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## **RESEARCH ON CIRCULAR ECONOMY AND ESG EFFECTIVENESS: FOOD WASTE RECYCLING PERSPECTIVES**

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### **Abstract**

This study investigates the effectiveness of circular economy and ESG (Environmental, Social, and Governance) principles in food waste recycling by employing a mixed-methods approach that combines quantitative modeling with qualitative analysis. A modified Theory of Planned Behavior (TPB)—enhanced with Personal Norms—was applied to survey data collected from 301 Taiwanese participants. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were used to assess the influence of Attitude, Subjective Norms, Perceived Behavioral Control, and Personal Norms on recycling intention. The results indicate that Subjective Norms ( $\beta = 0.45$ ) and Attitude ( $\beta = 0.34$ ) are the strongest predictors, while Personal Norms ( $\beta = 0.23$ ) also play a significant role. Beyond behavioral modeling, the study examines innovative circular waste processing technologies—including anaerobic digestion and black soldier fly treatment—and their contributions to emission reduction and resource recovery. These findings offer new empirical insight into how psychological and technological factors interact to shape sustainable behavior. By bridging ESG performance evaluation with behavioral science, this research contributes to the design of more effective circular economy policies.

*Key words:* circular economy, ESG, food waste, sustainable innovation, TPB

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