EMERALD POINTS

BEST PRACTICES IN URBAN SOLID WASTE MANAGEMENT

Ownership, Governance, and Drivers of Performance in a Zero Waste Framework

GIULIA ROMANO
CLAUDIO MARCIANO
MARIA SILVIA FIORELLI

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GIULIA ROMANO
University of Pisa, Italy

CLAUDIO MARCIANO
University of Turin, Italy

And

MARIA SILVIA FIORELLI
University of Pisa, Italy

United Kingdom – North America – Japan – India
Malaysia – China

Emerald Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2021

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-80043-889-7 (Print)
ISBN: 978-1-80043-888-0 (Online)
ISBN: 978-1-80043-890-3 (Epub)

ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

Certificate Number 1985
ISO 14001

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LIST OF ABBREVIATIONS

ATO	Optimal Territorial Areas
BSR	Berliner Stadtreinigungsbetriebe
CEO	Chief Executive Officer
DGERT	General Direction of Employment and Labor Relations
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EU	European Union
FRZ	Formia Rifiuti Zero
GDP	Gross Domestic Product
HSY	Helsinki Region Environmental Services Authority
KPI	Key Performance Indicators
MOE	Municipally Owned Enterprise
MSW	Municipal Solid Waste
NIMBY	Not In My Backyard
OECD	Organisation for Economic Co-operation and Development
PAP	Personal Absorbent Products
PAYT	Pay As You Throw
PSO	Public Sector Organization
RFID	Radio-Frequency Identification
SDG	Sustainable Development Goal
SGEIs	Services of General Economic Interest
SGIs	Services of General Interest
SOE	State-Owned Enterprise
TBL	Triple Bottom Line
TMW	Take–Make–Waste
WEEE	Waste of Electrical and Electronic Equipment
ZW	Zero Waste
ZWE	Zero Waste Europe
ZWIA	Zero Waste International Alliance

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ABOUT THE CONTRIBUTORS

Maria Silvia Fiorelli is Researcher and Teacher of Business Organization at the University of Pisa; She has a Phd in Business Economics. She is authors of papers and books about network and human resources. She teaches Business Organization in Master classes at the University of Pisa.

Latest publications: Fiorelli, M. S. (2019), Family business and leadership models; in *International Journal of Business and Social Science*; Fiorelli, M. S. (2018), Il processo generazionale nelle PMI (analisi e modelli di sviluppo imprenditoriale), ed. Arnus, 988865284414

Claudio Marciano is a Postdoctoral Researcher at University of Turin in Sociology of Economy and Adjunct Professor in Sociology and Politics for Innovation at University of Aosta Valley. His research interests concern sociology of territory with a focus on the urban public policy, local public services, and social innovation. Engaged in several multidisciplinary team of research for private companies and no profit organizations, he was deputy major on charge of urban sustainability and smart cities in Formia Municipality (40.000 inhab.).

Latest publications: Torres, A., Bejarano, J. F., Manzanera, R., Pellizzoni, L., Marciano, C. (2020), A critical analysis of circular economy among Southern Europe: an innovative proposal for environmental degradation and sustainability of life. In "Social Problems in Southern Europe: A Comparative Assessment" (eds Entran Duran, F., Soriano Miras, R. M., Duque Clavache, R.). Southern European Societies, Edward Elgar Publishing, London, ISBN: 978-1-78990-142-9; Marciano, C., Cassone Idone, V., Onnis, E., Paini, G., (2020), Università e Territorio: il modello del Knowledge Interchange. Il caso Piemonte 2029. In Autonomie Locali e Servizi Sociali, n.1/2020, Il Mulino: Bologna. ISSN: 0382-2278

Giulia Romano is Associate Professor of Business Administration, Corporate Governance, and Economics of Public Services. She has the National Scientific Habilitation to Full Professor. She was Scientific Coordinator of the Jean Monnet Module "European Water Utility Management" funded by the EACEA (EU) (2014–2017). She coordinated and participated in many research

projects and is author of more than 50 international research articles, books, and book chapters on utility management, waste management, performance analysis, and corporate governance.

Latest publications: Minoja, M., Romano, G. (2021), Managing intellectual capital for sustainability: Evidence from a Re-municipalized, publicly owned waste management firm, *Journal of Cleaner Production*, 279, 123213; Romano, G., Masserini, L., Lombardi, G. V. (2021). Environmental performance of waste management: Impacts of corruption and public maladministration in Italy. *Journal of Cleaner Production*, 288, 125521; Romano, G., Molinos-Senante, M. (2020), Factors affecting eco-efficiency of municipal waste services in Tuscan municipalities: An empirical investigation of different management models, *Waste Management*, 105, 384–394; Romano, G., Rapposelli, A., Marrucci, L. (2019), Improving waste production and recycling through zero waste strategy and privatization: An empirical investigation, *Resources, Conservation & Recycling*, 146, 256–263

ACKNOWLEDGMENTS

Giulia Romano and Maria Silvia Fiorelli acknowledge financial support from the University of Pisa, PRA 2018.

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INTRODUCTION AND METHODOLOGY[1]

ABSTRACT

Public service provision in the European Union has received great attention in the last decades. Waste management is among the most important public services and challenges for a sustainable world owing to its impact on the environment, economic development, human health, and equity. Throughout Europe, along with the circular economy, the related zero waste (ZW) framework is also rapidly spreading. This introduction provides information about research questions and methodology used to discuss the most relevant and critical issues for good management of waste service provision under the ZW framework.

Keywords: Public service; waste management; European Union; zero waste framework; best practice; case studies

Public service provision in the European Union (EU) has received great attention in the last decades. Public services such as drinking water provision, urban waste collection and treatment, and transport are essential for granting an adequate quality of life and supporting the unification process, by allowing European citizens to benefit from a standard level of public service quantity and quality. Good public services are regarded as pillars of the European model of well-being and development, as they affect the general interest of communities at the local, regional, and national levels; they can even influence migration policies, owing to their impact on the environment, sanitation, and health. Their relevance requires specific public service obligations as they can be provided either by the public or by the private sector.

Transition toward a circular economy is not only a critical need for global policy but also an opportunity to enhance the relevance of protecting the environment for business success and sustainability. Waste management is among the most important public services and challenges for a sustainable world owing to its impact on the environment, economic development, human health, and equity.

1 This chapter was written by Giulia Romano.

Waste is defined by the Waste Framework Directive (Directive 2008/98/EC) Article 3(1) as *any substance or object which the holder discards or intends or is required to discard*. Currently, urban waste management is under increasing pressure, given the worldwide challenges of population, urban, and gross domestic product (GDP) growth, and the threat of global climate change. Indeed, recent communication from the European Commission is called "A New Circular Economy Action Plan for a Cleaner and More Competitive Europe," and started by saying that

> *…there is only one planet Earth, yet by 2050, the world will be consuming as if there were three. The global consumption of materials such as biomass, fossil fuels, metals, and minerals is expected to double in the next forty years, while annual waste generation is projected to increase by 70% by 2050.*
>
> (European Commission, 2020a)

According to the European Commission, the transition to circular economy principles could support the increase of EU GDP by an additional 0.5% by 2030 and create around 700,000 new jobs (Cambridge Econometrics, Trinomics, and ICF, 2018). Further, European firms could increase their profitability by reducing their costs for materials and better shield their accounts from resource price fluctuations (European Commission, 2020a).

For the waste sector, transitioning toward a circular economy presents an opportunity to promote organizational changes and improve performance from a broad perspective, which encompasses economic, financial, environmental, social, and even accountability issues.

Several challenges currently affect the waste industry. The waste sector is a particularly delicate and complex industry that presents problems affecting several aspects worldwide, from organized crime and corruption to public versus private management conflict, lack of proper plants, and strategic planning.

At the European level, data from the last two decades showed that urban waste generation increased; however, the most recent trend highlights a marked tendency to decrease waste generation, in accordance with the first step of a successful waste policy: waste reduction. Along with waste reduction and reuse, separate waste collection is a relevant step to sustainable waste management and meeting circular economy targets (BiPRO/CRI, 2015). Indeed, it could support effective recycling and composting activities, and realize a real recovery of waste, avoiding the disposal of material and energy losses.

Recently, in 2019, the European Investment Bank decided to refrain from financing the municipal waste incinerator in Belgrade, Serbia, by highlighting

that incinerators tend to crowd out waste prevention and recycling measures (CEE Bankwatch Network, 2019). Thus, at the European level, along with waste directive and action plans, financial institutions are also fostering the circular economy by avoiding supporting unsustainable practices that can reduce the efforts to increase recycling and composting.

Considering exemplary cases of waste management firms and municipalities that have implemented effective innovations in the management of urban waste services in well-developed European countries such as Italy is of utmost importance. As a matter of fact, waste management services are not only economic activities but also key environmental and societal issues, needing innovation at managerial and technological levels. Economic, social, and environmental aspects of waste management activities should be considered in the impact assessment of policy options (BIO Intelligence Service, 2011a) as well as in performance assessment using the triple bottom line (TBL) approach (Elkington, 1997, 1998).

Throughout Europe, along with the circular economy, the related zero waste (ZW) framework is also rapidly spreading, owing to innovation in legislation and regulation and to the increasing relevance of citizens' concerns about a more sustainable way of living, waste production, and treatment.

This book aims to discuss the most relevant and critical issues for good management of waste service provision under the ZW framework: ownership and corporate governance, performance measurement based on the TBL approach, key drivers of good waste management (innovation, responsibility, stakeholder engagement through communication and training, and knowledge sharing), and discussing the relationships among these issues.

A selection of case studies of urban waste management operators will be presented throughout the text, ranging from well-developed waste management firms to start-ups created after remunicipalization processes, from firms with complex ownership and governance characteristics to sole shareholder firms, from firms realizing internally developed innovations to firms that have realized joint ventures and collaboration with several partners. Most cases are derived from the Italian waste management experience, which is considered internationally relevant and pioneering in the European ZW framework. Other cases concern European experiences.

Successful best practices in urban waste management realized by cutting-edge firms and municipalities will be used to provide relevant examples, considering their collection methods, tariff setting systems, collaborations, and knowledge sharing processes with partners and providers, recycling procedures, and employees' and stakeholders' engagement programs.

We chose the "multiple case design" (Bourgeois & Eisenhardt, 1988; Eisenhardt & Graebner, 2007), to access to information not available from publicly available sources.

Our research questions were as follows:

(1) Which are the key drivers of sustainable urban solid waste management?

(2) How does ownership affect these key drivers?

(3) How do these drivers affect the performance of urban waste operators?

(4) What is the role of different social actors, such as grassroots movements, local public administrations, and innovative start-ups, to foster key drivers?

A multiple case approach allows treating a series of cases as a series of experiments in replication logic. Each case study can corroborate or disprove the suppositions drawn from the preceding one (Yin, 1984).

These case studies were selected using the snowball sampling technique. After a careful analysis of existing literature and documentation available, we started by interviewing a well-known manager of several Italian waste utilities with relevant experiences in different contexts.

Following this initial interview, we identified four other important professionals in the waste management industry, chosen as key informants about the "zero waste" framework. We, thus, held unstructured interviews with a well-known activist, leader of the "zero waste" movement in Italy and Europe, and the winner of the Goldman Environmental Prize; a technical and EU waste legislation expert and researcher, with decades of experience in separate collection, recycling, composting, and prevention; a manager that directed many relevant waste utilities in Italy; and a former alderman of a well-functioning Italian municipality for waste management activities, who later became the manager of several relevant waste utilities.

Furthermore, a focus group lasting four hours was organized to discuss the experiences of three of the above-mentioned key informants. Then, we identified other key informants to be interviewed, owing to their relevant experiences, and new case studies were identified, owing to their best practice role.

After preliminary contacts, key informants were selected for each case study, that is, officers with substantial or direct responsibilities for strategy definition, communication activities, and innovation process development.

Informal discussions, on-site observations, and document studies were performed along with meetings. Interviews and other documents were processed and interviews transcribed (Corvellec, Bramryd, & Hultman, 2011).

This study adopted an iterative process (Eisenhardt, 1989; Glaser & Strauss, 1967). Divers data collection methods were combined (Eisenhardt, 1989): analysis of archival sources (e.g., annual reports, websites, sustainability reports,

informative materials, organization charts, and other provided documentation) and in-depth interviews.

According to the suggestion of López-Gamero, Zaragoza-Sáez, Claver-Cortés, and Molina-Azorín (2011) and as in Minoja and Romano (2021), internal and external validity and reliability tests were carried out with real-time amendments on data to fit emerging knowledge (Eisenhardt, Graebner, & Sonenshein, 2016). Iterations and follow-ups were conducted with the interviewees. Email, telephone calls, and informal meetings were realized to obtain feedback and further information.

Each investigator recorded all the data collected during the interview, taking notes of their impressions (Yin, 1984). After generating preliminary theory with the within-case analysis, we examined similarities and divergence between cases (Eisenhardt, 1989). The comparison among cases allowed us to define whether an emergent outcome was replicated in other cases (Eisenhardt & Graebner, 2007) (Table 1).

Table 1. An Overview of the Urban Waste Management Operator Case Studies.

Waste Operator	Country	Year of Foundation	Ownership	Revenues (2018)	% RD (Last Available Data)
ASCIT SpA	Italy	2004	Public	16,728,476	82.4%
Contarina SpA	Italy	1989	Public	78,559,805	85.6%
Formia Rifiuti Zero SpA	Italy	2014	Public	7,340,274	67.6%
HSY	Finland	2009	Public	99,300,000 (waste management only)	48%
LIPOR	Portugal	1982	Public	39,600,000	41%
Ponte Servizi Srl	Italy	2007	Public	1,209,407 (2017)	90.3%
Voka Snaga	Slovenia	1890	Public	47,090,241	68%

Source: Our elaborations from data available on AIDA and corporate website.

Given the complexity of challenges and expected results of urban waste management in developed countries, a multidisciplinary perspective was assumed, which encompassed management, economic, environmental, and sociological issues.

The book will provide an outlook of reflections on relevant topics and case studies that demonstrate the ability of municipalities and waste utilities to use opportunities for innovating, networking, and knowledge sharing to exploit synergies and value creation processes.

The first chapter of the book provides an overview of the urban waste management sector in Europe, its characteristics, evolution, and perspectives given the normative framework in force and main sustainability challenges, while introducing the circular economy approach and the increasingly relevant ZW strategy.

The second chapter is dedicated to the ZW framework regarding cultural hegemony, genealogy, and social movement, which are derived from sociological theory and are useful for analyzing the phenomenon. Additionally, the reconstruction of the most relevant topics, events, and social actors that spread ZW globally in competition/alternative with the traditional system of waste collection and treatment is provided. Further, it describes the Italian case, one of the geographical contexts where the strategy has been most consolidated and where it is possible to observe more clearly both the knowledge exchange between movements and companies and the connection with the theme of republicization of local public services.

Chapter 3 describes the characteristics and perspectives of the different management models for European urban waste management operators, describing the role of different ownership (public vs. private; direct vs. delegated) in shaping strategies and targets. Further, the remunicipalization process in public service provision is described by considering some existing experiences.

Chapter 4 discusses the importance of the TBL approach in performance measurement for urban waste operators, stressing the need to measure and compare performance, avoiding the pure reference to financial and economic results. Instead, it is of utmost importance to include social and environmental results, in terms of quality of service provided, contribution to environmental sustainability, affordability of tariffs, etc.

Chapter 5 describes the key drivers of good urban waste management, that is, innovation, shared responsibility, stakeholder engagement through communication and training, and knowledge sharing, creating a growing network of knowledge shared among managers, policymakers, civil servants, citizens, and associations. These four drivers mutually reinforce each other and should

be developed synergistically by waste managers to define a sustainable waste management system, inspired by existing best practices and that could spread its advantages in benefit of citizens and local governments, beyond the territories served.

Chapter 6 develops a conceptual framework to generalize the empirical evidence and best practices described in the book. A description of the linkages among ownership and management models of waste operators, key management drivers of successful urban waste management, and performance in a TBL approach is provided in the conceptual model, highlighting the relationships among shareholders, business models, and the joint achievement of economic, environmental, and social results.

Special thanks should be devoted to all the managers, policymakers, and researchers who gave us the opportunity to realize interviews and direct visits, that participated in a focus group and a workshop giving us the opportunity to obtain relevant information about relevant best practices in waste management throughout Italy and Europe. Regarding Capannori and its public waste utility Ascit Servizi Ambientali SpA (ASCIT), we interviewed Roger Bizzarri and Maurizio Gatti, actual General Manager and Chairman of ASCIT, the publicly owned waste utility of Capannori, respectively; Alessio Ciacci, the former environment alderman of Capannori, who then became manager of several relevant waste utilities and a start-up for waste management called Minerva; Rossano Ercolini, Goldman Environmental Prize 2013, former president of ASCIT. We interviewed Paolo Contò, the executive director of the Priula Consortium that owns Contarina SpA, a cutting-edge waste utility operating in the Veneto Region, Italy; data gathered through direct interviews for studying the Contarina case were also used (Minoja & Romano, 2021); Enzo Favoino, a technical and EU waste legislation expert and researcher, with decades of experience in separate collection, recycling, composting, and prevention; Raphael Rossi, a manager that directed and administered many relevant waste utilities throughout Italy; Walter Ganapini, scientist, former Italian public manager and alderman, cofounder of Legambiente, and former president of Greenpeace Italia; Nina Sankovič and Vanja Fabjan of Voka Snaga in Ljubljana, Slovenia; Susana Lopes, technician of the International Business Unit, LIPOR, in Greater Porto area in Portugal; Andrea Weckman and Elina Mattero-Meronen, Helsinki Region Environmental Services HSY; Attilio Tornavacca, scientist and founder of ESPER; Roberto Cavallo, founder of ERICA and environmentalist activist.

Our gratitude goes to all the informants we met and interviewed for their support and for sharing with us their experiences and knowledge.

Finally, we gratefully acknowledge the support of the University of Pisa, which financed the Progetti di Ricerca di Ateneo (PRA) 2018 project "Performance and knowledge management of water and waste utilities in the Circular Economy framework," coordinated by Giulia Romano. All the members of the research team and coauthors of papers written during the two-year PRA project period, which were realized with fruitful discussions, deserve special thanks.