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Data Article

Survey data for assessing the socio-economic performance of End of Life options of a bio-based product based on expert knowledge

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ABSTRACT

This data article aims at providing a data description about the manuscript entitled “A socio-economic indicator for EoL strategies for bio-based products” [1]. Data regarding the socio-economic assessment of End of Life (EoL) options for the specific case of PLA-based film for food packaging are presented, with a special emphasis on policy recommendations and actions for the EoL practices in the bioeconomy sectors. A new framework, based on data gathering and validation through experts involvement, is proposed in order to calculate a new indicator to measure the socio-economic performance of EoL practices (SEI-EoL) for bio-based products. Experts were identified from the Horizon 2020 LIFE-funded projects and/or Scopus databases. Two rounds of survey were carried out to determine the weights of socio-economic criteria for bio-based products and the values for the selected case study. The aggregation of these data enabled us to obtain a final ranking of different EoL alternatives. Finally, a third round of survey was conducted to further deepen our

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understanding of actions and recommendations needed to improve EoL practices in bio-based sectors. Resulting data have a mix of quantitative and qualitative characterization. A potential reuse of these data can allow future estimations, empirical analyses or a direct comparison with the use of experimental observations.

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Specifications Table

Subject	Economics
Specific subject area	Bio-based Economy
Type of data	Table Figure
How data were acquired	This investigation is based on literature review and primary data. The experts' responses were collected through three rounds of a survey conducted using Excel files with the support of Skype video calls.
Data format	Raw Analyzed
Parameters for data collection	The comparison of EoL alternatives was performed using criteria selected from the literature and relating to the stakeholder categories suggested by the UNEP-SETAC [2]: i) workers, ii) consumers, iii) general society, iv) the local community and v) value chain actors.
Description of data collection	The dataset is built starting from a literature review to identify potential EoL options and define the relevant socio-economic criteria. Based on this information, a three-step process for data collection has been employed. First, experts were identified. Second, two rounds of a survey were directed to experts to determine the best EoL option (experts assign weights and values to the criteria, which are associated with several groups of stakeholders). Finally, a third round of survey was aimed at deepening policy recommendations and actions needed.
Data source location	City: Rome Country: Italy
Data accessibility	Latitude and longitude: 41°53'30.95"N, 12°30'40.79"E Data are available in this article as three supplementary files along with the questionnaire used in the survey: The file "First survey.xlsx". The file "Second survey.xlsx". The file "Third survey.xlsx".
Related research article	Authors' name: Idiano D'Adamo, Pasquale Marcello Falcone, Enrica Imbert, Piergiuseppe Morone. Title: A socio-economic indicator for EoL strategies for bio-based products Journal: Ecological Economics

Value of the Data

The data contain experts' perspectives and knowledge about the socio-economic value of EoL options for bio-based products that have been taken from scientific sources.

Researchers and practitioners can utilize these data to compare the performance of the EoL strategies across different geographical contexts, across different time and selecting different bio-based products/materials.

The clear gap in the data (i.e. environmental dimension) might motivate additional investigations in the waste management community.

1. Data Description

This article includes detailed data provided by 20 experts identified among the Horizon 2020 LIFE-funded projects and/or Scopus databases (i.e. academics, policymakers and representatives of trade associations and waste management companies) with a significant experience (i.e. at least 10 years' worth) with EoL strategies. The proposed framework of data contains:

- EoL options: all potential EoL alternatives for bio-based were derived from the scientific literature
- Socio-economic criteria: 25 criteria relating to specific categories of stakeholders were defined based on a review of the literature.
- Scores and weights for each criteria: as determined by the experts
- Policy and actions relevance: Experts, using a Likert Scale, assigned a value for each proposed policy recommendation and action.

The dataset is composed by three Excel files and each file presents the instructions provided to the experts to elicit their knowledge. Specifically, the file "First survey.xlsx" (provided as a supplementary file) shows gathered input data to define a priority level among five categories (workers, consumers, general society, local community, value chain actors) and five criteria selected for each category through a pairwise comparison. The core of the analysis is their impact on the end of life strategy. The file "Second survey.xlsx" (provided as a supplementary file) presents collected data to define the best choice among several End of Life strategies, namely i) Reuse; ii) Mechanical recycling; iii) Chemical recycling; iv) Aerobic composting; v) Anaerobic digestion; vi) Energy recovery and vii) Landfilling. The core of the analysis is to compare several EoL strategies for a specific bio-based product. The file "Third survey.xlsx" (provided as a supplementary file) displays gathered data useful to determine some policy recommendations and actions to encourage EoL practices in bioeconomy sectors with the aim to assign an order of priority among these items.

2. Experimental Design, Materials, and Methods

A method based upon an integrated analytic hierarchy process–multicriteria decision analysis (AHP-MCDA) was implemented with the aim of developing a new indicator for EoL, i.e. the SEI-EoL, for assessing the socio-economic performance of different EoL options associated to bio-based products. As depicted in Fig. 1, the dataset construction was based on the literature and on three rounds of survey. Specifically, a comprehensive literature review was first conducted to identify potential EoL options and define the relevant socio-economic criteria. After having gathered such desk information, experts were involved in a first round of survey with the aim of assigning weights to the selected socio-economic criteria. In the second round, experts were asked to assign values to the criteria, which were associated with several groups of stakeholders. In this way it was possible to calculate the SEI-EoL. Notably, the aggregation of results allowed us to measure the socio-economic performance for each alternative EoL option relating to the specific case study of polylactic acid (PLA)-based film for food packaging. Finally, the same group of experts was asked to validate an initial list of policy recommendations based on the literature. Moreover, they were also requested to propose new actions able to improve the EoL practices in bioeconomy sectors. We aggregated all results, obtaining an improved revised list that was once again shared with experts, which were finally asked to rank each policy recommendation/action by using a Likert scale. Survey with the experts were conducted using an Excel file with the support of a Skype video call during the time period March 2019 - April 2020.

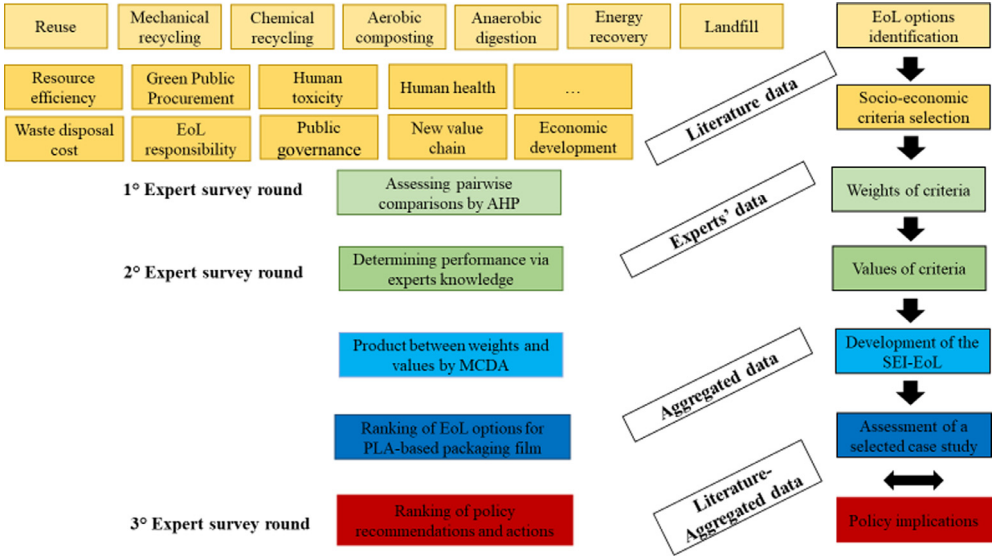


Fig. 1. Data source for socio-economic sustainability assessment of EoL options

3. Ethics Statement

This dataset has been collected with the support of a number of subjects that accepted to join our experiments, after an appropriate information and training phase and by signing an Informed Consent form.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.dib.2020.106199](https://doi.org/10.1016/j.dib.2020.106199).

References

[1] Idiano D'Adamo, Pasquale Marcello Falcone, Enrica Imbert, Piergiuseppe Morone. Title: a socio-economic indicator for EoL strategies for bio-based products, ecological economics, in press. 2020
 [2] UNEP-SETAC. Guidelines for social life cycle assesment of products. 2009