SARI

Kabupaten Banjarnegara bagian selatan, Jawa Tengah, Indonesia, mengalami kekeringan dan kekurangan air bersih tiap tahunnya. Hal tersebut terjadi karena kondisi meteorologi dan batuan kristalin (batuan beku dan metamorf). Sekitar 85.000 orang terdampak akibat bencana tahunan tersebut. Penelitian ini bertujuan untuk mengidentifikasi faktor pengaruh dan zona potensi air tanah di daerah penelitian. Faktor yang dipilih antara lain rekahan, litologi, curah hujan, topografi, dan penyaluran. Metode identifikasi zona potensi air tanah yang digunakan yaitu metode *Groundwater Potentiality Index* (GPI) menurut Ettazarini (2007) dan *Analytic Hierarchy Process* (AHP). 5 (lima) faktor dianalisis dengan pendekatan dan pengolahan yang berbeda tergantung dua metode tersebut. Verifikasi dilakukan menggunakan data mata air dan sumur bor. Hasil kedua metode tersebut dibandingkan dan dianalisis untuk memperoleh metode yang sesuai dengan kondisi daerah penelitian. Hasil analisis sensitivitas menghasilkan urutan faktor pengaruh yaitu rekahan, topografi, curah hujan, litologi, dan penyaluran. Modifikasi dan penyesuaian metode AHP dan GPI menghasilkan metode AHP_{ZPAT} yang mana urutan bobot faktor sesuai hasil analisis sensitivitas. Zona potensi air tanah di daerah penelitian diklasifikasikan menjadi 5 (lima) kelas antara lain sangat rendah, rendah, sedang, tinggi, dan sangat tinggi dengan luas 1529 m^2, 37,12 km^2, 33,65 km^2, 14,49 km^2, dan 1,02 km^2 secara berurutan. Zona potensi air tanah tinggi-sangat tinggi memiliki karakteristik pada pada (1) zona patahan rapat dan patahan mayor yang panjang (2) kelerengan $<20^0$, (3) *Greywacke*, Formasi Waturanda, Endapan Undak dan Aluvial, dan (4) curah hujan tinggi >3000 mm/tahun. Kemunculan mata air di daerah penelitian utamanya berhubungan dengan zona rekahan. Zona potensi air tanah ini dapat dijadikan sebagai dasar dan pedoman bagi pemangku kepentingan untuk kegiatan eksplorasi dan eksploitasi air tanah untuk pemenuhan kebutuhan air bagi masyarakat di daerah penelitian.

Kata kunci: *Groundwater Potentiality Index*, AHP, Zona Potensi Air Tanah, Banjarnegara, Indonesia

ABSTRACT

Southern region of Banjarnegara, Central Java, Indonesia have been encountered drought and clean water scarcity throughout the dry season every year. It happens due to meteorological and hardrock geology condition. About 85,000 people are affected. The objective of this study is to identify the controlling factors and groundwater potential zones in the research area. To evaluate groundwater potential zones, five parameters, viz. fracture, lithology, topography, drainage, and rainfall were selected as the influential factors. Groundwater Potentiality Index (GPI) by Ettazarini (2007) and Saaty's Analytic Hierarchy Process (AHP) are used to identify groundwater potential zones. All five factors were processed based on the procedure of each methods. Results validation was conducted using springs and bore wells data. The results of both methods were compared and analyzed to obtain a new modified method which suit to case of research area. Sensitivity analysis showed that the controlling factors and order of weights are fracture, topography, rainfall, lithology, and drainage respectively. Adjustment of GPI and AHP method resulted a new AHP method which is called $AHP_{ZPAT.}$ *Order of weights and processing data of fracture factos were adjusted based on sensitivity analysis. Groundwater potential in the study area is classified into five classes including very low, low, moderate, high, and very high which have area of 1529* m^2*, 37.12* km^2*, 33.65* km^2*, 14.49* km^2*, dan 1.02* km^2 *respectively. High to very high groundwater potential zones are characterized by located in (1) frequent faults and mayor long faults, (2) slope <*20^0*, (3) lithology of greywacke, Waturanda Formation, sand terrace deposit, and alluvium, and (4) high annual rainfall of >3000 mm/year. Spring emergence in research area are strongly correspond to fracture zones. This GPZ map can be a guide and basis information for local authorities and planners about the favorable area for prospective exploration of groundwater.*

Keywords: Groundwater Potentiality Index, AHP, Groundwater potential zones, Banjarnegara, Indonesia