ABSTRAK

Permasalahan pemanfaatan limbah ampas teh di PT Sinar Sosro Gunung Slamat Pabrik Ungaran mendorong kebutuhan diversifikasi produk yang berkelanjutan. Penelitian ini bertujuan menganalisis dan memilih alternatif produk diversifikasi berbasis ampas teh menggunakan metode *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS). Data yang digunakan meliputi kuesioner internal untuk pembobotan kriteria, hasil diskusi ahli, dan kajian pustaka. Empat alternatif yang dievaluasi adalah silase pakan ternak, eco-enzyme, lilin aroma terapi, dan briket dengan sepuluh kriteria teknis, ekonomi, sosial, dan lingkungan. Proses analitis mencakup penyusunan matriks keputusan, normalisasi, pemberian bobot, pembentukan solusi ideal, serta perhitungan jarak separasi dan skor kedekatan relatif. Hasil TOPSIS menunjukkan eco-enzyme berada pada peringkat teratas ($Vi = 0{,}571$), didorong oleh potensi pemanfaatan limbah, ketersediaan bahan baku, potensi pasar, serta estimasi biaya produksi yang kompetitif. Formulasi rekomendasi: ampas teh:air:gula merah = 3:10:1; penambahan inokulum *Rhizopus oligosporus* ±3% mempercepat fermentasi menjadi 10–14 hari; produk dapat dimanfaatkan sebagai konsentrat pembersih, pupuk organik cair, dan bahan pra-perawatan rambut setelah uji mutu.Pada penelitian ini, eco-enzyme sebagai alternatif prioritas untuk pengembangan usaha sampingan koperasi, dengan rekomendasi tindak lanjut berupa optimasi formulasi dan uji mutu sebelum komersialisasi.

Kata Kunci: Pengolahan limbah; Diversifikasi Produk; TOPSIS; Ekonomi Sirkular; Eco-enzyme

ABSTRACT

The issue of tea waste utilization at PT Sinar Sosro Gunung Slamat Ungaran Factory has prompted the need for sustainable product diversification. This study aims to analyze and select alternative tea waste-based diversification products using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. The data used included internal questionnaires for criterion weighting, expert discussion results, and literature reviews. Four alternatives were evaluated: animal feed silage, eco-enzymes, aromatherapy candles, and briquettes, using ten technical, economic, social, and environmental criteria. The analytical process included the preparation of a decision matrix, normalization, weighting, formation of an ideal solution, and calculation of separation distance and relative proximity scores. The TOPSIS results showed that eco-enzymes ranked highest (Vi = 0.571), driven by the potential for waste utilization, availability of raw materials, market potential, and competitive production cost estimates. Recommendations: tea waste:water:brown sugar = 3:10:1; addition of ±3% Rhizopus oligosporus inoculum accelerates fermentation to 10–14 days; the product can be used as a cleaning concentrate, liquid organic fertilizer, and hair pre-treatment after quality testing. In this study, eco-enzymes are a priority alternative for the development of cooperative side businesses, with follow-up recommendations for formulation optimization and quality testing prior to commercialization.

Keywords: Waste processing; Product Diversification; TOPSIS; Circular Economy; Eco-enzymes