is an area that needs serious attention because it has the characteristics of high poverty, low HDI, very inadequate sanitation, small amounts of KUR, as well as underdeveloped economic growth and frequent flooding events. Increasing economic growth through developing sectors that have the potential to increase PAD can be carried out for areas included in cluster 3. Determining priority areas for poverty alleviation in East Java by paying attention to the spatial distribution pattern of poverty and prioritizing pockets of poverty as well as determining programs that are adapted to conditions. Each characteristic in each cluster will bring programs that are right on target so that they will be able to accelerate poverty alleviation in East Java as an effort to achieve the SDGs priority goals

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