

# Socio-economic aspects of innovation in solid waste management

E. Lakioti<sup>1</sup>, K. Moustakas<sup>2,3</sup>, D. Komilis<sup>3,4</sup> and V. Karayannis<sup>1,3\*</sup>

<sup>1</sup>Dept. of Environmental Engineering, Technological Education Institute of Western Macedonia, 50100, Kozani, Greece

<sup>2</sup>School of Chemical Engineering, National Technical University of Athens, 15773, Zographou Campus, Athens, Greece

<sup>3</sup>School of Science and Technology, Hellenic Open University, 26222, Patras, Greece

<sup>4</sup>Dept. of Environmental Engineering, Democritus University of Thrace, 67100, Xanthi, Greece

Keywords: social, economic, solid waste management, innovation; sustainability.

Presenting author email: konmoust@central.ntua.gr

\*Corresponding author email: vkarayan@teiwm.gr

## Abstract

The significance of economic issues to accelerate the implementation of innovative environmental technologies is broadly recognized, and economic drivers are considered critical factors for policy-makers to develop effective strategies. On the other side, the study of social perceptions and attitudes, which refer to people's understanding and favorable or unfavorable evaluation of the issue in question, can provide an insight into several parameters affecting and shaping public awareness of innovative actions related to the environment and energy. Several works are reported in the scientific literature that point out the role of relevant social and economic research for detailed plans and further steps in communication and participation to enhance public acceptance of emerging technologies with cost-effectiveness.

In the present study, recent socio-economic aspects of innovation in solid waste management (SWM) are discussed, considering economic viability and public support as key factors of concern for the implementation of SWM, along with technological advancement and ecological impact, thus linking society, economy and the environment, towards sustainable development.

In fact, SWM appears to be a complicated procedure involving multiple environmental and socio-economic criteria. In particular, the influence of socio-economic status on both the quantity and composition of MSW in designing an effective SWM plan for a city has long been recognized, and the importance of reliable relevant information has been highlighted in several studies. For the assessment of solid waste generation, socio-economic parameters such as education level, occupation, family members and income should be taken into account. Moreover, factors including seasonal variation, living habits, social attitudes, religious and cultural beliefs, and even regional idiosyncratic features, may affect the amount and composition of waste. Also, various socio-economic factors influence willingness to pay for the introduction of recycling actions into existing SWM services. Furthermore, decision-making in specifying realistic policy objectives and operational measures and alternatives for finding appropriate solutions to SWM problems or even for the transition from a traditional SWM scheme to a more integrated approach, often requires the encouragement of the participation of multiple stakeholders in the society, such as government, municipalities, industries, experts, and certainly public. Particularly for the economic assessment of SWM technologies, cost models based on the principles of LCC are lately proposed, providing detailed cost items for all key technologies within modern waste systems.

Concluding, social acceptance and awareness should be considered along with the evaluation of environmental impact and economical issues, in order to ensure the efficient implementation of SWM actions. The active involvement of society appears to be key factor for establishing a high degree of confidence, placing the emphasis on the contribution of possible positive outcomes to the protection of the environment and the well-being of the society, in order to promote communication of expert knowledge and participation for the advancement of novel and cost-effective SWM systems.