

Presentation Exploring Tree-Based Circular Economy Models for Urban Environmental Management: A Qualitative Study of Nuvali, Sta. Rosa, Laguna

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Abstract

This qualitative case study investigates tree-based circular economy models in Nuvali, Sta. Rosa, Laguna, aiming to operationalize the ReSOLVE framework (Regenerate, Share, Optimize, Loop, Virtualize, Exchange) amidst intensifying regional urbanization. Guided by the concept of "Double Materiality," the research utilized data triangulation—including documentary analysis of 2023-2024 sustainability reports, site observations, and stakeholder interviews—to assess the ecological and financial resilience provided by urban green infrastructure. Findings reveal that Nuvali has successfully established a "Regenerative Loop." The estate manages 1,252 hectares of permeable green space and 38,000 native trees (*Narra*, *Bagras*), validated under ISO 14064-2:2019 to have removed 8,732 tCO₂e. The study identified functional "Industrial Symbiosis" where biological and technical loops intersect: 563 tons of yard waste were diverted to waste-to-energy plants, while 107 tons of recycled plastics were integrated into hardscapes as "eco-pavers." These practices are sustained by a "Hybrid Governance" structure aligning private financing incentives with CALABARZON Regional Development Plan goals. The study concludes that tree-based circularity is a viable mechanism for Enterprise Risk Management and disaster resilience, though challenges in institutional fragmentation persist. To address these, the research proposes a "Strategic Roadmap for Regenerative Urban Forestry," advocating for standardized carbon accounting and shared bio-circular hubs. This framework offers a replicable model for transforming urban vegetation into quantifiable biological assets, supporting SDG 11 (Sustainable Cities) and SDG 13 (Climate Action).

Keywords: Circular Economy, Urban Environmental Management, Carbon Sequestration, Double Materiality, Hybrid Governance, Nuvali.