Goal Programming Model for Sustainability and Circular Economy Evaluation

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Abstract

This study investigates into the sustainability landscape of the United Arab Emirates (UAE) through the Circular Economy (CE) principles, emphasizing four conflicting multi-objectives: economic, environmental, energy, and circularity development. Over recent years, CE has witnessed substantial growth, offering compelling opportunities for sustainable development. This expansion enables businesses and industry sectors to integrate CE into their overarching strategies, positioning it as an appealing alternative for manufacturing companies aiming to enhance performance through optimized resource efficiency. The study quantifies these objectives by maximizing GDP, minimizing GHG emissions, electricity consumption, and waste generation, respectively and optimizing number of employees. Two models are formulated based on these objectives, with the second model incorporating waste recycling. Utilizing a goal programming approach, the models are applied to assess eight economic sectors in the UAE. This research seeks to make a substantial contribution to both researchers and practitioners, enhancing sustainable theory and offering practical guidance for those aiming to promote their enterprise's sustainable development. The findings emphasize the significance of waste minimization and recycling in attaining the country's sustainability goals, highlighting their impact on energy conservation and the reduction of greenhouse gas emissions.

Keywords
Circular Economy, Sustainability, Goal Programming, Multi-objectives, Waste Minimization.

Biographies
Noushin Bagheri possesses a Doctorate in Business Administration and Management. She has authored papers for both journals and conferences and has rich background in teaching at both university and business school levels. Her current research focuses on sustainability and sustainable development goals.

Fouad Ben Abdelaziz is currently Distinguish Professor at NEOMA Business School. He received his PhD in Operations and Decision Systems from Laval University, Canada. He was a Senior Fulbright scholar at the Rutgers Center for Operations Research, Rutgers University, NJ, USA. He is a leading researcher in multi-objective stochastic optimization. Aside his publications in outstanding journals like EJOR, ANOR and FSS, he served as Guest Editor of special issues of reputed international Journals. Dr. Ben Abdelaziz has been working/visiting many Universities around the world, as the University of Tunis, the American University of Beirut and the University of Dubai.