ABSTRACT

The environmental crisis occurring in Indonesia and around the world is one of three major crises that need to be addressed. Poor environmental conditions are causing the loss of biodiversity and threatening human health. The components of the environmental quality index are determining factors for monitoring the state of the environment in more detail. Grouping provinces in Indonesia based on the components of the environmental quality index can be a method to identify environmental conditions and help stakeholders make more targeted efforts to improve environmental quality according to group characteristics. The K-Medoids method with Genetic Algorithm optimization is used in grouping the components of the environmental quality index in Indonesia. Outliers were detected in the data of the components of the environmental quality index. K-Medoids was used because this method is robust against outliers. Genetic Algorithm optimization was used to improve the cluster goodness score. Validation using the Silhouette Coefficient obtained many optimal clusters, namely q=3. The highest Silhouette Coefficient of 0.5187 was obtained from the K-Medoids method with Genetic Algorithm optimization, which was categorized as good. The score was successfully improved through the optimization process, from 0.4501 in the K-Medoids method without optimization.

Keywords: Environmental, Grouping, *K-Medoids*, Optimization, *Genetic Algorithm*, *Cluster*, *Silhouette Coefficient*