

# KAJIAN PENCEMARAN LINGKUNGAN AKIBAT MIKROPLASTIK TERHADAP PRODUKSI GARAM RAKYAT DI PANTAI SEPANJANG KABUPATEN GUNUNGKIDUL DAERAH ISTIMEWA YOGYAKARTA

## INTISARI

Pencemaran mikroplastik di lingkungan pesisir menjadi ancaman serius, terutama karena kontribusi plastik yang mencapai 10% dari total produksi global dan membentuk 80–85% dari sampah laut. Sampah plastik yang berada dilaut berpotensi menjadi mikroplastik yang dapat mencemari proses produksi garam. Penelitian ini bertujuan untuk mengkaji kelimpahan dan karakteristik mikroplastik dalam proses produksi garam rakyat, mengevaluasi potensi risiko ekologisnya, serta merumuskan strategi pengelolaan lingkungan di Pantai Sepanjang, Kabupaten Gunungkidul, Daerah Istimewa Yogyakarta. Sampel diambil secara purposif dari tiga lokasi: Pantai Nglolang (5 titik, 7,5 L), Pantai Sanglen (6 titik, 9 L), dan Pantai Sepanjang (16 titik, 240 L), serta dari garam krosok dan garam kemasan masing-masing 500 gram. Sampel air laut disaring dengan plankton net berukuran 30  $\mu\text{m}$ , dan sampel garam diambil dan disimpan menggunakan sendok perak dan *aluminium cup*. Hasil menunjukkan mikroplastik ditemukan di seluruh lokasi, dengan kelimpahan tertinggi di Pantai Sanglen dan Nglolang sebesar 19 partikel/L, sedangkan untuk pantai sepanjang sebanyak 6 partikel/L. Jenis mikroplastik yang ditemukan pada sampel air laut meliputi fragmen, film, fiber, dan pelet. Pada garam krosok ditemukan mikroplastik sebanyak 16 partikel/gram, dan pada garam kemasan sebanyak 13,7 partikel/gram. Jenis mikroplastik yang ditemukan pada sampel garam meliputi fragmen, film, dan fiber. Polimer mikroplastik di Pantai Sepanjang berupa *Polypropylene* (PP) dan *Polyethylene* (PE), sedangkan polimer pada garam krosok dan garam kemasan berupa *Polyethylene* (PE), *Polypropylene* (PP), dan *Ethylene vinyl acetate* (EVA). Analisis *Pollutant Load Index* (PLI) menunjukkan kategori pencemaran sangat tinggi di Pantai Sanglen dan Nglolang, sementara analisis *Pollutant Hazard Index* (PHI) menunjukkan bahwa Pantai Sepanjang, garam krosok dan garam kemasan memiliki tingkat toksisitas yang rendah. Analisis *Potential Ecological Risk Index* (PERI) mengindikasikan risiko ekologis tingkat menengah pada Pantai Sepanjang dan garam krosok, serta risiko rendah pada garam kemasan. Strategi pengelolaan meliputi zonasi, edukasi publik, penerapan teknologi penyaringan, pemeliharaan sarana produksi, serta pengawasan dan sertifikasi garam rendah mikroplastik.

**Kata Kunci** : Mikroplastik, Produksi Garam, Pencemaran Lingkungan, *Pollutant Hazard Index*, *Pollutant Load Index*, *Potential Ecological Risk Index*

## **ENVIRONMENTAL POLLUTION ASSESSMENT DUE TO MICROPLASTICS IN TRADITIONAL SALT PRODUCTION AT SEPANJANG BEACH, GUNUNGGIDUL REGENCY, SPECIAL REGION OF YOGYAKARTA**

### **ABSTRACT**

*Microplastic pollution in coastal environments poses a significant threat, particularly given that plastics contribute approximately 10% of global production and account for 80–85% of marine debris. Marine plastic waste has the potential to degrade into microplastics, contaminating traditional salt production processes. This study aims to examine the abundance and characteristics of microplastics in traditional salt production, evaluate their potential ecological risks, and propose environmental management strategies for Sepanjang Beach, Gunungkidul Regency, Yogyakarta Special Region. Samples were purposively collected from three sites: Nglolang Beach (5 sampling points, 7.5 L), Sanglen Beach (6 points, 9 L), and Sepanjang Beach (16 points, 240 L), along with 500 grams each of unprocessed (krosok) and processed (packaged) salt. Seawater samples were filtered using a 30 µm plankton net, while salt samples were collected and stored using silver spoons and aluminum cups. Results indicated the presence of microplastics at all sampling locations, with the highest abundance observed at Sanglen and Nglolang Beaches (19 particles/L), followed by Sepanjang Beach (6 particles/L). The types of microplastics identified in seawater samples included fragments, films, fibers, and pellets. In salt samples, unprocessed salt contained 16 particles/gram, while packaged salt contained 13.7 particles/gram. The microplastic types found in salt were fragments, films, and fibers. Polymer analysis revealed the presence of Polypropylene (PP) and Polyethylene (PE) in seawater from Sepanjang Beach, while both unprocessed salt and packaged salt contained PE, PP, and Ethylene Vinyl Acetate (EVA). The Pollutant Load Index (PLI) analysis indicated a very high pollution level at Sanglen and Nglolang Beaches. Meanwhile, the Pollutant Hazard Index (PHI) showed low toxicity levels in Sepanjang Beach seawater, unprocessed salt, and packaged salt. The Potential Ecological Risk Index (PERI) analysis suggested a moderate ecological risk for Sepanjang Beach and unprocessed salt, and a low ecological risk for packaged salt. Recommended management strategies include zoning, public education, the application of filtration technologies, maintenance of production facilities, and the implementation of monitoring and certification systems for low-microplastic salt.*

**Keywords:** *Microplastic, Salt Production, Environmental Pollution, Pollutant Hazard Index, Pollutant Load Index, Potential Ecological Risk Index*