

## ABSTRACT

Sermo Reservoir is located in Hargowilis Village, Kokap District, Kulon Progo Regency and is used as a provider of raw water for PDAM, irrigation water, and tourism facilities. The use of reservoirs in various community activities can reduce the quality of reservoir water. Community activities in the watershed area that end in reservoir, around the reservoir, and in the reservoir body can become a source of pollutants for the reservoir itself. This study aims to (1) analyze water quality and determine the pollution level of Sermo Reservoir, (2) analyze phytoplankton communities based on the level of pollution in the Sermo Reservoir, and (3) analyze the effect of community activities on the Water Quality Status of Sermo Reservoir. This research was conducted by taking reservoir water samples at 8 points which were divided based on community activities. Analysis of water quality consists of physical and chemical parameters of water, while the level of water pollution was analyzed using the Pollution Index method. The parameters tested consisted of temperature, color, odor, brightness, TSS, pH, DO, BOD, COD, ammonia, nitrite, nitrate, and phosphate. Phytoplankton community analysis using diversity, dominance, and evenness index. Analysis of community activities was carried out by interview to determine the form of reservation water utilization. The results showed that (1) the water quality of the Sermo Reservoir had decreased, indicated by the parameters of TSS, BOD, COD, phosphate and nitrate that did not meet the water quality standards of Class I and II of Yogyakarta Special Province. Sermo Reservoir waters are classified as lightly polluted in its designation as PDAM raw water with a Pollution Index value ranging from 1.007 to 3.153. The designation of Sermo Reservoir as a provider of irrigation water, tourism facilities, plantations, and livestock is classified as non-polluted and lightly polluted with a Pollution Index value ranging from 0.733 to 2.993, (2) the phytoplankton community in the Sermo Reservoir is composed of 5 classes with a total of 49 genera found. The abundance of phytoplankton ranges from 1,075 to 66,000 ind/L. Phytoplankton diversity is low to moderate, there is no clan dominance, and clan uniformity is relatively even, (3) community activity waste come from rivers and around the reservoir becomes a source of pollution, resulting in the Sermo Reservoir Water Status being classified as lightly polluted. Waste from household, agriculture, livestock, and home industry along the Gelo, Ngrancah, Bengkok, and Lurung rivers tends to be dominant in contributing pollutants compared to waste from community activities around the reservoir.

**Keywords:** Community Activities, Phytoplankton, Pollution Level, Sermo Reservoir, Water Quality.

## INTISARI

Waduk Sermo terletak di Desa Hargowilis, Kecamatan Kokap, Kabupaten Kulon Progo dimanfaatkan sebagai penyedia air baku PDAM dan air irigasi, serta sarana pariwisata. Pemanfaatan waduk dalam berbagai aktivitas masyarakat dapat menurunkan kualitas air waduk. Aktivitas masyarakat baik yang ada di Daerah Aliran Sungai yang menuju waduk, di sekitar waduk, maupun di badan waduk dapat menjadi sumber pencemar waduk itu sendiri. Penelitian ini bertujuan untuk (1) menganalisis kualitas air dan menentukan tingkat pencemaran Waduk Sermo, (2) menganalisis komunitas fitoplankton berdasarkan tingkat pencemaran Waduk Sermo, dan (3) menganalisis pengaruh aktivitas masyarakat terhadap Status Mutu Air Waduk Sermo. Penelitian dilakukan dengan mengambil sampel air waduk pada 8 titik yang dibagi berdasarkan aktivitas masyarakat. Analisis kualitas air terdiri atas parameter fisik dan kimia air, sedangkan tingkat pencemaran air dianalisis dengan metode Indeks Pencemaran. Parameter yang diuji terdiri atas suhu, warna, bau, kecerahan, TSS, pH, DO, BOD, COD, amoniak, nitrit, nitrat, dan fosfat. Analisis komunitas fitoplankton menggunakan indeks diversitas, dominansi, dan pemerataan. Analisis aktivitas masyarakat dilakukan dengan wawancara untuk mengetahui bentuk pemanfaatan air waduk. Hasil penelitian menunjukkan bahwa (1) kualitas air Waduk Sermo mengalami penurunan, ditandai dengan parameter TSS, BOD, COD, fosfat, dan nitrat yang tidak memenuhi standar baku mutu air Provinsi Daerah Istimewa Yogyakarta kelas I dan II. Perairan Waduk Sermo tergolong cemar ringan dalam peruntukannya sebagai air baku PDAM dengan nilai Indeks Pencemaran yang berkisar antara 1,007-3,153. Peruntukan Waduk Sermo sebagai penyedia air irigasi, sarana pariwisata, perkebunan, dan peternakan tergolong tidak tercemar dan cemar ringan dengan nilai Indeks Pencemaran yang berkisar antara 0,733-2,993, (2) fitoplankton Waduk Sermo tersusun atas 5 kelas dengan total 49 marga yang ditemukan, dengan kelimpahan fitoplankton berkisar antara 1.075-66.000 ind/l. Diversitas fitoplankton tergolong rendah dan sedang, tidak ada dominansi marga, dan keseragaman marga relatif merata, (3) limbah aktivitas masyarakat yang berasal dari sungai dan sekitar waduk berperan sebagai sumber pencemar sehingga Status Mutu Air Waduk Sermo tergolong cemar ringan. Limbah aktivitas rumah tangga, pertanian, peternakan, dan industri kecil yang berada di sepanjang sungai Gelo, Ngrancah, Bengkok, dan Lurung cenderung dominan menyumbangkan bahan pencemar dibandingkan limbah aktivitas masyarakat di sekitar waduk.

**Kata Kunci:** Aktivitas Masyarakat, Fitoplankton, Kualitas Air, Tingkat Pencemaran, Waduk Sermo.