ABSTRACT

The welfare of the people is the main goal of national development, which emphasizes not only economic growth but also the equitable distribution of development outcomes. Regional inequality persists, including in Central Java Province, which has the third largest population in Indonesia and a relatively high poverty rate compared to other provinces on the island of Java. Variation in social, economic, educational, and health indicators across districts/cities indicates the need for an analysis capable of objectively identifying regional characteristics as a basis for development policy formulation. This study aims to classify 35 districts/cities in Central Java Province based on seven welfare indicators, namely population percentage, health complaints, expected years of schooling, labor force participation rate, proportion of food expenditure, access to proper sanitation, and poverty rate. The methods used are Fuzzy Possibilistic C-Means (FPCM) and Possibilistic Fuzzy C-Means (PFCM), which are extensions of Fuzzy C-Means (FCM) and Possibilistic C-Means (PCM) and are able to handle heterogeneous data containing outliers. Cluster structure evaluation was conducted using the Modified Partition Coefficient (MPC) and Xie-Beni (XB) validity indices. The research data are secondary data obtained from the 2024 Central Java Province People's Welfare Indicators publication. The analysis results show that the optimal cluster structure consists of three clusters. Cluster 1, with a medium welfare level and comprising 13 districts and 1 city, is characterized by relatively high health complaints and uneven sanitation access. Cluster 2 includes 1 district and 5 cities with high welfare levels, marked by the highest expected years of schooling, low poverty rates, and the best sanitation access. Cluster 3 consists of 15 districts with low welfare levels, characterized by higher health complaints and low socioeconomic conditions.

Keywords: Cluster, People's Welfare, Fuzzy Possibilistic C-Means, Possibilistic Fuzzy C-Means, Xie-Beni, Modified Partition Coefficient