

# MODELING OF GROUNDWATER VULNERABILITY ASSESSMENT USING DRASTIC METHODS (STUDY CASE : PARANGTRITIS COASTAL ZONE, YOGYAKARTA SPECIAL REGION)

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**Abstract :** Groundwater is a finite resource, associated with the unequal distribution and potential pollution caused by human activities. Development of residential areas can increase pollution from domestic sewage, and thus the existence of groundwater that has suitable quantity and quality for consumption will be more limited. Furthermore, the more porous media it is, the greater the level of potential contamination. Water gets to pass easily in porous media, and so does the pollutant that is brought by the water, which will lead to fast velocity of groundwater flow and widely spread distribution. Parangtritis Coastal Zone is one of the main tourist destination in Yogyakarta Special Region. Parangtritis coastal development have caused many people to make a transition, especially the permanent one. The consequence is that the potential for land conversion becomes higher and it will automatically have an impact on the high pollution potential. These conditions indicate the need to spatially identify groundwater vulnerability classes as an effort to preserve groundwater resources in coastal areas, especially to make spatial planning of coastal areas in order to prevent damage of the existing water resources. Study area is a part of Parangtritis coastal zone that is classified as sand dune and beach ridge landform. Both of the landform have dominated by sandy material, therefore it hypothetically has a high vulnerability to contain pollutant. DRASTIC is one of the methods that is developed by PCMS (Point Count System Models). It is known by the term weighting method and assessment (weighting parameters and rating method). DRASTIC method consists of seven parameters that are taken from the acronym DRASTIC, which are Depth to groundwater (D), Recharge (R), Aquifer media (A), Soil type (S), Topography (T), Impact of the Vadose zone (I) and Hydraulic conductivity (C). This method is able to quickly identify the level of vulnerability with the help of GIS-based data processing. Accuracy test is done by examining existing Coli bacteria levels in groundwater. The results of groundwater vulnerability modeling showed that 2.23% had very low susceptibility class, 5.24% low, 13.67% moderate, 54.42% high and 24.44% is very high.

**Keywords:** groundwater, pollution, coastal zone, GIS, DRASTIC