



Food Waste Prevention: Reduction, Reuse, and Recycling

Konstadinos Abeliotis ^{1,*}  and Katia Lasaridi ² 

¹ Department of Economics and Sustainable Development, Harokopio University of Athens, 17676 Athens, Greece

² Department of Geography, Harokopio University of Athens, 17676 Athens, Greece

* Correspondence: kabeli@hua.gr; Tel.: +30-2109549363

1. Introduction

Food loss and waste (FLW) is a global concern that has adverse environmental, social, and economic impacts [1]. FLW occurs during the entire food supply chain, from production, processing, transportation, retailing, and up to final consumption [2]. The third target under SDG 12 (Target 12.3) postulates “halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains (including postharvest losses) by 2030” [3]. Therefore, this Special Issue aims to compile novel approaches to food waste, prevention, reuse, and recycling.

The Special Issue features five contributions that focus on various cross-cutting areas of FLW interest. The first cross-cutting area was that of food waste valorization. Tsai [4] discussed efforts made in Taiwan for the production of value-added resources (i.e., organic fertilizer, pig feed, and bioenergy) from food waste. Elejalde et al. [5] submitted a case study on the valorization of unpicked grapes as a potential source of natural antioxidants. Lanno et al. [6] presented the recovery of phosphorus nutrients from food waste via composting. Finally, Abeliotis et al. [7] reported on the valorization of food waste as animal feed. Then, the next cross-cutting theme was on the contributions of the HoReCa (hotels, restaurants, and catering) sector to the FLW., FLW by HoReCa was examined in Poland by Gładysz et al. [8]. Moreover, food waste generated by hotels in Greece serves as a raw material for the production of animal feed, as reported by Abeliotis et al. [7].

Overall, the five submitted manuscripts cover a wide geographical range, extending from Europe to Asia; they also include case studies from various economic sectors ranging from hotels, restaurants, and the wine industry to animal feed production. The five contributions are presented in brief in the following section.

2. Towards Food Waste Reduction, Reuse, and Recycling: Insights from the Publications Included in the Special Issue

Tsai [4] presented data on food waste recycling in Taiwan and reported that food waste has officially been designated as one of the mandatory recyclable wastes on the island. The study analyzed the online reporting amounts of collected food waste based on the official statistics and regulations database. Furthermore, the study presented regulatory measures for promoting food waste utilization in Taiwan to valorize it for the production of value-added resources (i.e., organic fertilizer, pig feed, and bioenergy). The author reported that through the central governing authority, local governments, and private recyclers, about 2000 metric tons of food waste is recycled daily in Taiwan. This recycling approach mitigates the pressure on waste incineration and disposal systems, and also conforms to the trends of environmental sustainability and circular bioeconomy.

Gładysz et al. [8] reported that a significant share of food waste originates in the food services domain and the HoReCa (hotels, restaurants, and catering) sector. Organizational improvements leading to the minimization of food waste and associated costs in the food service domain are needed. This manuscript also discussed the applicability of lean



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management methods for food services to achieve efficient operations and eliminate food waste, based on a literature review and three case studies from Poland. Lean management was found to be useful in these cases to decrease food waste and reduce operational costs. The case studies suggest a set of activities for organizations delivering food services to streamline their processes by applying lean management practices.

Lanno et al. [6] presented the results of recovering nutrients from various organic wastes, including food waste, via composting. The authors maintained that every input waste has different nutrient contents, in turn suggesting that every compost has different fertilizer and/or soil improvement values. The focus of this study was on phosphorus as a compost nutrient, and it aimed to investigate the content and relative share of phosphorus forms in composts made from fish waste, sewage sludge, green waste, and horse manure. Six forms of phosphorus were determined using the sequential extraction method. The authors concluded that the evaluation of composts as alternative phosphorus sources in agriculture should rely on the relative distribution of phosphorus forms in the compost in addition to the typically recognized value of the total phosphorus.

Elejalde et al. [5] carried out a study focusing on the polyphenolic profile characterization of different unpicked grape varieties using an ultrasound-assisted extraction technique to extract the polyphenolic fractions. The driver for their study was the fact that significant amounts of high-quality wine grapes are left unpicked on the vine every year and are consequently lost. In the context of the circular bioeconomy, the valorization of these grapes as a potential source of natural antioxidants is of great interest. The findings reported in the manuscript may help the wine industry to consider the valorization of unpicked grapes, classified as wastes, as an interesting source of natural antioxidants to be used as food supplements and with potential applications in the pharmaceutical industry.

Abeliotis et al. [7] presented a case study on the valorization of food waste via its transformation into animal feed. The authors claimed that former foodstuffs should be regarded as a resource, not a waste product. They presented the results of the environmental life cycle impact assessment centered around the construction and operation of a novel solar food waste drying unit on the island of Crete in Greece, which treats food waste from hotels and transforms it into a raw material for the production of feed for pets and fur-bearing animals. The results presented indicate that the major environmental impacts of the solar drying unit are generated by the operation of the solar drying unit due to the usage of electricity. The use of electricity resulting from renewable energy sources can also alleviate the carbon footprint of the entire process.

3. Conclusions

The minimization of food waste and losses will continue to be at the forefront of the research agenda in years to come. It is hoped that this Special Issue will help to accelerate progress toward food waste prevention and sustainable management, and the readers are invited to study the individual publications in detail.

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