

ABSTRAK

Marsita, Della, 2021, *CLUSTERING DAERAH RAWAN GEMPA DI SUMATRA BARAT MENGGUNAKAN METODE CLUSTERING LARGE APPLICATION DAN METODE DENSITY-BASED SPATIAL CLUSTERING OF APPLICATIONS WITH NOISE*, Proposal Skripsi, Program Studi Statistika, Universitas Muhammadiyah Semarang, Pembimbing : I. Tiani Wahyu Utami, S.Si, M.Si. II. M. Al Haris, M.Si.

Gempabumi (*earthquake*) adalah peristiwa bergoncangnya bumi karena pergerakan/pergeseran lapisan batuan pada kulit bumi secara tiba-tiba akibat pergerakan lempeng-lempeng tektonik. Sumatra Barat merupakan salah satu daerah rawan gempa di Indonesia. Hal ini disebabkan karena letaknya yang berada pada jalur patahan Semangko, tepat di antara pertemuan dua lempeng benua besar, yaitu Eurasia dan Indo-Australia. Oleh karenanya, wilayah ini sering mengalami gempa bumi. Permasalahan yang dihadapi sampai saat ini yaitu belum ada teori yang tepat dan dapat digunakan untuk memprediksi kapan dan dimana gempa bumi akan terjadi. Algoritma clustering yang diterapkan dalam penelitian ini adalah metode CLARA dan DBSCAN. DBSCAN (*Density-Based Spatial Clustering Of Applications With Noise*) merupakan proses clustering yang dilakukan berdasarkan tingkat kedekatan/kepadatan jarak antar obyek dalam dataset. Sementara metode CLARA dibentuk karena ketidakefektifan Algoritma PAM yang bekerja efektif hanya untuk himpunan data kecil. Metode CLARA (*Clustering Large Applications*) menggunakan himpunan data sampel secara random. Cluster dibentuk menjadi 5 cluster dengan menggunakan Skala SIG BMKG. Dari kedua metode tersebut akan di buat perbandingan dengan menghitung *Coefficient Silhouette*. Metode CLARA mempunyai nilai *Coefficient Silhouette* sebesar 0,57 sementara metode DBSCAN 0,45. Maka metode yang cocok di gunakan adalah metode CLARA dengan daerah yang termasuk kerusakan berat (*heavy damage*) adalah Kepulauan Mentawai.

Kata Kunci: Gempa Bumi, Sumatra Barat, Data Mining, Euclidean, CLARA, DBSCAN, *Coefficient Silhouette*.

ABSTRACT

Marsita, Della, 2021, *CLUSTERING OF EARTHQUAKE PROPOSED AREAS IN WEST SUMATRA USING CLUSTERING LARGE APPLICATION METHOD AND DENSITY-BASED SPATIAL CLUSTERING APPLICATIONS WITH NOISE METHOD*, Proposal Skripsi, Program Studi Statistika, Universitas Muhammadiyah Semarang, Pembimbing : I. Tiani Wahyu Utami, S.Si, M.Si. II. M. Al Haris, M.Si.

Earthquake is an event that shakes the earth due to the sudden movement of rock layers in the earth's crust due to the movement of tectonic plates. West Sumatra is one of the earthquake-prone areas in Indonesia. This is due to its location on the Semangko fault line, right between the confluence of two large continental plates, namely Eurasia and Indo-Australia. Therefore, this area often experiences earthquakes. The problem faced so far is that there is no appropriate theory that can be used to predict when and where an earthquake will occur. One of the clustering algorithms applied in this research is the CLARA and DBSCAN methods. DBSCAN (Density-Based Spatial Clustering Of Applications With Noise) is a clustering process that is carried out based on the level of proximity/density of the distance. Meanwhile, the CLARA method was formed due to the ineffectiveness of the PAM Algorithm which works effectively only for small data sets. The CLARA (Clustering Large Applications) method uses a random sample data set. The cluster is formed into 5 clusters using the BMKG SIG Scale. From the two methods, a comparison will be made by calculating the Silhouette Coefficient. The CLARA method has a Silhouette Coefficient value of 0.57 while the DBSCAN method is 0.45. So the suitable method to use is the CLARA method with the area which includes heavy damage is the Mentawai Islands. The CLARA (Clustering Large Applications) method uses a random sample data set. The cluster is formed into 5 clusters using the BMKG SIG Scale. From the two methods, a comparison will be made by calculating the Silhouette Coefficient. The CLARA method has a Silhouette Coefficient value of 0.57 while the DBSCAN method is 0.45. So the suitable method to use is the CLARA method with the area which includes heavy damage is the Mentawai Islands. The CLARA (Clustering Large Applications) method uses a random sample data set. The cluster is formed into 5 clusters using the BMKG MMI Scale. From the two methods, a comparison will be made by calculating the Silhouette Coefficient. The CLARA method has a Silhouette Coefficient value of 0.57 while the DBSCAN method is 0.45. So the suitable method to use is the CLARA method with the area which includes heavy damage is the Mentawai Islands.

Keywords: *Earthquake ,Sumatra Barat, Data Mining, Euclidean, CLARA, DBSCAN, Coefficient Shilloute.*