15th IconSWM-CE & IPLA GF 2025

Zero Waste and Circular Economy 2025

Editor-in-Chief
Prof. Sadhan Kumar Ghosh

Editors:
Prof. Narpinder Singh,
Dr. Gopalji, Dr Manavendra Singh,
Dr. Rachn Karmakar, Dr Sutripta Sarkar,
Dr Ipsita Saha, Dr Debasis Mitra, Prof Rahul Baidya
Assistant to Editor-in-Chief: Mr. Dineshkumar M

Abstract Book

Proceedings of the 15th IconSWM-CE & IPLA Global Forum 2025
15th International Conference on Sustainable Waste Management & Circular Economy and IPLA Global Forum 2025

Graphic Era (Deemed to be University), Dehradun, India
International Society of Waste Management, Air and Water (ISWMAW)
International Partnership for Expanding Waste Management Services of Local Authorities
IPLA (A SDG Partnership)

October 29 - November 01, 2025, India

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Year of Publication: 2025

ISBN: 978-93-48697-31-8 (e-copy)
ISBN: 978-93-48697-87-5 (Paper Back)

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Graphic Era (deemed to be) University,
Dehradun, Uttarakhand, India

International Partnership for Expanding Waste Management Services of Local Authorities (IPLA), Japan, Global Secretariate at ISWMAW, India

SINTEF, Oslo, Norway

Catch Them young; Zero Waste & Circular Economy in Campus

CRIC [Consortium of Researchers in International Collaboration]

The book's publisher: International Society of Waste Management, Air and Water (ISWMAW), 2025
The book's printer: Dutta Copier, Jadavpur, Kolkata 700032
The book's typesetter: Ribboning Solutions, R C Thakurani,284 M G Road Kolkata 700104,
The book's publication date : 29.10.2025

1st Edition,
ISBN: 978-93-48697-31-8 (eBook)
ISBN: 978-93-48697-87-5 (Paper Back)

This International Society of Waste Management, Air and Water (ISWMAW) .
The registered office address is: 29/6, Jadunath Ukil Road, Kolkata 700041, India
For communication send mail to: iswmaw@gmail.com; iconswm.ce@iswmaw.com, iconswm2025@geu.ac.in;

Price: INR 500/- (Soft Copy / Paper Back);

ISBN: 978-93-48697-31-8 (eBook)
ISBN: 978-93-48697-87-5 (Paper Back)

Editorial Board

IconSWM-CE Excellence Award 2025 for Co-processing

Award Listing	Diamond Award	Platinum Award	Gold Award
Category 1: TSR % in 2024	Adani- Ambujanagar Cement Plant (Kiln 1), Gujarat	JSW- Nandyal Cement Plant, Andhra Pradesh	JSW- Shiva Cement Plant, Odisha
Category 2: TSR % in 2020-2024 (5 years)	Nuvoco Vistas- Chittor Cement Plant, Rajasthan	MP Birla- Chanderia Cement Plant, Rajasthan	--
Category 3: NRPW utilized in 2024 (tonnes)	Adani- ACC Chanda Cement Plant, Maharashtra	JSW- Nandyal Cement Plant, Andhra Pradesh	Nu Vista (Nuvoco)- Risda Cement Plant, Chhattisgarh
Category 4: NRPW utilized in 2020-2024 (5 years) (tonnes)	MP Birla- Chanderia Cement Plant, Rajasthan	--	--
Category 5: AR utilized in 2024 (tonnes)	Adani- Marwar Mundwa Cement Plant, Rajasthan	Nu Vista (Nuvoco)- Risda Cement Plant, Chhattisgarh	JSW- Shiva Cement Plant, Odisha

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IconSWM-CE Excellence Leadership Award 2025 for Co-processing	
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Mr. Deepak Jasuja	Chanderia Cement Plant, Rajasthan
Mr. Anik Kumar Mishra	Shiva Cement Plant, Sundargarh, Odisha

Individual Category Award	**Awardees**
Award of Appreciation for the Significant Support to ISWMAW Initiatives	Dr. Christian John Engelnsen
Award of Appreciation for his outstanding activities as the Vice President, ISWMAW	Prof. Amit Kumar Ghosh
Award of Appreciation for the Significant Support to ISWMAW Initiatives	Dr. Mitali Ghosh Bakshi
Award of Appreciation for his continued support in the IconSWM-CE Excellence Award Scheme for Coprocessing	Mr. Palash Kumar Saha

Contents

Deep Learning–Driven Automated Classification and Segregation of Food Waste for Circular Economy Application

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ABSTRACT: *In order to facilitate value-oriented recycling within the framework of a circular economy, this study proposes a deep learning-based system for the automated classification and segregation of food waste. Fruit peels, vegetable residues, bones, dairy, oils, and other organic materials are among the different kinds of food waste that are automatically recognized and categorized using computer vision models. Each item is subsequently routed to the proper recycling stream-composting, fermentation, anaerobic digestion, oil recovery, or landfill diversion-by a post-processing layer. To increase domain specificity, the framework is trained using publically accessible datasets (Fruits360 and TrashNet) supplemented with unique food waste photos. Classification performance is greatly improved by using MobileNetV2 as a feature extractor in conjunction with transfer learning. During model training, the system makes use of binary cross-entropy loss and the Adam optimizer. Accuracy, F1-score, and confusion matrix analysis are used to evaluate the model. In addition to classifying and separating garbage, the system determines and forecasts how much of each sort of waste is needed for particular agricultural uses. It produces a minimum of three waste ratio combinations, showing either mixed or individual proportions along with their suggested recycling processes. In order to facilitate effective trash sorting, lower contamination, and encourage sustainable resource recovery, the finished trained model is stored and ready for practical implementation.*

Keywords*: Food Waste Classification; Transfer Learning; Circular Economy; MobileNetV2; Recycling Pathway Prediction.*

A Review on the Use of Artificial Intelligence for the Development of a Smart City through Integrated Waste Management system and Circular Economy

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ABSTRACT: *Smart City development with circular economy requires an integrated waste management system and can be ensured through the use of smart technologies like integrating the city waste management facilities through IoT and artificial intelligence. This is done through use of real time bin monitoring by smart sensors, using artificial intelligence-based route optimization for waste collecting trucks, use artificial intelligence in various aspects of waste management like segregation of wet, dry and hazardous waste at source, composting, recycling, waste to energy facilities and using predictive analytics for optimum resource and infrastructure planning. The objective of smart city with integrated waste management is to use holistic approach in reducing the volume of waste, increase resource recovery, and bring overall improvement in sustainability. Successful case studies from around the World like San Francisco and Los Angeles from USA; Singapore; Msheireb Downtown from Doha, Qatar; Barcelona from Spain and Indore from India were discussed to emphasis on the role of integrated waste management in making cities smart and sustainable. Life cycle assessment must be carried out for every product and services provided, so that the assessment of environmental impacts of the products and services can be done. Circular economy provides solutions for these environmental impacts.*

Keywords*: Artificial intelligence, integrated waste management, route optimization, IoT sensors, circular economy.*