

Agent-based Model: Environmental Awareness and Circular Economy in Developing Countries

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Abstract

Since 1971, the impact of population growth on the environment has been a topic of interest. This growth has been a degrading factor of environmental quality: as the pressure on the assimilative capacity of the environment increases, air and water pollution, along with the amount of solid waste generated also increases. The circular economy is considered as a potential solution, oriented to protect the environment without becoming an obstacle to economic growth.

To make an effective transition towards a circular economy, we must have the responsibility and active participation of all the stakeholders involved, including customers. In this work, we seek to develop an agent-based model to describe and analyze an environmental awareness system in a population, whose behavior is based on an indicator that can change by agent's interaction and modify its consumption habits.

After the model validation process, its results are analyzed to understand how the environmental awareness level, consumption habits, and social skills of each individual, can influence the average environmental awareness level of a heterogeneous population, which makes simple the identification of emerging behaviors and the forecasting of the potentially recyclable waste according to the quality in the separation at source.

Keywords

Agent Based Modeling (ABM); environmental awareness; social influence; sustainable behavior; extended producer responsibility (EPR).

Biographies

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